

A Climate for Change

An exploration towards Integral Action Loops to apply our
knowledge for sustainability success

Simon Divecha BSc (Hons)

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Abstract

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A Climate for Change addresses an integration gap - how do we make sense of sustainability and the multiple perspectives on it? It does this through four major steps. First, I introduce meta-theory and a particular type of it, integral theory. Steps two and three draw on action logics then common pool resource research to examine case studies. Finally, these areas are analysed together - the results from the case study correlations, and the meta-theory analysis, are structured through integral theory with loop learning.

At the heart of the investigation are questions of appropriate interventions and theory. In the face of multiple sustainability perspectives and practices, how can we take effective action to meet the demands we face? An *Integral Action Loop* framework is proposed as a mechanism to understand important catalysts, fulcra that can be focused on.

The scales of consideration associated with sustainability are, necessarily, expansive - from politics, cultures and across institutions, to governance and multinational corporations, global, local and individual considerations. That is, the range of theory is vast. At the same time, I would argue we need practical results to assist us with sustainability transformations.

Consequently, to manage the scale, this thesis looks at sustainability through a multinational company case study and climate change framework. However, it does so using a range of approaches - meta-theory alongside correlating theory with the cases - to understand both particular theories and the relevance of each for another.

Given the scope outlined, there is an implicit reach towards integrated approaches and a search for joined up consideration, as opposed to a list of factors, to manage through the complexity. In this light, it may be unsurprising to some that I encountered integral theory at an early stage of the work. Integral theory has guided much of this inquiry and it is tested for its usefulness. It is explicitly applied, alongside a more general meta-theory methodology, to understand the paradoxes and incongruities through which we approach sustainability. Energy efficiency, and the gap between profitable opportunities and actual implementation, is used to illustrate the usefulness of these theoretical approaches.

This integral/meta-theory examination highlights significant structures. In particular, developmental hierarchies - as represented by action logics - are prominent. Action logics is

a constructive developmental theory modelling how people make sense of the world around them. I find that these discrete stage structures are strong sustainability categories. I develop theory that correlates distinct stages to how case study senior leaders describe sustainability. Similarly, organisations can be examined for collective action logics. The company leaders describe aspirations for enhanced sustainability success in a manner mirroring later organisational stages. Consequently, by being mindful of action logics we may be able to actively design sustainability interventions with a greater likelihood of success.

Human societies have, however, successfully addressed some environmental dilemmas for millennia. Research into these outcomes is relevant with respect to today's sustainability issues and organisational actions. An examination, of data in this thesis, uncovers strong parallels between principles correlated with historic success and the case study multinationals.

These parallels, the meta-analysis of sustainability and energy efficiency, and the action logics correlations, demand integration. For institutions, there are multiple theoretical lenses describing sustainability transformation. We clearly need effective frameworks to manage between different approaches and, importantly, apply the interplay of many factors to circumstances at the various scales we are operating within. For example, underpinning factors, such as action logics, are important considerations but are they key to a particular intervention? I consequently propose *Integral Action Loops*, based on the theoretical and practical research from the integral, meta-theory, and case studies correlations in this research, as a framework that may be used to bridge gaps revealed through the course of the thesis.

Integral action loops examine subjective and objective facets and theories of change. The structure considers wide ranging individual and collective influences against the depth of change – first, second and third order. These orders correspond to directly addressing problems, through to a more fundamental shift in physical structuring and subjective meaning making systems such that the whole phenomenon is reconceptualised. That is, to facilitate change we need capacity to work across the depth of theory, as well as surface circumstances. Integral action loops may deliver clarity on interrelationships, and the influences of multiple factors on each other, to assist understanding and practice for sustainability success.

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Preface and Acknowledgements

This thesis inquiry developed from a lifelong fascination and engagement in environmental issues. I can trace my interests back to early memories, as a young child captivated by science and an awareness of the atmosphere, global warming and the need for action. Throughout my adult life, topics such as these have been an abiding passion and this is a critical support for the research - when I started, I could not have imagined how all consuming, structuring and demanding a thesis, while simultaneously working in challenging and worthwhile employment, was going to be. There is more on this journey in the last chapter. However, in the context of this introduction, there is no way I would be finishing the research now without the motivation derived from sustainability issues and the exceptional assistance of many along the way.

First and foremost this has been a shared exploration. My wife, Niki, and I embarked on doctoral studies at the same time. Extraordinarily, we look likely to finish at nearly the same time and this is substantially down to the support, insight, inspiration and encouragement she provides for me. I have needed this; there have been many personal challenges during the research, such as a two year, life-threatening, illness of Niki's eldest daughter and the death of my father - both meaning numerous emergency dashes to airports, transcontinental and intercontinental flights. Throughout this, and more, her presence, whether physically close or halfway around the planet has meant the world to me. It is fundamental to this thesis and its completion. Academically, Niki has been the source of reviews and conversations, we have explored the analysis and potential for each other's theses and she profoundly influences this work. I am deeply grateful and privileged to have

shared this journey with her and thrilled that we may soon experience a weekend unstructured by doctoral expectations!

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Declaration

I, Simon Divecha, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Simon Divecha

16 July 2014

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Chapter 1

Generating Business Sustainability Insights for Broad Application

Introduction

Everyone in the world depends on nature and ecosystem services to provide the conditions for a decent, healthy, and secure life.

Millennium Ecosystem Assessment Board, Living beyond our means: Natural assets and human well-being (2005).

The only institution on earth that is large enough, powerful enough, wealthy enough, pervasive enough, and influential to lead humankind out of the mess it's making for itself is the same institution that is doing the most damage -- the institution of business and industry, my institution.

Ray Anderson, On responsibility in the private sector (2005).

We have acquired extraordinary knowledge about the physical, biological, psychological, and sociological world. Science is increasingly expanding the domain of empirical and logical methods of verification... At the same time, everywhere, error, ignorance, and blindness advance alongside our knowledge.

Edgar Morin, On complexity (2008).

The research in this thesis is an exploration of sustainability change, business initiatives advancing such shifts and a contribution to better understand, and enable, the types of transformations we desire. With respect to sustainability, the opening quotes above illustrate the nature of the challenges we face - it is important, it is an area in which we have great knowledge, yet we are simultaneously struggling to manage change. As an example, if you are reading this opening, it is quite possible you have a sense of the urgency inherent around issues related to this topic, such as those connected to climate change. You undoubtedly know of standout transformation examples, inspirational stories of leadership for sustainability, rapid community shifts and corporate action to voluntarily address

greenhouse gas emissions. At the same time you are, most likely, knowledgeable about degradation to the earth's systems and are probably concerned about the quality of lives - yours or your family's, or of those around the world less privileged and arguably at greater risk - and care for the diversity of species threatened. These are unlikely to be academic concerns, rooted as they are in our fundamental sense of wonder and connection to those around us and our environments. Additionally, you may be motivated by the opportunity, the cascade of innovation and creativity surrounding clean technology and sustainable social systems. You may also be aware of the paradoxical nature of this problem - we have abundant evidence around the technical need and economic feasibility of change and yet, a collective, global step addressing issues such as these often, despite decades of effort, seems irrationally hard to progress.

It is these types of considerations that led me to the topics of this thesis. In particular, this research explores success. Working from multiple frameworks and areas of deep analysis, I am interested in how we are applying our knowledge and what we can learn from leading cases. This interest is centred on how our generalised experience, abstracted from theory, can be used in the types and diversity of modern day contexts that are important for the required changes. Across the breadth of my thesis, I also explore how we can integrate multiple important considerations that are relevant to sustainability shifts.

To explain further, the *Background* section below considers the evidence. This includes sustainability arguments around issues such as climate change, alongside a wealth of research and practice demonstrating feasible and viable future alternatives. To put this into a practical research context, the following *Purpose* section links a consideration of two leading sustainability company's activities with social dilemmas - an examination that may

help to apply our expertise for broader success. Additionally, this chapter briefly outlines, in the *Theoretical Framework* section, how some of the wide scope I have just described can be managed in my thesis. The *Dissertation Overview* section that follows reviews the major lines of investigation I pursue in the subsequent chapters. A *Definitions* section concludes this chapter. It provides a reference list of common terms used throughout my thesis.

Background

The science is sobering—the global temperature in 2012 was among the hottest since records began in 1880. Make no mistake: without concerted action, the very future of our planet is in peril

Christine Lagarde, Managing director of the International Monetary Fund (2013).

The estimated economic loss of the 2011 Thailand floods... was US\$ 30 billion, and of Hurricane Katrina US\$ 125 billion; meanwhile, the 2003 European heat wave resulted in more than 35,000 fatalities and the Horn of Africa droughts in 2011 claimed tens of thousands of lives and threatened the livelihoods of 9.5 million people. More recently, Hurricane Sandy left a heavy bill, estimated today at over US\$ 70 billion for New York and New Jersey alone.

Global risks 2013 report, World Economic Forum (2013)

There is a clear need for major changes to sustain future human generations and the ecological systems required to support ourselves. This is widely documented from physical perspectives, such as avoiding dangerous climate change (Garnaut, 2009; IPCC, 2007c; Schneider, 2001; N. H. Stern & UK Treasury, 2007b) and supported by the latest science. For example, the 20th Century has been the hottest in 1400 years (Ahmed et al., 2013) and there are impacts that are consistent with climate change (Karoly, England, & Steffen, 2013; S. C. Lewis & Karoly, 2013; Steffen & England, 2012; Westra, Alexander, & Zwiers, 2013). The current Ecological Footprint of the world - which measures humanity's consumption and

waste - finds that we are running a deficit each year, i.e. using more land and sea resources (biocapacity) than is available from this planet (Wackernagel et al., 2002; Wiedmann & Barrett, 2010). This is reflected as unprecedented global ecosystem pressure taking us to the “*edge of a massive wave of species extinctions*” (Millennium Ecosystem Assessment Board, 2005).

At the same time standout changes - dramatically cutting the environmental impacts from human activities and consumption - are documented. Examples include: a factor of five reduction in environmental impact per unit of economic activity (von Weizsäcker, Hargroves, Smith, Desha, & Stasinopoulos, 2009); northern Sweden policy to eliminate fossil fuel use by 2020 (L. R. Brown, 2006; Senge, Smith, Kruschwitz, Laur, & Schley, 2008); comprehensive analysis to end USA oil dependency while generating profits, jobs and security (Lovins, 2005); and, numerous case studies and examples of effective, profitable, sustainability change globally (e.g. Banuri & Najam, 2002; Carbon Disclosure Project, 2005; Divecha, Whitfield, Ball, & Carre, 2009; Hargroves & Smith, 2005; Hawken, Lovins, & Lovins, 1999; PricewaterhouseCoopers, 2010; Senge et al., 2008; The Climate Group, 2005; von Weizsäcker, Lovins, & Lovins, 1997). On an aggregate basis, climate smart development can simultaneously “*build prosperity, end poverty and combat climate change*” with annual GDP benefits of between USD 1.8 and 2.6 trillion by 2030 (World Bank, 2014).¹

¹ These figures are based on three case studies, in six regions, with the benefits likely to be underestimated. However, the analysis does not extend past 2030. Overall, it is generally considered that addressing sustainability issues, such as climate change, will mean some economic costs (Garnaut, 2009; N. H. Stern & UK Treasury, 2007b). The costs are not necessarily as significant as they may at first appear. Nicholas Stern estimated that 1 to 2% of global GDP is sufficient to address climate change (DARA, 2013; DARA & The Climate Vulnerable Forum, 2012; N. H. Stern & UK Treasury, 2007b) however there are offsets such as those derived from cutting fossil fuel subsidies and prosperity and health benefits. For example, the IMF finds that 2.7% of

Despite this evidence, worldwide greenhouse gas emissions continue to grow (Bernstein et al., 2007; IPCC, 2001) with carbon dioxide concentrations higher now than at any point in the last 650,000 years (Brook, 2005) and there are other environmental losses.² This is occurring despite substantive analysis that it is in our interests to address these issues (Azar & Schneider, 2002; Garnaut, 2009; Millennium Ecosystem Assessment Board, 2005; N. H. Stern & UK Treasury, 2007b).

There are direct economic drivers for greenhouse gas reduction including profits, such as from saving energy. Globally, profitable emissions cuts have been calculated at 5 billion tons - out of an estimated 40 billion tons of required reductions (Enkvist, Nauclér, & Rosander, 2007). On a broader basis, within businesses, the financial returns of 'carbon performance leaders' are double those of the non-leaders average (Carbon Disclosure Project, 2012).

Beyond direct fiscal opportunities, there are many other reasons to act on climate change and sustainability.³ For example, the economic impact of human activities can be quantified - USD 6.6 trillion of environmental damage in 2008, 11% of that year's global GDP (Mattison

global GDP subsidises greenhouse gas emitting fossil fuels (Lipton, 2013). Similarly, the International Energy Agency found global subsidies for fossil fuel stood at USD 312 billion in 2009 versus approximately USD 57 billion in subsidies for renewable energy (IEA, 2010). In Australia, Riedy (2005) calculated there are 9 billion dollars of subsidies every year. Out of this total figure, around 5 billion is perverse – that is, such subsidies not only encourage greenhouse emissions but also reduce economic efficiency. Regardless of an exact reconciliation between these perspectives, the overall point around numbers such as these is that profitable opportunities for change are significant. Costs, related to sustainability, are often cited as a reason that action is not undertaken yet profitable opportunities are also not pursued - making this contradiction something of a paradox.

² There are many measures illustrated by metrics such as forest decline (United Nations, 2002; World Resources Institute, 2010), increasing ecological footprint deficits (Wackernagel et al., 2002; Wiedmann & Barrett, 2010) and, decreasing biodiversity (Hails, Humphrey, Loh, & Goldfinger, 2008).

³ Climate change, in this thesis, is treated as a particular subset of our sustainability challenges. It reaches globally, effects everybody and needs worldwide, as well as localised, responses.

et al., 2010). The expenses to prevent or limit the causes of the damage - water and air pollution, greenhouse gas emissions, general waste and depleted resources – were generally less than the actual damage incurred. Beyond economics, physical issues are apparent for many resources such as fish stocks - at least one quarter are over-harvested and fish catch is now declining (Millennium Ecosystem Assessment Board, 2005). In agriculture, overproduction degrades an area of soil larger than China and India combined (Reid et al., 2005; Senge et al., 2008). On climate change alone, disease increases are already attributable to temperature rise (Costello et al., 2009; Patz, Gibbs, Foley, Rogers, & Smith, 2007) while there are clear ethical, social and justice reasons for addressing emissions (Gardiner, 2004; Grubb, 1995; Singer, 2006). In the future, problems are predicted to significantly increase and substantial responses are required (Garnaut, 2009; IPCC, 2007a; Smith et al., 2009; N. H. Stern & UK Treasury, 2007b).

While worldwide agreement on action is elusive, some institutional responses are strong. A subset is business-specific actions including voluntary environmental and/or social programs (Leigh & Waddock, 2006; Potoski & Prakash, 2005; Prakash, 2000a). These extend to net zero emission (carbon neutral) business policies (e.g. HSBC, 2004, 2008; Kleiner, 2007; PricewaterhouseCoopers, 2008). Of particular interest is the fact that many business actions are voluntary. The businesses are not regulated to undertake such change. The changes involve some costs - labour, time, capital and operational expenses etc. - notwithstanding the positive impacts that may accrue for both the company and individuals. A broader understanding of why such voluntary initiatives arise may assist us to enable similar action - particularly in light of the fact that the profitable opportunities have been documented for

well over a decade and implementation appears to be very slow. This is a key reason for undertaking my thesis research.

Purpose

Business has become the most powerful institution on the planet. The dominant institution in any society needs to take responsibility for the whole. But... business now has to adopt a tradition it has never had throughout the entire history of capitalism: to share responsibility for the whole.

Richard Barrett, *Liberating the corporate soul* (2006).

The *Background* section above outlines a pressing need to shift our society onto a more sustainable footing. Collective action is inherent with respect to such shifts and we consequently face a social dilemma – individuals, groups, business or countries could free ride on the efforts of others to the perceived detriment of the sustainability leaders. With respect to such collective action, however, there are large knowledge gaps. Nobel Prize winner Elinor Ostrom succinctly summarises challenges saying: *“if political scientists do not have an empirically grounded theory of collective action, then we are hand-waving at our central questions. I am afraid that we do a lot of hand-waving”* (Ostrom, 1998).⁴

Given the collective action challenge - alongside evidence that individuals and institutions undertake voluntary actions such as carbon neutrality - I examine the contexts enabling these activities, policies or programs. Understanding sustainability from a business frame, while considering a broad range of analysis relevant to such issues and success, may help fill gaps in our collective action knowledge. Additionally, this should assist to replicate such successes.

⁴ Elinor Ostrom shared the The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in 2009, with Oliver E. Williamson, for her work on economic governance and the commons.

To undertake this work my thesis focuses on two major multinational companies - a building and land development company and an insurance company. These two organisations are commonly regarded as leading sustainability institutions with prominent green buildings and developments, supply chain and customer sustainability oriented services or public advocacy on climate change.

Sustainability has many facets - a few of these, economic and social were illustrated in the previous section. Consequently, there are global and local influences, group and personal preferences and biases, intersecting scales of governments, markets and many more factors to consider - theoretically and practically - in relation to this topic. To approach the breadth of this work my research uses three principle theoretical approaches, meta-theory, integral theory and mid-range theory. These are briefly introduced in the *Theoretical Framework* section below.

Theoretical Framework

Sustainability and Mid-range Theory

We are faced with an extraordinary situation. Never before in the history of the world has the viability of much of the life on this planet been under threat from humanity

Dexter Dunphy, Alan Griffiths and Susan Benn, Organisational change for corporate sustainability (2003 p3)

Meeting the sustainability challenge will require the kind of cross-sector collaboration for which there is still no real precedent. Business, governments and NGO's will increasingly confront sustainability problems for which isolated efforts are inadequate. ...

Peter Senge, Benyamin Lichtenstein, Katrin Kaeufer, Hilary Bradbury and John Carroll: Collaborating for systemic change (2007).

Sustainability can encompass many different approaches and perspectives depending on whether it is discussed from an organisational, society-wide or individual viewpoint. Even within a particular sector, such as a business, there are multiple ways in which this concept is understood (Pezzey, 1997). These may be particularly dependant on an individual's, organisation's, government's or international body's sustainability focus or span diversity concerning 'what we are trying to sustain, for whom and/or what, and for how long' (Varey, 2004). Consequently, the scales considered - time, geographic and group - can vary widely.

This variation can be both objective measured considerations as well as more subjective ethical, motivational, interactional, behavioural, cultural and physical dimensions (e.g. Dietz, Ostrom, & Stern, 2003; Garriga & Melé, 2004; Lingl & Carlson, 2010; van Marrewijk, 2003). Additionally, in a globalised world, international and local influences intersect - global cultural phenomena, ethical arguments, markets and more (e.g. Friedman, 2005; Senge, 2008b; Singer, 2006) may all be relevant to any particular sustainability intervention and its success. Collective considerations run alongside individual perspectives and there are many standout leaders - around the business field Hunter Lovins, Peter Senge, Ray Anderson and Janine Benyus to mention only a few (Anderson, 2009; Benyus, 1997; Hawken et al., 1999; Senge, 2008b). Consequently, from individual inspiration to global climate models, organisational norms to globalised markets, historic success matched against future vision, a wide range of conceptual scales is relevant to this topic.

As mentioned in the section above, my research uses the three principle theoretical approaches In order to manage this scale - meta-theory, integral theory and mid-range theory. Mid-range theory, in my thesis, defines a class of theory relevant to specific phenomena - in particular the two multinational companies that are case studies for this

work. Theory, in this class, is applied to understand the circumstances around sustainability and the success of programs -as described in interviews with company leaders. An example, of this type of theory, is that developed from common pool resource research and used to understand the type of collective action problems outlined in the preceding *Purpose* section. With respect to business sustainability, contributing to the common good, similarities and correlations between such resource success and company initiatives can be investigated with this type of theory.

Meta-theory and integral theory are introduced in the subsection below.

Meta-theory and Integral Theory

We are constructing an artificial global system within a preexisting natural one. It is easy to forget that the industrial system as a whole, as it is now structured, depends on a healthy natural global ecosystem for its functioning.

Hardin Tibbs, *Industrial ecology* (1992)

Sustainability is not only a very suitable topic for demonstrating the utility of a metatheory for organisational transformation, but... a metatheoretical approach is also urgently needed within the field of sustainability research itself.

Mark Edwards, *Organizational transformation for sustainability* (2010)⁵

Meta-theory, as the name implies, means abstracting theory from examining other theories and models, looking for the synergies, conflicts and generalities to develop a holistic overarching framework. It can help to synthesise, structure knowledge, control for biases and place mid-range theory in a wider context (Edwards, 2009 p39; Finfgeld, 2003; Paterson & Canam, 2001 pp91-95). Consequently, applying meta-theory across the scale of concepts

⁵ Note: Throughout my thesis Australian English spelling is used, including in quotes, except when other English forms are part of the title of a text.

discussed in the preceding subsection should enhance understanding. To illustrate the potential, a particular type of meta-theory, integral theory, is introduced below.

Ken Wilber (2000c, 2005) argues that the sum of human knowledge can be used to find critically essential keys to explain physical, psychological and metaphysical realms and that a composite map of such knowledge can *“turn out to be surprisingly simple and elegant”* (Wilber, 2007 p16). Wilber calls the resulting map ‘Integral Theory’. Integral theory encompasses the growth and evolution of today’s society from both individual and group perspectives. It holds that for any given phenomena there are four quadrants – individual and collective mapped over subjective and objective. Development can occur in stages across each of these quadrants, for different aspects of any whole (lines) and transitory states (e.g. conscious and unconscious), along with enduring types (e.g. Myers-Briggs personality style), completing the picture. Integral theory proposes that these 5 elements – quadrants, levels, lines, states and types – can be used across human issues (Wilber, 2000a, 2000c, 2005). The theory’s ability to add explanatory power, and if this enhances our ability to act on sustainability issues, are questions for this thesis.

Integral theory can be, and is, applied to sustainability and related topics including leadership, management, organisations and future studies. For example, McCauley, Drath, Palus, O'Connor and Baker (2006) argue that integral theory, applied to leadership, could expand the scope of research such that it encompass complex social interactions and more holistic perspectives. Chris Riedy (2005), Barrett Brown and I (2013b) and Richard Slaughter (1998) argue that an analysis of sustainability based on objective measured criteria alone (e.g. economic cost) is limited - incorporating human considerations, such as motivation and worldviews, is critical (Esbjörn-Hargens, 2010b; O'Brien & Hochachka, 2010). Combining

objective perspectives, with the more subjective aspects of society, is important for better outcomes - social processes are necessary to implement technological solutions (Bradbury, 1998). Many of the arguments throughout my thesis expand on this theme.

Integral theory is used across extensive fields with an estimated 35 to 50 academic disciplines using this framework in applied, conceptual and theoretical endeavours, including constructive critiques and development of theory along with the application of it (Esbjörn-Hargens, 2010d; Forman & Esbjörn-Hargens, 2008).⁶

Using integral theory's quadrants, stages, lines, states and types can help to clarify relationships, surface under emphasised factors and structure disparate conceptualisations against each other for a deeper understanding. As a meta-theory, it can be applied to and categorise phenomena - including theories and the concepts that are used with such models. This organising ability, and the clarity that may arise from it, lead to the use of these types of theories in my research.

⁶ Examples include: adult development and play (Gordon & Esbjörn-Hargens, 2007); integral ecology (Esbjörn-Hargens, 2005), broad application to leadership research (Pauchant, 2005), management, organisations, leadership and change (Barrett, 2006; Benefiel, 2003; Cacioppe, 2000; Cacioppe & Albrecht, 2000; Cacioppe & Edwards, 2005a, 2005b; Edwards, 2005; Küpers, 2005, 2008; Landrum & Gardner, 2005; Laske & Maynes, 2002; Locander, Hamilton, Ladik, & Stuart, 2002; Neal, Lichtenstein, & Banner, 1999; Paulson, 2002; Reams, 2005; Scharmer et al., 1999; Volckmann, 2005; J. E. Young, 2002); management and sustainability (Gladwin, Kennelly, & Krause, 1995, 1996; Waddock, 2001); management more generally (Landrum, Gardner, & Boje, 2013; Robledo, 2013); software (Millar, Choi, Russell, & Kim, 2005); development (Hochachka, 2005, 2008; Irwin, 1996); complexity (Dent, 1999); scenario analysis (C. C. Stewart, 2008; Tourki, Keisler, & Linkov, 2013); futures (Riedy, 2008; Slaughter, 2003; Voros, 2008); spirituality and business (Dean, 2004; Pielstick, 2005; Steingard, 2005); collaborating (Chesterman, 2001); education (Davis & Callihan, 2013; Haigh, 2013); sustainability assessment, water and social systems (Akiyama, Li, Kubota, Konagaya, & Watanabe, 2012); development and literacy (Gómez, 2008); climate change, understanding, adaptation and transformation (Esbjörn-Hargens, 2010c; O'Brien, 2012; O'Brien & Hochachka, 2010; Riedy, 2011a); psychopathology (Ingersoll & Marquis, 2014) and many more areas such as art, criminology, environmental philosophy, intersubjectivity, medicine, music therapy, politics, psychotherapy and counselling (Esbjörn-Hargens, 2006b).

Dissertation Overview

This chapter introduces the importance of sustainability alongside the high levels of evidence that practices should change - for example, through deep and significant cuts to human greenhouse gas emissions. I also provide an initial overview of the topics I address in this thesis and pose broad questions related to these.

Chapter 2 discusses the methodology used throughout my thesis. It details the three major approaches - mid-range theory, meta-theory and integral theory. To illustrate relevance the relevance of the methodology, I use a practical example throughout the chapter - profits associated with greenhouse gas reductions and the paradoxical lack of implementation around these opportunities. Additionally, the chapter provides a background on the two multinational companies that form the case studies of my thesis and discusses how theory is developed and applied throughout this research.

Chapter 3 develops meta-theory and integral theory to examine its explanatory power around sustainability topics. In order to do this, I focus on a particular paradox around the implementation gap related to energy efficiency. The chapter examines the conceptual lenses associated with theories, used to examine issues related to the efficiency gap, and considers how integral theory can help order and sort the resulting frameworks.

Chapter 4 investigates an aspect of integral theory and one highlighted in the Chapter 3 review as a mediating structure - it looks at a framework that is likely to be underpinning approaches to sustainability as examined through the energy efficiency gap. These are developmental stages and a particular group of theories describing such stages, known as constructive developmental theory, is outlined. In my thesis, I refer to this group by a specific term, action logics - constructive developmental theory associated with businesses

and individuals. I examine how action logics can help us to understand sustainability responses and I correlate this theory, it models stages of discrete meaning-making, to how case study interviewees express sustainability initiatives - or the engagement undertaken at the companies to realise sustainability change. The chapter considers how these correlations can help to replicate and deliver successes.

As discussed, there are wide ranges of factors that are relevant for sustainable outcomes and this diversity naturally drew me to research documenting effective sustainability over long time periods. Additionally, the nature of sustainability as a social dilemma (see the *Purpose* section above) points at the broad work around common pool resources that is used to investigate how such difficulties have been overcome. Chapter 5, consequently, discusses how this research is used with business sustainability initiatives, as well as global scale issues such as climate change. I investigate if business sustainability efforts are mirroring the types of conditions present when groups voluntarily and successfully maintain a resource (known as a common pool resource). There are a multitude of examples under which voluntary resource regimes have been successful over decades and centuries. There is evidence today that such systems can be as, or more, effective than government intervention in certain circumstances.

A feature of my thesis is integrating human perspectives alongside the sorts of more physical conditions commonly described around resource and sustainability management regimes. Such an approach is mirrored by a number of researchers who examine organisational sustainability through stage models and develop these with a range of other theories, such as that related to stakeholders. Additionally, whole organisational development models exist. Consequently, to understand the relationships between

concepts, Chapter 6 re-examines theoretical lens sets from Chapter 3, alongside those related to organisational transformations for sustainability. To consider the relationships between lenses, integral theory quadrants are used alongside the frameworks of single, double and triple loop learning. This examination reveals depth - some concepts, such as developmental stages, correlate at a triple loop level describing the reconceptualisation of phenomena and organisations. To evaluate this in a practical sense, related to the two company case studies, I correlate how the interviewees discuss their institution's sustainability aspirations against action logics organisational stages.

Chapter 7 concludes this work through considering the importance of the interplays between all the theoretical perspectives and empirical correlations found across my thesis research. It proposes *integral action loops* as a framework that can help us to initiate and integrate change, across subjective and objective understanding, relating to ourselves and communities, what we are becoming, to the challenges we are answering in realising sustainability futures.

The integral action loops emerge from the data and analysis throughout my thesis research. The proposed framework consequently is a fruitful area for future research, as well as application. I propose action research, engaging businesses, communities, theorists, leading institutions and practitioners, holistically around depths of sustainability transformation, is likely to be much more manageable through elegant modelling and that the integral action loops can help to do this. Chapter 8 discusses such opportunities.

The afterword, Chapter 9 offers my perspectives on the research I have undertaken. This work developed from long standing participation in environmental and sustainability issues across non-government organisations, leading international campaigns, developing cutting

edge business sustainability programs and working in academia with outstanding researchers and empirical scientists. I hope the research journey I describe, and the foundations for it, is useful for others considering investigating topics of this nature.

Definitions

Action logics - This is a system categorising how individuals understand phenomena and themselves. Chapter 4's *Theory Underpinning Constructive Development and Action Logics Model* sections outline the theoretical base for this model, which describe a set of stages that form an overarching system of meaning-making, correlating to how we make sense of and create our realities. These stages are hierarchical with each advancing step transcending and including previous levels (Cook-Greuter, 1999; McCauley et al., 2006).

Collaboration - Processes through which individuals and organisations, seeing different aspects of a problem, explore the differences and search for solutions beyond the current vision of what is possible. This collaboration can achieve (otherwise unattainable) objectives (Blume, Karell, & Outhwaite, 2006; Gray, 1989; Lasker, Weiss, & Miller, 2001).

Common pool resources – A resource (such as a regional ocean ecosystem) that a large number of people can access and where overuse would create problems and/or degradation of the resource or the benefits derived from it (Dietz, Dolšak, Ostrom, & Stern, 2002; Ostrom, 1990).

Free-rider problem – A problem that occurs where users of a common resource benefit from that resource, without paying for or contributing to its upkeep. If it is not practical to

exclude a user from a resource, or get it to contribute to the upkeep of the resource, the user is called a free-rider. (Dietz et al., 2002 p19).

Holon - Any whole that is a part of another whole (Koestler, 1967; Rentschler, 2006).

Institution - Broadly defined as any scale of group that organises and structures interactions, especially, in relation to this research, those that are related to common resources. Such institutions include families, regions, neighbourhoods, private associations, communities, businesses, non-government organisations, markets, statutory authorities and local, state and national governments at all scales (Ostrom, 2005 p3).

Integral action loops - a framework for considering the profundity of transformations, social and science theory, practice, phenomena and structures against how different approaches, opportunities and analytical focuses may play together and influence each other.

Understanding of such dynamics and interplay may assist investigations and interventions to enable a flourishing of sustainability outcomes.

Meta-theory – Encompassing theory that takes an overarching perspective of more specific theories and is constructed from and tested by the analysis of other theories (Edwards, 2009 p38; Gioia & Pitre, 1990).

Paradigm – A perspective reflecting a general way of thinking about a fundamental set of assumptions, theories and/or methods (Gioia & Pitre, 1990; Mingers, 2001).

Paradox - The term is used to describe a contradiction that is “socially constructed when people frequently simplify reality into polarised either/or distinctions in order to make sense of an increasingly intricate and ever-changing world.” (Caprar, Gao, Haezendonck, Pinkse, & Tams, 2010 pp146,147).

SCT - Sentence Completion Test, written assessments used to gauge the stage of development or action logics - the manner in which an individual is likely to express him or herself, or make-meaning of phenomena, is correlated to levels returned from these tests.

Social dilemma - Circumstances in which the (so called) 'rational' choice of an individual is to maximise their own benefit from a common pool resource. However, with limited resources this can result in less for everyone including the individual. A classical understanding of this is that the individual is trapped without the ability to change the circumstances for themselves (Kollock, 1998; Ostrom, 2010a).

Values and worldviews - these two concepts are often used interchangeably. Broadly, the terms refer to primary deep-seated principles and preferences that guide actions, judgements and choices. They are socially mediated and have a cultural context with values regarded as distinct although inextricably linked to worldviews (A. Hedlund-de Witt, 2013 p348; K. O'Brien, 2009) - see *Worldviews and Development Levels* section of Chapter 4 for details on the worldviews and values distinctions.

Chapter 2

Methodology, Mid-range Theory, Meta-theory and Integral Theory

Introduction

One thing very unique about sustainability issues is that they typically involve tensions or contradiction of some sort, such as responsibility/costs, legitimacy/efficiency, social considerations/economic calculations, as well as society/business in general.

Dan Caprar et al., Academic Theory (2010 pp146,147)

This chapter discusses the range of methods and theory used throughout the thesis. The scales and perspectives that my thesis considers are substantial and consequently multiple methodologies are required. I am seeking to understand the components that lead to sustainability action. Considerations range from how individuals within companies personally view sustainability to perspectives on their organisations. This includes what they may see as (personal to global) enabling factors - interrelationships and influences that may mediate successful initiatives.

Sustainability and climate change related issues are inherently complex. Within an organisation, this can be closely linked to individuals (such as leaders), organisational policy, stakeholders, customers, layers of governance frameworks within which the organisation operates, and broader social and economic drivers (Divecha & Brown, 2013a; Edwards, 2009; Esbjörn-Hargens, 2010c). The scope that can be considered is broad. It includes geographic and physical scales, social, economic and environmental valuing, as well as timescales, history and future orientation.

These factors are outlined in the first section of this chapter, *Rationale, Focus and Need*. The section reviews this study's background concepts arguing that the range of issues inherent

within them require research on several levels. That is, there are collective and individual beliefs to consider. Moreover, the expectations or perspectives that make up these perceptions may be conscious and/or based on data or, equally, unconscious or unquestioned. When phenomena and theory in this section are compared to each other, some are paradoxical. Consequently, building, applying and testing theory to consider these issues should enable a better understanding.

To cater for the broad scope and perspectives, the *Methodology Outline* section discusses approaches needed to undertake this work and how these relate to each other. The section describes the three major theory perspectives used in this research - mid-range, meta and integral. These can be regarded as two classes of theory, mid-range and meta-theory, alongside a particular meta-theory - Integral Theory.

The first class, mid-range, is primarily used with (and developed by) interacting with other theories of this nature and data. The case study material in my thesis is an example of such data and is examined with relevant methods. The *Mid-range Theory* section outlines the research, describes this class of theory and discusses how it is applied in this thesis.

Mid-range theory also interacts with and is informed by meta-theory. Meta-theory, and the associated methodologies, aims to clarify the relationship between theories that deal with specific phenomenon (mid-range theories) with the aim of creating an encompassing big-picture framework. The *Meta-theory Rationale and Methodology* section of this chapter describes and defines meta-theory. This section argues that meta-theory can be applied to the material in my thesis and that doing so will help clarify how organisations engage in successful sustainability initiatives. That is, the meta-theory analysis helps to highlight

relationships between mid-range theory applied to sustainability and the way in which such theories interact with the material in my thesis.

Early literature reviews, initial data and my experience during the design phase of this research suggested that a particular meta-theory, integral theory, could bring clarity and understanding to the topics I explore in my thesis. Consequently, the *Integral Theory* section describes this theory and outlines how it is applied in this research.

These three major methods are each discussed in detail in the relevant sections. Please see the *Dissertation Overview* section in Chapter 1 for the main research areas considered using these theories throughout my thesis.

Rationale, Focus and Need

Theory, for theory's sake, can easily degenerate into an uninteresting art form. Yet, practice without theory can quickly become a dull and dangerous occupation. Unfortunately, the world is a complicated place and complicated solutions and processes are often required...

John Wacker, A Definition of Theory (1998)

All models are wrong. Some models are useful.

George Box, Robustness in the strategy of scientific model building (1979 p202; cited in Dietz & Kalof, 2009 p6)

The substantial environmental challenges our society faces are outlined in the *Background* section of Chapter 1 - at face value there is more than enough evidence to quickly act, implementing sustainability changes that are collectively within all of our interests.

However, change is far slower than is desirable or justified - especially in light of the substantive risks created by the level of environmental change already underway, or locked-in, from factors such as human greenhouse gas emissions. Such emissions persist in the

atmosphere for decades and consequently avoiding these risks means early action.

However, over the decades to date such action has not occurred at sufficient speed, despite knowledge of the risks. Evidence is seemingly insufficient to enable action and, despite many advancing theories about the reasons for this, the situation remains something of a puzzle against background claims of rational human logic.

A case example highlighting this puzzle is an emissions, energy and economic paradox around efficiency. Globally and locally, energy efficiency opportunities are implemented at a rate that is significantly less than should be expected. A paradox arises as significant parts of business and society believe we will act to maximise profits, for example in accord with economic theory assuming rational choices, and this view is prominent in a great deal of climate change discussion within contemporary society (for example see Biggart & Lutzenhiser, 2007; Parnell & Larsen, 2005; Slovic, 1995; Toke, 2000). However, a substantial evidence base demonstrates that profitable, low-risk, energy efficiency change - change that can mitigate greenhouse gas emissions - is not implemented. This case is expanded on in detail in Chapter 3.

The energy efficiency example is demonstrating a broader issue – relatively simple conceptualisations, such as ‘we will act when it is in our financial interest to do so’, can obscure the complexity that is associated with climate change action. For example, humans are often viewed as ‘rational’ beings motivated to maximise short-term individual benefit (Sen, 1977). However, in reality, we consistently make many decisions for the common good (Ostrom, 1998, 2010a). Motivation for environmental action is much more complex than being purely based on economic interests (Kollmuss & Agyeman, 2002; Simon, 1979). Direct measurable factors such as profit and a broad range of subjective factors, perceptions and

values influence the establishment, delivery and success of these initiatives. Cultural, behavioural and emotional, preconceptions and mindsets - the ways in which we make sense of information we receive about the world around us - and many other subjective and deeper level influences are important (Ballard, Reason, & Coleman, 2010; Hoffman, 2010; Hoffman & Henn, 2009; Kegan & Lahey, 2009; Shellenberger & Nordhaus, 2005; N. H. Stern & UK Treasury, 2007b p381).

While this complexity is not surprising, understanding and navigating it is important. This is true for overcoming broader sustainability and climate change social dilemmas as well as the particular case outlined on energy efficiency. For example, the evidence that humans will take action for the common good, and not solely within their own individual interest, is strong. It is the subject of further discussion in my thesis, particularly in Chapter 5 on social dilemmas and common pool resources. However, while there is a substantive body of work on such issues, it is far from the only significant theoretical approach relevant to sustainability.

An example from the *Background* section of Chapter 1 provides an additional illustration. The section discusses unrealised profit and touches on broader contexts such as subsidies to fossil fuels. These subsidies, on a global scale, are of the same order as funding required to address carbon emissions. We could cut fossil fuel subsidies with net positive economic, climate and sustainability outcomes (Burniaux & Chateau, 2011).⁷ Energy efficiency is a similar conundrum. Both efficiency and subsidies are commonly discussed as a subset of

⁷ Note this assumes that an appropriate proportion of the economic gain is directed into clean energy and other sustainable initiatives. This appears to occur but explicit intervention to counteract the Jervons effect may be necessary. The effect describes resource climate and waste impacts that can occur from the economic activity enabled by cost savings through efficiency (Herring, 1999).

effective action on climate change (e.g. Garnaut, 2009; N. H. Stern & UK Treasury, 2007b). Consequently, understanding why groups or individuals do not act to maximise profit, or implement zero and negative cost change, such as may occur from addressing subsidies and efficiency, may assist in understanding related climate and sustainability issues.

Multiple perspectives on these issues inherently involve examining factors past the immediate and obvious, measurable and technological. The *Energy Efficiency Theory* section of Chapter 3 explains this in more detail. For the purposes of this methodology chapter, however, it is important to note that we are asking people, groups and global society to change the ways in which they think and act and this is a substantive challenge (Argyris, 2004 p10; Kegan & Lahey, 2009). The list of barriers and drivers is extensive and, while it includes responses such as our society is beholden to vested fossil fuel interest, much more may lie beneath such explanations. This may include (adapted from Ballard et al., 2010) a range of individual and social concerns such as:

- Awareness of climate change and a meaningful understanding of probability as it relates to the likelihood of climate impacts affecting what a person cares about and/or values. For some, such probability could include substantially under-valuing future price increases to impact decision making on energy efficiency today (e.g. Gillingham, Newell, & Palmer, 2009; Hardisty & Weber, 2009).
- Values and approaches that may prioritise action in a particular manner or area over the likelihood of others being motivated by such factors - e.g. Norwegian Saami reindeer herders concern for snow cover - or, from a broader perspective of different outlooks, hierarchical or egalitarian values that may emphasise avoiding disruption over addressing inequality. For others, this could include prioritising

global ethical concerns over impacts on others less responsible for the problems and less able to manage them (e.g. Marco Janssen & de Vries, 1998; K. O'Brien, 2009; O'Brien & Wolf, 2010; Singer, 2006).

- Fear of potential climate change impacts and disengagement from addressing the whole area, including energy efficiency (e.g. O'Neill & Nicholson-Cole, 2009).
- The capacity any individual feels they have to effect meaningful change. For example, people may feel that their individual impacts, whether at home or for a significant company, are only a drop in the ocean and so of no overall significance (e.g. Swim et al., 2009 p131).
- Global scales over long time periods – the impacts of climate change can occur well into the future, and on people significant distances from the person making a subjective assessment about impacts (e.g. Swim et al., 2009 p128).
- Vision – ability to inspire and implement energy efficiency and change (as well as action on climate issues more generally) can be catalysed through demonstrating (at an emotional level as well as technical) the futures this can create. Conversely, absence of such positive connected visions make progress difficult (e.g. D. L. Meadows, 2006).
- Levels of ego development, action logics and the unfolding of human development through distinct stages. This is a substantively discussed area in this thesis, see chapter 4 (and see, for example, Boiral, Cayer, & Baron, 2009; B. C. Brown, 2012a; Divecha & Brown, 2013b).
- Multiple intelligences and disparate 'lines' of understanding along with the need to present sustainability and climate issues in manners that are most likely to be

understood by some distinctly different audiences such as the science community versus those prioritising artistic or experiential understanding (e.g. Lloyd, 2009; Riedy, 2009).

In addition to these subjective individual influences, the groups we belong to, and organisations we are associated with, shape our responses. For example, there is an extensive body of work on management and organisation culture – particularly developed from Edward Schein's (1990) research. From a developmental perspective, organisational levels are described generally for groups and specifically for sustainability (e.g. Ballard et al., 2010; Barrett, 2006; Dunphy et al., 2003; Torbert et al., 2004). Such developmental stages can also influence individual responses and group and organisational stages are discussed in detail in Chapter 6. Additional factors include distinct cultural or sub-cultural groups holding shared positive environmental values and these group attitudes enabling climate action (Ballard et al., 2010; Swim et al., 2009). Ballard et al. go on to outline other society organisation and/or community phenomena that shape, without direct or apparent effort, climate change responses. These include shared mindsets, cultural theory and social constructions of environmental risks.

The perspectives above are clearly numerous and are only representative of the number of approaches that could be used to address these topics. Clearly, it would be very difficult to encapsulate all of this, and the relative priorities of each different perspective, without some organising frameworks. This has led to the mid-range theory, meta-theory and integral theory lenses used in this thesis.

This theory analysis effort is informed by John Wacker (1998) who lists three broad rationales for theory development. Firstly, theory provides a framework for analysis so that

we can more readily compare differences of opinion and clarify the relative benefits of different approaches – these different opinions and approaches are apparent in the energy efficiency discussion above. Secondly, theory can help us use methods that are more efficient and reduce errors when we try to solve problems – by building on current theory. Through developing or refining a ‘single integrated body of knowledge’ we are able to more clearly differentiate between competing (or seemingly mutually exclusive) theories. Thirdly, theory can provide clear explanations to use in practice – good theory advances our knowledge, focuses research and investigation on critical questions and creates understanding (Van de Ven, 1989; Wacker, 1998).

Wacker’s principles, applied across the broad scope of sustainability and climate change, informed the choice of theory categories used in this thesis. Meta-theory is a significant method through which differences of approaches across theories can be evaluated. Integral provides a clear logical structure and, among other outcomes, manages the significant scale of theory and information related to this research. Both categories offer potential through which synthesised and prioritised interventions can be designed. In addition, alongside mid-range theory, these theories allow frameworks to be built to understand effective sustainability action - a structured interplay between these approaches helps to refine and differentiate what is important within particular contexts.

The next section, *Methodology Outline*, details the different frameworks touched on above and explains the application of these classes of theories.

Methodology Outline

Managing transitions towards a pre-defined goal (e.g., sustainability) is very difficult and, for a single actor, even impossible to pursue, because of the interdependence between multiple actors and the role of autonomous developments in the socio-technical landscape.

Rob Raven, Niche accumulation and hybridisation strategies in transition processes towards a sustainable energy system: an assessment of differences and pitfalls (2007)

There are multiple scales over which issues of sustainability, climate change and energy efficiency need to be examined within the context of my thesis and its two case study organisations. The preceding section builds on a general discussion of sustainability, and issues related to it, suggesting that different types of theory were required. The purpose of this section is to provide an overview of how such theory approaches fit together, detail the distinctions between them and further demonstrate the relevance to the thesis topics.

My thesis' case study organisations provide a more specific illustration of the scale and scope issues. The organisations are influenced by external events, are multinationals operating in several countries, have historical legacies and future aspirations, have charismatic individuals who have been involved with the organisations at different times, engage with governments and international fora, work with the wide diversity of stakeholders and suppliers, are engaged with customers, as well as are driven by - and influence - the purchasing behaviour and decision-making of customers. Consequently, individual and group considerations are relevant. Similarly, localised conditions, as well as national and global pressures and motivators, will affect decisions.

There is a wide diversity of theory that looks at this cross-disciplinary field. This includes psychology, business, social science and economics - with many sub disciplines in each area; plus physical science and engineering all have relevance, at different degrees, to the subject

at hand. That is, in attempting to have a holistic understanding of this topic, big picture theory as well as perspectives pertinent to individuals (such as leadership or action logics) are likely to be relevant, alongside theory addressing organisational scales.

Consequently, this research builds and tests theory at several levels. I do this using the mix of methods touched on above to triangulate the theories and conclusions (Strauss & Corbin, 2008 p27). The different data and methods are compared and contrasted to present a set of overall interpretations drawn from examining the topics in multiple ways.

In the *Thesis Map* section of Chapter 1 I outline these data sources, developmental timescale and methods. The methods fall within two broad classes - middle-range theory (abbreviated as mid-range theory) and meta-theory and use the following data sources:

- first person perspectives from myself and individuals engaged in this research;
- Interpretative analysis of interview material;
- case studies;
- existing and emerging mid-range theories; and,
- existing, developed and refined meta-theories.

The associated methodologies across these two relatively distinct scales of theory are:

- *Mid-range Theory*

This thesis uses multiple methodologies to examine and test mid-range theory.

These multiple methodologies are applied to the case study data, testing and developing such theory in this thesis. The introduction to the *Mid-range Theory* section of this chapter provides an overview.

- *Meta-theory*

Meta-theory can assist us to navigate and prioritise, clarify and resolve sources of bias and create options for action – ultimately aiding us to improve worldwide conditions (Edwards, 2009; B. C. Taylor, Irvin, & Wieland, 2006; Wallis, 2010). To do this the method uses mid-range, as well as meta-theories themselves, as the data sources.

I use meta-theory methods to assess an existing meta-theory, integral theory, and its applicability to the climate change and sustainability topics under investigation. I do this through an analysis of energy efficiency mid-range theory in chapter 3. In addition, outputs from meta-theory reviews are then used as a basis for focusing the enquiry, with respect to organisations, in chapter 6.

The *Meta-theory Rational and Methodology* section details these methods.

Integral Theory

During early research for this thesis, a particular meta-theory theory – integral theory – stood out. It appeared to have significant explanatory power that would assist my (and broader society's) understanding of climate change and action on sustainability. In the context of this thesis, I test and develop integral theory from a sustainability related perspective. I apply the outputs from the energy efficiency meta-theory review to integral theory. The analysis occurs in two major parts. Firstly, through theoretical lenses identified from the energy efficiency review in Chapter 3; and, secondly, combining these lenses with Edwards' (2009) analysis of organisational transformation for sustainability meta-theory. Combining the two meta-theory analyses with integral theory occurs in Chapter 6. The chapter's *Loop and Lens Analysis* section structures the conceptual lenses (from Chapter 3

and Edwards) using the integral theory framework. I look for foundational concepts that may underpin perceptions, actions and change.

Integral theory also offers a particular methodological framework through which concepts and phenomena can be examined. It holds that any phenomenon can only be properly understood when it is addressed from at least first, second and third person perspectives. As a range of these person perspective approaches are used in this research, this structure consequently assists to triangulate the data, as discussed above. In addition, the timescale of this research (over seven years) has allowed theory, understanding of it, and conclusions drawn from it, to be validated over time. That is, inferences, correlations, theory development and arguments, from the initial and mid stages of this research can be triangulated against chronologically later reasoning. See the *Integral on Integral* subsection in this chapter for further details.

The next three sections - *Mid-range Theory*, *Meta-theory* and *Integral Theory* - detail the theories and associated methodologies.

Mid-range Theory

This section describes the role of mid-range theory in this thesis. It outlines the methodological and theoretical basis through which theory is used, such as theory that is applied to the case studies. As discussed above, mid-range theory can help to explain puzzling relationships. For example, undertaking energy efficiency actions at far lower rates than would be economically rational for organisations are one such puzzling example.

The label *mid-range theory* applies to theory that helps us understand phenomena at a level of detail where topic specific theories are used. One such example is the theory that describes discount rates as they are applied to the energy efficiency paradox outlined above (Boudon, 1991; Merton, 1968). This is distinct from overarching meta-theory. The aim of such overarching theory is to be relevant to a wide diversity of situations and circumstances. The key distinction in scale between the two types of theories is that mid-range theories individually explain specific social processes, as opposed to more generalised overarching principles that aim to describe all such processes (Boudon, 1991).

This mid-range theory section is divided into subsections. The *Grounded Theory* subsection discusses the theoretical basis for using and developing theory in the thesis.

The *Research Development* subsection outlines the development of this thesis' investigation and the methodology to do it. Mid-range research in my thesis is principally applying theory, and testing it, through case study material. Such research, and its strengths, is outlined in the *Case Study Research* subsection. The following *Case Study Design* subsection details the design components of this research on two case study companies with the *Participants* subsection adding further relevant information.

Following these subsections on methodology and research design, the *Semi-structured Interviews* subsection describes how the case study material was gathered. The *Analytical Approaches* subsection then introduces the techniques for analysing this material and terminology for the methodologies such as positivist, post-positivist and action inquiry analysis. The methodology description is then continued in the *Thematic Analysis* subsection which describes the how the data is used to create and validate theory.

A short discussion on *Insider Research* concludes the *Mid-range Theory* section.

While this section focuses on mid-range theory there are some significant crossovers. One is the distinction between scales of theory referred to above. The differences and links between mid-range and meta theory are not absolute and this is discussed further in the *Meta-theory Rational and Methodology* section. In addition, while grounded theory is an overall approach to mid-range theory its concepts, such as triangulation, are appropriate and used across other theoretical frameworks. For example, see the *Integral on Integral* subsection of this chapter.

Grounded Theory

Grounded theory describes an overall approach to developing, evaluating and testing mid-range theory in my thesis. This grounded theory approach involves a set of guidelines for the analysis and collection of data and, subsequently, the development of mid-range theory to explain this data (Bailey & Jackson, 2003; Charmaz, 2005).

My thesis derives theory and carries out analysis using pre-existing theory (such as constructive development theory and common pool resource theory) as well as allowing its theoretical constructs to emerge from the data. This is not the original concept of grounded theory (and methodology associated with it) as articulated by Glaser and Strauss (1967).

These original guidelines held that theory emerged during the course of the data analysis.

The structured process – simultaneous collection and analysis of data, coding, constant comparison, memos written about the concepts revealed by analysis and sampling to refine emerging theory – was seen as a methodology to derive theory true to the data.

Glaser held that the theory emerged from the data using this methodology. That is, this theory emerges – and indeed must result – from an absence of preconceived notions, questions or frameworks (including other theory). Glaser and Strauss substantially disagreed on this point. After the 1967 Glaser and Strauss publication, Strauss and fellow researcher Corbin argued that prior knowledge, theory and preconceived notions were not just inherent and useful constructs that a researcher brought to data analysis, but that they are also unavoidable (Strauss & Corbin, 1998). Such an approach Glaser (1992) saw as forcing preconceived notions of frameworks onto the data as opposed to what he advocated as valid methodology – constantly comparing data to data so that theory emerges (Bailey & Jackson, 2003; Charmaz, 2005; Myers, 2008; Urquhart & Fernandez, 2006).

A contemporary version of Corbin and Strauss's (2008) approach to grounded theory, labelled by Charmaz (2005) as Constructivist Grounded Theory, acknowledges that theory emerges from the data as well as the backgrounds and knowledge of the researchers. That is, sensitising concepts and prior knowledge can be used alongside the data driven approach where the theoretical constructions emerge from the data (Boyatzis, 1998; Charmaz, 2005; Strauss & Corbin, 2008). This constructivist grounded theory methodology is the overall grounded theory approach taken in my thesis. It is the structure rationalising the more detailed data analysis methodology (see the *Analytical Approaches* subsection) that follows Boyatzis' (1998) hybrid data and theory driven approach.

This mixed method of analysis (Bailey & Jackson, 2003) is adopted in my thesis partly because of the surprisingly strong correlation between the data and constructive developmental theory I found in the early stages of this research (as described by Torbert et al., 2004). The strength of this correlation was, unexpectedly, apparent during the first

interviews and grew stronger during the initial coding of the transcribed interviews as well as through the subsequent interviews. That is, this prior theoretical exposure, and the suggestive fit with this theory from the interviews, was too strong to purely be treated as a 'sensitising concept' (Charmaz, 2005) leading to the use of mixed methods. This mixed method methodology – thematic analysis – is outlined in the *Analytical Approaches* subsection (Boyatzis, 1998).

The use of grounded theory – as it applies to the case study data, the semi-structured interviews that I conducted and analysis of material - is further outlined in the following the *Semi-structured Interviews* and *Analytical Approaches* subsections as appropriate. The next subsection, *Research Development*, describes the grounded theory methodology as it applies to this research.

Research Development

My thesis topic arose from a decade long interest in, and consideration of, possible research questions and potential investigative studies before the start of this thesis. The research I was interested in needed to fulfil certain goals including to add to my, and our societies', capacity to create effective interventions. The development of the research follows grounded theory methodology and this section describes the major steps.

To refine the field of interest identified above, I initially developed a broad and open ended research problem and question (Strauss & Corbin, 2008 p41). I was interested in why some groups and/or organisations act on climate change and sustainability issues. I felt that a reason some may take such action could, in part, stem from valuing future outcomes and consequences more than other groups. Nevertheless, even if this was the case, the next

logical question became: why such groups would have different values? Some worldwide groups, organisations and countries at the time this work started (2005) had clearly adopted progressive targets and policies. However, in Australia as a whole – and at a smaller scale within many companies and organisations – this had not occurred. This was the case even when direct profits would result from implementing change.

The overarching research question was consequently: why do some organisations act, with respect to climate change, and does this arise from valuing future consequences that may occur because of greenhouse gas emissions? Clearly, the value on future consequences also meant I was interested in why the organisations or individuals within them held such values.

At an early stage in the development of the research, I checked that the broad and open-ended problem was likely to lead to successful outcomes. Robson (2002 p56) lists five factors for successful and unsuccessful research. Such a '*Real World Check*' argues that successful research develops from:

1. Activity and involvement – are there good and frequent contacts for the research?
2. Convergence – does the research arise from two or more activities or interests?
3. Intuition – is there a feeling that the work is important and timely (with an emphasis on perception rather than logical analysis)?
4. Theory – interest and desire to understand the issue from a theoretical perspective.
5. Real world value – is the research useful?

Using the criteria I found the research was likely to be successful:

1. I was actively involved with the organisations that were identified as potential case studies.

2. The research resulted from many years of advocacy and business activity on the issues of concern. At the time, these activities had converged with a rapid increase in interest in business sustainability and climate change solutions resulting in favourable conditions for the research topic. That is, it was likely to interest many people I needed to interact with, particularly around data gathering for the case studies.
3. The work is important and there were obvious intuitive links between the proposed research topic areas and prominent discussions in our society. The topics of the research are the subject of active debate throughout the period of the research.
4. I am actively interested in a theoretical understanding of the research topics. I felt (and still do) that the critical nature of these issues required active understanding, development and interest harnessing multiple tools, including theory, to create better outcomes.
5. The research problem came from a topical and pressing social, environmental and economic issue. At the start of this work, it was obvious that humans must address climate change or face the likelihood of significant negative, and disproportionately unjust on those least responsible, impacts over the long term. It was also clear there was, and is, a real risk of irreversible (at least on human society timescales) and dangerous changes. The thesis research was likely to assist us to address the issues inherent in these problems.

The initial broad question and field of inquiry has subsequently been refined through technical and non-technical literature as well as sensitivity to the data. For example, I initially explored altruistic behaviour and the conditions under which people collaborate

(Güerker, Irlenbusch, & Rockenbach, 2006; Henrich, 2006) as well as success and society collapse (Diamond, 2006). Both fields opened windows into a wide body of research on common pool resources - work that documents outcomes that are opposite to the way our society commonly assumes we will act (Dietz et al., 2003; Ostrom, 1990).

To understand such seemingly counter-intuitive findings (at least a wide body of evidence that humans collaborate beyond our immediate self-interest) I looked for theoretical frameworks to help explain the broader phenomena (Strauss & Corbin, 2008 p42). These included individual and organisational stage and developmental theories as well as integral theory (e.g. Beck & Cowan, 1996; Donovan, 1997; Wilber, 2000a). I was particularly interested in the application of common pool resource research – showing humans voluntarily protect common resources and do so often for long periods of time. However, this research tends to look at traditional practices or geographically distinct regions. In a modern diverse world with a global commons (the atmosphere), additional theory to understand today's influences seemed necessary (Lebel et al., 2006).

Grounded theory reflects this development of ideas as outlined above. It views research as dynamic - inductive and deductive (Strauss & Corbin, 2008 p46). The research work began with inquiries seeking to understand general laws from specific cases (inductive). At the start, currently available knowledge was sufficient to draw a number of broad inferences. For example, from one perspective it is (and was) apparent that society and individuals are not acting on climate change in ways that are consistent with our collective best interests. Simultaneous data collection and analysis has occurred throughout this research alongside comparing this information to theory (deductive). For example, climate change and sustainability action is a quickly evolving field undergoing many evolutions for the

organisations and individuals involved. Such changes – within both attitudes and society-wide approaches to the issue – continued for the duration of this study and so, with respect to this research, inductive and deductive processes continued through the thesis research and writing.

Beyond these broad processes, the original thesis concepts were developed into a more specific research problem following grounded theory principles (Strauss & Corbin, 2008 pp53-58). These included:

1. Making systematic comparisons throughout the research. For example, the meta-theory review (Chapter 3) arose, in part from comparing the overarching paradox of inaction on sustainability with the specific economic, profit and missed opportunities widely documented for energy efficiency.
2. Continuously interacting with my data from the research – both with respect to the case studies and overarching meta-theory. I also coded the data for key concepts that emerged from it, as well as how it related to the theory in this thesis in an ongoing process. This interaction continued throughout the research.
3. Commencing analytical writing at the start of the research – initially this was by way of memos and notes and the research proposal. The memo and notes practice continued throughout the research. Writing and further notes specifically related to the data coding process supplemented these practices. Trial analysis occurred, and was written up, across the major themes of this research including a thesis proposal, common pool resources and action logics papers and multiple presentations (e.g. Divecha, 2009a, 2010a, 2013, 2014; Divecha & Brown, 2013b).

4. Making early links between theory and my field of research. This occurred, as described above, from the start. Some issues, like the energy efficiency paradox discussed above, suggested there were important questions to answer. These questions have been developed and refined against existing theory as well as material from the case studies.

A part of this early design suggested that seeking to understand the research questions through case studies was appropriate. The next subsection details this reasoning.

Case Study Research

In one of the outstanding cases of propaganda analysis on record, British content analysts were able to infer that Nazi propaganda talk about the forthcoming use of a secret, unconventional air-bombardment weapon was no bluff.

Alexander George on the British World War II qualitative analysis that correctly identified the creation - and launch date within weeks – of Nazi Germany's V1 rockets (George, 1956; Krippendorff, 2004 p9).

Case studies form a principal data source in my thesis particularly for the development and testing of mid-range theory. This approach is used, in line with Yin's (2003 pp5-10) guidelines, as there is a primary focus for the research on how and why style questions. The thesis investigates why sustainability is, or is not, implemented and looks for determining factors and theories that may help understand such issues. It is also dealing with contemporary events. These are all factors that argue a case study approach is likely to be effective.

These case studies are qualitative research and Figure 2.1 illustrates the overall methodology for the case studies. This investigation starts with the conceptual framework

and the research’s development (as outlined in the previous section). The inductive and deductive approach suggested, at an early stage, that relationships between collaboration, climate change, business sustainability and how we understand the world - in often uniquely, but categorisable, different ways - were likely to be important. Consequently, looking at a whole organisation, those working for it and how it acted on a problem that requires collaboration - climate change - was likely to deliver evidence and insight into this topic. Two multinational companies were chosen for this work.

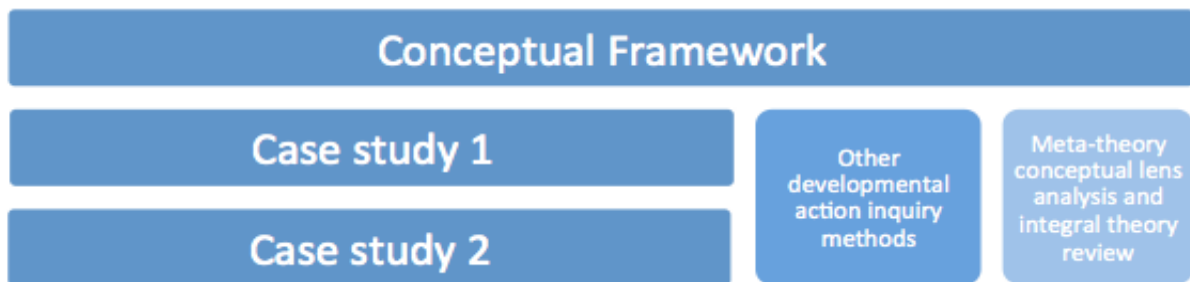


Figure 2.1: Case study research methodology.

The two case studies are of major international business organisations that have gained a climate change profile and are regarded as being proactive on sustainability. The leading examples of these company’s sustainability practice were standout projects or programs and/or visible public climate change leadership. The case studies comprise interviews with key individuals – current and former employees of the two corporate organisations. The individuals interviewed (with limited exceptions) either had an overview of the whole company or were leading specific sections of the companies and/or activities for the companies. The next subsection, *Case Study Design*, adds further detail to the case study methodology.

Case Study Design

Robert Yin (2003 pp21-28) describes five components that are especially important in the design of case study research. These are:

1. A study's questions
2. Its propositions
3. Its unit (as) of analysis
4. The logic linking the data to the propositions
5. The criteria for interpreting the findings

As applied to my thesis, the case study looks at organisational and group action:

- Some organisations and groups within our society undertake successful sustainability initiatives beyond levels required by regulation or law. Are there identifiable characteristics that describe factors that enable this, or are meaningfully related to such action? If there are, do these help others, across the broad spread of areas where groups and organisational action for sustainable change is required, undertake such action?
- The case study proposition:
- The principles and structure mapped by integral theory, particularly (but not exclusively) including organisation and individual stages of development (as they are applied to approaches and understanding of sustainability) are evident and relevant to the capacity of such groups to implement change on sustainability issues that require collaboration. Such theory (including the stages of development) adds refinement and applicability (for current and future society) to the principles

underpinning the successful management of common pool challenges. It thus helps to extend the use of these principles to current global and organisational issues (with common pool dimensions) such as climate change.

The case study's unit of analysis:

- This research is a multiple case study with the major units of analysis being two whole corporate organisations. These businesses have embedded sub-units, e.g. separate organisations within each corporate entity, a separate corporate sustainability unit etc. (Yin, 2003 pp39-55).

The linking logic:

- The development of this logic is outlined above in the *Research Development* subsection and described further in Chapters 3, 4, 5 and 6.

The criteria for interpretation:

- Thematic analysis (Boyatzis, 1998) is a primary analytical approach used within these case studies. This interview material is supplemented through 'developmental action inquiry' (Bradbury, 1998; Bradbury & Lichtenstein, 2000). The *Analytical Approaches* subsection is a detailed overview of these methods.

The criteria for interpreting the findings are further described in the *Analytical Approaches* subsection of this chapter below. These criteria are applied to one-on-one interview transcripts and supporting research notes. The participants in these interviews are described in the next subsection.

Participants

The case study material is drawn from direct interviews with people associated with the two case study companies. The people interviewed for the case studies were selected based on my determination of the individual's likely ability to help understand the underlying influences and directions the organisations were taking. I assessed this from my own personal knowledge, the person's role and seniority in the organisation, and recommendations made by their peers within the organisation during the interviewing process. That is, the interview selection followed the grounded theory purposive approach (theoretical sampling) to maximise the opportunity to discover, and understand, theoretical relationships and apparent contradictions (Robson, 2002 p193; Strauss & Corbin, 2008 p144).

The participants are all multinational corporate leaders with a couple of exceptions. The group comprises 30 mostly senior managers/directors of two major multinationals that are commonly regarded as being at the cutting edge of corporate sustainability delivery. Generally, interviewees were people with a significant depth of experience and either CEOs, senior executives or middle management. Three held more operational roles within the two case study companies and all but one of these people managed other staff within the relevant organisations. Most of these people could, and did, draw on a wide range of experience across several fields of business as well as personal views and knowledge.

I approached interview participants directly or via intermediaries associated with the two case study organisations. These intermediaries were people who offered to help organise the interviews. Of the 36 people approached only one did not respond, three declined to be interviewed (or suggested an alternative interviewee), one could not be interviewed and one

recording failed. Nearly all interviews were conducted either in person or via video conference and usually at the interviewee's workplace.⁸ These were in-depth interviews for between 90 and 120 minutes (occasionally longer).

Interviewees are quoted in this thesis using an individual pseudonym. The names generally indicate if the person is male or female as there is enough diversity for the interviewee's gender not to be disguised while maintaining anonymity.

These company's leading examples of sustainability practice were, for example, standout projects or programs and/or visible public climate change leadership. The individuals interviewed (with limited exceptions) either had an overview of the whole company or were leading specific sections of the companies and/or activities for the companies. The choice of companies was also partly based on excellent access to senior managers however this is also a potential weakness. While I have not worked for the companies I have consulted and/or advised individuals and groups within the organisations - see the *Insider Research* subsection for details on how this potential difficulty was managed.

The interviews followed a semi-structured format as described in the next subsection.

Semi-structured Interviews

The semi-structured interview format allowed me to follow lines of inquiry and probe into interviewees' responses in line with the theoretical and design principles outlined in

⁸ Interviewing people, in person or by video, enhanced my understanding of the material we were discussing. Interviews at the person's workplace often allowed the interviewee to illustrate our discussion with practical examples. See the *Integral on Integral* subsection of this chapter for further details on the use of this observational and interaction data.

preceding subsections (see *Research Development, Case Study Research and Case Study Design*).

In designing these questions and discussing issues during the interviews, particular attention was paid to ensuring that there was a subjective and objective spread across these questions (see the Integral Theory section below). The questions and interviews aimed to offer the interviewee every opportunity to respond from 'all-quadrant' viewpoints.

The interviewees were told that the research was based on 'case studies'. Each received a letter that informed them that the research aimed to explore these two questions:

- Are climate change concerns transforming organisations and prompting a shift to more sustainable business practices?
- When collaborative principles – associated with successful protection of 'common pool' or shared resources such as clean air – are more widely applied within organisations, do those organisations exhibit a more advanced level of sustainability?

Questions used, and other relevant information, are reproduced in Appendix 1.

The interviews are used as data for examining the main themes this process was structured for - see *Case Study Design* subsection. The next subsection, *Analytical Approaches*, describes the methodology used to undertake this investigation.

Analytical Approaches

Thematic analysis is a main analytical approach used to examine the case study material. It structures the process of transforming interviews and generating theory (Boyatzis, 1998).

The technique is suited to this research as the case study interview materials are best understood using both a 'positivist' and 'post-positivist' analysis (Boyatzis, 1998 p.xiv). That is, the information from the interviews is most likely to be understood by formulating theories based directly on what is observed (positivist), as well as deconstructing the ideas to look for meaning beneath what is immediately apparent (post-positivist).

For example, I am seeking to understand the meaning people make around sustainability from a perspective that encompasses 'empirical positivism' – e.g. a relatively direct comparison of what people say are the reasons for action on sustainability issues. I also look at the meaning of what people say from a 'post-modern interpretivism' perspective, looking for what rationales may sit behind such stated reasons and the underlying perspectives that may have shaped how such conclusions were reached by the interviewees (Torbert, 2000a, 2000b). To do this the semi-structured interviews are designed for both classical ethnographic analysis – positivism – and an iterative, post-positivism, approach (Grbich, 2007` pp6-8,21,40).

This research is also informed by a conceptualisation of qualitative research, known as Developmental Action Inquiry (Bradbury, 1998 p44; Torbert, 1999), and expanded on as a 'pallet' of research methods by Bradbury and Lichtenstein (2000). Such a research design is used as Bradbury and Lichtenstein hold that social systems can't be studied without influencing the system (Bradbury, 1998 p43; Bradbury & Lichtenstein, 2000). Similarly, Corbin (2008 p11) argues that the researcher influences the research process just as the

research has an influence on the researcher. Additionally, utilising the researcher's experience can open up other meanings in the data and thus add depth or alternative interpretations to the analysis (Strauss & Corbin, 2008 p80).

To document my own perspectives and the development of these, I have written notes during and after the interview process. These notes inform the analysis in my thesis and this practice continued throughout the theory analysis processes and write-up of the research. My thesis therefore enquires into its topics from a 'first', 'second' and 'third person' perspective to cross-reference the findings. This also helps to address any potential insider research issues (Coghlan & Shani, 2007). See the *Insider Research* and *Integral on Integral* subsections of this chapter for further details.

Thematic Analysis

To interpret the results from these interviews thematic analysis is used to develop a coding system and frames (the conceptual and contextual interpretations I and the interviewees make) for the case study material. This development is from theory, as well as through the interview data. This development is not confined to an observing (third person) approach, but is also informed by my substantial background in sustainability issues (Boyatzis, 1998 pp33-53; Grbich, 2007 pp46-49). Consequently, the case study work is analysed using a hybrid approach - data and theory driven - two of Boyatzis' methods (1998 pp 51-53).

For an example of theory driven analysis, see the use of codes drawn from Torbert's action logics descriptions (2004) to analyse the data. Chapter 4 uses these descriptions as an analytical starting point. This, in turn, helps to assess the usefulness and applicability of Torbert's theory in the context of this research.

The case study analysis is also data driven. I use an inductive approach to coding the data through identifying themes within the interview material, initially within a smaller subsample of the whole set of interviews. Codes are then developed from these themes. For example, this particularly helps test and refine the assessment of action logics (Chapter 4). While some action logic framing stands out, aligned with Torbert's codes, there also appears to be other common patterns and structures at play. This leads to a search for further refinement and, in turn, the application of O'Fallon's theory (2010) onto this material - see Chapter 4.

An additional framework is present throughout the analysis. I have substantial prior and ongoing experience working actively on sustainability, environmental issues and climate change. The input of my experience and knowledge effectively becomes Boyatzis' third analytical approach 'prior research driven' (Boyatzis, 1998 p52). I have formed theories, as well as written on these topics, before undertaking this research (e.g. Barclay & Divecha, 1992; Cobbing & Divecha, 1993; Divecha, 1990, 2001; Divecha, Cobbing, & Vallette, 1994; Divecha, Lisle, & McCray, 1990; Divecha, Rakova, & Oakwood, 2000).

The case study analysis is thus a hybrid of three approaches. Table 2.1 outlines the stages and steps used for the analysis.

Stage	Hybrid theory, data and prior theory driven approach	Chapter / Section
1	<ul style="list-style-type: none"> Deciding on sampling and design issues Selecting subsamples 	<i>Case Study Design and Semi-structured Interviews</i> subsections
2	<ul style="list-style-type: none"> Reducing the raw information Identifying themes within subsamples Creating codes Determining the reliability 	Chapters 4, 5 & 6
3	<ul style="list-style-type: none"> Applying codes to the raw information Determining validity Interpreting results 	Chapters 4, 5 & 6

Table 2.1: Thematic analysis summary of stages and steps.

(Adapted from Boyatzis, 1998 p44)

Functionally, to analyse the case studies, the interviews were professionally transcribed and the transcript checked against audio. Coding of the data was often carried out while simultaneously reading the transcript and listening to synchronised original interview audio. Analysis of data is assisted by coding software (Atlas.ti).

Insider Research

With both the major corporate organisations I am, to an extent, an insider. While I am not an employee of either of the companies, I have been involved in some capacity with the organisations, particularly consulting to or advising both companies during the period 2005 to 2010. This results in a number of advantages as well as issues that have to be considered. Principle issues are pre-understanding, role duality and organisational politics (Coghlan, 2001; Smetherham, 1978).

I have a significant amount of pre-understanding with the organisations and the context in which they operate. This sits alongside an advantage of good access to senior management. To manage familiarity and the risk it might lead to a lack of probing analysis, case studies are designed to engage known and unknown individuals. This allows data to be checked against multiple sources while maintaining the benefits of a substantial grounding in the fundamental issues related to this research (Boyatzis, 1998 p9; Coghlan, 2001; Kanuha, 2000; Smetherham, 1978).

Insider research also creates a dual role – I am both a participant in, and investigator of, the organisations being researched. The possibility of conflict means careful management for any organisational political issues that arise (Coghlan, 2001; Smetherham, 1978). However, overall, this work is not primarily insider research. The major unit of analysis is the whole organisation – my engagement with the organisations was consulting and external advisory, that is external roles engaging with a limited number of the organisation's employees, albeit usually middle to senior management.

In summary, I have shared professional histories and/or identities with many of the study participants, in some cases with elements of insider research. This meant careful management for the neutrality of interpretation. This includes monitoring the research process over years as it developed through memos and tracking changes in my assumptions. It also includes triangulating the results and actively considering my own perspectives to assess the influence of these on the reported results. The *Integral on Integral* subsection below contains further details.

Meta-theory Rationale and Methodology

A meta-theory presumes that several theories ... are adequate but apply under different conditions; it attempts to specify those conditions and the relationships among theories.

Andrew Van De Ven and Marshall Poole,

Toward a general theory of innovation processes (2000)

In outlining the research development and methodologies in the preceding sections of this chapter, it is already clear that there is the potential for significant interplay between theories. This opens questions into how different perspectives may be relevant and relative rankings or influence of specific reasons for sustainability actions or success. Naturally, research of this nature seeks to identify the most important factors. However, any particular framework may be more or less applicable depending on specific circumstances, timing or individuals. As an example of some of the potential range of topics, the *Theoretical Framework* section of Chapter 1 touches on the sustainability as a multidimensional issue. In addition, earlier sections of this chapter, such as *Rationale, Focus and Need, Methodology Outline* and *Research Development* discuss the context and scope, scale and complexity inherent with investigating sustainability.

To understand the relationships between theories, and investigate these sustainability topics at some depth, I propose to use meta-theory. This structure and methodology, when applied to these topics, should create some greater level of certainty as to the generalisability and appropriateness of any particular perspective for a given sustainability situation.

My thesis approaches topics in this way as good sustainability theory should have coherent principles that help us to understand, explain, predict or initiate effective action. Theories inevitably have a scope and domain and a set of circumstances and conditions within which

they were developed. As such, they are likely to suffer at least some limitations arising from these contexts (Adler & Borys, 1993; Poole & Van de Ven, 2000; Van de Ven, 1989). One example is the contexts in which economic theories about energy efficiency adoption were developed and, subsequently, the gap between action and theory documented. Testing, comparing and working with such paradoxes to separate the circumstances or conditions within which the theory has been designed – the framework and parameters it seeks to be relevant within – can introduce new terms to resolve the tensions (or understand inherent paradoxes). This is exciting as it promises to create a more encompassing picture, more capable of understanding complexity. Meta-theory allows us to compare and contrast such conditions or contingencies or contradictions, illuminating where the theory, and models derived from these theories, hold (Poole & Van de Ven, 1989; Poole & Van de Ven, 2000). It also allows us to test existing meta-theory and its usefulness to the sustainability topics considered here (Edwards, 2009).

At an early stage of the development of this research, I was exposed to and read about integral theory. As touched on in the *Methodology Outline* section, the theory appeared to have significant potential to assist in understanding sustainability and, more specifically, organisation actions on climate change. The concepts from this overarching theory appeared to be relevant to, as well as to help explain, an organisation's sustainability responses and could assist to interpret the case studies.

Consequently, meta-theory methodology is used to inquire into integral theory's usefulness to the research. There are three primary reasons for this approach:

1. Using meta-theory to synthesise existing theory and incorporate the mid-range theory developed or tested from the case studies can produce a comprehensive analysis (Finfgeld, 2003).
2. The meta-theory analysis can help to make sense of my research by looking at the ways theory operates within the research as well as seen through the case studies. It helps to explain the nature and structure of this knowledge and how it is constructed (Paterson & Canam, 2001 p95).
3. Meta-theory, analysing theory for the basic premises on which its theoretical concepts are based, explores the frameworks or lenses that researchers were using when they created their theories. Such meta-theory should enable us to describe and explain the approaches – as well as predict and control for implicit or explicit biases and place the theories in a larger context (Edwards, 2009 p39; Paterson & Canam, 2001 pp91-93; Ritzer, 1992 cited in Paterson 2001, Edwards, 2009; and, B. C. Taylor et al., 2006).

Some meta-theory analysis can distinguish between theory and models. Poole and Van de Ven (2000) categorise data sources used for meta-theory development in such a way.

Models are defined as being derived from theory describing a system – with relationships, events and actions – through which an operation's phenomena are described and understood. Examples of models include Piaget's theory of children's stage development – describing in detail how these different stages of development unfold (Piaget, 1954, see Chapter 4 for a discussion of such stages).

In my thesis this distinction did not add additional clarity. For example, constructive development theories (Cook-Greuter, 2002; Loevinger, 1976a; O'Fallon, 2010; Torbert et al.,

2004) describe abstract principles that can help us to understand action on sustainability - 'theory' for the purposes of the analysis description from in the previous paragraph. Additionally, such theories model a progression through particular individual stages of development, a detailed projection of how the theory might explain actions and relationships and this can be viewed as a 'model' (Poole & Van de Ven, 2000 p639). The distinction is not useful however given this thesis's scope. The research crosses from individual perspectives to conceptual sustainability - it ranges across territory defined as both theory and models with the terminology changing with the scale of phenomena considered. Consequently, theoretical frameworks are treated (and labelled) interchangeable without distinguishing between theory and models.

Theories and models are thus the data for meta-theory development and testing. To undertake the reviews in this thesis, the meta-theory methodology explicitly draws such theory and model data especially from mid-range theory developed, tested and used in this thesis – e.g. action logics (Torbert et al., 2004) and stakeholder sustainability engagement (Maon, Lindgreen, & Swaen, 2010).

Meta-theory is defined as conceptual research – it uses theory as its data and clarifies the conditions or contingencies of such theory (Edwards, 2009 p38; Poole & Van de Ven, 2000). However, there is significant latitude within this definition. The scale of meta-theory varies based on the concepts and phenomena it is seeking to analyse. For example, conceptual research looking at economic theories may create meta-theory that helps to define and clarify circumstances and paradigms that distinguish different viewpoints within such research - e.g. an economic meta-theory assessing behavioural, evolutionary, neo-classical and other distinct viewpoints on exchanges, markets and goods. Similar research on the

implementation of energy efficiency within organisations could include what was this economic meta-theory alongside organisational change, governance, cultural and psychological theories. The economic meta-theory has now become the object (data) in a meta-theory of organisational and household energy efficiency implementation.

An example of this range is that I use constructive development theory as mid-range theory - among other uses, it informs the analysis of case study data. In addition, it makes a substantial theoretical contribution to the meta-theory developed and tested in this thesis. For other purposes, it could be considered meta-theory. For example, Torbert's (2004) Developmental Action Inquiry (DAI) has constructive development theory as a fundamental part of its approach to framing change in organisations. DAI is regarded as a meta-theory (Edwards, 2013 pp58-79), and constructive developmental theory is one of its two dominant lenses. However, Torbert's action logics lens (the constructive developmental part of this theory) is widely used as a mid-range theory (e.g. Boiral et al., 2009; B. C. Brown, 2012b; Presley, 2014 pp63-68).

The steps taken to build meta-theory help to ground this abstract discussion. Edwards (2013) develops the methodology as cycles for building and testing both mid and meta-theory. The interlocking cycles help to define, and redefine, the theories - Figure 2.2 (on the following page) illustrates the dependencies and development cycles.

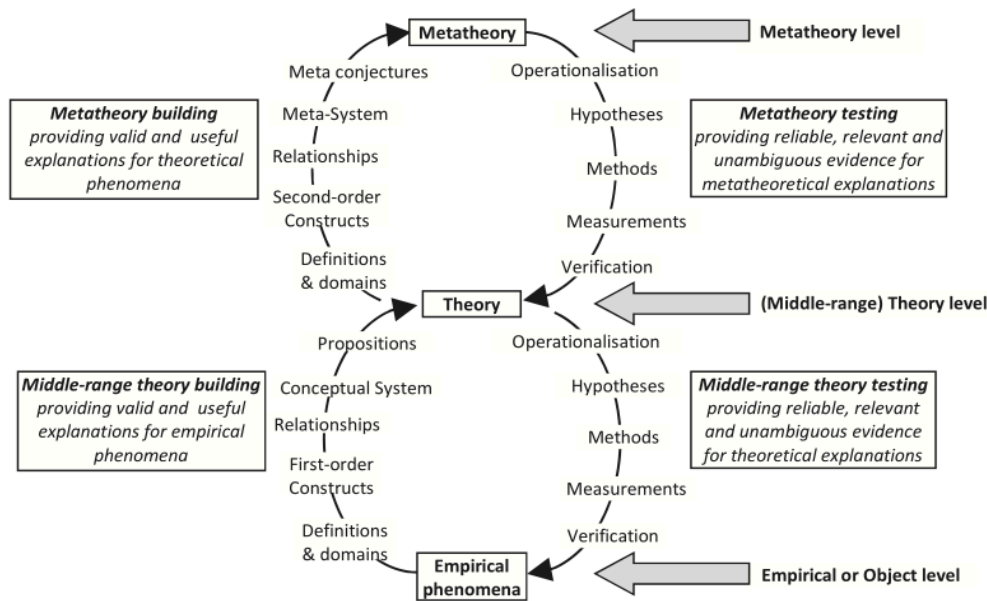


Figure 2.2: The research cycles of building and testing middle-range and meta-theory.
 Source: Misunderstanding Metatheorizing (Edwards, 2013).⁹

Another manner in which this can be conceptualised is to consider meta-theory as a Holon – a whole that is part of another whole (see the *Holons and Quadrants* subsection this chapter). Using this mental model, and the previous example of Torbert’s DAI theory, DAI would be made up of other individual holons. One of the components, holons, that makes up DAI is constructive developmental theory.¹⁰

Similarly, economic theory can be a holon that informs energy efficiency economic meta-theory. Energy efficiency economic meta-theory, alongside big picture psychological and organisational theory applied to understanding energy efficiency could then be considered a set of holons, theories, that inform a meta-theory on the energy efficiency perspectives relevant to sustainability. This conceptualisation builds on Edwards (2009 p40) “holarchy of

⁹ Used with permission.

¹⁰ Edwards also uses such holon relationships to structure theoretical concepts - notably the conceptual lenses described from a meta-theory review of organisational transformation theories (Edwards, 2010).

sense-making” by explicitly recognising that “overarching big pictures” - the meta-theoretical level – exists at different scales for different practitioners and circumstances.¹¹

Figure 2.3 (next page) illustrates this relationship.

¹¹ In another example Marshall (2012) discusses the similarities and differences between two meta-theories - integral theory and critical realism (metaRealism). One way of framing this discussion is to view each of these two meta-theories as a holon each of which becomes data for meta-theory building. Similarly Esbjörn-Hargens (2010c) could be considered as developing meta-theory from meta-theories (e.g. critical realism and integral theory).

There are other large-scale theories that are integrative approaches (Esbjörn-Hargens, 2010e; Riedy, 2011a). Some of these, for example the work of Ervin Laszlo (2007) and Edgar Morin (Montuori, 2013; Morin, 2008), could also be meta-theory ‘data’ which combined with integral theory ‘data’ builds meta-theory.

However, meta-frameworks such as critical realism, and the recent (2010-2014) growing discussion and synthesis between these, are outside the scope, and earlier design which preceded these developments, of this PhD.

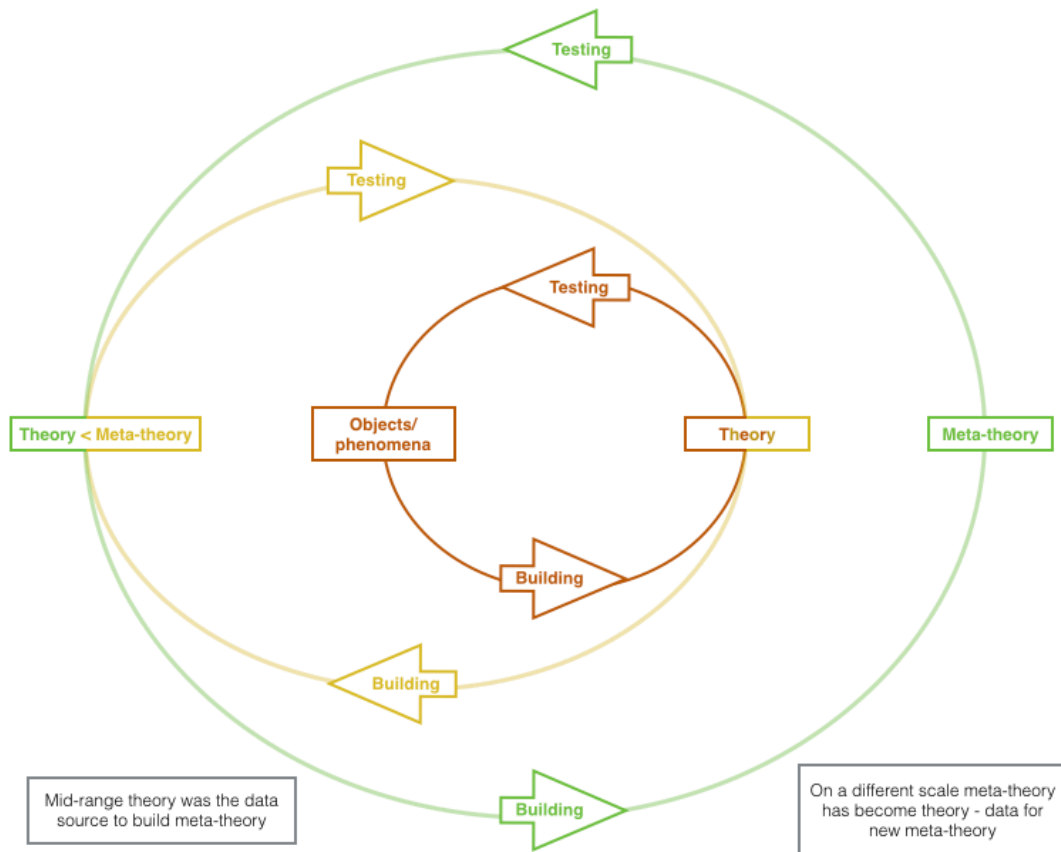


Figure 2.3: Theory that is appropriate and relevant for the particular investigation - a meta-theory and holons perspective.

This interplay of meta-theory and mid-range theory - theory that is meta-theory from one perspective and mid-range when serving another purpose - describe a group of scales of theory and models. To assist understanding, an example from the theory and data in my thesis is that it includes measurable objective perspectives on sustainability such as pricing, profit and market failures (e.g. N. H. Stern & UK Treasury, 2007b) alongside society engagement. Some significant overarching models have been described from such aspects of sustainability, for example in the *Organisational Sustainability Stages* section of Chapter 6. In addition, these sustainability stage models, alongside energy efficiency meta-theory from Chapter 3 and organisational transformation for sustainability meta-theory from Edwards (2009) become data for the *Loop and Lens Analysis* section of Chapter 6.

The discussion above shows that mid-range and meta-theory distinctions and delineations can sometimes suggest that the two categories are independent of each other or generate confusion around overlaps. To clarify this further, the next subsection - *Meta-theory Development and Testing* - outlines the steps used to create and test meta-theory. This is followed by, in Chapter 3, a practical example of the use of this methodology applied to energy efficiency.

Meta-theory Development and Testing

Metathoretical research is the systematic and deliberative study of theories and their constituent conceptual lenses.

Mark Edwards, Organizational transformation for sustainability (2008 p2)

This subsection outlines the methodology used in my thesis for testing and developing meta-theory. Edwards (2009) describes this methodology for the purposes of a systematic study of theory and building meta-theory from such a study.

Edwards' (2009 pp92-95) methodology has eight research phases. The first phases set the context and boundaries of the research – phases one and two. The study design is detailed and then a '*multiparadigm*' review follows – phases three and four. Edwards argues the multiparadigm review is distinct from simply identifying the paradigms related to the theories under review. Rather, such a review looks at theories in depth and sources from a range of materials where such theory has been used. This aims to identify multiple perspectives to discover all appropriate paradigms and lenses through which to view the theories, rather than just a more limited existing framework underlying these theories. A

review like this includes, but is not limited to, understanding the conditions or contingencies in which such theories are useful.

The results are then analysed and meta-theory is built – phases five and six. The final stages are for the implications of this meta-theory to be considered and then the process and meta-theory (personal reflection for those involved in its development as well as the actual results) evaluated – phases seven and eight. Table 2.2 names and describes these eight phases.

Phase 1.	Set the context: <i>Groundwork</i> This phase identifies the topic, aim and objectives of the study and rationale for undertaking it.
Phase 2.	Boundaries: <i>Domain Specification</i> During this step the area of knowledge studied is identified, its key terms and concepts defined and a description of any meta-theory sources used in the study is provided.
Phase 3.	Study: <i>Design</i> In this phase the sampling procedures are outlined, rationale for structuring the data is determined and units of analysis (e.g. conceptual themes), techniques used to analyse and overall outline of study are finalised.
Phase 4.	Assessment: <i>Multiparadigm Review</i> The review ordering the data, sorts key themes etc. using techniques from phase 3, and ensures that multiple perspectives are used to look at the concepts, and the layers of concepts, within the data.

Phase 5.	<p>Analysis: <i>Multiparadigm</i></p> <p>The results from the review are collated, analysed looking for meta-theoretical lenses (e.g. interplay, bridging and bracketing the perspectives from phase 4), compared and refined.</p>
Phase 6.	<p>Build: <i>Meta-theory</i></p> <p>This phase presents the results, describes how they were derived and explains the whole resulting meta-theory system along with its application to an example. This theory can be thought of as something that in itself evolves, that is not a ready-made prescription that is now applied. For example, knowledge and theory about society and group change evolves as the change itself occurs. Thus, meta-theory will too.</p>
Phase 7.	<p>Significance: <i>Implications</i></p> <p>This phase focuses on metaconjectures – statements about conclusions and options from the meta-theory (about other theories) that may require further research to test. Supporting arguments are also provided along with key judgments about other theories or meta-theories based on what has been developed and other implications (e.g. further areas for research) discussed.</p>
Phase 8.	<p>Review: <i>Evaluation</i></p> <p>This phase allows for critical self-reflection, specific evaluation of the meta-theory and the resources plus processes used.</p>

Table 2.2: Eight phases of meta-theory building.

Adapted from Edwards (2009 pp92-95).

Edwards' methodology is adopted with two significant changes to analyse energy efficiency and for use in this thesis.

The first is that Edwards (2009) outlines the methodology for phase 5, multiparadigm analysis, using bracketing and bridging. This terminology - bracketing and bridging - involves the following steps:

- Bracketing - groups and summarises the themes within a specific identified paradigm to identify the core conceptual lenses within it.
- Bridging - looks for conceptual lenses that are shared across different paradigms.

Edwards cites the outline of this technique to Schultz and Hatch (1996). However, Schultz and Hatch go further to describe a method they label as interplay. Interplay identifies both conceptual lenses that are shared across paradigms, as well as looking for contrasts. Such contrasts could serve to highlight conceptual lenses specific to a paradigm that may not be shared, or may be contradicted, by another paradigm - for example apparent paradoxes between theories (Poole & Van de Ven, 1989). Consequently, for this study, the interplay method is a useful addition to Edwards' meta-theory methodology.

The second change is that the methodology used in my thesis combines Edwards' last two phases, numbers 7 & 8. This is done as the implications and evaluation of meta-theory research and discussion (phases 7 and 8 from Edwards methodology) are conducted in relevant chapters of my thesis. The two are interdependent and an artificial separation did not help develop an integrated perspective on my research. The *Phase 1* subsection of Chapter 3 summarises all adaptations (see Figure 3.1).

The meta-theory methodology is used in Chapter 3 to directly consider energy efficiency. Results from this chapter provide insight and data that are further analysed in Chapters 6 and 7.

As introduced in the *Methodology Outline* section of this chapter however, there is a third important framework that is prominently considered and used for this research - *Integral Theory*. Integral theory can be thought of as a meta-theory having been developed from

multiple subsidiary theories and schools of philosophy, thought and practice. Its genesis as a “*theory of everything*” particularly aligns it with this thesis for its ability to enquire into overarching structures. Consequently, a practical methodology to consider any limitations and enhancements, the meta-theory methodology just outlined, is useful. The next section discusses integral theory and its use throughout this thesis.

Integral Theory

There is no doubt that we are now in a state of global emergency. This unprecedented worldwide crisis is a symptom of a much deeper problem: the current state of our consciousness; how we think about ourselves and our world. We have the urgent need, and now the opportunity for a complete rethink ...

Ervin Laszlo and David Woolfson in Thomas Berry - Dreamer of the earth (2011)

Ken Wilber ... highlighted how serendipitous it is that integral frameworks are emerging at the same time that humanity is being confronted with complex issues like climate change... it is no mere coincidence that such post-national problems are arising at the same time that integrative approaches are being developed to provide global solutions.

Sean Esbjörn-Hargens, Executive editor introduction, Volume 5(1) Journal of Integral Theory and Practice (2010a)

Integral theory (Wilber, 2000b, 2005), also sometimes referred to more formally as an ‘all quadrants, all levels’ (AQAL) framework, is a prominent foundation for this research. In the initial phases of this work, integral theory suggested itself for its ability to map and model an understanding across broad, wide-ranging and divergent fields. It promises to assist in navigating the complexity inherent in any investigation that considers an issue such as sustainability. As a ‘*Theory of Everything*’ (Wilber, 2000c) it had significant appeal for this investigation. It is suited to the multi-scale scope and disparate perspectives (see *Methodology Outline* section) through which this thesis’s research material could be

examined and it additionally assists to identify suitable research approaches (Esbjörn-Hargens, 2010d; Marshall, 2012).

A theory of everything is naturally not limited to sustainability and climate issues - grand scale theory has obvious relevance across society and the full spread of our human, ecological, organisational, social, political, cultural, ethical, historical and future development, transformation capacity- potentials and present awareness. Thus, it is not surprising that integral theory has found widespread uses and for a brief description of some of many disciplines and fields it has been applied to see the *Integral Theory* subsection in the introductory Chapter 1.

Using integral theory for an investigation into sustainability has broad appeal. The field is characterised by our own and other's perspectives, alongside cultural-style influences and shared unconscious biases, as well as more obvious economic or scientific drivers as significant and important influences. Consequently, developing sustainability theory informed by integral theory lenses and, in turn, discussing areas of enhancement to these lenses is a focus of this research.

Integral theory explicitly sets out a core focus on valuing both subjective and objective perspectives (Ballard et al., 2010; Slaughter, 2002). The AQAL acronym encompasses more than *all quadrants all levels* also including *all lines, states and types* concepts (Marshall, 2012; Wilber, 2005). Within this, the primary aspects of integral theory considered and discussed in my thesis are as follows:

Quadrants

- Subjective and objective aspects of any phenomena. For example the short discussion in the *Rationale, Focus and Need* section of this chapter illustrates the difficulty of explaining decision-making and action from a purely objective perspective. Integral theory argues that trying to describe phenomena using this approach is akin to a 'flatland' – divorcing meaning and purpose from human activities, business or society endeavours (Slaughter, 2002; Wilber, 2000a). Consequently, the framework explicitly recognises such objective perspectives alongside the subjective factors - those that are less immediately quantifiable and/or are non-measurable.
- Individual and collective influences or facets of a phenomenon. Individual values and personal financial motivation are clearly factors considered throughout the *Rationale, Focus and Need* section of this chapter above. Equally – within a business, organisation or society more generally – collective systems including culture-style influences or shared or tacit value systems. In the more measurable objective sphere, business capital expenditure prioritisation or country economic policy provide direction to, and influence on, decisions.

The subjective and objective aspects both have individual and collective facets and consequently the combinations are a four-part structure - the quadrant part of AQAL (all quadrants). The *Holons and Quadrants* subsection below discusses this concept.

Levels

- Development and stages or levels. A developmental perspective is central to integral theory and my thesis - this is the all levels part of AQAL. The structure is seen throughout the thesis with individual and organisational developmental hierarchies. In particular, Chapters 4 and 6 address the *all levels* component of integral theory and the concept is outlined further in the *Holarchies and Hierarchies* section below.

States, Lines, Types

Other aspects of integral theory are states, lines and types. The *Why, how, who, where, when and what* subsection and *Integral Meta Discussion* section of Chapter 3 examine the concepts in more detail with specific examples. These concepts are also incorporated into this research through other theorists consideration of them, such as O'Fallon (2010) and the integration states and stages - see Chapter 4.

In brief:

- States are temporary manners of being or external conditions.
- The concept of multiple lines is common in developmental hierarchies that may include cognitive, moral and emotional development. For example Kohlberg's (1981, 1984) moral development and Cook-Greuter's (1999) ego development could be regarded as such separate lines of development.¹²

¹² The concept of lines and development can become confusing. In part, this is due to overlaps between models and metrics - calibrated measures of stage vs. descriptions of increasing maturity, ego or moral levels. Such multiple lines can be measured in an instrument (metric). See Stein (2009) for a discussion incorporating models and metrics and the measurement of multiple lines, such as through Dawson-Tunik, Commons, Wilson and Fischer's metric (Dawson-Tunik, Commons, Wilson, & Fischer, 2005).

- Types describe typically fixed preferences. For example, a person's Myers-Briggs type it is argued does not change. However, the non-preferred way of being may be learned (McCaulley, 1990).

Integral theory's proponents hold that utilising all elements in any situation increases the likelihood of better understanding and/or successful outcomes (Esbjörn-Hargens, 2006b; Wilber, 2005).

Given the depth and scope inherent to a theory of everything, integral theory is explored throughout this thesis and expanded on in relevant chapters. Chapter 3 looks at the integration between sustainability theory (as represented by energy efficiency) and integral theory. Chapter 4 explains the developmental hierarchy (levels) used to evaluate individuals sustainability perspective. Chapter 6 details the application of levels to sustainability within collective groups and applied to the two multinational business case studies. The levels frameworks used are constructive development theory, action logics, and a variety of sustainability hierarchical stages models.

Important aspects of integral theory are discussed below as they form a basis for the research in subsequent chapters. The *Holons and Quadrants* subsection below outlines quadrants - the subjective and objective, individual and collective aspects of integral theory described above. It also covers a foundational concept for this theory - a holon.

The subsection following this one, *Integral on Integral*, considers mechanisms to assess results that substantiate (or otherwise) integral theory and its usefulness. It outlines the overarching approach to using the theory's framework to triangulate results. A substantive part of this approach is through the use of the meta-theory methodology outlined in the

Meta Theory Rationale and Methodology section above. It highlights that meta-theories can be applied and developed, tested and changed, through interaction with real world phenomena and research (including the mid-range theories developed to understand these phenomena). The section discusses how this approach is a rigorous examination of proposed links between concepts, phenomena and theory. The *Integral on Integral* subsection, additionally, explains how such a meta-theory approach meshes with other perspectives and frameworks to validate results and conclusions.

Holons and Quadrants

'Holon', a whole that is simultaneously part of some other whole (a whole atom is part of a whole molecule, a whole molecule is part of a whole cell, etc.)...

But individual holons always exist in communities of similar holons. In fact, the very existence of individual holons in many ways depends upon communities of other holons that, if nothing else, provide the background fields in which individual holons can exist.

...while individual holons generally get bigger (because they transcend and include their predecessors: molecules are bigger than the atoms they contain), the collective usually gets smaller (planets are smaller than galaxies; families are smaller than planets, etc.)...This entire trend I have summarised as: evolution produces greater depth, less span.

Ken Wilber, *An integral theory of consciousness* (1997)

Integral theory is grounded, in part, on the key concept of a holon - a notion that was introduced by Koestler (1967 p48). A holon is simultaneously an entity that is complete in itself, as well as being itself composed of holons and is capable of forming part of a larger holon (Koestler, 1967; Rentschler, 2006).

Integral theory categorises holons as to whether the concept or phenomena being described can be measured objectively or an assessment of them is inherently subjective in nature. Integral theory further divides these holons by categorising those describing a

phenomenon or concept from an individual perspective or from a group collective/society perspective.

Together, therefore, there are four possible combinations of such perspectives and concepts – individual and collective subjective, i.e. ‘subjective’ and ‘inter-subjective’, and individual and collective objective, i.e. ‘objective’ and ‘inter-objective’ (Ballard et al., 2010; Esbjörn-Hargens, 2010d; Wilber, 2005). Integral theory organises these combinations into quadrants - a four by four matrix (Rentschler, 2006). These quadrants can be thought of through the metaphor of a lenses – that is there can be a singular or plural focus and any issue can be considered subjectively, as well as from a more measured and quantifiable perspective - objectively (Divecha & Brown, 2013b; O'Brien & Hochachka, 2010). The four quadrants are:

- The Upper-Left (UL), usually representing individual-subjective viewpoints (for example personal meaning, emotions)
- The Lower-Left (LL), usually representing collective-subjective viewpoints (inter-subjective - for example worldviews, culture and shared values)
- The Upper-Right (UR), usually representing individual-objective viewpoints (for example objective reality – measurements made of a human brain when the subject is undertaking a specific behaviour)

- The Lower-Right (LR), usually representing collective-objective viewpoints (inter-objective - for example objective reality – visible social structures such as the economic system).¹³

The integral theory quadrants identify and map concepts and phenomena across one or more quadrants with a type of categorisation that is found in every major world language - first, second and third person pronouns. Integral theory uses this structure as I and We (first person plural addressing the reader and self collectively) and third person singular and plural - It and Its (B. C. Brown, 2005a). These pronouns are a useful analogy to distinguish the quadrants and through this to map any particular concept or phenomenon. Using this, the upper-left becomes 'I' – for example, with respect to human interactions, shorthand for the way that individuals treat another – first person. Upper-right becomes 'it' an objective truth about an individual - for example, rate of growth measured by science – third person. Lower-left is a simplified understanding of the second person pronoun 'we' – a person who is spoken to when communicating a message from two or more people, for example, how we are treating each other (Wilber, 2005). Table 2.3 (on the following pages) illustrates these relationships as relevant to a human and with a sample of climate change causes and actions.

¹³ Note the acronyms UL, UR, LL, and LR in the table are commonly used when referencing these quadrants. For clarity, in this long thesis, the full names are often used rather than abbreviating to the acronym.

	Subjective	Objective
I n d i v i d u a l	<p><i>Upper Left (UL)</i></p> <p><i>Consciousness – “I”</i></p> <p><i>What do I experience</i></p> <p>Areas studied: subjective realities e.g. consciousness, states of mind, psychological development, mental models, emotions, will</p> <p><i>“Personal meaning and sense of self”</i></p> <p><i>Causes/action - Terrain of Experiences</i></p> <ul style="list-style-type: none"> • Own our psychological projections • Suspend our own views more often • Explore the role of self-identity, structure of mindsets and increase reflectivity • Develop spiritual awareness and address emotions & reactivity • Cultivate moral sensibilities • Foster awareness of assumptions and decrease ideological posturing • Overcome psychology of denial/alarmist • Address the abstract nature of problem 	<p style="text-align: right;"><i>Upper Right (UR)</i></p> <p style="text-align: right;"><i>Behaviour – “It”</i></p> <p style="text-align: right;"><i>What do I do</i></p> <p>Areas studied: objective realities e.g. brain and organism, visible biological features, degrees of activation of bodily systems</p> <p><i>“Body and interpersonal behaviours”</i></p> <p><i>Causes/action - Terrain of Behaviours</i></p> <ul style="list-style-type: none"> • Reduce personal carbon footprint • Develop behavioural incentives • Inspire personal political action • Plant trees for carbon sequestering • Shift our consumer habits • Better agricultural practices • Eat less meat • Replace old appliances

C o l l e c t i v e	Lower Left (LL)	Lower Right (LR)
	Culture – “We”	Systems – “Its”
	What we experience	What we do
	Areas studied – inter-subjective realities e.g. shared values, culture and worldview, webs of culture, communication, relationships norms, boundaries, customs	Areas studied – inter-objective realities e.g. social systems and environment, visible societal structures, economic systems, political orders
	<i>“Culture and shared values”</i>	<i>“Institutions systems, processes and nature”</i>
	Causes/action - Terrain of Cultures	Causes/action - Terrain of Systems
	<ul style="list-style-type: none"> • Empower effective leadership • Explore environmental values • Develop multi-value communications • Enlist religious traditions • Create better philosophical maps • Involve multi-stakeholders • Articulate ethical considerations • Include cultural constructions of nature • Interact with other perspectives • Foster less ideological rhetoric • Develop better rhetorical strategies • Avoid politicised discourse 	<ul style="list-style-type: none"> • Address global security issues • Protect endangered species • Prepare for food and water shortages • Explore/develop clean technologies, transportation and production • Develop better computer models • Establish international agreements • Address population growth • Create better social programs • Restructure the auto industry • Regulate carbon dioxide emissions • Build better educational systems • Develop and pass legislature • Build global infrastructure

Table 2.3: Four quadrants with respect to humans, climate change and physical environment.

Adapted from Brown (2005a), Esbjörn-Hargens (2010b) and Pauchant (2005).

Wilber proposes that understanding a phenomenon, in an integral fashion, requires all four quadrants to be explored and related to each other. Such an approach means concepts are not looked at in isolation. Rather they are interconnected to each other and with evolving

relationships between the phenomena (Slaughter, 2004; Wilber, 2005). These interrelationships are developed and used in this thesis - particularly in Chapter 6 and 7.

An important distinction, clarifying the use of this framework, as well as relevant theoretical perspectives, is whether the quadrants are being used to look 'at' something or 'as' something (Esbjörn-Hargens, 2014b pp2,3). The left hand quadrants are often referred to as inside, a concept that makes sense differently if, for example, the subject in question is yourself. For example, looking 'as' yourself you have subjective values and worldviews and are influenced by the society around you. Looking 'at' another person this interior view, for example, is the way in which that individual makes sense of sustainability as interpreted by observing how this is expressed. Table 2.3 above illustrates a person looking at him or herself, humans, climate change actions and physical environment. The 'at' and 'as' distinction is expanded on and used in the following *Integral on Integral* subsection.

Four examples help to illustrate the usefulness of integral quadrants applied to sustainability and how the quadrants can help correct for bias. Riedy (2005 p76) argues that mainstream sustainable development conceptual approaches do not focus enough on subjective aspects, such as the way a community or business may construct reality.

Bradbury (2000) argues that addressing subjective cultural and behavioural motivators is essential for effective sustainable development - and that such consideration is required in addition to the technical or analytical elements of a problem. Slaughter (2004) highlights the need to transcend '*flatland*' for creating, understanding and supporting wide ranging progressive initiatives. Flatland is, for example, some current ideologies that are centred on economic growth or nature as a resource. Integral theory, and expanding beyond this current limiting structure, creates a "wider, richer view" which, in part, values and

incorporates individual and cultural inner meaning (Slaughter, 1998). Fourthly, Esbjörn-Hargens and Zimmerman specifically point out many environmentalists' reliance on "objective, scientific (third person) account of Nature (habitat and organisms)" is problematic, limited and detrimental - understanding and agreement necessarily requires interior, left hand side quadrants, growth and development (Esbjörn-Hargens & Zimmerman, 2009 loc1052,1647,9240).

The four basic quadrant lenses can be applied to any issue – not just a view of an individual (as represented in table 2.3 above). Esbjörn-Hargens (2014b pp2,3) classifies these units of analysis as: 1- an individual holon; 2 - a social holon; 3 - an artefact; and, 4 - a heap. For example, Owens (2005a) applies the quadrant model to (primarily) a social holon - a group planning sustainable consumption and waste reduction in Calgary Canada. This leads to internal and external perspectives on reducing waste that incorporate individual and collective motivation considerations as described in table 2.4 below. I (Divecha, 2010b) apply the integral quadrant model to an artefact - energy saving light bulbs alongside expressed group (social holon) attitudes (uptake, barriers, the business case, installation and use). Barrett (2006 pp2-4) similarly places the four quadrants as centrally important in understanding organisations and cultural transformation - social holons. In Chapter 6, of this thesis, I apply this framework by looking 'at' a 'heap' of conceptual lenses.

<p>I</p> <p>Outreach / education / community based social marketing (CBSM)</p> <p>Education centre at landfill</p> <p>Promotion of 'self-stewardship' ideal</p>	<p>It</p> <p>Calgary's success in reducing waste</p>
<p>We</p> <p>Outreach / education / CBSM / Communication with other governments and non-government organisations</p> <p>Citizen engagement</p> <p>Waste Diversion Forum</p>	<p>Its</p> <p>Implementation of user fees</p> <p>Expansion of facilities / programs</p>

Table 2.4: Calgary waste reduction.
Adapted from Owens (2005b).

These quadrants can be, and are, integrated with levels. The next section *Holons and Hierarchies* describes these interactions.

Holons and Hierarchies

The concept of holons is introduced in the preceding subsection. As a part of another holon, a holon is inherently part of a hierarchical system - it's made up of smaller holons and, in turn, is part of a larger whole. For example: a cell in an animal is a holon; many cells together make up the animal's skin, bones, liver, lungs etc.; and these organs, skeleton etc. are also holons. In turn, these larger holons make up the animal (another holon), which is itself part of a group of similar animals (e.g. mammals). That is holons, at each level, make

up the constituent parts of the next level (Koestler, 1967; van Eijnatten, 2004; Wilber, 1995 p29).

These holon systems are not limited to physical structures and Koestler (1967) describes a variety of classes such as social holons (individuals, families, tribes and nations), behavioural holons and linguistic holons. These classes have obvious links with quadrants (described in the preceding subsection) and such links developed by Wilber (1995, 2000a, 2000c). Figure 2.4 (on the following page) illustrates this development and while the diagram reduces important subtleties and complexities, Wilber argues the simplicity helps to demonstrate linkages across the quadrants. For example, with respect to the evolution of complex life, the figure shows physical development (upper-right It quadrant) mirroring cognitive capacity change (upper-left I quadrant).

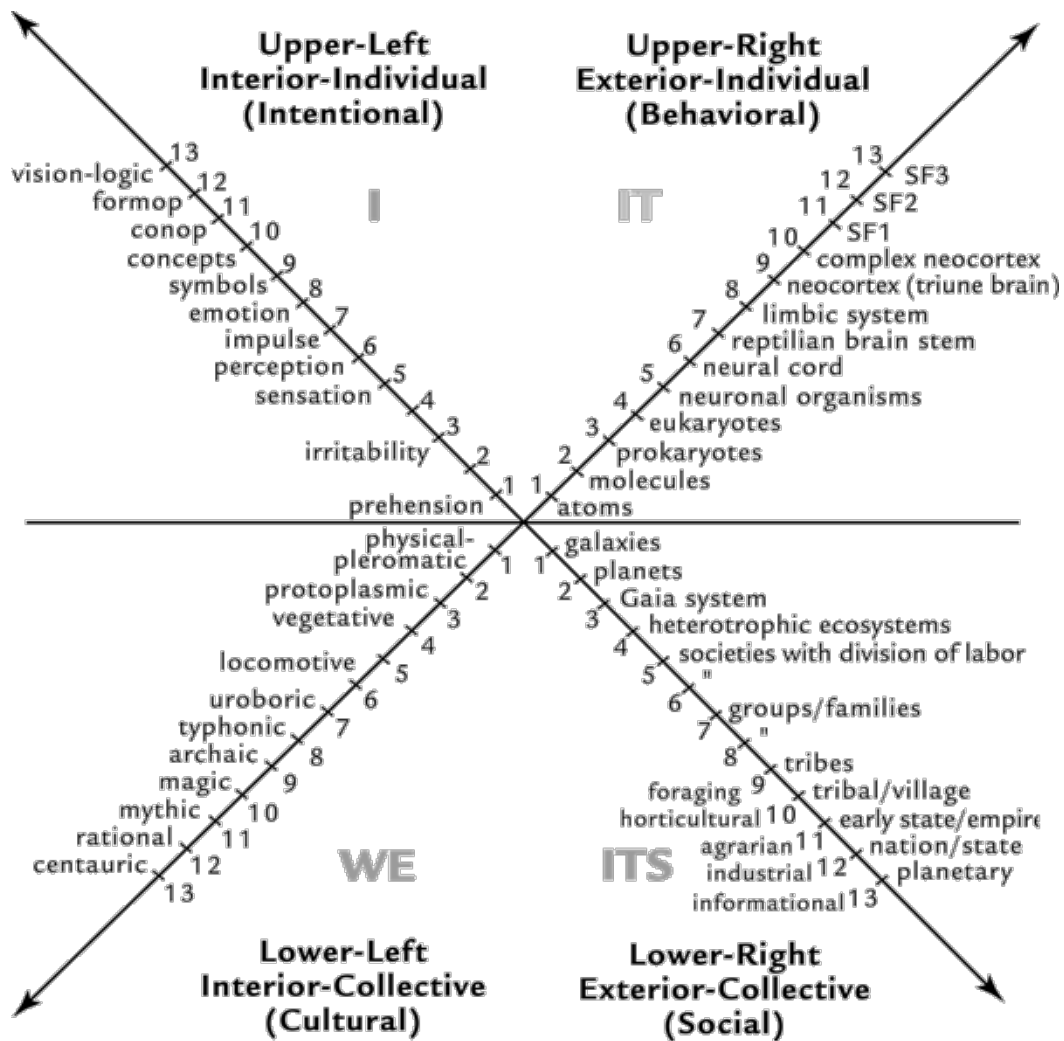


Figure 2.4: Quadrants, holons and hierarchies.

Source: Wilber Sex, Ecology and Spirituality (1995 p198) and Esbjörn-Hargens, TetraDynamics (2014b p173).¹⁴

This conceptualisation has important implications with Wilber arguing the steps emerge ‘holarchically’ - that is, a larger holon transcends, but includes, the smaller holons of which it is made (Marshall, 2012; Wilber, 1997). With respect to human and organisational development, an example is constructive developmental theory. The theory proposes that development unfolds in a defined, identifiable and invariable sequence - through specific stages or orders - within which people construct and understand themselves (and the world) within describable parameters. As a person shifts, from one stage to a new order, the

¹⁴ Used with permission.

new level includes previous orders and thus must be more complex to support this more comprehensive understanding. A person would thus make sense of themselves and the world in a holistic manner when at a particular stage and then, in a subsequent order, this holon forms part (but not all) of their new meaning-making (McCauley et al., 2006). That is, the new meaning-making stage transcends and includes the previous steps - it transcends its previous level of knowledge but still includes this knowledge (Koestler, 1967; van Eijnatten, 2004; Wilber, 2000c). Such cognitive stages are similarly linked to physical perspectives - for example perceptions and objective statements about why we should, or should not, act on climate change (Divecha, 2014 p11).

Chapters 4 and 6 detail and discuss individual and organisational growth holarchies-hierarchies.

The integral theory outline, so far, illustrates the lenses through which phenomena can be considered through a structured and logical framework - quadrants, levels, lines, states, types. The phenomenon being considered can clearly be theory and the development and practical application of it. As such, integral theory ought to be able to inquire into this theory framework and, if integral theory was structuring the development, it effectively becomes a phenomena that is being examined through integral lenses. That is, integral theory is inquiring into itself. The next subsection considers how such methods can be used.

Integral on Integral

Integral, as a theory of everything, presents some clear advantages and obvious challenges. For instance, it should be applicable to sustainability in organisations. By reviewing how sustainable issues manifest within the organisations, a large-scale theory like this should let

us examine effective action as it is correlated to integral theory. That is, the theory of everything may highlight key points and correlations that enhance our understanding of sustainability and this, in turn, builds confidence that integral theory framework is likely to be a useful structure (e.g. for change, implementation of initiatives and understanding of such issues).

However, this study's design was informed by integral theory at an early stage.

Consequently, there may be blind spots arising from the design such that any perspectives not encompassed by the theory's framework might be missed. These may have been overlooked if they are not explicit within integral theory and/or if they have not been considered within the original theory or subsequent discussion of it. As a theory of everything it should be expected that it is an all-encompassing framework covering everything – evidence fits within it. On the other hand, mechanisms to enquire into what may be missed, should the theory be incomplete, are clearly desirable. Consequently, methods to enquire into the validity of this theory when applied to sustainability, and determine if there are concepts or structures that may sit outside of it, are used in this thesis. These are primarily triangulation and meta-theory. How this assists to validate the conclusions reached in this thesis is expanded on below for triangulation and developed in Chapter 3 and 6 for meta-theory.

Integral theorists additionally argue that multiple methods should be used so as to replicate at least some of the numerous perspectives through which a phenomenon can be examined. Broadly, there are eight theoretical methodologies (internal and external perspectives on the universe as a whole) that Wilber argues are important when considering

totality (Paulson, 2008; Wilber, 2006). The eight methodological zones are shown in Figure 2.5.

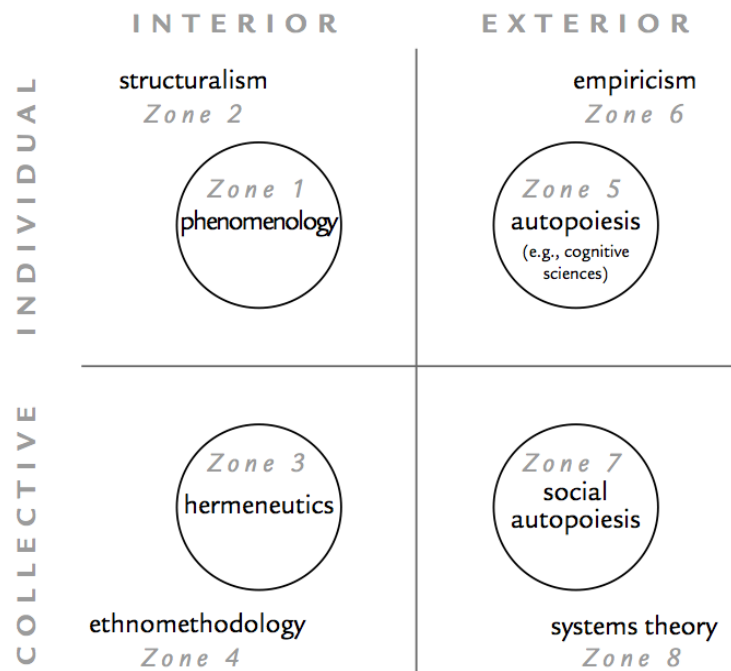


Figure 2.5: Eight Methodological Zones

(Source: Esbjörn-Hargens, 2014b p60; Wilber, 2006 p37).¹⁵

The eight zones approximately correspond to ‘looking as’ (zones 1, 3, 5 and 7) and ‘looking at’ (zones 2, 4, 6 and 8) theoretical perspectives across each quadrant. That is, there are two methodologies for first, second, third individual person and third person group. Esbjörn-Hargens (2006b) argues that integral research, at the very least, would include one first, second and third person methodology - that is three or more approaches. For example, in the first person upper-left quadrant, looking as yourself (a first person perspective on yourself), methodology could be considered as phenomenology. Where as ‘looking at’ yourself, in this same quadrant (a third person perspective on yourself), methodologically

¹⁵ Used with permission.

would be a structural assessment technique (Esbjörn-Hargens, 2006b, 2014b; Hedlund, 2010).

Within the context of my thesis, these upper-left methodologies are used and relevant. Over the eight-year part-time Ph.D, looking as myself research was principally recorded through journalling and research note taking. This was, and currently as I write this is, to consciously study my subjective experience (Küpers, 2008). These notes are drawn on throughout the analysis in my thesis - particularly in Chapter 4. Looking at myself, I have undertaken a number of constructive developmental theory assessments (Washington University Sentence Completion Test (SCT) style assessments) as well as type assessments (Myers-Briggs and Enneagram) over the eight-year period. The SCT maps my developmental change over the course of my Ph.D. - a reflection that appears to be supported in the journal and research notes, complexity of thinking and construction of arguments. A relevant aspect of this developmental change is that it is correlated with greater capacity to create connections and consciously constructed meta-perspectives (O'Fallon, Fitch, Ramirez, Kesler, & Divecha, 2014). From a personal perspective, I experienced this change as positively influencing aspects of this research - such as Chapters 3, 4, 5 & 6 (these were the chapters written over the longest time periods and the timescale assists this comparison). Knowledge of my personality type has helped me design this study both to cater for natural strengths (e.g. Myers-Briggs intuitive) and focus effort and management in areas that may be less strong or not my natural preference.

Second person, the lower left quadrant, methodology in this thesis is primarily one-on-one interviewing - 'looking as' individuals in the group - discussing sustainability perspectives and the interpretive analysis of this material. The detailed methodology for this is discussed

across the *Mid-range Theory* section (particularly *Semi-structured Interviews* and *Analytical Approaches* subsections) and examples of the results from this are extensively quoted in Chapters 4, 5 and 6. Additionally, in the course of these interviews I was also observing myself and the interviewee - both during the interview and reflecting back on it (as recorded in the research notes). This deepened my understanding of the material and highlighted key points interviewees viewed as particularly important. This participant-observer technique added to the analysis of the interview material and can be regarded 'looking at' the interviews and perspectives within them - a third person observation of myself and the interviewee's interactions (Esbjörn-Hargens, 2006b, 2014b). The observation extends to viewpoints on my own and the interviewee's body language and presence - nearly all the interviews were in person, at the person's workplace, or by video, which assists with this.

Third person research in this thesis is principally analysis of existing theory and comparing it to data from the two case study companies as well as meta-theory analysis. This meta-theory analysis is also a tool to check and validate the overall integral theory framework. As a theory of everything, the meta-theory methodology allows the comprehensiveness of such theory to be considered. This style of analysis is also developed in Chapters 3 and 6 to reach into the relationships between theories, using other theories to map and model key concepts that can be tested against the case study data.

Thus the thesis research has a multilayered approach - it uses multiple methodologies, covering first, second, third person approaches. It includes methodologies that address the research from each of these person perspectives across the subject matter and is a strength given the wide scale of this investigation. The research crosses from meta-theory to case study and individual sustainability perspectives. Multiple methods are far more likely to be

appropriate across these different landscapes and comparing conclusions and inferences with each other helps to validate the outcomes.

The multiple method approach carries some risk. A principle issue is that it may result in trying to encompass too great a scope at the risk of not enough depth to the research (Hedlund, 2010). In part this is addressed by identifying core areas - energy efficiency (Chapter 3), individual worldviews (Chapter 4), common pool resources (Chapter 5) and sustainability/organisational stages (Chapter 6) that are examined in some detail against a common denominator, sustainability, and, in the case of the last three, the case study research. That is, a considerable part of the depth to this research is centred on the second and third person techniques - analysing the interview material and theories against theory to evaluate and modify such theory (with the aim of enabling better sustainability outcomes). These risks are also addressed making use of the first, second and third person methodologies throughout the eight-year course of this research - that is, the techniques have continued to inform this work throughout all of its major phases (Hedlund, 2010).

Notwithstanding such issues, it should also be recognised, as outlined in the *Rationale, Focus and Need* and *Methodology Outline* sections of this chapter, the scope of sustainability is inherently large. Consequently, attempting to limit this investigation within narrower boundaries would also present difficulties. In my view, such difficulties outweigh other risks with respect to this investigation.¹⁶

¹⁶ The discussion in this section draws on published research for integral methodologies. Additionally, components of any integral research go beyond the quadrant methodologies discussed in this section. Integral methods could also consider the research methodology levels (action logic). For example, the positivist and post-positivist stages discussed in the *Analytical Approaches* subsection of the *Mid-range Theory* section are correlated with action logics (Torbert, 2000b). Such worldview considerations are not limited to methodology -

Integral Triangulation

The arguments and conclusions in this thesis are derived through applying multiple methods to multiple data sources (as described in this chapter). In integral theory terms first, second and third person methodologies are used to interpret and theorise about sustainability. Organising these multiple approaches through integral theory's quadrants assist to mesh and triangulate this data (Esbjörn-Hargens, 2006b). For example, there are two distinctly different data sources for evaluation of meta-theory. The first is the *Multi-paradigm Review of Energy Efficiency Gap* (see the section with the same name in Chapter 3). The second are the conceptual lenses from Edwards' (2009) *Organisational Transformations* for

researcher and research methodologies will address the topics through the action logics of the participants (including the researcher and those utilising and reviewing the work). With this in mind I have tried to write this thesis so that it is accessible to people holding many such perspectives. However, the worldview lens is also true for the manners in which this research is conducted. An integral methodology may manifest differently e.g. at late stage action logics this could be seeking to bring together different approaches and create (construct) elegant methods that benefit our societies and humanity - the research is a constructed tool, so why should it not serve a greater purpose? Other different conceptualisations are possible - such as using a construct like science to support elegant new methodology investigating constructed research topics. Recognising the constructed nature of all such methods, this could support application onto reified research - graceful purposeful design of entirely new methodology, encompassing very subtle phenomena in a manner that generates creative conceptual understanding, of what was abstract, for many and human benefit (O'Fallon et al., 2013).

From a practical perspective, with this thesis, such considerations are complicated by the long eight-year timescale of this work and its original design. As noted in this *Integral on Integral* section my action logics have shifted during the period of the research. Consequently, the design phase and final write up were conceptualised through different worldviews. A later action logics stage design might occur if the work was starting now. However, there are other considerations. Physical timelines for the thesis process constrain redesign alongside practical concerns - the research has greater use when it is publicly available in a timely fashion. I have thus adopted an approach of consciously recognising these shifts and viewing the thesis as a whole from current worldview perspectives, as well as reflecting back on the stages of this process.

Sustainability Integral Metatheory. Results from both analyses are triangulated using quadrants in the *Loop and Lens Analysis* section of chapter 6.

As mentioned above, a second aspect of triangulation, quadrants and this multiple methodology approach is that the research is being conducted over time - my (first person) perspective, and theory, is changing during the course of this work. This is particularly noticeable in the case of the divergent action logics sustainability perspectives (Chapter 4). Early coding of this material included a code used when I was uncertain about the action logics or felt that the examples were unclear. Over time, not only did my own understanding of this material deepen (aided by the personal action logics stage shifts described above), but additional theoretical contributions also clarified the application of such theory to my data (and vice versa).

Notable theoretical developments during the course of this research include the combining of stages and states with respect to a person's action logics (O'Fallon, 2010). This combination can be regarded as third person research for its theoretical contribution to the thesis (while also having a significant first person impact on my own capabilities). These developments enable clearer decision-making and correlation between theory and observed perspectives. For example, O'Fallon's (2010) revised methodology and model helps to discern how action logics relates to sustainability as discussed in Chapter 4. However, this development (at approximately the halfway point of this thesis's research) also meant that the revised theory could be retrospectively used to question and validate previous action logic sustainability coding. The iterative process means that two separate third person methodological lenses have been used to triangulate the results presented in Chapter 4. Alongside this, the first person reflection (in part prompted by my engagement

with these new theoretical structures) and personal action logics change assists with checking validity. In addition, interaction with others about the data and interpretation of it - such as Divecha and Brown (2013b) - provides further reference points and a second person perspective on the research.

A second example of the theoretical development over time is seen with common pool resources principles as described in Chapter 5. This body of work has grown significantly over the last decades. More specifically, the perspectives held by researchers, as it has increasingly been applied to global scale sustainability issues, developed considerably over the early and mid-stages of this research (e.g. development from Dietz et al., 2003; to Ostrom, 2010a; Ostrom, 2010c). As with the action logics example above, this has enabled a deeper enquiry into my research material and also allowed me to triangulate early conclusions against later theoretical developments.

In both of the examples given above, the later theory development supported earlier analysis of the material in this thesis and strengthened the arguments. Additionally, data from the thesis tends to reinforce the conclusions and arguments made by these researchers as they updated their respective bodies of work. That is, the conclusions from the research in my thesis add weight to other theoretical developments - see Chapter 4 for an example. In addition, the afterword - Chapter 9, discusses the research journey over time.

Consequently, triangulation, with the integral theory framework in this thesis, can be thought of through quadrants, stages, types and states lenses as well as having a dimension related to time.

Chapter 3

A Meta-theory Review of Energy Efficiency

Introduction

There can no longer be any doubt that the micro assumptions of the theory - the assumptions of perfect rationality - are contrary to fact. It is not a question of approximation; they do not even remotely describe the processes that human beings use for making decisions in complex situations.

Herbert Simon, Rational decision making in business organizations (1979)

The next stage in progressing this research is to examine energy efficiency, a discrete sustainability case, with meta-theory. The aim is to build resources and analyse the usefulness of them, alongside Integral Theory, with respect to the thesis topics.

This chapter is grounded in the previous one, which illustrates the research by relating cases and methods to energy efficiency issues. It does this to explain the context for the range of methods and as sustainability, organisations and climate change are very broad topics.

Efficiency provides a more tangible case and helps to assess the potential, or relative significance, of proposed analytical methods.

Chapter 2 is also a starting point into the substantive body of theory and practitioner literature available to inform policy makers, individuals and organisations about opportunities that can be realised through addressing efficiency. Researchers have naturally enquired into this topic, particularly around the unexpectedly low uptake and rate of

change associated with efficiency. With this body of research, alongside applied literature, the topic is well placed to be used with meta-theory.¹⁷

The first sections of this chapter consequently refine the aims of the review and data sources. Meta-theory methodology is specifically outlined for this integral and energy efficiency case. After this, the analysis derives conceptual lenses through which practitioner and researcher literature addresses energy efficiency. The significance of the findings are then contrasted with integral theory. Finally, I address the implications of the review, and next steps arising from it, for this thesis.

The *Energy Efficiency Theory* section is the initial step. It defines the scope, building on the *Rationale, Focus and Need* section of the previous chapter. That section outlines some of the substantial gaps between what would represent logical action - viewed through an economic paradigm - and actual observed behaviour. Such a paradigm, that we will individually act to maximise our own profit - as well as business groups will similarly act when it is profitable to do so - is apparent throughout society.

The *Energy Efficiency Theory* section highlights the extent to which profitable, low-risk, changes are not implemented. There is a substantial body of evidence demonstrating that currently available technologies and practices could cut energy demand and deliver cost savings. Moreover, such changes offer substantial returns on investment and could result in meaningfully large greenhouse gas emission reductions. Viewed in this light this is something of a paradox. It is quite common for us to believe we will act on climate change

¹⁷ Although reported in this chapter as an integrated meta-theory analysis, the first step of this work was a trial run on limited texts. This initial meta-theory review of energy efficiency literature was conducted early in the course of this research. It informed the research highlighting areas, such as relationships between information and sustainability leadership, that might warrant attention.

when it is in our financial self-interest to do so. Conversely, the fact that it may be less profitable to act is often raised as a barrier and as a reason why these issues are not addressed sufficiently. Hence the paradox - we say we will act to maximise profits but fail to act on very low risk energy opportunities that would deliver such profits.

Paradoxes such as these are useful as they highlight conditions and inconsistencies that may lead to a deeper or more integrated understanding. This is especially important when dealing with complex and ambiguous issues such as sustainability.¹⁸

Following this paradox outline, the *Multi-paradigm Review of Energy Efficiency Gap* section uses the theory reviewed, alongside practitioner and policy literature, to investigate this topic. It derives the major paradigms - and the theories and themes that sit within them - through which researchers and practitioners seek to understand and stimulate change regarding energy efficiency. From these categories, the concepts - conceptual lens sets used in the various texts addressing energy efficiency - are identified.

The review creates a large group of sixty conceptual lenses. To refine and structure this collection the *Conceptual Lens Sets* section assesses them through theoretical filters. These classify the concepts with why, how, who, where, when and what questions. For example, the lenses may concentrate on the “why” of action, or “how” action occurs, “who” engages

¹⁸ A paradox occurs when related concepts contradict each other - any element on its own makes logical sense but when put together the contrasts appear irrational or absurd. For clarity, it's useful to think of the term 'paradox' in general and specific categories. Firstly, it's an umbrella definition of contradictory statements. It gets used to point out inconsistent perspectives, for example questioning how an individual can hold one view about themselves but, paradoxically, not behave in this way to others. Secondly, there are logical paradoxes (e.g. “I always lie”), which are difficult to understand as either true or false. Paradoxes in social research and the one being examined here, energy efficiency, are generally the first type (M. W. Lewis & Smith, 2014; Poole & Van de Ven, 1989).

to create such action and “what” is occurring when action transpires. There are also some lenses that fall across all questions. The output from this section is a consolidated group of twenty conceptual lenses.

These conceptual lens sets represent perspectives through which theories and frameworks understand and assess efficiency. These are a subset of broader sustainability and climate change questions. The lenses form a resource through which the initial, primary, purpose of this review can be assessed. To do so, the *Integral Meta Discussion* section uses these lenses as meta-theoretical resources for model building. The lens sets are discussed with respect to integral theory.

The section synthesises the conceptual lenses against integral theory. It looks at whether the concepts form part of this framework and if integral can help add clarity and understanding to the meta-theory that has been built. With multi-dimensional, complex topics like sustainability we need structures through which interactions, important approaches and transformational catalysts can be assessed. The preliminary conclusion from this section is that integral theory is well placed to deliver such a structure. The section also highlights meta-theory conceptual lenses where further discussion will be useful. It outlines the use of the resources from this chapter in the remainder of the thesis and where the initial preliminary conclusions will be further developed.

Energy Efficiency Theory

Practical analysis of energy efficiency and other GHG mitigation options often makes the narrower assumption that people are cost-minimisers. Such assumptions are undermined by experience with energy efficiency programmes. It has long been recognised that consumers do not necessarily act on their stated values, and fail to take up measures that appear on paper to be economically worthwhile.

IPCC: Jayant Sathaye, Daniel Bouille et al. Barriers, Opportunities, and market potential of technologies and practices (2001 p367). Note: quote omits citations.

Over a decade ago, Cameron and Quinn (1988) claimed that by exploring paradox, researchers might move beyond oversimplified and polarised notions to recognise the complexity, diversity, and ambiguity of organisational life.

Marianne Lewis, Exploring paradox: Toward a more comprehensive guide (2000)

To outline the scope of the meta-theory review, this section discusses energy efficiency, the economic action paradox within this topic, and some of the approaches to understanding such a gap.

Energy efficiency refers to improvements that can be undertaken that reduce the amount of power used for a given activity. A clear example is lighting. The same amount of light can be delivered from a variety of sources including incandescent, compact fluorescent and LED bulbs. An LED bulb is approximately an order of magnitude more efficient, delivering the same quantity/intensity of light while using 10 times less electricity. Changing a light bulb, or lighting sources, is relatively simple, low risk, with savings and profits quickly realised (IEA, 2006 pp25-28). Consequently, from a purely objective or financial perspective, high rates of uptake and implementation should be expected (Gillingham, Newell, & Palmer, 2006; Gillingham et al., 2009).

Energy efficiency opportunities extend well beyond artificial lighting and are ubiquitous across human power uses. The term is used specifically for a technology as well as more

broadly across a physical system. For example, using waste heat from electricity generation (combined heat and power) can be regarded as energy efficiency (Garnaut, 2008 p445; Sorrell, 2007 p11; von Weizsäcker et al., 2009). There are multiple examples including designing buildings, suburbs, transport systems, industrial production, and across primary and secondary industry (Farrell, Nyquist, & Rogers, 2007; von Weizsäcker et al., 2009). Importantly, cutting carbon intensive power use through efficiency can address greenhouse gas emissions and these technologies are commonly discussed in relation to climate change (IPCC, 2007b; Pacala & Socolow, 2004).¹⁹

Despite this evidence, cost effective changes generating profitable returns through reduced energy bills are not being implemented. Studies (e.g. Energy Efficiency and Greenhouse Working Group, 2003; Enkvist et al., 2007; Farrell et al., 2007; Gillingham et al., 2009; A. Lewis et al., 2008; Sanstad, Hanemann, & Auffhammer, 2006) demonstrate that substantial unrealised efficiency opportunities exist. Internationally, these assessments typically calculate large savings (negative cost greenhouse gas abatement) that can be achieved through efficiency measures. There are numerous examples such as Farrell, Nyquist and Rogers (2007) who find that efficiency could be implemented at more than twice the current rates. For lighting alone, the International Energy Agency finds that US \$2.6 trillion

¹⁹ There is considerable discussion on whether the '*Jevons*' paradox means that energy efficiency, within a household or organisation with net positive economic and emissions benefits, leads to an overall reduction in greenhouse emissions on a larger scale. The issue arises as an overall increase in greenhouse emissions could result if energy becomes cheaper - if this occurs as a result of resource efficiency. Broader policy, cultural, pricing and behaviour measures are likely to be necessary to address this. Consequently, a policy which relies solely on promoting energy efficiency is unlikely to address greenhouse gas emissions effectively (Hanley, McGregor, Swales, & Turner, 2009; Herring, 1999; Sorrell, 2007). Conversely, economy wide savings from efficiency can beneficially offset climate mitigation costs (Enkvist et al., 2007; Farrell et al., 2007). As a result, efficiency is generally regarded as a major mechanism to mitigate emissions.

of costs could be avoided by shifting to more energy efficient lights globally (IEA, 2006 p28; Waide, 2007 p26).

In Australia, six giga-tonnes of greenhouse gases cuts are available at a net profitable return or at zero cost (A. Lewis et al., 2008). Nearly 25% of the total target for Australian greenhouse gas emissions reduction that could be met with profitable or zero net cost actions.²⁰ Similarly, a major Australian Government report (all state, territory and the federal governments) calculates the potential for emissions reduction from efficiency opportunities. It finds 20 to 30% of Australian emission reduction requirements can be achieved from efficiencies with a payback period of less than four years (Energy Efficiency and Greenhouse Working Group, 2003).

The Energy Efficiency and Greenhouse Working Group (2003) using a conservative scenario (50% adoption in 12 years of its low improvements scenario) finds the following benefits:

- Real GDP would be \$1.8 billion higher (+0.2%)
- Employment would increase by around 9000 (+0.1%)
- A 9% reduction in stationary final energy consumption
- A 9% reduction in greenhouse emissions from the stationary energy sector.

Such benefits are a two part paradox. The first element of this is that there is an enduring gap between the rate at which such efficiency opportunities should be implemented – as gauged by economic theory – and actual practice (DeCanio, 1994, 1998; Gillingham et al., 2009; van Soest & Bulte, 2001). The gap is well documented with a wide range of publications addressing the topic (Shove, 1998; Thollander, Palm, & Rohdin, 2010; Weber,

²⁰ Target to meet Enkvist, Nauclér and Rosander's (2007) total based on global requirements.

1997). However, the existence of such a paradox is not necessarily widely accepted (Gillingham & Palmer, 2014).

Economic theory struggles to explain the gap. For example, Diederer, Van Tongeren and Van Der Veen (2003) analyse a specific case using a hurdle rate – that is, assuming that people are unwilling to invest as they may believe that in doing so they miss out on other potential profitable opportunities. However, the hurdle rate only correctly models 6% of businesses that did not invest in such efficiency. Consequently, hurdle rates do not account for this gap (Diederer et al., 2003; Sanstad, Blumstein, & Stoft, 1995).

How people think they act, versus what can be measured in practice, is a second element of the paradox. Economically rational human behaviour should result in the adoption of energy efficiency actions at optimal rates and such rational behaviour does not occur (Gillingham et al., 2009; van Soest & Bulte, 2001). This paradox manifests as the difference between polarised perspectives – that we will act on climate change mitigation if it is in our economic interest to do so – and actual behaviour observed from energy efficiency studies. Such an economically driven action perspective – we do not act on climate change as it is not in our economic interest to do so – is an established reason for the lack of action on sustainability or climate change issues. Stern (2007b) and Garnaut (2009), for example, highlight market failure, as the world's ability to absorb carbon emissions is overused and using this resource is free. However, slow implementation of economically beneficial energy efficiency actions contradicts theory that humans behave in such a rational manner. Yet the assumption that we do act in this way dominates climate change discussions – a paradox (as defined by Caprar et al., 2010 pp. 146-147).

For efficiency, Gillingham, Newell and Palmer (2009) analyse this paradox – defining it as a significant difference between the level of energy efficiency implementation we observe and what could be regarded as ‘socially optimal’. In seeking to understand this they argue from two perspectives: market and non-market failures. Market failures include the perception of cost and price, as well as more objective pricing and investment barriers. Non-market failures are those particularly related to individual and group actions – that is, behavioural failures.

Within such broad categories there are a range of theories and frameworks such as discount rates - a ‘discount’ on future cost savings and profits that is typically applied to investment decisions (Weitzman, 1998). The higher the rate, the less value placed on profitable future savings. For typical investments, this rate is approximately 5 to 10%. However, the implied discount rates for energy efficiency projects are estimated at 20% or more and continue upwards above 100% (Gillingham et al., 2009; Jaffe & Stavins, 1994b; Sanstad et al., 2006).

These high discount rates are well beyond levels expected for such investments. This raises significant questions about the presence of other factors, such as substantial non-market behavioural influences. Soest and Bulte (2001) highlight this, saying that *“the economic literature has difficulty explaining why firms don't undertake profitable investments in energy saving”*. Gillingham et al. (2009) are more direct – discussing behavioural economics and non-market barriers and arguing that *“consumers are irrationally reluctant to move from the status quo”* and *“systematic biases may exist in consumer decisionmaking (sic)”*. Stern (2007b p378) similarly notes that *“consumers and firms frequently do not make energy efficiency investments that appear cost-effective”*.

Consequently, the literature and analysis supports considering objective factors (such as discount rates and market forces), as well as subjective influences (such as individual perspectives and organisational cultures) to explain and understand individual and society responses to energy efficiency. This paradox reflects the main lines of enquiry for this thesis - why do some organisations or groups act while others may not? For example, within the case example of energy efficiency, employees of the companies in this study describe success and failure that is not necessarily based on economics (see Chapters 4 and 5).

The short review in this section illustrates some of the multiple perspectives from which energy efficiency is addressed. It also builds on previous sections (e.g. *Background* Chapter 1 and *Rationale Focus and Need* Chapter 2) linking efficiency with climate change and sustainability and outlining some of the multiple perspectives used to look at all these concepts. As such energy efficiency can be regarded as a whole that is part of another whole, climate change, which is in turn part of a larger whole, sustainability. That is, energy efficiency is a holon within the sustainability holarchy. This distinction, the paradox and the many links between these concepts are the major reasons for investigating energy efficiency in more detail.

In order to manage this, and to structure it for application and use (both within the thesis and by others), meta-theory methodology is used (see the *Meta-theory Rational and Methodology* section in Chapter 2 for a description of this method). The next section *Multi-paradigm Review of Energy Efficiency Gap* commences this appraisal.

Multi-paradigm Review of Energy Efficiency Gap

The previous sections of this chapter show that a range of broad perspectives, beyond rational economics, is used to analyse energy efficiency. A variety of literature and reports makes such assessments, for example looking at the agency (the means and/or mode of acting) required to make such transitions. Understanding which factors are important, how theories interrelate and the interplay between various motivating and action variables is important.

For example, Geels (2010) uses a multi-level perspective that includes seven foundational theories – rational choice, evolution theory, structuralism, interpretivism, functionalism, conflict and power struggle, relationism. This is a rich model and is discussed in some detail in the sections below. However, Geels highlights it is not a grand theory synthesising all available theories. He argues that transitions *“to sustainability form a rich and challenging topic that will not only remain socially relevant for decades to come, but may also benefit from dialogues between various approaches”*.

For this research, seeking to comprehend sustainability action, such a dialogue is a relevant consideration. In this thesis the material being considered crosses individual viewpoints, case studies, mid-range theory, meta-theory and integral theory. To undertake this the next step is to clarify the relationships between theory related to sustainability and integral theory. This helps to address questions related to the usefulness of the integral framework with respect to the material in my thesis. In doing this a manageable review, alongside having a tangible link with practice, is important. The links are built by using meta-theory methodology on energy efficiency (a holon of sustainability) in the sections below. This aims to facilitate greater understanding and maintain a focus on practical application. With such

a focus, it is more likely that there will be direct useful outcomes for practice, as well as theory, from such a review.

Phase 1 – Research Aim and Process

The review of energy efficiency follows several distinct steps. The first of these is to define the research aim - this multi-paradigm review of energy efficiency is seeking to inform our knowledge and understanding of sustainability through examining the links between integral theory and energy efficiency. Within this overall aim, a purpose of this review is to understand factors that may be underpinning concepts and structures relating to sustainability.

To undertake this, the review seeks to assess the extent to which integral theory may clarify or order relevant concepts, constructs, theories and models that are represented when energy efficiency is discussed or implemented. This includes addressing the topic from a business perspective, but is naturally not limited to this as the context for business is influenced by a wide range of external and internal factors (see the *Rationale, Focus and Need* section of Chapter 2 for a discussion on scope).

There are multiple steps after defining this research aim. Figure 3.1 (on the following page) illustrates these.

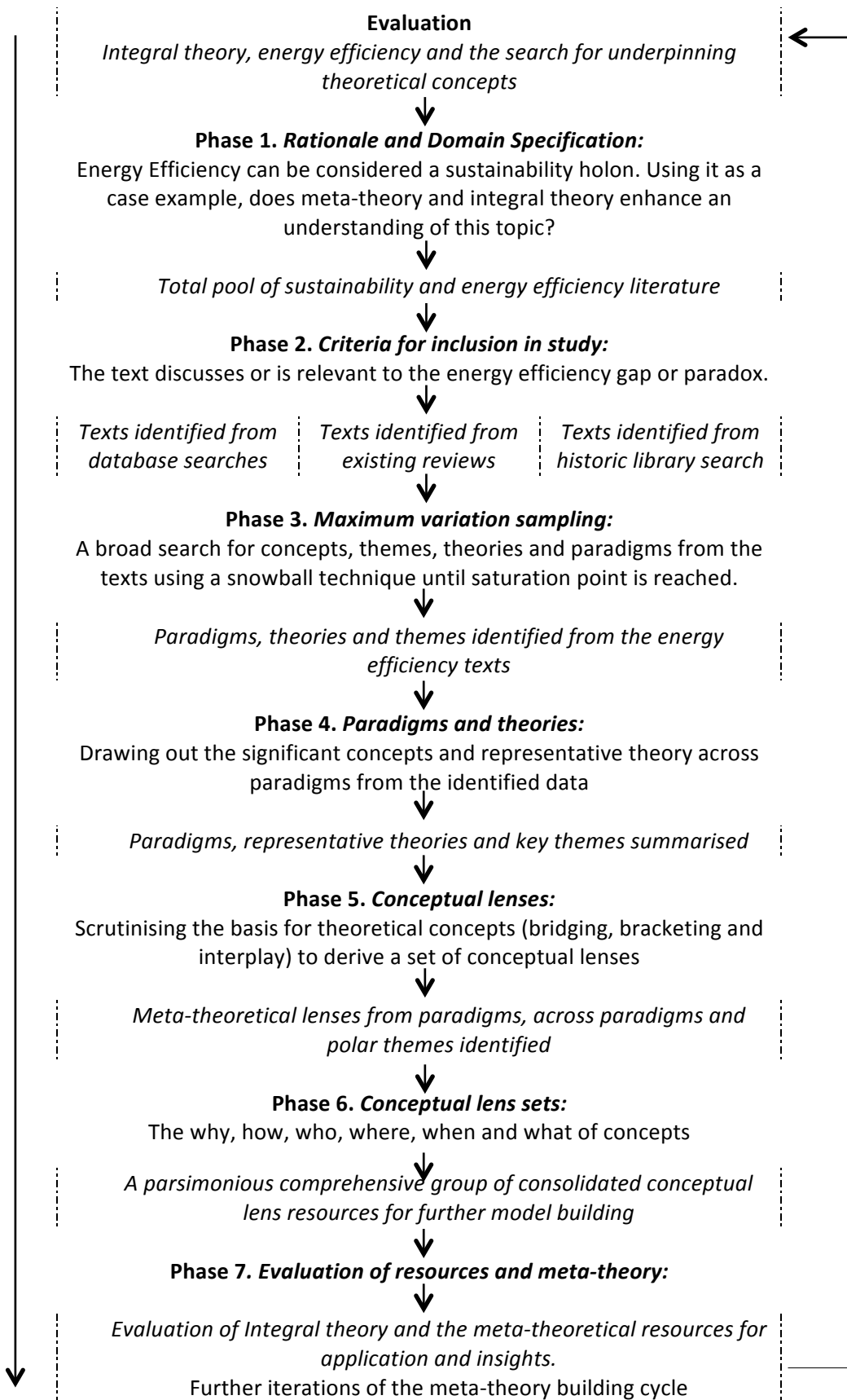


Figure 3.1: Multi-paradigm review of energy efficiency research steps.

Adapted from Edwards, Organizational transformations for sustainability (2009 pp92-100).

The subsections of *Multi-paradigm Review of Energy Efficiency Gap* section in this chapter follow the methodology outlined in Figure 3.1 through to Phase 5 - meta-theoretical lenses from paradigms, across paradigms and polar themes. Phases 6 and 7 are undertaken in the sections after these.

Phase 2 and 3 – Data and Texts

The second and third steps of the multi-paradigm review define the texts - data from which this research is conducted and the sources from which themes and theories relating to energy efficiency are identified.

A multi-paradigm review aims to identify themes from a wide range of sources - see the *Meta-theory Development and Testing* subsection of Chapter 2. Consequently, this analysis uses a broad variety of publications addressing (implicitly and explicitly) the energy efficiency gap from a variety of perspectives including barriers to change, detailed reviews of a specific industry sectors, personal motivations, group behaviour and policy analysis.

The search for texts starts from two directions. Firstly, the *Energy Efficiency Theory* section of this chapter reviews and summarises some of the relevant literature. Secondly, for a broad practitioner reference base, I started from my own personal collection. I have actively worked to promote and implement sustainability and climate change initiatives over the last two decades. As a result of this work, I have a substantial library of relevant articles. These represent a broad selection of reports and reviews collected for a wide range of purposes - from energy and climate advocacy, to business-industry-community solar transformation programs, to home and residential development efficiency, and to address national and international policy. Consequently, the library is diverse and so it was searched for energy

efficiency related documents. As it was not specifically kept for this purpose, this method helps to ensure that a wide range of data sources are used.

From these two starting points a snowball sampling technique was employed (Strauss & Corbin, 2008 p148). The search for texts concluded on reaching 'saturation point' - additional texts were not revealing new themes and theories (Strauss & Corbin, 2008 p318).

This review is not limited to works purely focused on energy efficiency. Texts often discuss efficiency from a climate change or clean technology focus and, within this, energy efficiency is a component of the actions or considerations. Articles of this nature include several standout reviews aimed at companies and government policy makers. The Stern (2007b) review is a good example of a policy focus and broadly defined business cases, researched by organisations such as McKinsey and Company (e.g. Farrell et al., 2007) and The Climate Group (2005), are examples of business targeted literature.²¹

Overall, phases 2 and 3 identify existing appraisals and specific articles while drawing from my long-term collection of literature and sourcing additional reports from references in the initial and subsequent texts. The total group includes books, book chapters, reports, academic articles, theses, conference papers, proceedings and online information. There are general texts as well as those specific to businesses and households covering psychological frameworks, economics, organisations, governments, regulation and more. In particular, the inclusion of household energy efficiency adds greater depth to the range of studies that

²¹ Some of these resources, such as the McKinsey and Company articles (e.g. Enkvist et al., 2007; Farrell et al., 2007) helped to catalyse initial lines of inquiry in my thesis. The articles document wide-ranging profitable opportunities that were not being realised despite a dominant narrative, globally and in Australia, around the costs of climate change. Moreover, this narrative consistently framed cost as a 'show-stopper' barrier to action addressing greenhouse gas emissions.

address individual psychological processes, motivations and worldviews. Geographic distribution includes global, Europe, Australia, New Zealand, India, North America, Japan, China, Brazil and southern Africa.²²

²² The full list comprises a total 106 such articles, reports, books and book sections (Abrahamse, Steg, Vlek, & Rothengatter, 2005; Akerlof, 1970; Attari, 2012; Baldwin & Rafiquzzaman, 1998; Benson, 2008; Berchicci & King, 2007; Biggart & Lutzenhiser, 2007; Blumstein, Krieg, Schipper, & York, 1980; Boiral, Baron, & Gunnlaugson, 2013; Breukers, Heiskanen, Brohmann, Mourik, & Feenstra, 2011; Brohmann et al., 2007; M. A. Brown, 2001; Browne & Bishop, 2011; Burke, Prior, Spehr, & members of the APS Climate Change Reference Group and Public Interest Team, 2010; Caldwell, 2008; Chatterton & Wilson, 2012; Cheng, 2005; Churchouse & Mahoney, 2012; ClimateWorks Australia, 2010; Daley & Edis, 2011; De Groot, Verhoef, & Nijkamp, 2001; DeCanio, 1994, 1998; DeCanio & Watkins, 1998; Diederer et al., 2003; DiPiazza, 2009; Dusyk, Berkhout, Burch, Coleman, & Robinson, 2009; Energy Efficiency and Greenhouse Working Group, 2003; Enkvist et al., 2007; Farrell et al., 2007; Fleiter, Worrell, & Eichhammer, 2011; Garnaut, 2011; Geels, 2010; Geels & Schot, 2007; Gillingham et al., 2006, 2009; Gillingham & Palmer, 2014; Gruber & Brand, 1991; Hamdouch & Depret, 2011; Hanley et al., 2009; Hargreaves, 2012; Hastings-Simon, Pinner, & Stuchtey, 2014; Heiskanen et al., 2008; Herring, 1999; Hirst & Brown, 1990; Hoffman et al., 2006; IEA, 2006, 2013; IEA & Waide, 2006; IPCC, 2007b; IPCC et al., 2007; IPCC et al., 2001; Jaffe & Stavins, 1994a, 1994b; Kern & Howlett, 2009; Kern & Smith, 2008; Klotz, 2011; LaBelle, 2011; A. Lewis et al., 2008; Lingl & Carlson, 2010; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007; Markard & Truffer, 2006; McKenna, 2009; Mueller, 2006; Murtagh, Gatersleben, & Uzzell, 2014; Nässén, Sprei, & Holmberg, 2008; J. O'Brien, 2009; Ostertag, 1999; Parnell & Larsen, 2005; Patterson, 1996; Productivity Commission, 2011; Raven, 2007; Riedy, 2009; Rohdin, Thollander, & Solding, 2007; Rosen, 2009; Sandberg & Söderström, 2003; Sanstad et al., 1995; Sanstad et al., 2006; Sanstad & Howarth, 1994; Schellnhuber et al., 2011; Schleich & Gruber, 2008; Shove, 1998; Slocum, 2004; Solomon & Krishna, 2011; Sorrell, 2007; N. H. Stern & UK Treasury, 2007a, 2007c, 2007d; P. C. Stern, 1992; Swim et al., 2011; Szatow, Quezada, & Lilley, 2012; R. Taylor & Allen, 2008; Termini, 2013; The Allen Consulting Group, 2006; The Climate Group, 2005; Thollander et al., 2010; Toke, 2000; Ulli-Ber, Grösser, & Wokaun, 2011; van der Vleuten & Raven, 2006; van Soest & Bulte, 2001; Verbong & Geels, 2007; Wang, 2014; Weber, 1997; Wilson & Dowlatabadi, 2007; Wilson, Grubler, Gallagher, & Nemet, 2012). These texts include specific technology considerations such as co-generation, as well as technology substitution, and reports that broadly address climate change, economics and/or sustainability.

Phase 4 – Paradigms and Theories

The next step, after establishing relevant data sources, is to analyse the major themes, conceptual layers and paradigms in these texts. This is phase 4 of the multi-paradigm review (see Figure 3.1 above). During this phase, the texts are examined classifying the explicit or implicit frameworks of the theories and themes being discussed. A text can span several such paradigms and many of the texts discuss the topic from several paradigms and theories. A short overview of each prominent paradigm is below. This is followed by a detailed summary across themes and theories.

The *capitalist* paradigm - viewing energy efficiency as a product and mediated by economic incentives, barriers and models - is nearly ubiquitous. A wide range of analysis and quantification approaches is used, such as macro, traditional, neo-classical and behavioural economics. The paradigm is strongly influenced by technology appraisals and the effectiveness and profitability arising from the application of such technologies. For many texts, this is a common dominating framework and other structures, such as governance and information provision, are viewed as supporting or hindering economically led change. It is common for the capitalist focused texts to view energy efficiency from only one or two other paradigms and very uncommon for an article not to discuss, or reference to some extent, the links to economic drivers.

Many of the texts also have a strong *governance* framework and discuss a range of policy responses or other government interventions. This covers all levels from international agencies and treaty structures to national and local government. While governance is commonly focused on in tandem with the capitalist paradigm, it is relatively rare for such texts to look at factors that might influence policy making and/or policy makers. Such

analysis might either be viewed as beyond the scope of these papers and reports or potentially simply not considered. An impression from these texts is that policy making for energy efficiency and economic outcomes in society may be viewed as a one way outcome. That is, writers may consider it as self evident that policy makers should focus on these issues given the economic benefits. However, the wide range of evidence demonstrating that our societies, companies and institutions fail to act on economic efficiency opportunities makes such an assumption questionable. The exceptions (e.g. PricewaterhouseCoopers, DiPiazza, 2009) are notable - when there is an explicit call for engagement to catalyse climate policy making it is in an integrated form. It addresses much more than economic factors and ranges across risks, opportunities, mindsets, responsibility, leadership and empowering others.

The provision of *information* is often recommended to alleviate sub-optimal market led adoption of energy efficiency technologies. There is wide discussion on this need, particularly from a perspective that public information should be available and that the lack of it is a barrier to action. For example, included in the *information* paradigm are viewpoints that energy efficiency information is a 'public goods' and consequently there is an expectation that such information will be undersupplied in competitive markets (Gillingham et al., 2009; Sanstad et al., 2006).

In this analysis, I differentiate *information* from a second paradigm around *knowledge*, with the latter referring to quality, management or understanding - for example, with respect to how today's information is used for a future based decisions. The differences can be illustrated by the 'lemons problem' - inadequate understanding around the organisational consequences of being 'locked-in' to inappropriate or poor quality new technology that

might not be the best sort of investment given future innovations (Akerlof, 1970). Concerns around this are expressed partially as a factor of information availability and partly around the quality of the information, or knowledge capacity of the organisation to manage it, for good decision making (e.g. Berchicci & King, 2007; Gillingham et al., 2009). To a lesser extent, this lemons issue is also discussed from a *cognitive limits* paradigm perspective.

Heuristic decision making, the *cognitive limits* paradigm, refers to finding a solution that is satisfactory for the individual or group, but this may not be based on a consideration of broad consequences and opportunities. For example, there may be a tendency to use simple cost calculations and ignore future changes and risks (Gillingham & Palmer, 2014; Swim et al., 2011). My analysis views such limits as specifically different from *bias*. For example, the *bias* salience effect refers to circumstances where there is a disproportionate emphasis placed on psychologically vivid factors (Gillingham & Palmer, 2014; Wilson & Dowlatabadi, 2007). For *bias*, instrumental vs. intrinsic - with respect to the environment - can be values based on seeing nature as a useful amenity versus viewing it as worthwhile simply in its own right (Brohmann et al., 2007). Similarly, some descriptions of instrumental vs. intrinsic fall within an *individual outlook* paradigm when the concept is being applied more to how individuals make sense of the information around them.

People are influenced by, and clearly influential in, decision making on any group scale. The *Individual outlook* paradigm groups the range of theories and theme perspectives considering these factors. There is considerable discussion across a range of concepts including considering worldviews, values, morality and motivation (Benson, 2008; Boiral et al., 2013; Swim et al., 2011; R. Taylor & Allen, 2008; Wilson & Dowlatabadi, 2007).

Additionally, people and institutions are impacted by the society around them, the *social*

acceptance paradigm, including factors such as social norms and conventions, shared values and expectations (e.g. Benson, 2008; Churchouse & Mahoney, 2012; Heiskanen, Johnson, Robinson, Vadovics, & Saastamoinen, 2010).

The *institutional change* paradigm refers to organisational factors enabling or inhibiting change. For example, the organisation may view environmental delivery as important to its reputation (Lingl & Carlson, 2010), have differing levels of risk tolerance and aversion (Sandberg & Söderström, 2003) and group priorities and organisational structures can be barriers to energy efficiency (Weber, 1997). Related to this, the *innovation* paradigm is referring to factors such as the diffusion of new technology through organisations. A number of research and practitioner texts examine how innovative technology, processes and systems are adopted across companies and societies (e.g. Baldwin & Rafiquzzaman, 1998; Hastings-Simon et al., 2014 ; Termini, 2013).

Physical, external conditions are relevant to an institution's energy efficiency practices. The *structural* paradigm groups factors such as geography and infrastructure, including being 'locked-in' to existing systems (e.g. Brohmann et al., 2007; Hirst & Brown, 1990; Raven, 2007). The *climate/environmental* paradigm includes perspectives that people, organisations or societies are receptive to change based on external impacts including shocks - for example, post a major flood disaster (e.g. Swim et al., 2009).

A good illustration of several paradigms within a theory is the 'multi-level perspective' structure. It considers seven factors including interpretivism power, deep structures (structuralism), rational choice. As it is discussed in reviewed literature, the primary paradigms are *innovation*, *individual outlook*, *cognitive limits* and *institutional change*.

Capitalist and *governance* paradigms are apparent but they are slightly de-emphasised. For

example, rational choice is viewed through an individual self-interest lens, albeit with neo-classical economics as the main example of this. Its innovation paradigm looks at, for example, the potential for niche innovations to build up internal momentum within an organisation. This crosses into the *institutional change* paradigm, creating pressure and opportunity for innovative change with associated learning processes. Steps such as transformation, technological substitution, reconfiguration, de-alignment and re-alignment are discussed and co-evolution of actors and structures (e.g. consumers of solutions and how the solutions shape the company) are part of this. Such change can be supported (and hindered) by formal rules and standards including external regulation. In addition, the *individual outlook* paradigm features quite strongly in the multi-level perspective structure with cognitive rules such as belief systems discussed alongside *cognitive limits* - heuristics (Geels & Schot, 2007; Verbong & Geels, 2007).

The results of this phase 4 multi-paradigm analysis across themes and theories are detailed in Table 3.1 (on the following pages).

Paradigm	Representative theories of energy efficiency implementation gap and paradox	Key themes identified in the review
Capitalist	Theories about energy efficiency capital cost expenditure for cutting future operating costs and discount rates; macro, micro, neo-classical and behavioural economics; techno-economic models; game theory; utility maximisation, rationality	Net present value, rate of return, cost-benefit, lifecycle cost, hurdle rate, hidden costs, limited capital, market barriers, other investment priorities, partially irreversible decision making; split incentives; principal-agent; heterogeneity; technologies, time of use tariffs, smart grids, contracting; behavioural economics - market inefficiency, mispricing; rewards, incentives; competition - sector, global, future; externalities; markets, liberalisation, Europeanisation, globalisation, carbon price, resource efficiency
Knowledge	Insufficient knowledge leads to imperfect decision making and inefficient 'market'; expert, networked and tacit knowledge	Uncertainty about future - interventions, power price changes, 'lemons'; inappropriate measures of future energy use and price; lack of knowledge on options, expert framing, networks, clusters within company, cross regional/developing countries; complexity (or perceived complexity)

Information	Public good information provision; values and worldview theories; learning theory; social marketing; information's role in behaviour change; formal and informal education; asymmetric information	Imperfect, lack of public, relevant or asymmetric information; 'lemons problem'; motivating, framed as relevant, tendency to construct from own preferences, addressing social norms, targeted, tailored, credible, understandable, meaningful and rewarding information; information for public good in private markets and spread; information technologies/ranking/real-time feedback, demonstration projects, awareness campaigns; information alone is not very effective
Institutional change	Organisational change, behaviour, stages, inter-subjective, intergroup, culture, power; strategic timing, systems, complexity; multi-level perspective; sanctioning, self-regulation; learning organisation, leadership; socio-technical systems	Priorities, strategy, vision, values, future orientation, managerial capacities/support, internal resources, goals, targets, corporate or business unit level; learning strategies/processes; vested interests, reputation, employees, benefit assessment, appraisal and design, timing; market push/pull, weed out weak; behavioural factors, leadership
Cognitive limits	Bounded rationality; cognitive capacities; core values, multi-level perspective	Deviate from 'rationality', people cognitively constrained, decision maker capacities, finite time; heuristic decision making, behavioural economics heuristics, rule of thumb, cognition, conceptual chasms; basic psychological needs and beliefs; motivated by key aspects of messages

Bias	Bounded rationality, prospect theory; worldviews, values, meaning-making; hyperbolic discounting	Status quo bias, bias for present known conditions; professional bias, group-think; mental accounting; salience effect, irrationally reluctant to change; framing of decisions, loss averse; behavioural economics non-rational decision-making and heuristics; 'attitude-behaviour' gap
Individual outlook	Personal motivations, plurality of needs and desires, resilience, vulnerability; interpretive/constructivist, structuration; values, morality, altruism, worldviews, meaning-making, intra-psychic processes; social marketing; multiple intelligences; state of being receptive to change; planned behaviour; multi-level perspective; cognitive dissonance; thin rationality	Intra-psychic processes; ²³ individual variation, policy reaction, psychological valuing of trade-offs and choices, motivation, scarcity mentality, association with good feelings; reciprocate, authority, public commitment, influenced by peers/social norms/normative rules, cooperating, habit, disbelief of own agency, uncertainty and scepticism, distrust, externalising, fatalism, free-rider worry, capacity to be self reflective, strong emotional response, helplessness; instrumental vs. intrinsic - different views on desirable future, attitudes and behaviour towards environmental issues, discount distant outcomes, risk; experience of climate impacts, weather/affective and behavioural individual states; behavioural economics frames of mental subjective filters; fatalist, hierarchical, individualistic, and egalitarian stages; cognitive complexity, developmental capacity to take more perspectives; women vs. men

²³ Intra-psychic is a psychological term referring to internal psychological processes of the individual that could, for example, result in a mental predisposition to discount distant outcomes despite the fact they are of great value.

Governance	Incentives, sticks, carrots; common pool resources; polycentric governance, systems, supranational institutions, complexity; self- regulation; contextual factors; equilibrium models; socio-technical systems, evolution	Regulatory standards, minimum standards, policy, targets, mandatory, voluntary, short/long term, impact on innovation, urbanisation/green policy, energy consumption regulation; government as a leader and information provider, case studies, demonstrations; long-term consistency, cross policy coordination, rebound, risk, political uncertainty, policy for culturally different regions, libertarian, paternalism, effectiveness; policy networks, international, global engagement, polycentric, systems; regulation for markets, market distortion, grants, refunds, incentives, tax
Innovation	Diffusion of innovation, epidemic model, diffusion modelling; multi-level perspective; systems; learning processes; sequential theories of technology transfer; evolution	Diffusion of innovation, knowledge transfer between firms, radical innovations; transformation, co-evolving, discontinuities of technological progress, niche-innovation trajectories; address fundamental market barriers, heterogeneity differentiating technology adopters, learning, social networks; whole production systems vs. technical level; regime rules, governance enabled, policy barriers addressed, partnership, regulation enabling innovation, research incentives/funding; interplay between external impulses and internal structures

Social acceptance	Society and group influence; structuralism, deep structures; functionalism; stakeholders; social marketing; social value orientation; worldviews, values; socio-technical system; tacit knowledge	Social practices, relationships, supportive social networks, women's influence, socio-technical landscape, cultural influences, cultural validation and support; socio-cultural barriers such as high status from consumption, social comparison, conformity, norms, green activism/marketing, no-regrets strategy, socio-economic acceptability, market shift-sense; leadership, leadership roles for business, networks, supportive groups, teams, fostering shared understanding; broad societal trends, shocks, organisations localising climate change, mindsets
Structural	Physical objectives; structural-functionalism; complex systems theory	Geography, regional differences, climate (temperature, weather etc.), timing; quality of technology's outputs (e.g. light quality); physical infrastructure constraints, lock-in from existing infrastructure; lack of supporting competencies, services, alternatives
Climate-environmental	Receptive state; factors affecting society and organisational views	Pressure from energy supply and climate change; individual receptive states e.g. post-disaster predisposition to action; co-benefits, reduced pollution, health

Table 3.1: Energy efficiency gap paradigms and representative theories.

Phase 5 - Conceptual Lenses

The previous phase of this review, in identifying overarching paradigms, details theories and themes that are relevant to energy efficiency. This analysis has reduced source text detailed concepts and considerations to focus on the major theoretical items. However, as is

illustrated in Table 3.1 above, there is a large variety of intersecting and overlapping themes alongside the commonalities and differences. In order to structure this and clarify the differences and synergies, this phase brackets the themes and theories into conceptual lenses. It also examines the interplay between the paradigms, theories and themes to derive additional conceptual lenses. This interplay procedure is adopted so conceptual lenses that may span more than one paradigm are not overlooked. See the *Meta-theory Rational and Methodology* section of Chapter 2 for further details.

This analysis, by bridging and bracketing themes and theories, is seeking to identify lenses that were characterising concepts as they were formed. For example, within the capitalist paradigm core conceptual lenses are found in the theories that explain how energy efficiency is implemented. The *profit* lens is used to describe themes from the text related to maximising profit as determining behaviour. The *investment case* lens is when broader issues such as net present value, priorities and risk are considered within the profit assessment.

The concept of worldviews further illustrates this process. These are explicitly identified in discussions related to energy efficiency by Benson (2008), Boiral, Baron and Gunnlaugson (2013), Browne and Bishop (2011), Lorenzoni, Nicholson-Cole and Whitmarsh (2007), Riedy (2009), Toke (2000), Swim et al. (2009; 2011), Taylor and Allen (2008) and Wilson and Dowlatabadi (2007).²⁴

²⁴ For the purposes of this illustration, if the concept of a worldview is mentioned in the text (e.g. Schellnhuber et al., 2011) but the discussion does not feature it as an explicit factor, the text is not included. However, there are implicit worldview frameworks throughout these texts. For example, although worldview is touched on in relation to technology viewpoints, Schellnhuber et al. (2011) discuss the World Values Survey and core values such as “post-materialistic”. Such a conceptualisation is correlated to stage development - the *worldview-*

The worldview concept is used to discuss how people will perceive problems. In the *individual outlook* paradigm, for example, a ‘fatalistic’ approach (Lorenzoni et al., 2007) or ‘ecological’ worldview (Benson, 2008) affects action. Similarly, worldviews will influence how people engage with respect to information - *information* paradigm (Swim et al., 2011). Additionally, related to the *individual outlook* paradigm, more or less sophisticated approaches to energy efficiency and sustainability are correlated to manager developmental worldview (Boiral et al., 2013) or adult learning stages (R. Taylor & Allen, 2008). For the *social acceptance* paradigm, there are society and group influences such as shared or common social worldviews (Lorenzoni et al., 2007). When held by an organisation these could, for example, see it advocate for climate change and energy efficiency action (Toke, 2000). These worldview concepts, and making sense of issues through differing perspectives, are discussed across several other paradigms including *capitalist* (Boiral et al., 2013; Swim et al., 2011).

There are two distinct categorisations in the above worldview discussion. The first is associated with action from a relatively stable viewpoint, such as ‘ecological’ or organisation outlook. The second is associated with a hierarchical like change through developmental stages. Consequently, there are two different conceptual lenses - *world viewpoint* (relatively stable) and *worldview-meaning* (developmental). To illustrate this further, when *individual outlook* is being discussed in a manner correlated to constructing meaning, or making sense of decisions, it is bracketed under the *worldview-meaning* conceptual lens. When it is fatalist, egalitarian, individualistic etc. it is bracketed as a *world viewpoint* conceptual lens.

meaning lens. Materialistic values are associated with modernity/achiever worldviews and post-materialistic with post-modern/individualist (e.g. Fein, 2010). See Chapter 4 for discussion on stage development action logics and achiever/individualist terminology.

These lenses, alongside other conceptual lenses identified by bridging and bracketing, are shown in Table 3.2.

Paradigm category	Conceptual lenses identified through bracketing
Capitalist	i) profit; ii) investment case; iii) complex investment case (with external and future influences); iv) investment dichotomies (split incentives, principle-agent)
Knowledge	i) future orientation; ii) complexity capacity; iii) analytical ability (internal and external)
Information	i) public v.s private goods; ii) future lemons; iii) world viewpoint; iv) constructed from archetypes; v) meaningful timely relevant; vi) ability to learn; vii) asymmetric information
Institutional change	i) learning; ii) emergent stabilisation; iii) leadership; iv) timing
Cognitive limits	i) bounded rationality; ii) heuristic decision making; iii) core values; iv) perspective affinity
Bias	i) known frame; ii) salient perspectives; iii) stakeholders
Individual outlook	i) morality/values; ii) world viewpoint; iii) worldview-meaning; iv) temporary states; v) motivating factors; vi) internally-externally influenced; vii) future risk orientation
Governance	i) mandatory rules; ii) targets and incentives; iii) consistency and future uncertainty; iv) polycentric influences; v) leadership
Innovation	i) diffusion transfer; ii) types of innovators; iii) internal/external influences; iv) transformation process
Social acceptance	i) social norms; ii) leadership; iii) world viewpoint; iv) stakeholders; v) alignment

Structural	i) physical differentiating factors; ii) technology limits
Climate/environmental	i) receptive state; ii) pressure to change; iii) future outlook

Table 3.2: Conceptual lenses identified through bracketing.

As discussed above, the worldview concept spans several paradigms in addition to those included in the previous table. A purpose of interplay analysis is to identify such lenses. The lenses spanning paradigms are shown in Table 3.3 including the *worldview-meaning* lens discussed above.

As a second illustration, influences contributing to behavioural economics span several paradigm categories – particularly *capitalist*, *cognitive limits*, *bias* and *individual outlook*. Theory aims to model, for example, individual bias such that subjective factors can be applied within an objective economic formula assessment. It is represented in the table as an *adjusted rational economics* conceptual lens.

Perspectives can also appear to be mutually exclusive when viewed through particular structures and interplay analysis attempts to identify these conceptual dichotomies. To continue with the economic example, rational-irrational represents the perspective that we make decisions based on maximising our economic outcomes versus a much more subjective perspective, as outlined in this chapter (for example see the *Energy Efficiency Theory* section).

Conceptual lenses or dichotomy (<i>italics-hyphenated</i>)	Focus of these concepts or description of polarity
Adjusted rational economics	Measurable economic and subjective assessments with data from game theory experiments and agent simulations describe and define likelihood of action
<i>Rational-irrational</i> <i>Objective-subjective</i>	Decision making is based on economically rational assessment vs. decision making is biased by a wide range of subjective perspectives
Human capacity	Ability to comprehend and synthesise information and or act on such knowledge
<i>Measurable constraints-unconscious</i> <i>Objective-subjective</i>	Knowledge and intellectual limitations, such as time and resources to act vs. unconscious drivers and bias
Multiple understanding	Decision making and outcomes based on cross organisational, externally and internally influenced and multiple differentiated individual understanding depending on particular cognitive constructs
Worldview-meaning	Individual and group actions on energy are mediated by worldview understanding perspective
Multi-level perspective	Viewing the efficiency question through first, second and third person perspectives with individual, group and interpersonal theories
States	Temporary changes can mediate predilection to action; states of awareness
Alignment	Intergroup and interpersonal alignment between policies, outcomes and beliefs

Table 3.3: Interplay between paradigms.

From this analysis, there are 51 conceptual lenses identified by bracketing and nine lenses through the interplay technique. The total of 60 lenses is a rich and diverse number from

which meta-theory can be assessed. The next section, *Conceptual Lens Sets* uses the resources developed to refine the model. That is, the next section is undertaking phase 6 as outlined in Figure 3.1. Additionally, the section discusses the same texts related to the *world viewpoint* and *worldview-meaning* conceptual lens to illustrate the concepts' progression through the next stage of analysis.

Conceptual Lens Sets

The previous *Multi-paradigm Review of Energy Efficiency* section derived 60 conceptual lenses that are characteristic of the fundamentals from which theorists and practitioners view efficiency. Consequently, there is a wide range of interpretations possible from this multiplicity of lenses and it is clear that they can't form a simple way to communicate this topic. As part of this research aims to evaluate integral theory for its application on energy efficiency (as a discrete element of sustainability issues), there is a need to rationalise, structure and synthesise further.

As a general rule, strong theory building uses the minimum number of concepts possible (parsimony), to communicate and explain phenomena at a given scale of analysis and application (abstraction), while still aiming to provide a comprehensive explanation (Wacker, 2008; Whetten, 1989). These abstraction, comprehensive and parsimony principles apply to the meta-theory analysis as it involves building theory and it is clearly useful to simplify, where possible, the conceptual lenses.

To carry out this analysis, Whetten's (1989) organising structure is useful. Whetten highlights that frameworks for theory building can be just as likely to obfuscate as they are to clarify meaning. He proposes key questions through which theory development can be

considered to manage this difficulty. These questions have been adopted and adapted by Edwards (2009 p107) and are further revised in this section to apply to my thesis material. Edwards analyses theory related to organisational transformation, but this review is focused on the somewhat more concrete concept of energy efficiency. As a result, the conceptual lenses tend to be slightly more objective and consequently the physical aspects of Whetten’s questions (such as ‘*where*’), which were not emphasised in Edwards’ analysis, are useful. Table 3.4 outlines this framework.

Key question	Meaning	Focus
What, where	What factors are mediating	The structures
How	How does this happen	The processes mediating such action
Who, when	Who is responsible and when	Time and human context factors
Why	Why is action occurring or not occurring	A focus on underlying causes
Why, how, who, where, when and what	Concepts that cut across multiple categories and include facets of our lenses thus not reducible to single categories	Multifaceted conceptual lenses

Table 3.4: Structuring conceptual lenses by research focus.

From these key questions the conceptual lenses are refined in the subsections below. These sections cite examples for each conceptual lens group from the original literature data sources (see *Multi-paradigm Review of Energy Efficiency Phase 2 & 3* subsection).²⁵ In addition, the subsections occasionally refer to source literature beyond the reviewed

²⁵ As would be expected, these texts usually contain multiple conceptual themes. The examples are used to ground what could otherwise be a very abstract discussion with physical examples.

efficiency texts when this is necessary to clarify the derivation of lenses (e.g. archetypes Jung, 1936; and bounded rationality Simon, 1972).

What, where

This first question considers the factors that mediate energy efficiency actions - the conceptual lenses that are foundational to enabling an individual or group focus on such issues. To delineate these lenses, from the other questions, this is a classification of configurations and systems of phenomena that mediate change. It is not covering the conceptual lenses which focus on the actual process, or the more direct reasons, change may be occurring.

An analogy for this 'what and where' question is that it seeks to find the factors describing the landscape against which action occurs (Whetten, 1989). This landscape is, in turn, susceptible to being transformed when successful action may alter the group or individual in question. It is characterised by views that persist over long periods of time and form patterns that can be observed across multiple different cases. There are 4 groups of these apparent in this assessment – *deep structure*, *physical structure*, *governance holarchy* and *developmental holarchy* lens sets.

Deep structure lens set

The *deep structure* lens set describes a group of social style interactions and beliefs that persist over medium and long-term timescales. It is partly defined by the ‘archetype’ concept - the notion that information is commonly understood through patterns of unconscious ideas and that these particular subconscious structures may be universally present for an individual. On a group scale this might be represented as a fundamental set of beliefs within an organisation (Jung, 1936; Schein & Gallos, 2006 p784-786). This set encompasses the notion that our outlooks, or an individual’s acceptance of actions, are underpinned by unconscious ideas, values and/or perceived social norms - albeit that the way we make sense of these may change to a new formation should a transformation occur (Geels, 2010; Swim et al., 2011). Consequently, information, individual and social lenses describing deep structure type relationships are combined in a similar manner to Edwards (2009 p108) linking institutional archetype and deep structure. This lens set is shown in Table 3.5 below.

Information	iv) constructed from archetypes
Cognitive limits	iii) values
Individual outlook	i) morality/values
Social acceptance	i) social norms

Table 3.5: Archetype and deep structure lens set.

Physical structure lens set

Structural impediments may exist for organisations and individuals addressing efficiency.

For example, these appear in the limitations of electricity supply infrastructure, which can

be a significant disincentive to new technology as it can act to ‘lock-in’ groups to existing patterns of use (e.g. Hirst & Brown, 1990; Schellnhuber et al., 2011; van der Vleuten & Raven, 2006). There are also obvious regional structural differences such as hot, sunny or cold climates and such areas may be more, or less, suitable to currently available technologies (e.g. Brohmann et al., 2007). Overall, this set can be regarded as the physical barriers from actual infrastructure or geographic and weather related factors. They are thus grouped together as an objective set representing constraints based on observable material factors. Table 3.6 outlines this group. These physical structures, or the influence of them, are susceptible to change through technology shifts and/or a change in attitude towards such issues.

Structural	i) physical differentiating factors; ii) technology limits
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Table 3.6: Physical structure lens set.

Governance holarchy lens

Many of the efficiency texts discuss governance. This is often from a straight regulation or policy perspective and includes the interrelationships of governments, organisations and individuals. For example, regional and inter-governmental considerations mean that a range of overlapping regulatory structures, policies, standards and incentives may apply to any individual or group considering action on energy efficiency. Different scales are relevant - at least local or national governments are involved and often trans-national groups, such as the European Union or United Nations, are relevant. In particular, large international agreements affect, or are seen as likely risks for, organisational decision-making. This includes via direct and indirect influence from nation-state rules and potential influences on product market (e.g. Sandberg & Söderström, 2003; The Allen Consulting Group, 2006).

State institutions are commonly discussed as agents that can assist in overcoming barriers or, alternatively, may have created policies that interfere with adoption of efficiency (e.g. Gruber & Brand, 1991; Weber, 1997). Within this, government's role is often examined in relation to many of the paradigm structures identified in this review, such as *information provision*, *individual action*, *capitalist markets* and *innovation* (see the *Phase 4 – Paradigms and Theories* subsection for paradigm descriptions).

The *governance holarchy* lens is, however, describing perspectives that focus on how government may interact to address such issues as they are viewed through other paradigms. That is, this lens is a rules framework and looking at the particular institution, or overlapping set of institutions, that regulate. Clearly the influences of intersecting governance structures are related. A change from one group may catalyse a policy shift from others. This occurs from both a bottom-up and top-down perspective and these cross-scale 'polycentric' governance relationships are discussed further in Chapter 5 (see the *Introduction and Polycentric and Businesses* sections). Additionally, as noted above, the efficiency texts occasionally discuss the influence groups can have on national rule making - see *Phase 4* subsection of this chapter and DiPiazza (2009).

Governing groups are not necessarily formal governments. Other players include industry groups that, for example, set standards and codes of practice. Such groups exist across similar differentiated scales including national and trans-national institutions (e.g. Dusyk et al., 2009; Hoffman et al., 2006).

To structure these relationships, each of these governance groups - organisational institutions, company and industry networks, local, state, national and international governments - can be thought of as a set of holons. At any particular scale the group

possesses decision making and policy setting capabilities that intersect with other groups. A local government, for example, commonly sets rules within structures described by national frameworks. On a national scale, policy, in this simple example, could be thought of as comprising local and national rules - the local rules being a holon within the overall national set. The governance holarchy is consequently a lens that is a conceptual window on the overlapping multilevel groups that can be considered when initiating action around energy efficiency. It is referenced in Table 3.7.

Governance	iv) polycentric influences
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Table 3.7: Polycentric government and organisational holarchy lens set.

Developmental holarchy lens set

How information is framed, how people make sense of energy efficiency, the limits within which this occurs, as well as how people perceive society values and issues across all the paradigms, is mediated by worldviews. This topic is discussed at some length in my thesis – in particular see the first 3 sections of Chapter 4 (*Introduction, Why Worldviews, and Theory Underpinning Constructive Development*) for an individual perspective, while groups are discussed in Chapter 6. A short summary follows below.

The development holarchy lens set encompasses viewpoints that are characterised by stages. Each stage is a cognitive, moral, ethical, values and emotional frame of reference through which we make sense of the world around us. An individual shifting from one stage to the next transcends and includes prior understanding from the previous step, hence each step is a holon and this models a developmental holarchy.

These psychological models are apparent across the energy efficiency literature with individual’s sense making structures discussed and viewed as modelling differentiated decision making and the appeal of specific communication approaches (Boiral et al., 2013; Riedy, 2009; R. Taylor & Allen, 2008). However, treatment in a range of other texts is often not through explicit individual meaning-making stage models but referred to with concepts that are considered with this type of theory – e.g. how we perceive climate change (Swim et al., 2011). Table 3.8 summarises the developmental holarchy lens set across the paradigms.

Individual outlook	iii) worldview-meaning
<u>Cross paradigm</u>	
Worldview-meaning	Individual and group actions on energy are mediated by worldview understanding perspective

Table 3.8: Developmental holarchy lens set.

How

The ‘how’ set of lenses enquires into processes of change dynamics that are operating and relevant for energy efficiency actions (or inaction). There are 5 groups of such conceptual letters that take viewpoints on how efficiency action is supported, processed or powered - the factors and forces that are more directly part of change. These are *evolutionary innovation, learning, alignment, transformation process* and *emergent stabilisation*.

Evolutionary innovation lens

This lens represents theories that conceptualise innovation through evolutionary processes such as rules and outcomes, change as the result of selection pressures from markets, as well as deliberate discussed change. The lens conceives such pressures as a dynamic process – those impacted adapt to a new regime - for example, innovating to match new conditions, a process that describes the shifting mechanisms. It is characterised by variations, selections, retention of viable outcomes and reproduction and influenced from outside and inside organisations (with the later inner and outer framework being described by a specific *internal-external* lens set - see below).

The scope of this lens includes co-evolution - such as policy change in tandem, post or preceding technological shift, as well as longer timescales through the historic development of energy technologies and the evolution of new energy systems. These changes mirror biological evolution with competitive-like advantages favouring solutions that are more efficient and effective (e.g. Geels & Schot, 2007; Markard & Truffer, 2006; McKenna, 2009).

Table 3.9 summarises the derivation of this lens.

Innovation	i) diffusion transfer
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Table 3.9: Evolutionary innovation lens.

Learning lens set

This lens set is based around the ability to learn, as an individual or organisation, from experience, structures, experiments and learning type strategies. For example, when steps are taken, the lens describes learning outcomes as organisational strategy adapts based on understanding that emerges. In this case, successful examples are adopted provided they

are understandable, relevant and/or meaningful for the individual or organisation and the learning can subsequently assist further change.

The energy efficiency texts incorporate multiple frames of learning including: mutual learning with others; social learning - as individuals reference friends', organisational peers' and relatives' opinions; learning from experience; and, demonstration programs. Learning is not necessarily consistent but rather differentiated across actors in society, industry and government (e.g. Abrahamse et al., 2005; Heiskanen et al., 2008; Raven, 2007).

The processes described, as should be expected given that the energy efficiency changes can involve organisational change, tend to mirror Edwards' (2005; 2009 p115) learning lens for organisational transformation. Phases span across integral theory quadrants: cultural learning, learning from society – lower-left; reflecting on experience – upper-left; behavioural learning from, for example, involvement with efficiency – upper-right; and, social learning through the impact of, for example, demonstration technologies and sites – lower-right. See the *Integral Theory* section of Chapter 2 for a description of these quadrants. Table 3.10 shows this lens set.

Institutional change	i) learning
Information	vi) ability to learn

Table 3.10: Learning lens set.

The alignment lens set

This is a broad, paradigm-crossing, lens set with a range of texts looking at how concepts, actions, beliefs, individuals and groups align - that is, functionally fit together. For example, from a market or policy perspective, incentives can be mis-aligned with intended or

desirable outcomes (e.g. Farrell et al., 2007; Hirst & Brown, 1990). Similarly, discussions can explicitly focus on this lens set - for example de-alignment and re-alignment for innovation. As is the case for many theories, in addition to the alignment process this second example also includes another lens set, *evolutionary innovation*. A set of steps has differentiated a niche and other similar parts of the organisation come in to alignment with the new innovation (e.g. Geels & Schot, 2007).

The *alignment* lens set is also apparent in discussions around interactions between individuals and groups where subjective and inter-subjective beliefs interact with values and norms (e.g. Geels, 2010; J. O'Brien, 2009 pp136',137). For example, when a new set of pro-environmental behaviours are gradually adopted, aligning with a group shift to value such outcomes.

Additionally, the *alignment* lens set can cross physical to subjective/intersubjective variables. For example, in groups and regime systems, physical variables such as science and technology intersect with culturally derived views. The physical variables relevant to the groups and its views may change, with such structures influencing each other and being viewed as aligned when the influences balance (e.g Ulli-Beer et al., 2011).

The lens set consequently describes action-processes enabled across boundaries. It is concerned with congruence between group and individual objects as well as subjective perspectives and shared understanding of similar drivers that might lead to action (or otherwise). Table 3.11 summarises the *alignment* lens set.

Social acceptance	v) alignment
<u>Cross paradigm</u>	
Alignment	Intergroup and interpersonal alignment between policies, outcomes and beliefs

Table 3.11: The alignment lens set.

Transformation process lens

The adoption of efficiency technology is also described through sets of changes. Individual and relatively small incremental moves, when added together, define an overall process that occurs to create a significant change. Each step builds on the previous one.

In the case of an organisation, it may move through a range of phases with texts detailing the key stages undertaken to reach an efficiency outcome. Phase models describing such changes are relatively common with delineated steps - e.g. first - information, second - interest aroused, third - study commissioned, fourth - study completed, fifth - consideration, sixth - reconsideration, seventh - decision etc. Such models also view there being distinctly different barriers arising during different stages that needs to be overcome, as well as detailing key stages in a roll-out of new technology (e.g. Baldwin & Rafiquzzaman, 1998; Blumstein et al., 1980; Fleiter et al., 2011; Hoffman et al., 2006).

These process models share the notion that change occurs over time with steps that can be fairly measurable - for example a study is commissioned. These steps can also be describing more subjective phases such as a lack of transparency and information at a key stage. The process occurs in cycles and would be repeated through similar steps for each change or

adoption of new technology. Table 3.12 shows the primary paradigm such *transformation process* lenses arise within.

Innovation	iv) transformation process
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Table 3.12: Transformation process lens.

Emergent stabilisation lens

The *emergent stabilisation* lens describes a perspective on change with a dynamic force leading to a shift of equilibrium. This could be a cycle of transformation and integration - with steps from the *transformation process* lens as well as the *evolutionary innovation* lens.

The key feature is the shift from one balanced state to another - that is the system is viewed as stable in a particular condition. Raven (2007) describes energy system changes of this nature as characterised by “*the shift from one stable ‘socio-technical regime’ to another in such a way that the structure of that regime in the way it fulfils a certain societal function*”.

Particularly with the interface between society behaviours, expectations, acceptable technologies and new structures emerging (e.g. Heiskanen et al., 2010), such a change might involve those of the nature described by the *developmental holarchy* lens set.

Change may occur over relatively long time scales - the existing regime structures tend to be stable and conservatively resistant to shifting. Important lens intersections, such as any intermediary steps to create a new equilibrium - e.g. ‘niche accumulation’ (experiments in niche markets) and hybridisation with system changes gradually diverging to form the basis of a new state - are part of other lenses such as the *transformation process* lens above (e.g. Raven, 2007; Solomon & Krishna, 2011). Table 3.13 describes the lens.

Institutional change	ii) emergent stabilisation
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Table 3.13: Emergent stabilisation lens.

Who, when

In human systems, there is clearly a range of individuals acting on any issue, as well as considerations about when change may be appropriate. These time and human context factors are apparent throughout the energy efficiency texts. The lenses appear directly through discussions around leadership and stakeholders. Additionally, they are apparent from a more subjective perspective - the state of the individual and the conducive nature of what may be a temporary condition enabling change.

A mixed framework discusses efficiency through explicitly combining viewpoints similar to first, second and third person perspectives (see *Holons and Quadrants* subsection of Chapter 2's *Integral Theory* section). This multi-level perspective incorporates 'I' lenses - belief systems, individual interpretation and construction, a 'we' lens - collective actors and social systems and 'it(s)' lenses - rational economic choice for individuals and groups as well as evolution of physical systems.

The texts on efficiency also consider time - for example, how individuals perceive future opportunity weighed against current benefits. Logical or implicit consideration of the appropriateness of action, given present contexts, is a second time framework.

The *who* and *when* conceptual lens sets are thus *leadership, stakeholders, multi-level perspective, enabling states, future orientation and time appropriate*.

Leadership lens set

Leadership, human capacity and capability to effect change by individual and groups is quite widely discussed in energy efficiency literature, although it is often a supporting rather than central consideration (e.g. Energy Efficiency and Greenhouse Working Group, 2003; Hoffman et al., 2006; IEA, 2006 p452; IPCC, 2007c; Lingl & Carlson, 2010). Examples include a call from business and industry groups for government to provide consistency and leadership helping to set progressive directions that enable the implementation of energy efficiency. This includes a role for governments, business and others to provide leadership that helps set social standards across society, such that efficiency is regarded as important or a priority. Within organisations, internal and external leadership is viewed as important in helping to enable or prioritise a focus on efficiency. Table 3.14 summarises the set made up from such conceptual lenses.

Social acceptance	ii) leadership
Governance	v) leadership
Institutional change	iii) leadership

Table 3.14: Leadership lens set.

Stakeholder lens set

How actions are viewed, and the consequential priority placed upon such actions, is naturally mediated for any group by a wide range of influences that are beyond just the group members. For an organisation this includes suppliers, customers, regulators, employees and more. Stakeholder groupings can focus on immediate proximity, as well as having a much larger boundary and broader consideration of the impacts and influences

arising from any organisational action (e.g. IEA, 2013; Kern & Howlett, 2009). Such groupings extend to arguing that change may require broad engagement from a wide range of diverse groups – particularly if the aims are cross-society shifts. The widest frameworks argue that decision-making is shared by all, as well as that the influences, biases, beliefs and relevance of multiple different groups of stakeholders need to be considered (e.g. Burke et al., 2010; Klotz, 2011; Termini, 2013). Table 3.15 displays the main *stakeholder* lenses and paradigms. The stakeholder framework is expanded on, as a case example of additional clarifying perspectives on sustainability, in Chapter 6’s *Integrating Sustainability Stages* section.

Bias	iii) stakeholders
Social acceptance	iv) stakeholders

Table 3.15: Stakeholder lens set.

Enabling states lens set

Through the energy efficiency literature discussions around conditions that may enable, or predispose people and groups towards, action there are descriptions and theory similar to a temporary state or mindset. For example, a set of pictures, or coverage of climate events, may create a powerful impression. Under some circumstances this creates concern and an impetus for action - particularly when linked to local consequences - although this can often fade as the impact recedes in memory (e.g. Benson, 2008; Wilson & Dowlatabadi, 2007).

Consequently, these states of consciousness can be looked at as a window into how change sensitivity may exist - the state in which awareness makes the enablement of action (or inaction) more likely. As such, this groups together the pressures that may need to be

experienced to cause someone to act - an obvious example is community and society responses after hurricanes, bushfires and/or floods - with the concept that this has created a receptive state or condition within which a higher priority is placed on action. Table 3.16 summarises this lens set.

Climate/environmental	i) receptive state; ii) pressure to change
Individual outlook	iv) temporary states
<u>Cross paradigm</u>	
States	Temporary changes can mediate predilection to action; states of awareness

Table 3.16: Enabling states lens set.

Multi-level perspective lens set

Energy efficiency and sustainability discussions sometimes explicitly seek to integrate a range of approaches. This occurs across paradigms and conceptual lenses such as the *deep structure, objective-subjective, alignment* and *evolutionary innovation* lenses. Literature defines this as a multi-level perspective and the *Phase 4* subsection (the *Multi-paradigm Review of Energy Efficiency Gap* section of this chapter) details some of the components, paradigms and theory of this framework. As mentioned above, the core structures of a multi-level perspective approach map onto first, second and third person perspectives. Figure 3.2 below displays this structure along with the theories embodied within it.

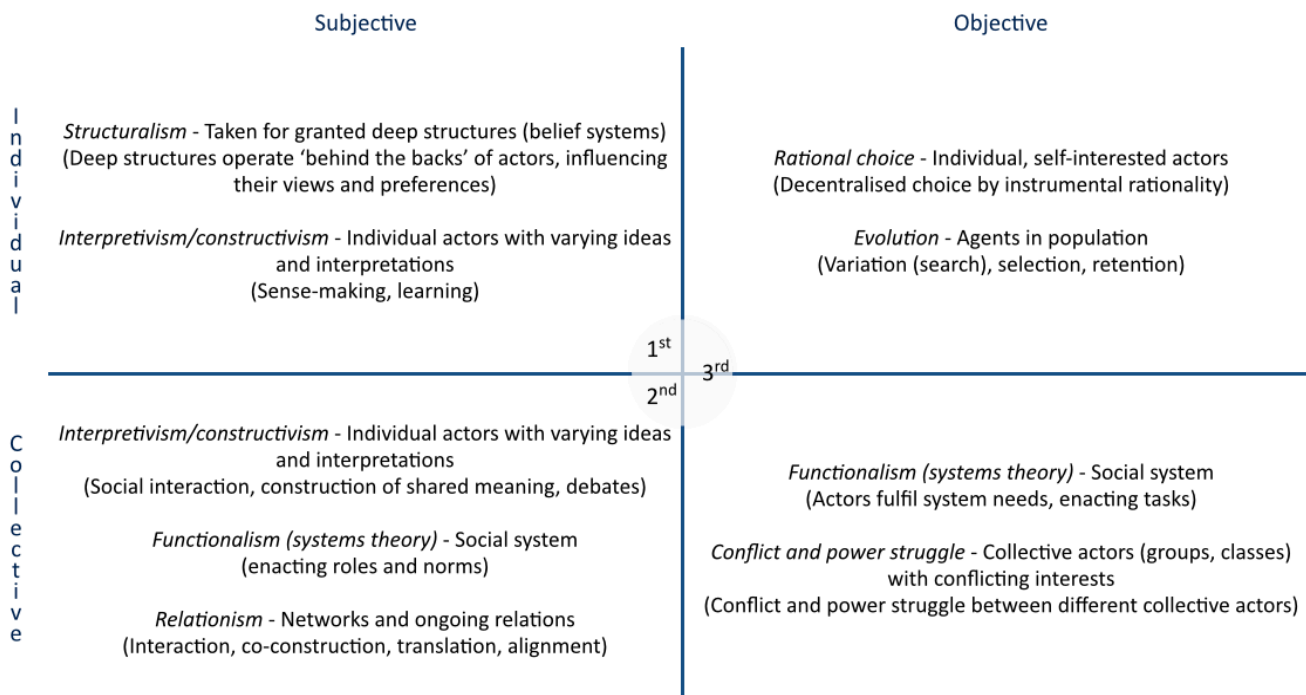


Figure 3.2: First, second and third person perspectives map. Derived from theories within Geels (2010). Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective.

This *multi-level perspective* lens is a framework concerned with the ‘who’s’ of action - that is, is change being facilitated by individuals or groups, rationally evaluated and/or with subjective influences from others? The framework is explicitly used (e.g. Geels & Schot, 2007; Heiskanen et al., 2008; Kern & Howlett, 2009) as well as present in discussions that view a wide scope of individual and society influences as important (e.g. Brohmann et al., 2007; Schellnhuber et al., 2011). Table 3.17 references the lens.

Multi-level perspective	Viewing the efficiency question through first, second and third person perspectives with individual, group and interpersonal theories
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Table 3.17: Multi-level perspective lens.

Future orientation lens set

This group of lenses focuses on the future and the objective and subjective valuing of it. The efficiency texts highlight a range of factors relevant to efficiency from a future perspective (e.g. Diederer et al., 2003; Hamdouch & Depret, 2011; IPCC et al., 2001). Such considerations include assessing hurdle rates and risk with quantitative economic methods. More subjective approaches are also described, looking at the ways individuals perceive and incorporate time as a factor in decision-making and the relevance to them of such considerations. Factors related to future goals can be distant and maybe substantially discounted if an individual's focus is much more on immediate consequences (Benson, 2008; Raynor, 1969).

In the more quantitative assessments, such as hurdle rates and the minimum acceptable rate of return, sophisticated models can be used. However, a level of qualitative assessment is still involved. For example, the appropriate net present value and discount rate still has to be determined and can be the subject of significant discussion and debate (e.g. see the discussion of Stern Review: Byatt et al., 2006; N. H. Stern, 2006; Tol & Yohe, 2006). These viewpoints all fall within a consideration of the importance, or otherwise, of future outcomes and, consequently, the *future orientation* lens set groups these frameworks. This is outlined in Table 3.18.

Capitalist	iii) complex investment case (with future influences)
Climate/environmental	iii) future outlook
Knowledge	i) future orientation
Individual outlook	vii) future risk orientation

Table 3.18: Future orientation lens set.

Time appropriate lens set

The *time appropriate* group is concerned with the impact of time as it is principally viewed from a risk and uncertainty standpoint. The framework differs from the *future orientation* lens set in that it has a technological or quite physical focus on an outcome. For example, a significant area of concern in relation to energy efficiency investment is being saddled with technology that may soon be outdated. A firm, in this example, could have invested in a technology that is soon to be superseded with something significantly more effective. This issue is sometimes referred to as the ‘lemons problem’ (e.g. Berchicci & King, 2007; Sanstad et al., 2006).

The appropriate time for a decision, if this is a strategic time to raise a capital expenditure request or market an efficient product, is a related consideration. Similarly, concerns exist over whether regulatory change may make an investment unwise and if the timing is consequently right for marketing a product or investing in new equipment (e.g. Hoffman et al., 2006; LaBelle, 2011). Table 3.19 groups this *time appropriate* lens set.

Information	ii) future lemons; v) meaningful timely relevant
Institutional change	iv) timing
Governance	iii) consistency and future uncertainty

Table 3.19: Time appropriate lens set.

Why

This question, 'why', considers the qualities of a phenomena or circumstance that enables, or is a barrier to, action. It has two primary polar lens sets - *objective* and *subjective, internal* and *external* representing some primary differentiated approaches. It also contains a common framework through which barriers are conceptualised - *information to capacity* - relating to our ability to manage, prioritise or access relevant information for good decision making.

Objective-subjective lens set

This lens set is a relatively large group. It encompasses a range of the polarity that is apparent across energy efficiency texts. In particular, it captures the money-measured versus values-driven conceptual discussions. It covers some of the capitalist paradigm frameworks that look at these issues from a (close to) purely classical perspective - in which we are all aiming to maximise material value in a given circumstance - to broader considerations where energy cost is only a factor in overall use and the adoption of efficiency technology (e.g. Biggart & Lutzenhiser, 2007; Gillingham et al., 2006; Hastings-Simon et al., 2014 ; Herring, 1999; Wang, 2014; Wilson et al., 2012). This *objective-subjective* framework is apparent from the interplay analysis (table 3.3 *Phase 5* subsection

this chapter) and is also discussed in Chapter 5's *Background to Common Pool Resources* section.

Bounded rationality, as a *conceptual* lens, falls within this set. The framework considers subjective limits as a consequence of the information we can make sense of and the objective decisions that may be taken. Decisions, on the basis of partial understanding, can be thought of as 'satisfactory action' - rather than acting in what could be regarded as a fully rational processed manner (Schleich & Gruber, 2008; Simon, 1972, 1991). Heuristic decision making, rule of thumb decisions where near enough is good enough, and salient information, in which some particular viewpoint is vividly understood and biases decision making, are of a similar nature. That is, the decisions are objective up to the point where the decision-maker is satisfied, a subjective condition.

The lens set also includes viewpoints that see action mediated by government objective policy and how the combination of such policies may motivate individuals (e.g. Hoffman et al., 2006; Verbong & Geels, 2007). Table 3.20 summarises this group - for more details on the theory relating to this concept see the *Integral Theory* section of Chapter 2.

Capitalist	i) profit; ii) investment case
Cognitive limits	i) bounded rationality; ii) heuristic decision making
Bias	ii) salient perspectives
Governance	i) mandatory rules; ii) targets and incentives
Individual outlook	v) motivating factors

<u>Cross paradigm</u>	
<i>Rational-irrational</i> <i>Objective-subjective</i>	Decision making is based on economically rational assessment vs. decision making is biased by a wide range of subjective perspectives
<i>Measurable</i> <i>constraints-unconscious</i> <i>Objective-subjective</i>	Knowledge and intellectual limitations such as time and resources to act vs. unconscious drivers and bias
Adjusted rational economics	Measurable economic and subjective assessments with data from game theory experiments and agent simulations describe and define likelihood of action

Table 3.20: Objective-subjective lens set.

Internal-external lens set

The *internal-external* lens set is concerned with boundaries between groups or individuals, or the insides and outside of a group. This is commonly seen across discussions about energy efficiency with, for example, innovation within a company being influenced both by external experts and internal capacity. This can be from a viewpoint of public and private partnership in research and development, or tacit knowledge within an organisation that helps to develop new systems and the internal ability within the organisation to drive such innovation (e.g. Gruber & Brand, 1991; Rohdin et al., 2007; Schleich & Gruber, 2008; N. H. Stern & UK Treasury, 2007a).

Additionally, split incentives and similar dichotomies fall into this category. For example, the original manufacturer of a product is viewed as having a low incentive to market an efficient motor as the cost of running this engine is born by the buyer of the product. Similarly, texts argue that investors or owners are not always the same groups as the users. This consequently creates an internal (e.g. users) to external (e.g. investors) split (e.g. Fleiter et

al., 2011; Jaffe & Stavins, 1994a). In the same manner, whether something is public or private goods (e.g. information) changes how it is viewed from within a group versus external to an entity (e.g. Gillingham et al., 2009; IPCC et al., 2001).

External influences, such as pressure from energy supply (a concept that also has aspects of it falling within the physical structure lens set) as well as perceived norms of external groups are also internal-external conceptual influencers (e.g. Benson, 2008; Ulli-Beer et al., 2011).

These are thus included in the table 3.21 lens set summary.

Capitalist	iv) investment dichotomies (split incentives, principle-agent etc.)
Innovation	iii) internal/external influences
Knowledge	iii) analytical ability (internal and external)
Individual outlook	vi) internally-externally influenced
Information	i) public vs. private goods
Climate/environmental	ii) pressure to change

Table 3.21: Internal-external lens set.

Information to capacity lens set

The *information to capacity* lens is looking at limited knowledge. Within the efficiency theoretical analysis texts, individual actors and organisations are seen as having incomplete information and prone to decision making based on what they know. The framework is present, for example, with smaller organisation difficulties analysed as including the fact such a group may not have the same internalised access to information as larger institutions. There is a consequential difficulty around action (e.g. Gruber & Brand, 1991). It

is also present in more subtle structures - psychologically a gap in the capacity of individuals to understand necessary or relevant information and/or manage its complexity. This may manifest as a preference for the status quo - known conditions are easier to understand - as opposed to dealing with a lack of information or too much information (e.g. Gillingham et al., 2009; Jaffe & Stavins, 1994b; Klotz, 2011; Sanstad et al., 2006). It is also seen as a gap between attitudes. For example, some may hold that the environment is important but that individual or group action capacity and behaviours are seemingly at odds with expressed opinion (e.g. Lorenzoni et al., 2007). Table 3.22 describes this *information to capacity* lens set.

Knowledge	ii) complexity capacity
Information	vii) asymmetric information
Bias	i) known frame
<u>Cross paradigm</u>	
Human capacity	Ability to comprehend and synthesise information and/or act on such knowledge

Table 3.22: Information to capacity gaps lens set.

Why, how, who, where, when and what

Some conceptual lenses appear to cut across all of the analysis questions. That is, they are concepts that provide a differentiating perspective for what mediates action, how the change dynamics are operating, who is involved and when this is appropriate, as well as the

why - barriers and enablers. The two conceptual lens in this category are *multiple lines* and *types*.

Multiple lines lens set

A theme across the paradigms is that there are different streams of understanding and knowing. For example, different groups of stakeholders (*stakeholder* lens set) may view efficiency from differing *deep structures* (underpinning archetypes that may be more unique to one particular group than another). Consequently there may be a tendency to frame such information (*developmental holarchy* lens set) differently. This could occur despite an *alignment* of developmental holarchy stages between such groups.

Parnell and Larsen (2005), for example, detail 3 distinct lines in relation to motivating efficiency change. The authors itemise this as: 1) how motivating the message content is for individuals around issues of personal gain, quality of life, self-identity and frugality; 2) how the message is presented in the vivid, specific, familiar, credible or timely terms; and 3) the supportive environments that the individual has to explore, participate and interact with others in regard to a message. To expand this example as lines within just one other conceptual lens: firstly the motivating message will be framed differently at different developmental stages (Divecha & Brown, 2013b). Secondly, its presentation can be considered and differentiated across such stages (B. C. Brown, 2006; Divecha, 2010b). Thirdly, the supportive environment will also change depending on the developmental centre of gravity of the group of individuals involved.

Additionally lines such as these cut across other conceptual lenses such as *time appropriate*, *objective-subjective* and *internal-external*. Consequently, a lens structure describing this concept is useful and table 3.23 illustrates it.

Cognitive limits	iv) perspective affinity
<u>Cross paradigm</u>	
Multiple understanding	Decision making and outcomes based on cross organisational, externally and internally influenced and multiple differentiated individual understanding depending on particular cognitive constructs

Table 3.23: Multiple lines lens set.

Types lens

A second, crosscutting, structure is that there are relatively fixed types of individuals and groups. For example, in discussing the ‘diffusion of innovation’ - a process covered in the energy efficiency texts and incorporating the *evolutionary innovation, transformation process, internal-external* and cross paradigm conceptual lenses above - Rogers (1995 pp166, 263-268) outlines types of knowers - early versus late. He also describes adopter type categories: venturesome innovators; respected early adopters; deliberative early majority; sceptical late majority and traditional laggards. Similarly, specific types are incorporated in the efficiency texts, which often draw on Rogers with respect to innovation (e.g. Klotz, 2011; Wilson & Dowlatabadi, 2007).

A further example of type structures is the *world viewpoint* lens outlined in the *Phase 5 - Conceptual Lenses* subsection. These are distinct, relatively stable worldviews, such as egalitarian or ecological (e.g. Benson, 2008; Lorenzoni et al., 2007; Toke, 2000).

In both cases, these distinctive type views do not reduce easily to any particular framework without losing quite a lot of meaning and so table 3.24 summarises the derivation of this lens.

Information	iii) world viewpoint
Individual outlook	ii) world viewpoint
Social acceptance	iii) world viewpoint
Innovation	ii) types of innovators

Table 3.24: Types lens set.

Consolidated Conceptual Lens Set

In total this exercise, refining and clarifying meaning from the 60 lenses the multi-paradigm review, has produced a set of 20 conceptual lens. This is still a rich selection of frameworks through which energy efficiency is viewed in practitioner and academic literature. The final set is:

What, where

1. Deep structure - archetypes and persistent feature patterns mediating motivation beliefs and action

2. Physical structure - structures, primarily physical, enabling or creating barriers to action
3. Governance holarchy - governments and institutions; polycentric influences
4. Developmental holarchy - stages, worldviews, constructive development and action logics

How

5. Evolutionary innovation - diffusion and adoption mirroring biological evolution
6. Learning - cycles and styles of learning for individuals and groups
7. Alignment - intergroup and interpersonal alignment between policies, outcomes and beliefs
8. Transformation process - phases and steps undertaken to create substantive change
9. Emergent stabilisation - change between equilibrium states

Who, when

10. Leadership - human capacity and capability to effect change by individual and groups
11. Stakeholder - viewpoints and influences of all those affected by or interested in the actions
12. Enabling states - temporary conditions mediating action; states of awareness
13. Multi-level perspective - 1st, 2nd and 3rd person perspectives; subjective, intersubjective and objective who's

14. Future orientation - the future and the objective and subjective valuing of it

15. Time appropriate - appropriate and strategic timing

Why

16. Objective-subjective - measured vs. psychological; interiors vs. exteriors; integral left hand side vs. right hand

17. Internal-external - within the entity vs. external to the entity; individual vs. collective

18. Information to capacity - comprehending and acting on information

Why, how, who, where, when and what

19. Multiple lines - cross cutting line structures appearing across multiple conceptual lenses

20. Types - typologies

The set of lenses needs be considered in light of the initial research aims. These were, from *Phase 1* of the *Multi-paradigm Review of Energy Efficiency* section of this chapter:

1. Inform our knowledge and understanding of sustainability through examining the links between integral theory and energy efficiency.
2. Understand factors that may be underpinning concepts and structures relating to sustainability.
3. Assess the extent to which integral theory may encompass relevant concepts, constructs, theories and models that are represented when sustainability is discussed or implemented.

The next section – *Integral Meta Discussion* - reviews these aims and this set of 20 conceptual lenses.

Integral Meta Discussion

This section seeks to assess the meta-theory and resources developed in the preceding sections of the chapter. This evaluation is phase 7 of the meta-theory review as outlined in the Figure 3.1 methodology - see the *Phase 1 – Research Aim and Process* subsection of this chapter.

Summary To Date

The review to this point, phases 1 to 6, analyses and clarifies conceptual frameworks underpinning energy efficiency theory. The research was undertaken to better understand integral theory and its potential usefulness in addressing sustainability and climate change. With energy efficiency's specific paradox, and as it can be regarded as an important sustainability focus (see the *Energy Efficiency Theory* section of this chapter for further details), theories addressing this specific topic offers significant potential as a practical investigative tool into wider sustainability questions.

This broad rationale led to the first aim of the multi-paradigm review to:

1. Inform our knowledge and understanding of sustainability through examining the links between integral theory and energy efficiency.

Integral theory is founded on a vision to include “*matter, body, mind, soul and spirit*”, as it appears in “*self, culture and nature*” within a genuine theory of everything (Wilber, 2000c pxii). From this starting point, a concern arises that integral theory may not necessarily be

designed for application to sustainability. Consequently, it may be difficult to apply to, or not help deepen our understanding of, this topic.

There are at least two responses to this concern. The first is that, as a theory of everything, integral would naturally apply to sustainability and this subset, efficiency. The second is that practical analysis and research may demonstrate integral's usefulness - a range of researchers and practitioners are already applying integral theory to sustainability (see the *Meta-theory and Integral Theory* subsection of Chapter 1). Examining the conceptual lens sets from this review, against integral theory's quadrants, levels, lines, states and types structure, should assist in developing links.

The Review's Lenses and Integral Theory

In order to analyse links, the final set of 20 conceptual lenses are discussed with integral theory below. To assist with this, figure 3.3 summarises the conceptual lenses by visually mapping the relationships with integral theory.

It is clear that many of these conceptual lenses are directly, or indirectly, already matched to integral theory. Integral theory explicitly incorporates states, lines and types. The conceptual lenses from this review, numbers 12 - *enabling states*, 19 - *multiple lines* and 20 - *types*, map onto such descriptions. For example, the *enabling states* lens described temporary state experiences that could catalyse action (see the *Why, how, who, where, when and what* subsection of this chapter). Similarly states, in integral theory, describe a mental way of being and experience, one that is likely to have a physical correlate (O'Fallon, 2010; Wilber, 2000c pp65-73).²⁶

²⁶ At its simplest, for example, a dream state while sleeping has a physical correlate - REM sleep.

Integral theory's quadrant framework maps, and is described by, several of the conceptual lenses from this chapter. The quadrants are based around objective and subjective, internal and external poles (conceptual lenses 16 - *objective-subjective* and 17 - *internal-external*). The first, second and third person considerations of conceptual lens 13 - *multi-level perspective* also form part of the quadrant framework - see the *Holons and Quadrants* subsection of Chapter 2 for details. In addition, holarchies are a foundational part of integral theory's structure and these are reflected in this review as conceptual lenses 3 and 4 - *governance* and *developmental holarchies*. *Deep structures*, fundamental versus superficial - conceptual lens 1, are quite widely discussed in integral theory and relate to the unfolding of developmental hierarchies as well as the thoughts, precepts and traditions that are foundational to many beliefs and cultures (e.g. Wilber, 2000c pp68-69). Likewise, *physical structure* - conceptual lens 2, can be considered as a facet of the upper-right and lower-right quadrants.

Many of the other conceptual lenses have strong relationships, and are used within, integral theory. *Future orientation*, conceptual lens 14, is commonly linked with later developmental stages. These stages are associated with greater capacity to consider distant futures and the implications of this for present day concerns or cognition (Cook-Greuter, 2002; O'Fallon, 2010).²⁷

For other lenses, the stage change process across holons in integral theory illustrates *emergent stabilisation* - lens 9. Additionally, a range of *evolutionary* and *transformation*

²⁷ Just as numbers, space and quantities can be regarded as constructed, Piaget argued that time was a category of thought and actively conceived by an individual in response to the need to understand the world. When contradictions arose across time, numbers, space and/or quantities, the manner in which an individual understands these phenomena can change, a stage change, to eliminate this contradiction (McCauley et al., 2006).

processes - conceptual lenses 8 and 9 - are inherent to holarchies that involve change. For example, the evolution of social systems and environment (Esbjörn-Hargens & Zimmerman, 2009 Loc1926-3406) illustrates such divergent and niche strategies and this is also discussed in the *Holons and Hierarchies* subsection of Chapter 2. Similarly, concerns about the appropriateness of a decision, or the *time appropriate* (lens 15) nature of change is describing, primarily, physical state structures. An example of this is the current level of information, or state of an organisation's investment priorities, and if these factors are conducive to implementing a new change (e.g. including a state of concern about being saddled with lemons).

Thus, for many of the lenses, integral theory provides a useful organising structure. This can help clarify appropriate approaches and enable working with the complexity embedded in such lenses. Such organisation is important to leverage theory into practice, target analysis, and generate realistic effective and informed solutions. With numerous theoretical and practical approaches there will be competing truths, multiple interpretations and contexts that shift, dimensionally and through time. There are also overlaps and intersections so this effort to rationalise such lenses and group them against a strong open framework like integral theory can help reduce confusion.

At the very least, a guiding structure like integral theory allows us to classify details across change mechanisms - a model to mentally hold or physically use when analysing interventions or circumstances. As some of the argument in this chapter showed, there was often an absence of integration between multiple barriers and considerations of the interdependency of any one action against others. The short governance discussion in the *Phase 4 – Paradigms and Theories* subsection illustrates this. Chapter 7 returns to these

interplays - integral theory can be a framework to consider skilful action across the complex interactions needed in addressing sustainability transformation.

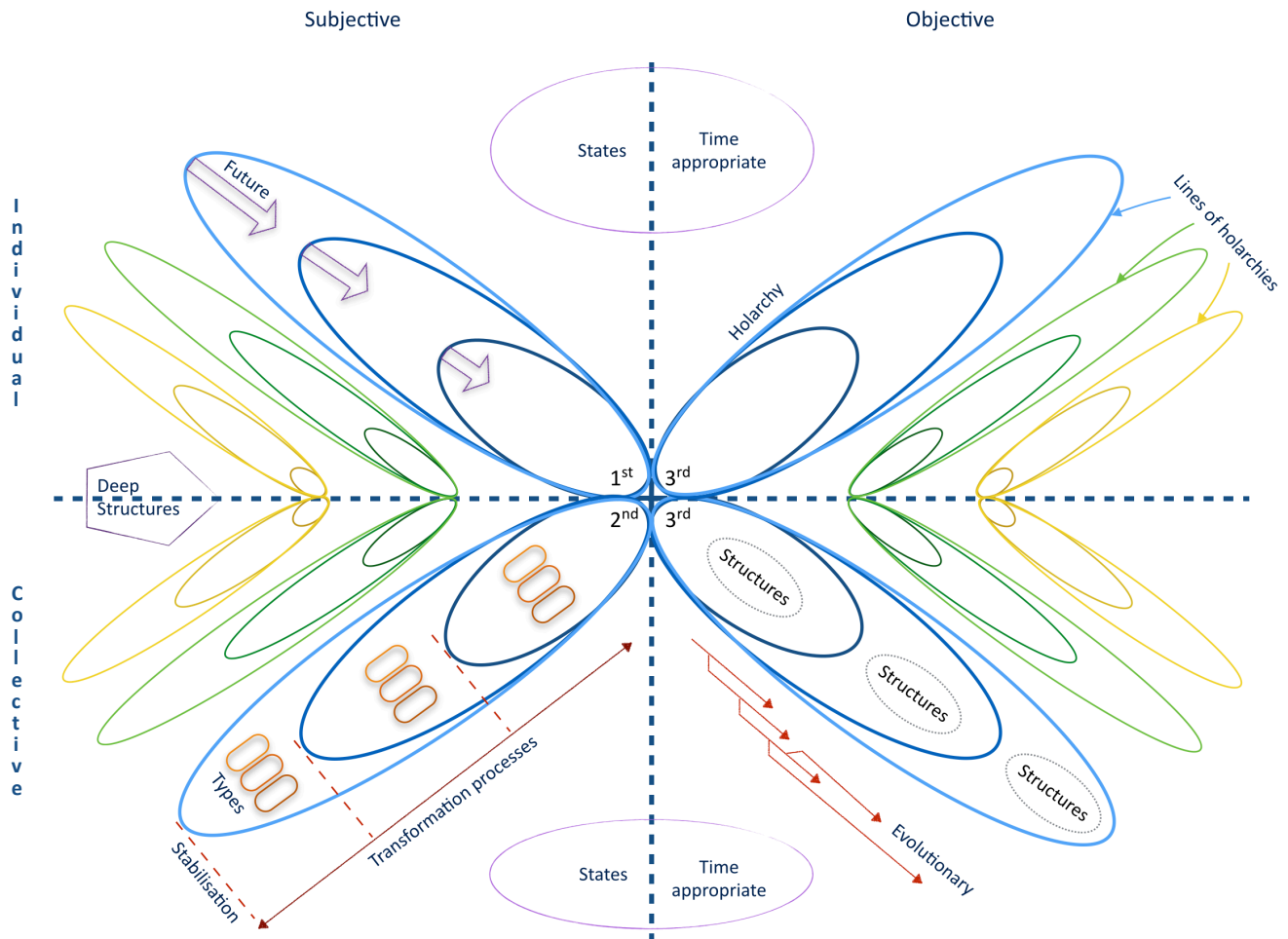


Figure 3.3: Conceptual lenses mapped on integral theory.

Note that the figure commonly illustrates concepts in one quadrant only for clarity. Types, for example, are seen across all quadrants.

In addition to the conceptual lenses discussed above, the *learning, alignment, leadership, stakeholder* and *information to capacity* conceptual lenses (no.s 6, 7, 10, 11, 18) require additional commentary and investigation. Stakeholders, for example, are clearly individuals and groups. This conceptual lens could sit in the upper-right and lower-right. Equally, it is a set of organisational influences and considerations including what are the most important

or priority influences. That is, there are lower and upper left facets of stakeholders. Similarly, groups of stakeholders can clearly be type structures (e.g. early adopting customers, pro environmental finance institutions etc.). That is, it is not immediately apparent what value an integral framework would add around this conceptual lens. A range of literature has discussed concepts such as stakeholders and learning, some making links to meta-theories such as integral theory and these concepts are worthy of focus and consideration. The discussion of these lenses is assisted, and supported, by other data from my thesis and so follows after the next two chapters - see the Chapter 6 *Beyond Sustainability Stages* section, and sections after it.

Chapter 6 also addresses the second and third purposes highlighted for this multi-paradigm review of energy efficiency in the original phase 1 subsection outline. That is, it uses the resources and frameworks built in this chapter along with other data to:

2. Understand factors that may be underpinning concepts and structures relating to sustainability.
3. Assess the extent to which integral theory may encompass relevant concepts, constructs, theories and models that are represented when sustainability is discussed or implemented.

In addition, Chapter 7 expands on the last point. As Geels (2010) highlighted, specific theories and detailed models, based on a few variables, are powerful. However, while *“such rigorous models are possible for demarcated topics that stay within one ontology, they face difficulties with broader, multi-dimensional and complex topics”*. Sustainability is such a topic. It requires open frameworks and *“systemic theories of change”* (Geels, 2010).

The types of broad considerations built, and argued, in this chapter - meta-theory and/or integral theory - are such frameworks. They have been correlated here with energy and sustainability, however only preliminary conclusions have been drawn. Chapter 7 further addresses links that may be understood from these theories. The chapter considers the usefulness this may have for addressing integrated challenges such as climate change. There are strong imperatives to act quickly around sustainability issues and the chapter demonstrates that frameworks like integral theory may help.

In addition, this chapter ordered conceptual lenses and identified a group that could be viewed as mediating structures addressing what conceptual factors might frame our approaches to sustainability. Many researchers argue that a group of these, developmental holarchies, are part of how we fundamentally make sense of the world around us and are crucial with regard to decision-making capabilities. The next chapter outlines the evidence for a discrete treatment of such holarchies - action logics - and examines empirical evidence related to this model.

Chapter 4

Developmental Holarchies and Action Logics: Sustainability Sense-making

Introduction

From Clare Graves to Abraham Maslow; from Deirdre Kramer to Jan Sinnott; from Jürgen Habermas to Cheryl Armon; from Kurt Fischer to Jenny Wade; from Robert Keegan to Susanne Cook-Greuter, there emerges a remarkably consistent story of the evolution of consciousness. Of course there are dozens of disagreements and hundreds of conflicting details. But they all tell a generally similar tale of growth and development of the mind as a series of unfolding stages or waves.

Ken Wilber, A theory of everything (2000c p5 emphasis in original)

The mental and emotional capacities managers develop at each new stage of ego development have a strong tendency to carry over into the way they exercise leadership... managers at more advanced stages of ego development... leadership agility... are more effective than conventional managers... To enjoy sustained success in this new century... the level of agility demanded by today's turbulent global environment, organisations need leaders who embody a corresponding level of agility.

Bill Joiner, Leadership at post conventional stages of adult development (2011 pp134-139)

Chapter 3's review of sustainability theory, or more specifically a discrete case as represented by energy efficiency, reveals a wide spread of conceptual approaches used to understand and address the topic. The chapter undertakes its analysis by identifying conceptual lens sets - fundamental frameworks characterising the conceptualisation of theories and actions on sustainability.

A prominent subgroup of the sustainability conceptual lenses is some of the underlying structures mediating change. That group - see the *What, where* subsection of Chapter 3 - of conceptual lens sets is made up of lenses described as *deep structure, physical structure,*

governance holarchy and *developmental holarchy*. To look into the basis for sustainability action further, this chapter investigates a particular developmental holarchy, action logics, in some depth. There are three principle reasons for this choice and these are outlined in the next paragraphs.

Firstly, by its nature, deep-seated structures - system-like fundamentals mediating sustainability at a archetype like level - suggest that theory related to these ought to be a prominent and important research framework. Such structures, by definition, may underpin others and may be some of the basic operating systems - rationales to look at when seeking to enable change.

Secondly, this *what, where* group of lens sets, particularly developmental holarchies, is also a foundation of integral theory. These holarchies are the *all levels* part of this theory - see *Holons and Hierarchies* subsection of Chapter 2. Further, as discussed in the *Integral on Integral* subsection of that chapter, integral informed my thesis design. Integral's apparent 'face validity', in relation to sustainability, seemed to hold promise for greater understanding of sustainability topics. As these are a prominent framework, I thought that evidence of developmental hierarchies might be present during the course of the interviews for this thesis. While I felt there might be some correlation between how people discussed sustainability with what could be recognisably categorised through an action logics framework, the strength to which this theory appeared to characterise interviewees' responses far exceeded my expectations. The forcefulness of this apparent evidence is the

second reason for undertaking a detailed analysis for the presence, and usefulness, of the framework as it relates to sustainability.²⁸

Thirdly, there is a strong broad case that later stage development, as described by constructive developmental theory, is important, even critical, to address complex issues such as sustainability. This theory describes stages of discrete meaning-making where orders of development unfold in a specific sequence, each transcending and including concepts and cognition internalised at the preceding stage (McCauley et al., 2006). Different action logics stages characterise our reasoning and behaviour (Cook-Greuter, 1999; Torbert et al., 2004). There is evidence that such discrete stages are important, with leaders' effectiveness in sustainability and environmental issue correlated to such stages (Boiral et al., 2009; B. C. Brown, 2012b; Greenwald-Robbins & Greenwald, 1994).

Researchers argue that individual later stage action capacity is useful, people are more capable and that this is necessary for addressing sustainability complexity (e.g. Boiral et al., 2009; B. C. Brown, 2012b). This recognises that multiple perspectives need to be considered alongside interconnected systems within systems, physical and human, for holistic

²⁸ With hindsight, it is quite apparent that the action logics lenses through which we can categorise people's understanding or expressed views on sustainability should be relatively obvious. As outlined in the theory, if we are making sense of the world in recognisably categorisable ways, it is only logical that this should be apparent in many conversations. If the converse were true it would lead to either questioning the basis or details of the theories, or arguing about the practical utility of what would then appear to be a mostly abstract set of insights.

The strength of approximating action logics from interactions is illustrated by an anecdote from a presentation of this work. The material in this chapter forms the substantive part of a journal article (Divecha & Brown, 2013b) and a conference presentation (Divecha & Brown, 2013a). During this presentation I asked the audience (including Bill Torbert) if they assessed other's action logics, when appropriate, based on talking and interacting with them (as opposed to a formal SCT). Everyone in the audience appeared to raise their hand to say that they did. This could be regarded as adding 'experiential validity' to the list of reasons for investigating action logics in this chapter.

sustainability responses. At a foundational edge of this, Stevens-Long (2011) and Andrade (2007) argue that ego development (people at later stage action logics) is crucial to address human destructiveness linked to intolerance for the unfamiliar. These are ways of being that are threatening life.

The developmental link occurs as later stages are associated with broadening tolerance for ambiguity, increased capability for managing conflict and doubts, improving awareness of whole systems and, deeper understanding and enhanced capacity to see further ahead in time alongside historic awareness (Cook-Greuter, 2000). Such capabilities can be explicitly correlated with sustainability. For example, Kegan (1994, 2013) outlines the challenges we face and the need for late stage cognitive capacities. He highlights one of the facets of environmental pressure is increasing human population due to longevity. However, this issue is also the source of a solution as older people are more likely to shift to a late mental complexity level - that described by Kegan's self-transforming (fifth) stage. The cognitive capabilities described by this stage are associated with vital capacities to act on the complexities related to addressing stresses placed on our biosphere. Other researchers reach similar conclusions. Brown (2012b) argues that leaders with the advanced meaning-making capacities, associated with late stage action logics, are needed to address global sustainability. The types of issues inherent to our modern day challenges - such as complex causality, a need for systemic adaptation, long-standing problems with deep future implications and entanglements and, deep-rooted disagreements - require, and benefit from, approaches characterised by later stage developmental capabilities (Joiner, 2011; Jordan, 2011; Kegan, 2013).

Later developmental stages are also correlated with organisational success and change (Kelly, 2011; Rooke & Torbert, 2005; Torbert & Kelly, 2013) alongside growing evidence that later stage meaning-making capabilities are related to more effective leadership (Herdman-Barker & Torbert, 2011; Joiner, 2011; McCauley et al., 2006). The *Theory Underpinning Constructive Development* section expands on these capacities and insights.

The focus on action logics in this chapter arises from the three reasons above: 1 - developmental holarchies appear to be fundamental underpinnings; 2 - strong face and experiential validity; and, 3 - a research base arguing a compelling case that such theories are applicable, relevant and important for sustainability. The next section, *Chapter Outline*, explains how the arguments are developed and related to the case study material.

Chapter Outline

Action logics is the particular developmental hierarchy framework used in this thesis to analyse individuals sense-making of themselves, the world around them and the sustainability topics that are the focus of this research. As outlined in the introduction, frameworks such as this appear to be fundamental factors that should be considered.

To analyse relationships it is important to be clear about terminology and distinctions between the theoretical frameworks used to describe basic factors mediating change. Among other things, such clarity will allow us to weigh the importance of any particular approach against another. Consequently, the *Worldviews and Developmental Levels* section of this chapter discusses the relationships between worldviews, values, action logics and developmental holarchies. All four of these terms are associated with the fundamental underpinning conceptual lenses discussed in the introduction to this chapter.

The following *Theory Underpinning Constructive Development* section explains the origins of a class of theory related to individual developmental growth. These theories are holarchies and are models - frameworks categorising individuals' meaning-making of the world around them, themselves and their experiences.

The particular constructive developmental theory model used for this research is *action logics*. Its roots, and the reasons for this choice, are discussed in the *Action Logics Model* section. The section discusses the likely spread of action logics across the sample of people I interviewed. It outlines the theory around why, as these stages describe profoundly different ways of making sense of phenomena, it ought to be possible to apply this model to sustainability.

In order to analyse for sustainability action logics correlations, the *Method* section briefly recaps on relevant parts of Chapter 2. It highlights the specific application of Chapter 2's methodologies to the case study material considered in this chapter.

Two sections of this chapter report the results derived from analysing case study interviews against action logics stages. The first, the *Initial Results* section, draws from the body of theory that existed at the start of the research - as it is described in the *Action Logics Model* section. Correlations between the interview data and action logics key characteristics are discussed in this *Initial Results* section.

This thesis, however, was conducted over a significant period of time. An advantage of this timescale is that models and theory related to action logics have been developed further. These developments add a great deal of clarity to later stage action logics descriptions and the ability to correlate the levels to sustainability related statements in my interview data.

There are two sections describing the theory development. The *Post 2004 Theory* section outlines developments that are particularly useful around individualist and strategist action logics. The *Stages and States* section discusses a major theoretical step. This development relates the action logics stages to states and describes a symmetrical stage progression through tiers - with each tier representing 4 stages and the whole set forming an iterating pattern describing holarchical growth. A model is built from the original action logics key characteristics, the post 2004 developments and the stages and states theory to test against sustainability statements.

The theory and model developments help overcome issues identified in the *Initial Results* section. I found that when I was first coding the data, before or during the developments described in the *Post 2004 Theory* and *Stages and States* sections, that clarity was lacking. In particular, it was hard to discriminate between later action logics step correlations, such as individualist and strategist. The *Final Results* section applies the model developed in the previous two sections to the case study material.

Being able to discriminate the likely meaning-making structure associated with sustainability perspectives can deliver a powerful tool. The final section of this chapter, *Conclusions and Discussion*, summarises the important inferences and potential value from this work. It clarifies the work of this chapter - developing a model, as opposed to a metric measuring steps, and discusses the importance and usefulness of such models.

Note: The material in this chapter has its origins in research, I undertook, for a paper published by myself and Barrett Brown (Divecha & Brown, 2013b). That paper combined the 30 case study participants reported on in this thesis, the analysis and the coding scheme

developed in this chapter and the research and theoretical developments described in this chapter, with Brown's data and investigation of 13 late stage action logics leaders.

Worldviews and Developmental Levels

One clear challenge of climate change adaptation is to take into account values that correspond to diverse human needs and multiple perspectives and worldviews.

Karen O'Brien, Do values subjectively define the limits to climate change adaptation? (2009)

The introduction to this chapter outlined three reasons for focusing on action logics and the potential strength of such models for assisting understanding and action on sustainability.

The first reason was a focus on fundamental underpinnings characterised by worldviews.

The category has a range of definitions and this section clarifies terminology related to such theories.

Worldviews and a related term, values, are quite commonly used together (K. O'Brien, 2009). In particular, theory associated with terms such as values and worldviews can be viewed as basic structures and of crucial importance for sustainability transformations (A. Hedlund-de Witt, 2013 pp2-5; P. C. Stern, 2000). Clarity around the definitions is useful, especially when a common, plain English word such as a 'worldview' is used specifically with regard to action logics to describe a discrete stage of human development (Wilber, 2000c pp108-135).

To disaggregate uses of the worldview term, a useful clarifying structure is to categorise theories by those describing horizontal or vertical development (Wilber, 2000c p114).

Horizontal worldviews describe typologies or perspectives such as those characterised by hierarchal, fatalistic, individualistic or egalitarian descriptions. These are relevant for

sustainability with, for example, risk perception crucially linked to environmental policy making - pro-climate policy preferences are strongly influenced by egalitarian worldviews (Leiserowitz, 2006).

These types and structures are distinguished from vertical worldviews - the vertical label is associated with hierarchical categorisations (Wilber, 2000c pp108-135). For example, at an individual level, worldviews can be linked to cognitive developmental systems (K. O'Brien, 2009; Wilber, 2000c pp119-122). Action logics style theory, such as the stages developed by Loevinger (1970) and Cook-Greuter (2004; Torbert et al., 2004), is an example.²⁹

Worldviews are related to, and often conflated with, values (K. O'Brien, 2009). The horizontal and vertical classifications just described can assist around these definitions. For example, Stern (2000) argues values are basic structures (e.g. biospheric, altruistic or egotistic) that influence beliefs (e.g. an ecological worldview), leading to norms such as a sense of obligation to act towards environmental issues. O'Brien (2009) highlights that values associated with an openness to change (e.g. stimulation and self direction) can occur across different worldview stages, for example those correlated to modern or post-modern. Closing this loop, modern or post-modern are used to delineate hierarchical developmental stages (Kegan, 1994 p315). In other words, a horizontal worldview or value type can exist through several different developmental stages. Such types and horizontal worldviews could persist for an individual as that person's meaning-making, correlated to a vertical worldview, shifts to the next step.

²⁹ In Chapter 3's Phase 5- Conceptual Lenses subsection horizontal and vertical worldviews were distinguished from each other by the *world viewpoint* and *worldview-meaning* conceptual lens terms.

The conceptual lenses identified in Chapter 3 provide a way of further classifying between vertical and horizontal worldviews. The vertical worldview systems map onto *developmental holarchies*; values and horizontal worldviews to *deep structures* and *types* (noting some theories will embody more than one of these lenses).³⁰

For clarity, in this thesis, I use the term worldview to refer to vertical development and developmental hierarchies.

The next section explains the theoretical and evidence base for arguing such worldviews are fundamental descriptors of the manner in which we make meaning and, through this, are crucial interpretive factors that can help us understand change. A deeper understanding of models such as action logics - in ourselves, others and organisations - may consequently assist sustainability transformations.

Theory Underpinning Constructive Development

It is still astonishing to me that one can comprehend another in important ways if one knows his or her developmental stage and that one can predict his or her behaviour in a number of dimensions. This includes preferences for relating to others, for ways of adjudicating in cases of conflict or doubt, and main preoccupations and concerns.

Susanne Cook-Greuter, Postautonomous ego development (1999 pp22,23)

³⁰ These descriptions are not the exclusive domain of psychology - many authors highlight the multiple perspectives we take when interpreting the world around us and the meaning of events and statements. For example, Edgar Morin traces the basis of knowledge by examining the underlying assumptions of various research approaches to understand and frame human nature. He applies this logic to multiple contexts such as research, environment and popular culture - framing knowledge differently may be correlated to disciplines. Consequently, explicitly surfacing assumptions - our own and others - underpins an ability to conduct trans-disciplinary research. By extension, the same techniques help us to understand complex societal issues such as sustainability (Montuori, 2013).

Human development, or rather understanding and developing models of how humans grow and expand our mental capacity, knowledge, skills, moral reasoning and/or awareness, is described in many ways. In the context of my thesis, the term development refers to growth in cognitive, emotional and awareness capacity, ego and self understanding. Associated theory models such growth as an elaboration of the ways in which we understand ourselves and others, and the ability to hold multiple, complex perspectives (Cook-Greuter, 2000, 2004; Torbert et al., 2004).

Constructive development theory, alongside the measurement or assessment of stages of development, is one of the more comprehensively validated and accepted descriptions of adult development. Since Loevinger and Wessler (1970) published on adult ego development more than 1,000 book chapters or articles have been researched and written on this topic (Blumentritt, 2011). Critical reviews find that substantive empirical evidence exists supporting the theory and its conceptual structures (Manners & Durkin, 2001; McCauley et al., 2006). At the heart of this theory is a core conceptual shift - that our understanding, of ourselves and the world around us, is mapped by distinct but developing meaning-making structures. This suggests that *how* we know is at least as important as *what* we know (B. C. Brown, 2012b).

To illustrate the application of this work it is useful to repeat the core tenants of constructive development theory. The basic principles are shown below (Table 4.1):

1. People actively construct ways of understanding and making sense of themselves and the world (as opposed to 'taking in' an objective world).
2. There are identifiable patterns of meaning-making that people share in common with one another; these are variously referred to as stages, orders of consciousness,

ways of knowing, levels of development, organising principles (or, in this thesis, worldviews and action logics).

3. Orders of development unfold in a specific invariant sequence, with each successive order transcending and including the previous order.
4. In general, people do not regress; once an order of development has been constructed, the previous order loses its organising function, but remains as a perspective that can now be reflected upon.
5. Because subsequent orders include all earlier orders as special cases, later orders are more complex (they support more comprehensive understanding) than earlier orders; later orders are not better in any absolute sense.
6. Developmental movement from one order to the next is driven by limitations in the current way of constructing meaning; this can happen when a person faces increased complexity in the environment that requires a more complex way of understanding themselves and the world.
7. People's order of development influences what they notice or can become aware of, and therefore, what they can describe, reflect on, and change (Cook-Greuter, 2004).

Table 4.1: The use of constructive-developmental theory to advance the understanding of leadership.

Source: Cynthia McCauley et al. (2006).³¹

Constructive developmental theory's foundations are the work of Jean Piaget (1954) describing the sequential step change growth in children's understanding. This is not a gradual development but a series of distinct and discrete stages describing transformation of the child's understanding of knowledge. This theory holds that we actively construct our

³¹ Used with permission.

thoughts in order to make sense of the world. When faced with contradictory information and/or experiences confronting our current meaning-making capacities, we can reconstruct the way we understand in order to transcend the contradiction (McCauley et al., 2006).

An example is a young three-year-old child in a bath. When the bath's plug is pulled out, she connects the disappearing water to herself and her toys, concluding she is in danger. If an adult reasons with her, pointing out she is too large to disappear down the waste, the adult is likely to meet little success - the child does not have the capacity to see the difference. She can't be soothed or reasoned with successfully. Six months later, the same scene sees the child playing happily in the bath as the water, with her toys, swirls into a vortex to flow down the drain. The scene has not changed but the child's capacity to distinguish herself from vanishing water, and understand that she or her toys are not about to follow, has shifted (Berger & Fitzgerald, 2002). That is, development has occurred consistent with being driven by limitations in the way the child understood the world around her. The limited view, that she was in danger as the water swirled away, faced with evidence she is not - a dis-equilibrating challenge - gives way to a step shift in understanding characterised by differentiation and separation in the way she understands the world, differentiating from her own embodiment.

Piaget's developmental stages describe child to adult cognitive development that stops with the emergence of 'modern mind'. At this point a person would describe themselves as capable of independent thought, in control of their actions and responsible for them (Cook-Greuter, 1999 p13). Since Piaget, theorists have extended the notion of stage development past early adulthood. Such work includes Jane Loevinger (1966), Lawrence Kohlberg (1984), Robert Kegan (1980, 1982), Bill Torbert (D. Fisher, Merron, & Torbert, 1987), Susan Cook-

Greuter (1999) and Terri O’Fallon (2010) and can include broader facets such as moral, ego and emotional change alongside cognitive development. The research is supported by other complementary and similar theories describing growing progressions through distinct stages for adults - for a review see McCauley et al. (2006).

A particular focus of constructive developmental theory is how we make sense of information, rather than the amount of information-style knowledge we have assimilated or remember. To clarify this distinction Susan Cook-Greuter (1999 p138) describes three dimensions of meaning-making - behavioural, affective and cognitive dimensions - that are distinctly different from the accrual and recall of knowledge and information. Table 4.2 below illustrates these dimensions.

Function	Dimensions of meaning-making / ego development
DOING Coping Needs and ends Purpose	<u>1. Behavioural dimension</u> How do people interact? What are the needs they act upon, and what ends do they try to achieve? How do they cope and master their lives? What function do others play in an individual’s life?
BEING Awareness Experience Affect	<u>2. Affective dimension</u> How do they feel about things? How do they deal with affect? What is the range of awareness and of their selective perception? How are events experienced and processed? What are the preferred defences?
THINKING Conceptions Knowledge Interpretation	<u>3. Cognitive dimension</u> How does a person think? How do individuals structure experience? How do they explain things? How do they make sense of their experience? What is the logic behind their perspectives on the self and the world?

Table 4.2: Postautonomous ego development.
 Source: Susanne Cook-Greuter (1999 p138).³²

³² Used with permission.

Many aspects of these dimensions are apparent when people discuss sustainability, climate change and environmental issues. Different perspectives are apparent in interviews in this research as individuals reflect on the same issues in different ways. Examples follow later in this chapter.

As outlined in the *Introduction* section to this chapter, constructive developmental theory and its supporting academic literature have been specifically applied to companies, managers and perspectives on sustainability. The next section describes the model used in this research to further investigate these links.

Action Logics Model

Environmental leadership... cannot be reduced to a single set of values for corporate sustainability but must be properly understood in the context of diverse meaning systems.

Olivier Boiral, Charles Baron and Olen Gunnlaugson, *Environmental leadership and consciousness development* (2013)

The stages of adult development revealed by research based on structural developmental theory illuminate the profound differences between the ways individuals make meaning in the world and then act given these meaning-making systems.

Dalmar Fisher, Keith Merron and Bill Torbert, *Human development and managerial effectiveness* (1987)

As discussed above there are multiple constructive development stage models. Given a focus of this research is on two major business organisations - and senior individuals working for these organisations - a stage model that has been developed for application with corporate groups was the starting point. This model, *Action Logics* (Torbert et al., 2004), describes both individual and organisational development drawn from the

framework researched and developed over time by Torbert and colleagues (D. Fisher et al., 1987; Herdman-Barker & Torbert, 2011; Rooke & Torbert, 2005; Torbert, 1987).

The action logics framework has its roots in management effectiveness research (D. Fisher et al., 1987; Torbert, 1987) considering human developmental stage theory from Kohlberg (1969), Loevinger (1976b), Selman (1980) and Kegan (1982) to “*identify clear, discrete steps along a stairway of human development*” (D. Fisher et al., 1987). Some of its development is through Cook-Greuter’s (1999) expansion of Loevinger’s (1976b) ego development and self-identity constructive developmental theory. The action logics framework presented here is from Torbert and Cook-Greuter et al.’s (2004) book, *Action inquiry*.

As discussed in the *Introduction* section of this chapter, action logics appeared to have strong face and experiential validity at early stages in this research. Consequently, an analysis starting point was to use these levels directly as they are described in *Action inquiry* (Torbert et al., 2004). Torbert et al.’s book provides a summary of each stage and a tag line describing one of the essential features that distinguishes and represents the transition from a previous stage to the current one. Additionally, Torbert and Cook-Greuter et al. summarise the key characteristics related each stage. These characteristics were the basis of the first prominent correlations I made during the interviews for this research. Table 4.3 below outlines this model for the individual stages.

Action Logics name and tag line	Key Characteristics
Opportunist Needs rule	Short time horizon; focus on concrete things; often good in physical emergencies; deceptive; manipulative; views rules as loss of freedom; views luck as central; rejects

<i>impulses</i>	critical feedback; externalises blame; distrustful; stereotypes; fragile self-control; hostile humour; flouts unilateral power, sexuality; treats "what can get away with" as legitimate; punishment = "eye for an eye"; positive ethic = even trade; timely action = "I win"
Diplomat <i>Norms rule needs</i>	Committed to routines; observes protocol; avoids inner and outer conflict; conforms; works to group standard; seeks membership, status; often speaks in favourite phrases, clichés, prefabricated jokes; face-saving essential; loyalty to immediate group; feels shame if violates norm; sin = hurting others; punishment = disapproval; positive ethic = nice, cooperative; timely action = "I'm on time"
Expert Craft <i>logic rules norms</i>	Interested in problem-solving; seeks causes; critical of self/others based on own craft logic; wants to stand out, be unique; perfectionist; chooses efficiency over effectiveness; dogmatic; accepts feedback only from objective acknowledged craft masters; values decisions based on technical merit; humour = practical jokes; sees contingencies, exceptions; positive ethic = sense of obligation to internally consistent moral order; timely action = fast, efficient
Achiever <i>System effectiveness rules</i>	Long-term goals; future is vivid, inspiring; welcomes behavioural feedback; timely action = juggling time demands to attain effective results; feels like initiator, not pawn; seeks generalisable reasons for action; seeks mutuality, not hierarchy, in relationships; appreciates complexity, systems; feels guilt if does not meet own standards; blind to own shadow, to the subjectivity behind objectivity; positive ethic = practical day-to-day improvements based on self-chosen (but not self-created) ethical system
Individualist <i>Reflexive awareness rules effectiveness</i>	Takes a relativistic perspective; focuses more on both present and historical context; often aware of conflicting emotions; experiences time itself as a fluid, changeable medium, with piercing, unique moments; interested in own and others' unique self-expression; seeks independent, creative work; attracted by difference and change more than by similarity and stability; less inclined to judge or evaluate; influences by listening and finding patterns more than by advocacy; may become something of a maverick; starts to notice own shadow (and own negative impact); possible decision paralysis

Strategist <i>Self-amending principle rules reflexive awareness</i>	Recognises the importance of principle, contract, theory, and judgment - not just rules, customs, and exceptions - for making and maintaining good decisions; high value on timely action inquiry, mutuality, and autonomy; attentive to unique market niches, particular historical moments; interweaves short-term goal-orientedness with longer-term developmental process-orientedness; aware of paradox that what one sees depends on one's action-logic; creative at conflict resolution; enjoys playing a variety of roles; witty, existential humour; aware of and tempted by the dark side of power
Alchemist <i>processes (interplay of principle/action) rules principle</i>	Continually exercises own attention, seeking single-, double-, and triple-loop feedback on interplay of institution, thought, action and effects on outside world; anchors in inclusive present, appreciating light and dark, replication of eternal patterns and emergence of previously implicit; stands in the tension of opposites, seeks to blend them; intentionally participates in the work of historical/spiritual transformation; co-creator of mythical events that reframe situations; near-death experience, disintegration of ego identity; treats time and events as symbolic, analogical, metaphorical (not merely linear, digital, literal)

Table 4.3: Key characteristics of discrete action logics.

Derived from: Action inquiry, Bill Torbert, Susanne Cook-Greuter, Dalmar Fisher, Erica Foldy, Alain Gauthier et al. (2004 pp74,86,102,108,126,127,182).³³

These stage descriptions are applied to the case study research drawing on Torbert et al. (2004) for further context. The action inquiry process offers tools to recognise one's own and others' action logics stages. An individual can subjectively observe themselves to self assess their likely action logics that best describes their meaning-making (Torbert et al., 2004 pp68–77). Similarly, action logics descriptions can be applied to other's actions and development. This includes describing how other's may be acting, based on a specific action logic, and how this may have changed over time (Torbert & Kelly, 2013).

³³ Extracts reprinted with permission of the publisher. From: Action Inquiry copyright® (2004) by Torbert, W. R. et al., Berrett-Koehler Publishers, Inc., San Francisco, CA. All rights reserved. www.bkconnection.com

While self assessment is possible, a person's meaning-making stage is commonly assessed using a metric such as the Washington University Sentence Completion Test (SCT for short, Loevinger, Wessler, & Redmore, 1970). SCT has been extensively refined and validated (Cohn & Westenberg, 2004; Hauser, 1976; Loevinger, 1979; Manners & Durkin, 2001), and revised. An SCT stage assessment can be regarded as representing the highest level of action logic that individual commonly accesses (Cook-Greuter, 1999; Hy & Loevinger, 1996). That is, the individual still has access to previous meaning-making structures and may consciously or unconsciously frame themselves and phenomena in ways correlated to a range of such stages.

Refinements and developments of theory, as well as the underlying constructive developmental framework, are discussed later in this chapter.

Using metrics, such as the SCT, a wide spread of these action logics is seen in adult populations. Later action logics stages, beyond individualist, are rare. Similarly, early stage action logics are uncommon in adult populations. This is true in both general population samples as well as in management samples. Table 4.4 (on the following page) shows several different samples of managers, consultants and leaders as well as a mixed group.³⁴

³⁴ Notes on table 4.4: 1) The table includes a rare, late stage, action logic, ironist that is not mentioned in Table 4.3. With the relatively low numbers associated with this step, it was the subject of active research during the majority of the time this thesis was being written. As such, it is not actively considered with case study interviewee responses and a review of the data does not reveal any clear statements that could be considered correlated to this late stage. This does not mean that ironists were not present in the sample - see the *Discussion* section of this chapter for the differences between statements that are correlated to a particular action logic and an individual's stage of development. For further background on ironist and other late stages see O'Fallon (2010) and Brown (2012a, 2012b) and table 4.5 in the *Stages and States* section of this chapter. 2) The 374 Aus/Nz sample is of participants in Australian and New Zealand community leadership programmes

Stage / Action Logic	535 UK managers & consultants	497 USA managers & supervisors	4510 USA mixed adult population	374 Aus/NZ leaders & managers
Impulsive/Opportunist	0.4	2.2	4.3	-
Diplomat	1.7	8.2	11.3	1.9
Expert	21.1	47.8	36.5	15.2
Achiever	33.5	34.8	29.7	67.4
Individualist	23.4	5	11.3	13.9
Strategist	13.5	1.4	4.9	1.6
Alchemist	5.6	<1 (inc. ironist)	1.5	-
Ironist	0.9		0.5	-

Table 4.4: Percentage of population from three sample groups measured at different action logics stages.

From: Cook-Greuter (2002) and Vincent (2013).³⁵

The participants in my thesis study are primarily managers. As such, it is likely that the spread of action logics for these individuals is similar to the managers, consultants, supervisors and leadership samples. That is, expert and achiever action logics are likely to dominate in this group. The relative commonality and substantive research base on such action logics perspectives (e.g. back to Loevinger, 1966) means that they ought to be identifiable in the interview data.

and university management training programs. The stages were determined when individuals entered the programs.

³⁵ Used with permission.

As outlined above, it is possible to identify another's action logic. With profound and distinct differences between how people across different meaning-making stages make sense of phenomena, it ought to be possible to infer the action logic that could be associated with a particular sustainability view as expressed by interviewees. Consequently, I use a framework of inquiring into my own, and the interviewee's, action logic stage to code each interview's data. The next section, *Method*, expands on this application.

Method

The primary methodologies for analysing material in this chapter are set out in the *Mid-range Theory* section of Chapter 2, which details the case study design, participants, and analytical approaches. The action logics analysis in this chapter also draws on the methodology from the *Integral on Integral* subsection of Chapter 2.

The first step is to review sustainability perspectives and statements from people interviewed against the key characteristics associated with each action logic - as reproduced in Table 4.3 above. This is a theory driven analytical approach - see the *Thematic Analysis* subsection of Chapter 2. These results are presented in the *Initial Results* section below.

There is also a data driven analytical approach brought to the chapter. This arises from uncertainty surrounding the coding of later stage action logics and the time period (8 years) over which the work was undertaken. The data suggested that coding from the key descriptions (Table 4.3) was difficult. For example, distinctions between later stages such as individualist and strategist were not always clear. However, the quality of description, physical variables, versus more tacit and subjective concepts, appears to be a substantive shift associated with the later stage action logics data.

The timescale, and data driven later stage action logics queries, opened the possibility of a deeper analysis. Over the time of the thesis work there has been some substantial research particularly around later stage action logics, as well as the theoretical model of stage growth. The *Post 2004 Models* section discusses the research over this time period and the *Stages and States* section outlines Terri O’Fallon’s stage growth theory (2010).

O’Fallon’s developed framework allows the correlations between sustainability statements and action logics (as described in the *Initial Results* section) to be examined again through a revised framework - that is, these correlations are triangulated over time (see the *Integral on Integral* subsection of Chapter 2). The analysis of case study material from the updated theory is reported in the *Final Results* section.

The last section of this chapter, *Conclusions and Discussion*, considers the importance of this research.

Throughout this chapter, the physical process of identifying action logics correlations involves coding statements with an electronic tag representing a correlation with a specific worldview. Additionally, I used tags when I felt that the statement was a strong correlation, or when I was uncertain and/or found it too difficult to code at an early point in the research stage. These tags allow the initial correlations to be reviewed as the theory develops from 2004 to 2014.

While undertaking this work I was also coding other defining features - some of which are pertinent to later chapters.

Initial Results

This section presents the results from coding against the *Action Logics Model* section's key characteristics. In the interview material paragraphs and quotes from the interviews stand out as correlating to certain characteristics (as described in the sections above). Some particularly strong descriptors stood out in this initial work. These include:

- Diplomat: works to group standard; often speaks in favourite phrases, clichés.
- Expert: interested in problem solving; seeks causes; critical of self/others based on own craft logic; wants to stand out, be unique; perfectionist; values decisions based on technical merit.
- Achiever: long-term goals; future is vivid, inspiring; feels like initiator, not pawn; seeks generalisable reasons for action; seeks mutuality; appreciates complexity, systems.

Two additional achiever action logics descriptions assisted to help distinguish between achiever and individualist: blind to own shadow, to the subjectivity behind objectivity; self-chosen (but not self-created) ethical system.

- Individualist: takes a relativistic perspective; focuses more on both present and historical context; often aware of conflicting emotions; interested in own and others' unique self-expression; seeks independent, creative work; less inclined to judge or evaluate.

The initial results from coding using Torbert et al.'s stage descriptions were sufficient to describe distinctly different ways in which people were discussing sustainability concepts

and relate these to action logics (Divecha, 2009a, 2010a). Some examples drawn from this early work are below.

Diplomat

Early action logics stages tended to be the easiest to identify. For example, the quote below is from Lee, an interviewee who is a self described climate sceptic. However, she has added a water tank onto her home and gives the reason for doing this (in part) as she has grown up always drinking rainwater. Similarly, she bought solar panels for her home and talks about the financial drive but mostly the expectations of her community. That is, in parts of the interview she is describing the reasons for acting from a perspective of *works to group standard, seeking membership and loyalty to the immediate group* in her community of peers (key characteristics from Table 4.3 are highlighted in the discussion throughout this section with *italics*).

For example, on solar panels, she highlights the attractiveness of these group characteristics:

Yeah I haven't got them installed yet but I see it as get some free energy from the sun and yeah if it can reduce our power use that's great... I am just going with the flow... Everyone else is doing it and it's good... (Lee).

Lee values working at the company seeing the culture as compatible with her, expressing people as members of the group, continually emphasising the importance, to her, of the group standards. In the quote below this is phrased as teamwork. It is a *favourite phrase*, almost a *cliché*, when considered in the context of other parts of the interview. For example, in one short extract when asked about the importance of the sustainability and the

advantages of working with the development company, Lee focuses in on the groups she works with, saying the:

Team is quite influential on how we come to do our work. So we have like a project team here and we always work as a team. So we have team meetings like, weekly, where we can, where the communication is open, it's frequent. We know what everyone is doing and if we have to put together a plan for something, we all come together as a team and we do it. So I think the collaboration like it is one of their values. But I think the way we are structured as well, we tend to do a lot of team work which is extremely important. And from that stems innovation. And I think you also need to be able to relate to other people to make that team work, so it's your respect and your integrity in that team. So I am still coming back to all the values but I think just the whole way in which we operate makes it easy. So, I think excellence and things just coming out of that because of that teamwork (Lee).

There is a an additional aspect correlating to the *group standard* characteristic in this quote - the values referred to are the company's values. Lee, in highlighting these values, was the only person I interviewed in the company who knew what these values were - she said they are on the screensaver of everyone's desktop computer. That is, the perspective here is primarily about *observing protocols, group standards* and *seeking membership* - as opposed to the next stage's characteristics such as *seeking causes* and *critical of self and others based on own craft logic*.

Expert

In the case study material, a significant number of statements correlate with the expert action logic. It was often relatively easy and quick to identify such statements. For example, those that were closely similar to a perspective asking about or encouraging change *based on technical merit* or critiques based on *own craft logic* tend to stand out. In the quote below a community of practice is being discussed. Drew, a manager with a substantial

amount of technical assessment expertise, relates how the problem solving framework can focus on detail. In the context of this interview, which was conducted in person at his workplace, when he is referring to “we” in the quote below it is a term including himself. That is, this quote illustrates some of the key characteristics of expert action logics: *critical of self and others based on own craft logic* and is relating a perspective that at least some of the group he is discussing *value decisions based on technical merit alongside problem-solving*.

I have access to not just research but [other people’s opinions] like, ah yeah, we tried that but it didn’t work... Even little things, even the inane sometimes like this - you might come across the eternal - it’s amazing what detail we can go down to sometimes, but things like what has more impact paper towel or hand dryer. And one of the blokes that actually looked around for the research to see which one the result was... (Drew).

Moving to the next stage and the distinction between the expert *problem-solving* and achiever *seeks generalisable reasons for action* was sometimes not so distinct. Such descriptions could be viewed as a gradual shift along a continuum of perspectives and/or it could be unclear when a person is *problem solving* as opposed to *seeking generalisable reasons for action*. However, other aspects of the shift to achiever, such as the *future is vivid, inspiring and appreciates complexity, systems*, did allow for clear distinctions to be made at this early stage of my thesis.

Achiever

The distribution of manager action logics (see Table 4.4) suggest that you would expect to find a large number of statements from participants in this study that correlate with an achiever worldview. This is the first stage where you will find significant action from a self chosen (but not self created) ethical system. It is a stage that mirrors the modern

industrialised world – modernism, analytical thought and technology answer problems - an approach to addressing issues based on looking at the generalisable reasons, planning how to overcome, and observing or evaluating the outcomes from action - typified by the ‘problem, action, outcome’ analysis sequence.

The key characteristics of *appreciates complexity and systems* alongside *seeks mutuality, not hierarchy* tend to stand out as people discuss sustainability interactions in ways correlated with the achiever action logic. For example, in the quote below, Mel is discussing the implementation and engagement around one of the company’s supplier sustainability programs. The partnership framework, and the importance of mutual organisational support, is prominent. That is the key characteristics of *seeks mutuality, not hierarchy, in relationships* is apparent. For the first stages of the supplier sustainability program she relates the effectiveness of shared responsibility:

It wasn't hard to initiate it within the business because we were partnering... so they saw value in getting their expertise and knowledge, and that knowledge sharing, and the fact that it wasn't a very large cost, so I think that's also a benefit.

And there was an appetite from suppliers, we did initial pilots to see what the interest levels would be and there was (good interest). They saw that as of benefit to their businesses so, given that we have that supplied by, given that we have the support of the Department of Climate Change, it was just a no-brainer for the business...

They saw improved processes from an efficiency perspective for them. They also saw the cost savings so, some of them, whilst they recognise that not all them were cost savings [were] immediate, they did see longer-term cost savings. And so they were prepared to invest a little to see what the longer-term results would be. They also saw a point of differentiation from their competitors, obviously local shops compete at the local level. And this is something that they saw as an advantage as well (Mel).

The quote also illustrates several distinct aspects, from cost to competitive advantage and differentiation, engagement, knowledge sharing and partnership. This can be said to align

with an additional achiever key characteristic, *seeks generalisable reasons*. It is qualitatively different from just trying to *problem solve* over a specific technical aspect such as the impact framework around paper towels in the previous expert correlated quote.

Individualist and later stages

The step from *generalised reasons for action* (achiever) to an individualist framework, evaluating from *a relativistic perspective*, is substantial. However, coding an individualist statement from the action inquiry descriptions (Torbert et al., 2004) can be difficult. To do this, I was looking for a relativistic perspective and other criteria such as *less inclined to judge or evaluate*. Relativity in values, or in conflicts, was also useful for discriminating this stage from expert and achiever. In the quote below, Dean is discussing the company's sustainability approach and its relative success and difficulties. He says:

I think that you can argue part of problems that we got globally is because actually we valued that [short-term shareholder value] far too much, and I actually believe our ability that we actually have a responsibility to educate our shareholders that they have to take a long-term view. Now that's in all the ways of degree, but that's mine.

As a management actually our job is to educate and then they can make a choice about whether they want to just trade, that's their choice, but at the end of the day we are going to say we will be managing the business in this way for the long-term (Dean).

This discussion with Dean *focuses more on both present and historical context* and has a *relativistic perspective* as Dean inquires into the company's prioritisation. He is interested in how others may view the company and the perceived concern or overweighting within the company that a perspective on short-term shareholders is important. However, as can be seen from the quote, and as was the case with coding a lot of this material that was

potentially correlated to later stage action logics, the distinctions are not as clear as between the earlier diplomat to achiever levels.

Beyond individualist, correlating sustainability statements with action logics stages using Torbert et al.'s (2004) descriptions becomes hard. I found I was uncertain around correlations between statements that might be strategist or individualist. In part, this is a function of the relative rarity of such statements. In part, it is the difficulty of seeing categorical differences in the interview material based on a differentiation such as *takes a relativistic perspective* (Individualist), versus *recognises the importance of principle, contract, theory, and judgment - not just rules, customs, and exceptions* (strategist).

Post 2004 Theory

The majority of action logics theory discussed and applied to date in this chapter is as it was developed by Bill Torbert, Susanne Cook-Greuter and others in 2004 (Torbert et al., 2004).

Throughout the processes of conducting this research, the theory continued to develop and this first section describes relevant enhancements.³⁶

Post 2004 research includes Joiner and Josephs (2007), Ingersoll and Cook-Greuter (2007), Boiral (2009), Brown (2010a, 2012b) and Pfaffenberger (2011). The research clarifies stage

³⁶ An additional pertinent change is my own personal development. Not only has my knowledge of action logics increased significantly during the course of this PhD thesis but my own personal stage of development has changed (as assessed over time by variations of the SCT). In line with this change I see that my capacities to interpret complexity, work simultaneously with multiple perspectives and recognise ambiguity and automatic habits of my own meaning-making have also shifted (Cook-Greuter, 1999; Angela H. Pfaffenberger, Paul W. Marko, & Allan Combs, 2011). These behavioural, affective and cognitive capacity differences may assist with the analysis of my thesis material - for example Susanne Cook-Greuter's SCT assessor training chooses to train individuals with late-stage action logics.

distinctions and several short key descriptions emerge from this clarification. These, in turn, further assist coding sustainability statements against action logics.

For individualist, the distinction:

- *inclined... to question preconceived notions* (Boiral et al., 2009) adds some clarity especially while reading interview material in context.

Looking back at Dean's quote, in the *Initial Results* section, *questioning preconceived notions* in the company, about the importance of short-term shareholder value, is apparent.

For strategist a number of refinements are important. These are:

- *Relativity, moderated by understanding of complexity and natural hierarchy, allowing principled choices - approximation for action* (B. C. Brown, 2010a)
- Co-create mutually beneficial solutions through collaborative conversation (Joiner, 2011, Joiner, 2007 #927)
- *Beyond win-lose to positive-sum gains, in which many win* through reframing and reinterpreting a situation so that decisions support and reflect overall principle, strategy, integrity and foresight (B. C. Brown, 2010a; Ingersoll & Cook-Greuter, 2007).

These additional strategist perspectives help to distinguishing an individualist's *relativistic perspective* from the strategist *importance of principle* criteria.

Stages and States

The second relevant area of development is enhancement of the constructive developmental theory framework by Terri O’Fallon. The change addresses some of the underpinning structures associated with constructive developmental theory and draws on a component of the constructive developmental stages that have not been discussed to date - person perspectives.

Cook-Greuter describes stage development through a specific *person perspective* lens. That is, as the individual shifts a stage they may, depending on which stage shift is undergone, move from a narrow focus just on themselves and others to a wider viewpoint - such as an observer viewing themselves and others. For example, an individual with a second person perspective is characterised by having a focus on themselves and others through which they make sense of themselves and information. A third person perspective shifts to being able to observe that second person interaction. Cook-Greuter’s person perspectives and stages are:

- Stage 2: 1st person *Impulsive* (Cook-Greuter, 1999 p139)
- Stage 2/3: 1st person *Opportunist* - self protective (Cook-Greuter, 2004)
- 2nd person *Rule-oriented* - a stage not tested for in SCT and generally not widely discussed. Named *Delta* in O’Fallon’s model (2010)
- Stage 3: 2nd person *Diplomat* - concrete operations; was originally called Stage E4 (Cook-Greuter, 1999 p139)
- Stage 3/4: 3rd person *Expert* - abstract operations; was originally called Stage E5 (Cook-Greuter, 1999 p139)

- Stage 4: 3rd person *Achiever* - a dominant adult stage perspective seen in modern western society; was originally called Stage E6 (Cook-Greuter, 1999)
- Stage 4/5: 4th person *Individualist* - characterised by features including relativism, discovery of cultural conditioning and the possibility of self-deception; was originally called Stage E7 (Cook-Greuter, 1999 p141)
- Stage 5: 4th person *Strategist* (Cook-Greuter, 2004)
- Stage 5/6: 5th to nth person *Magician* or *Alchemist* (Cook-Greuter, 2004)

Sources: Cook-Greuter (1999, 2004) and O’Fallon (2010).

Table 4.6 below further details these person perspectives from first to sixth person. It describes in further detail the widening of perspective as a person’s level of development shifts. Examples of these stage and person perspectives follow the table and, after this, an explanation of the last two columns in the table (tier and focus).

Action Logic	nth person perspective	Floor/Tier	Focus
Impulsive Opportunist	1. The first person perspective is a focus on the self.	Concrete floor	Quality of concrete self
Delta Diplomat	2. The second person perspective is a focus on self and other.	Concrete floor	Quality of concrete operations
Expert Achiever	3. The third person perspective is a focus on an observer who can focus on another self and other(s).	Subtle floor	Quality of abstract and formal operational thinking

Individualist Strategist	4. The fourth person perspective is a focus on an observer, observing another observer, observing another self and other(s).	Subtle floor	One's awareness of the quality, contexts
Construct- aware Transpersonal (Catalyst)	5. The fifth person perspective is seeing the previous pattern of observing observers observing; at the fifth person perspective, the observing can cycle from the 5 th to the n th positions.	Causal floor	Awareness of the quality, constructs
Universal (Unitive) Illumined (Illuminitive)	6. The sixth person perspective, seeing the n th perspectives, begins to step outside of those n th perspectives and begins to take a perspective using patterns of observation and perspective taking through tiers.	Causal floor	Awareness of the unity of opposites

Table 4.6: Action logics person perspectives, floor and focus.
Summarised from Terri O'Fallon (2010).³⁷

³⁷ For Table 4.6, please note that the later action logics stages are the subject of ongoing research. One consequence of this is that later stage names are evolving and becoming disambiguated. For example, alchemist and ironist have (loosely) become construct aware, transpersonal, universal and illumined in Table 4.6. These later stage names tend to change as research deepens understanding.

Only concrete and subtle groups are described in detail in this section as the sustainability perspectives encountered within this research only correlate with action logics stages from diplomat to strategist (with opportunist so rare in the interview material there are not enough examples to check the correlations against). Later action logics stages are uncommon and, past strategist, there are no strongly recognisable correlations between such action logics and sustainability statements made by interviewees during the course of this research. This does not necessarily imply that such correlations could not be made in other interviews or circumstances. For example Kelly (2011) identifies alchemist action logics in his longitudinal study of Warren Buffett.

Also, note that there are other groupings/tiers used by other researchers. These include pre-conventional (e.g. opportunist), conventional (e.g. achiever) and post-conventional (e.g. individualist see Pfaffenberger & Marko, 2011, Cook-Greuter, 1999 #716). Such stages have also been described as first tier, second tier etc. (e.g. Wilber, 2000c). Between these groupings, there is some overlap. Individualist is post-conventional and 1st tier; strategist is still post-conventional but 2nd tier.

The list above illustrates that a person perspectives step covers two action logics stages. O'Fallon (2010) argues that these perspectives form an iterating pattern. At the early step of the new person perspective (the first action logic stage relevant to the perspective) an individual is experiencing internal aspects of their new expanded perspective. Then, at the later stage within the same person perspective (the second action logic stage relevant to the perspective) they are able to contextualise across, prioritise and categorise between such internal aspects. O'Fallon likens this to a person at the first step unpacking metaphorical boxes representing aspects of the new person perspective. Later, as these become integrated, the individual is able to categorise across such boxes – the equivalent of an external perspective on the metaphorical boxes.

Relating this to the original set of action logics stage descriptions (see key characteristics, table 4.3 above), the expert is experimenting with abstract knowledge, problem-solving on individual specific issues as they relate these to their *craft logic*. With the shift to achiever there is an expanded ability to categorise and prioritise across boxes of different craft logic. That is, the achiever is seeking generalisable reasons that explain and allow a focus on key aspects and strategies. They are appreciating the *complexity* and *systems* that allow these specific issues to be interrelated. Figure 4.1 illustrates this by representing the expert viewpoint as looking out from the inside of a person perspective and the achiever taking an external view on several expert perspectives.

It is possible to apply this model to Drew's expert correlated quote in the *Initial Results* section. In this quote, Drew is observing a conversation between members of a sustainability community of practice he participates in. The craft logic here is applying technical expertise in the form of looking for research or expert opinion. There is a specific

concrete problem discussed - paper towels versus hand dryers - and an attempt to problem solve by using technical expertise to exploring the inside of this metaphorical box specific to environmental impact.³⁸

A similar pattern occurs for individualist and strategist. For example, a fourth person individualist may be unable to prioritise across their critiques of systems. This could result in the *possible decision paralysis*, a key characteristics of the stage - see Table 4.3 above. There is a repeating pattern here with what was the expert unpacking the box of abstract knowledge to understand a problem (and often be *critical of self/others based on own craft logic*) now becoming the individualist unpacking the systems box to critique the system. An example, drawing from the Dean's individualist correlated quote in the *Initial Results* section, follows in the paragraphs below (after the discussion of concrete and subtle tiers).

For a strategist style viewpoint this changes to being much more able to categorise and balance across such systems critiques - that is, at late fourth person the strategist viewpoint is engaging with multiple systems critiques and understanding the value and different subtle framing of each. Such categorisation is, in part, described by the *importance of judgement not just exceptions* key characteristic from the action logics Table 4.3 above.

O'Fallon's (2010) model adds further conceptual depth integrating stages with states alongside the person perspectives. To map shifts in these meaning-making stages, it

³⁸ Note this does not mean that Drew would make sense of this circumstance in a manner correlated to expert action logic but rather that this description of *seeking causes* and an *interest in problem solving* investigations typifies the expert stage model. If there was a recoding of the community of practice's conversation it may be possible to identify those who commonly discussed such problems in a manner correlated with expert. Further consideration of the generalisability and usefulness of these correlations is in the *Discussion* section of this chapter.

overlays these stages, states and perspectives into the integral quadrants. As an assessment tool it has been successfully validated against sentence completion tests (O'Fallon, 2013).

One more change that is pertinent relates to correlating the sustainability statements with action logics in this thesis. Grouping of stages by tiers (or also called floors) is based on concrete, subtle, causal, and non-dual states and stages. For the practical purposes of this research only concrete and subtle floors are relevant.³⁹

The concrete floor draws from the state described by it - awareness of anything an individual can experience with external senses and the extensions of these senses such as microscopes and x-rays. The subtle floor similarly is mirroring a subtle state experience common to many people. This is the range of emotions and interpretations that we cannot generally measure with external senses such as thoughts and feelings, dreams and internal experiences (O'Fallon, 2010).

The first and second person stages, impulsive to diplomat, are the four stages that make up the concrete floor. The third and fourth person stages, expert to strategist, are four stages making up the subtle floor. These are substantive shifts and the shift from the last concrete floor stage, diplomat, to the first subtle floor stage, expert, illustrates the importance.

Expert is the first stage that engages formal abstract thinking in the form of abstract knowledge and plans. Such knowledge relates to making sense with subtle concepts, such as reasoning, engaged in designing and redesigning from a plan, one that is felt and visualised into the (near) future - for example, what the plan may become once built (O'Fallon, 2010; O'Fallon et al., 2014).

³⁹ See previous footnote on Table 4.6.

However, the expert is still only categorising across concrete topics. As discussed above in *Initial Results* section, Drew describes the investigation his sustainability community of practice undertook into the relative merits and impacts of paper towels versus electric dryers. The group individuals are described as using subtle style abstract knowledge to investigate what is the lowest impact type of a physical technology.

This shifts, concrete to subtle, at fourth person. The individualist starts investigating between subtle concepts. For example, Dean, in the same section above, was considering relative merits across responsibilities to educate shareholders, long-term views, and a priority placed on such by his company's individuals, leaders or its strategy. That is, he is describing a subtle analysis of subtle concepts and seeing: 1 - the potential over prioritisation of shareholder short-term value within his company; and, 2 - the demand to demonstrate the company is managing for the long-term and that this is valuable. For a strategist classification there would need to be consideration of how what seems to be a set of polar issues can be integrated. This does not occur in the quote, with Dean simply suggesting a subtle solution - educating the shareholders (so that their priorities change).

For this research, the clarifying parts of O'Fallon's model are:

- Two stages per person perspective, dividing such a person perspective from early - when the individual is first exploring the quality of the stage - to late - when the individual is able to categorise and look at these new qualities from a more systems like perspective
- Concrete floor and subtle floor – for example, when an expert is critiquing issues or solving problems this is subtle reasoning logic, but in the case of the expert this is

applied to concrete topics. At individualist, subtle reasoning is being applied to subtle topics.

- The ability to apply a set of questions to clarify the correlation between a sustainability statement and an action logic. These are: Is this statement discussing a concrete or a subtle issue? Is it looking at the internal part of such an issue or categorising across such issues? Is deconstructing or reconstructing from a concrete or subtle perspective? These three questions, in combination, distinguish between the stages discussed from the interview material - diplomat to strategist stages.

To assist in applying all the relevant developments from this section, the *Post 2004 Theory* section, and the original *Action Logics Model* section, there are two summaries below. The first, Figure 4.1 illustrates person perspectives for the subtle floor and early (looking out) versus late (looking back on) framing. The figure describes an iterating pattern in 4 steps:

1. Expert “*seeing only one side*”. E.g. It’s extraordinary that we’re wasting this water by not recycling it.
2. Achiever “*seeing more than one side and having the capacity to make a choice (either/or)*”. E.g. Our design integrates water saving into the fundamental layout of our new suburb with recycled and freshwater sources used. By so doing we offset the additional infrastructure costs with efficiency gains.
3. Individualist “*seeing and choosing two or more (both/and)*”. E.g. I feel like I’m really making a difference by contributing to solving our demand on resources, reusing the waste water I used to produce and contributing to a fair share for everyone especially those who are less affluent than me but most at risk from environmental pressures.

4. Strategist *“integration of the two sides of the overarching polar pair into one, which then becomes one side of a later overarching polar pair”*. E.g. We’re offering appropriate solutions that allow individuals to cut their resource use while, at the same time, not coming at an unacceptable cost to either them (in lifestyle and economic terms) or the earth. The benefits go beyond just resources and economics to a truly liveable and aesthetically soothing suburban environment.

Source: Material in italicised quotes from O’Fallon (2010) .

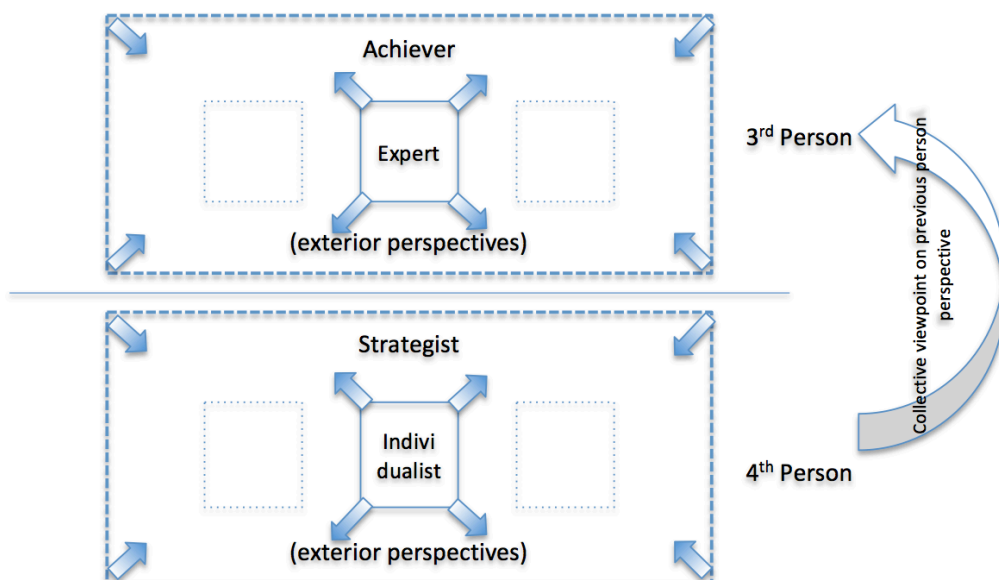


Figure 4.1: Conceptual diagram illustrating person perspectives overlaid on an integral (lower and upper - collective and individual) framework.

For the second summary, Table 4.5 consolidates the stage clarifications into a set of key characteristics and delineators. Where possible, descriptions from Table 4.3 that were not commonly used to correlate characteristics to the sustainability statements are removed from this second table. The table covers the alchemist and ironist stages but does not disaggregate into construct-aware etc. stages. It also leaves out the delta stage. There are

not recognisably strong correlations to these late stages (or earlier than diplomat) in the interview data and consequently these stages are not foci of this research.

Actions Logics and Tag line	Key Characteristics / Identifiers	Person, Tier and Focus
Opportunist <i>Needs rule impulses</i>	Short time horizon; focus on concrete things; manipulative; views rules as loss of freedom; views luck as central; rejects critical feedback; externalises blame; distrustful; stereotypes; hostile humour; flouts unilateral power; treats "what can get away with" as legitimate; punishment = "eye for an eye"; positive ethic = even trade; timely action = "I win"	1 st person – first person perspective is characterised by a focus on self. <i>Focus:</i> awareness of quality of concrete self
Diplomat <i>Norms rule needs</i>	Committed to routines; observes protocol; avoids inner and outer conflict; conforms; works to group standard; seeks membership, status; often speaks in favourite phrases, clichés; loyalty to immediate group; sin = hurting others; positive ethic = nice, cooperative	2 nd person – second person perspective is characterised by a focus on self and another. <i>Focus:</i> awareness of the quality of concrete operations
Expert <i>Craft logic rules norms - seeing only one side</i>	Interested in problem-solving; seeks causes; critical of self/others based on own craft logic; wants to stand out, be unique; perfectionist; chooses efficiency over effectiveness; dogmatic; values decisions based on technical merit; sees contingencies, exceptions; details with a system but not categorising across competing and different systems	3 rd person – early third person perspectives add to one's awareness the quality of abstract and formal operational thinking. <i>Focus:</i> an observer who can focus on another self and other(s)

<p>Achiever <i>System effectiveness rules - seeing more than one side and having the capacity to make a choice (either/or)</i></p>	<p>Long-term goals; future is vivid; feels like initiator, not pawn; seeks generalisable reasons for action; seeks mutuality, not hierarchy, in relationships; appreciates complexity, systems; feels guilt if does not meet own standards; blind to own shadow, to the subjectivity behind objectivity; positive ethic based on self-chosen (but not self-created) ethical system</p>	<p>3rd person – later third-person perspective adds to one’s awareness the prioritisation of abstract and formal operational thinking. <i>Focus: an observer categorising and integrating between another self and other(s)</i></p>
<p>Individualist <i>Relativism rules single system logic - seeing and choosing two or more (both/and)</i></p>	<p>Takes a relativistic perspective; focuses more on both present and historical context; often aware of conflicting emotions; experiences time itself as a fluid, changeable medium, with piercing, unique moments; seeks independent, creative work; attracted by difference and change more than by similarity and stability; possible decision paralysis</p>	<p>4th person – early fourth-person perspective involves one’s awareness of the quality and contexts. <i>Focus: on an observer, observing another observer; observing another self and other(s)</i></p>
<p>Strategist <i>Most valuable principles rule relativism - integration of the two sides of the overarching polar pair into one, which then becomes one side of a later overarching polar pair</i></p>	<p>Recognises the importance of principle, contract, theory, and judgment - not just rules, customs, and exceptions - for making and maintaining good decisions; relativity, moderated by understanding of complexity and natural hierarchy, allowing principled choices - approximation for action; categorised complexity; beyond win-lose to “positive-sum” gains, in which many win, co-create mutually beneficial solutions; high value on mutuality and autonomy; interweaves short-term goal-orientedness with longer-term developmental process-orientedness; aware of paradox that what one sees depends on one's action-logic, creative at conflict resolution</p>	<p>4th person – late fourth-person sees an iterating horizontal pattern; contexts within contexts within contexts; systems within systems within systems – contextualising and prioritising the individualist’s quality and context views. <i>Focus: on an observer categorising and integrating, observing another observer, observing self and other(s)</i></p>

<p>Alchemist <i>Deep processes and intersystemic evolution rule principles</i></p>	<p>The process of meaning-making is always inadequate; meaning understood as constructed from increasingly complex theories arising from reification and segmentation of reality; reality an ever-changing, dynamic flux of phenomena; sense unitive nature of reality but recognise meaning-making process can never accurately articulate reality; collapse of subtle stage to causal emptiness and fullness, holding of paradox and pole; may initially struggle to find agency and priority in cascade of conflicting parenthesised qualifications and subtleties.</p>	<p>5th person - fifth-person perspective includes one's awareness of the quality, constructs. <i>Focus:</i> seeing the previous pattern of observing observers observing; can cycle through multiple cascading person perspectives</p>
<p>Ironist⁴⁰</p>	<p>Focuses on being as well as on witnessing moment to moment flux of experience, states of mind, arising of consciousness; holds unified perspective with the other as one; holds partnership of beyond us and them; holds and rests in the tension of not knowing and wonders into the moment – without predefined constructs and perspectives – to allow what is needed to emerge; each time a solution arises, wonders and inquires into it; hold the space for the integrative nature of consciousness to express; holds a mirror to individuals/groups to see themselves, self-reflect, and wonder; attuned to evolving nature of consciousness and wonders “where are we?” “what are we becoming?” and “what is needed and wanted next?”</p>	<p>6th person - sixth-person perspective involves one's awareness of the unity of opposites <i>Focus:</i> Seeing the nth perspectives, begins to step outside of those nth perspectives; begins to take a perspective using patterns of observation and perspective taking through tiers</p>

Table 4.5: Model of eight most prevalent action logics applied to sustainability. Origin from Divecha and Brown (2013b).⁴¹

⁴⁰ Summary subject to further research. See previous footnote on Table 4.6 for more details and relevance notes.

These clarifications are applied in the *Final Results* section below.

Final Results

This section applies the theoretical developments, outlined in the two preceding sections, to the interview data. Key changes as they apply to each stage, when relevant, are briefly discussed. Tag lines from column 1 of Table 4.5, the key characteristics and identifiers (column 2), as well as person or focus descriptions (column 3), are italicised when used in the discussion below. While reading these quotes, it is important to note that a quote correlated to a particular action logic does not mean that the person making this statement makes meaning of themselves or phenomena in a manner that is correlated to that particular action logic – see the *Conclusions and Discussion* section below.

Diplomat

In the quote below, Lee discuss why the company they work for should implement positive environmental policies (e.g. for water and greenhouse gas emissions). Statements correlated with this stage were characterised with a focus on conforming to their community, *group standards* and *company protocols* as well as *favourite phrases/clichés*.

I don't believe in climate change. At this stage I haven't seeked [sic] to understand it more. I have just been going on what the media are pretty much telling me, but at the same time I haven't seen any proof for climate change. I think our weather patterns follow cycles. Although I do understand that, you know, I went to Canada two years ago and I saw the glaciers and things and they are all melting and the Canadians are very excited because it means they get more fresh water and the temperatures are bit warmer for them, so the

⁴¹ Used with permission.

people up there in Canada are really embracing the climate change, if there is climate change (Lee).

Lee's statement relates strongly to the individuals around her and in this quote, as well as other discussion around it there is a focus on *herself and another*. The abstract concept of climate change is largely presented as physical, concrete, images such as melting glaciers and fresh water. Additionally, the quote illustrates the characteristic of *avoids inner and outer conflict* as Lee seemingly avoids reconciling her own disbelief in climate change with the perspectives of Canadians.

Expert

Shifts between action logic stages are characterised by a clear step change to more comprehensive and complex understanding (McCauley et al., 2006#1097). This shift from diplomat to expert is one of the most substantive - not just as individuals now gain a 3rd person perspective (more readily able to focus as an observer on themselves and others), but also for the additional abstract style thinking capacities (Hy & Loevinger, 1996 p5; O'Fallon, 2010). The focus of meaning-making adds subtle complexity on top of the previous concrete considerations (see the discussion in the previous section).

The impact is illustrated in the quote below with a focus on *problem solving*, as Rod looks for reasons he often expresses these technically. He focuses on why recycled water should not just be mixed with mains water in reservoirs. In talking about this issue, Rod does not consider in this quote the *subtle systems* around this problem – such as risks that make using stormwater difficult. If these were expressed, e.g. as a capacity to consider the risks of houses not selling if people had no choice about using recycled water or not (as it is mixed with the mains water), the quote would be more typical of an achiever response, *seeing*

more than one side, and seeking generalisable reasons. Rod says on the technical aspects of recycled water:

I mean when you look at the recycled water in [the development], the first project to scale to have recycled water in Australian...it's still the wrong way to do it. Here we are putting in all the second [pipe system]... we are putting in this whole second layer of infrastructure to manage this water that ideally why wouldn't we be... use the reservoirs and pump up the reservoirs and then we just use all, everyone uses it, problem solved. Now, how easy is that? ... Sometimes I think you just have to bite the bullet and you just have to take the simple approach, but I don't think now our bureaucracy is just capable of doing that. Just the mind boggles, all this recycled water we put out in the ocean, it could be harvested, cleansed, go through a wetland, yeah, it might be wetlands, it might be some other filtrated, I don't know, but you could get it, it's just water... if you take out the impurities and it's fine (Rod).

Distinctions also need to be made when there is a range of problems, related as a list in a quote. In the example below, Victor is discussing why he works for the company. The sustainability concepts are consistently related to concrete examples and in this quote it can be regarded as a simple list examination (expert) categorising concrete concepts, as opposed to seeing more than one side (achiever). He says:

I try and work for a responsible organisation as much as developer can be, because you got commercial viability and I would get quizzed sometimes a bit, you know [company] should be doing more for the environment. But I do believe wholeheartedly that we are forerunners in that regard and you just can't use star ratings for dwellings as an example. You just can't say right, every dwelling is going to have a seven and half star efficiency rating because all of a sudden it becomes unaffordable. So then you got another social sustainability issue as well whereby you know people have to live somewhere. So we pushed the boundaries but within reason and we always aim to keep raising the bar, so to speak. So we have got, some of the [efficiency standard] requirements and all that sort of stuff, which we think is really important. But it's also about having the public transport here, having the facilities here so people don't have to get in their car and drive to the other side of town to do their shopping or to go to school or work or whatever, and bike paths, and all of those sorts of things to create a healthy environment (Victor).

This was one of the quotes tagged, during initial coding, as a test case. There are clearly some elements of making a choice, such as between affordability and dwellings for people to live in. However, these are resolved individually against concrete criteria of efficiency standards and bike paths. In the context of the question that Victor sets out to answer - why he works for the company - the justification is a list of abstract concepts related to concrete phenomena. That is, it is a set of *problem solving* answers (expert) rather than an observer *categorising and integrating* across these perspectives (achiever).

To further illustrate the difference Carrie's quote, in the achiever example below, talks about finding an equilibrium between governance and economic outcomes and making choices across concepts to arrive at a balance she regards as holistic. That is, an achiever correlated quote balances and categorises importance across such a list of problems and different areas. This is in contrast to the list in Victor's quote where the affordability issue is resolved directly against transport, shops, facilities and efficiency standards.

Achiever

As introduced above, a differentiating aspect of achiever is the ability to categorise clearly between a wide range of what were expert sustainability concepts. *Generalisable reasons* and *mutualism* - recognising the importance of other people's perspectives becomes much more prominent (see Table 4.5). When asked what sustainability means for her, Carrie says:

I like to think of sustainability in a holistic sense in that it is sort of trying to find that balance of environmental, social, governance and economic outcomes, but to me it's breaking it down into simple terms; it's about being smarter about what we do, and how we live, and how we build, how we design; it's about being smarter, it's being more sensible about how we use our resources, it's being smarter with the end outcome in terms of it not using as

much or producing as many harmful impacts on the environment. But, yeah it really is about improving outcomes for the environment in which we live today, so that it's still there, and still healthy and happy tomorrow and thereafter (Carrie).

The balance Carrie talks about is across environmental, social, governance and economic spheres. This differentiates it from the less complex and more direct resolution of affordability issues in Victor's expert correlated quote above.

From a floor perspective Carrie is still, however, primarily categorising across concrete concepts, with abstract thinking. The outcomes referred to in the opening sentence are drawing on discussion in the interview that relates to physical concepts such as standards for efficient buildings, policy with the UN Property Finance Initiative and working with peak green building non-government groups in Australia, such as the Green Building Council.

To further illustrate the difference between expert and achiever, Damara, in the quote below, is discussing reasons for the company to adopt sustainability. Damara's quote is one that was tagged as a test case during the initial coding. During this initial phase it was not clear if it was *problem solving* (expert) or *seeking generalisable reasons* (achiever). She says:

I guess, it's not about being green in my mind, it's about running your business efficiently for the better tomorrow, and for the savings that you can achieve today. It's basically looking forward... and making sure that this planet exists for the generations to come, but at the same time, running the business that's extremely successful and efficient today, for your own good. That's how I would probably define it in my own head (Damara).

The quote illustrates achiever *prioritisation and categorisation*. There is a balance being made between the future and present (*future is vivid*). Damara is looking to integrate her current day perspectives with future outcomes. It is a type of forward oriented time integration that is not apparent in the earlier expert correlated quotes. There is also the key

characteristic of *long-term goals* from the achiever description - see table 4.5 in the previous section.

Craig's quote below also illustrates similar prioritisation and choice, alongside achiever correlated *mutuality seeking*. He discusses innovating, and the need for such innovation to be adopted and used for it to be considered as an 'innovation'. He prioritises and chooses between demonstration projects and the usefulness of these versus mass market appeal.

Craig says:

It's one of the things... in our company culture about innovations, whether they be in sustainability or whatever, to me are not true innovations unless they can be broadly transferable in marketplace. And we use the term marketplace a lot, which causes some academics and others to sort of say oh, tut-tut it's all about making money. It's not that, it's actually about the marketplace as you and me and everyone else, it's about people taking it up.

And it's - you do need demonstration projects, you do need projects that are heavily propped up by specialist funding, your one-off to demonstrate the art of the possible. But they alone are not going to bring about change. And that's why I think, when you can get change on a mass scale; you know, here is Commodore, or Holden's all of a sudden bringing out, you know, waving the flag saying, look at our new Commodore it's the greenest ever. I mean this is a company that burns V8s around the streets of Adelaide and all over the country, but that's where all of a sudden big muscley blokes with tattoos, the next time they buy their V8 ute, the one thing they'll say, oh, yeah and it's green too, you know, beauty.

And that's what I mean, you've got to embed it in there, so that the broader community actually, even without thinking about it is actually starting to be more sustainable, it has got to be driven from the top down through government and industry (Craig).

For the step to the next stage, to discriminate Craig's quote correlated to achiever with individualist, the concrete and subtle tiers assist. While Craig is arguing about definitions and concepts these are broadly physical and tangible illustrations such as v8s, demonstration projects and big muscley blokes with tattoos. The step to individualist brings

in *awareness of the quality and contexts* - explicit concern about subtle subjective phenomena. Dean's quote, below, illustrates this.

Individualist

Individualist responses, as they were described in the *Initial Results* section, encompass relativistic perspectives, such as the person is describing taking a perspective on a whole generalised system. The step is the first fourth person perspective, broadening awareness not just to achieve quality of abstract and formal thinking, but across the individual's own awareness of such quality and contexts. To illustrate this, in the quote below, Dean is discussing the influence of over one hundred years of organisational history within the present day company. He is considering how it subtly influences peoples thinking (or possibly helps self select such individuals) to predispose these individuals towards considering long time periods compared to other organisations. He opens his argument relating behaviour to subtle concepts - morality:

I mean you go into investment banking, I mean they deserve everything they got in their house because, they are, I call them the forces of darkness, right. They are amoral I would say. They will do whatever they need to get the deal, and the culture within the investment banks is do whatever you need to do to get these next deal and it doesn't matter, right. It doesn't matter whether it's good, it doesn't matter whether it is ethical, it doesn't matter anything, you just do anything get the deal, right. And for me that is. I mean it's despicable actually. Personally and I hate that. I hate the sort of corporate greed the sort that you see in corporations where people will do whatever they need to do, it doesn't matter whether it's right, ethically correct in order to maximise their bonus... No, I couldn't do it... It's pretty obvious when you hear an investment bank advising you to buy or sell, they're really only interested in the transaction, because that's when they earn, they don't actually care if it's a good transaction, the right transaction, a moral transaction, just the transaction, right (Dean).

The distinction between concrete and subtle tiers is useful in correlating this quote to individualist. Dean is critiquing, arguing and inquiring into subtle concepts with subtle arguments - the person's interest and motivation related to the amoral and ethical analysis in the quote. For the next stage, strategist, the quote would need to seek to contextualise or prioritise across several such concepts or subtleties and inquire further - for example are all the investment banking sector individuals complicit in creating a force of darkness? Do some have deeper long-term motivations?

In a similar manner, Stan discusses the drivers for leadership, including sustainability, in his company. In the discussion, prior to the quote below, he has been focusing on a number of relative concepts such as needing to manage complexity. In the quote he is reflecting on the drivers for this within the company. The quote contains subtle concepts and consideration of the advantages and disadvantages of working with complexity or confrontation. Stan says:

I think it's driven by people, and it's driven by people in terms of the sorts of people that are attracted to [the company], so it starts with that culture. It's driven then, by the sorts of people that are attracted, and those people attract more of that, and it's also driven by the leadership, so there's some outstanding individuals that - because you don't want complexity for complexity's sake, you actually don't want complexity, it's about trying to cut through that, but it's about being able to see the end, and then having the guts and the tenacity, and the ability to get through all of that. And I think that that is - what's the word I'm going to look for - it's not coordination, it's... it's the ability to work with people, and I mean we, as a business typically, are far less hard-nosed and confrontational than a lot of our building peers, for example - collaborative was the word I was looking for, and it's a lot - it's very much overused, but really, the key to anything multiple, multiple stakeholders and really ugly, complicated things is collaboration. As soon as you do it in any sort of aggressive manner, consistently, then it's confrontation, it's just an ugly pathway, and on these projects that last for ten years, you burn the bridges in the first twelve months and the next nine years are not very pleasant (Stan).

While Stan considers emotional issues from the subtle collaborative drivers of group culture and leadership - that is an *awareness of the quality and contexts* - he does not offer an integrating perspective. Such a perspective, e.g. the qualities of a circumstance in which confrontation could be appropriate within specific stakeholder groups, is likely to correlated with the next strategist stage - that is, it would have been *contextualising and prioritising* the individualist's *quality and context* views.

Strategist

The shift to strategist sees individualist *relativistic perspectives* categorised, organised and structured - for example, looking at *systems within systems within systems*. This helps to ensure action or avoid decision paralysis (O'Fallon, 2010; Torbert et al., 2004). In the quotes below this is related to people applying such reasoning to what could have been an individualist expression of sustainability with the relativity developed by an understanding of complexity across multiple individualist style observations. That is, these quotes correlate with concepts that are integrating the potential for positive synergy between what could previously have been competing, isolated system-perspectives (see *Post 2004 Theory* section).

Leanne's quote below illustrates the comparison with respect to Stan. For Stan, above, culture was expressed as being an important driver. However, Leanne reaches into a variety of cultural contexts to describe the importance of discussion between the corporate's varied groups. This is a discussion that recognises differences in culture and approach. She says:

One of the things that we are driving quite strongly from the group in all of the businesses is a consistent way to measure intangibles. Don't just go it's too hard, so we won't do it. It is okay then, so the measure is you know we want to have ... want to be an employer of choice

or something like that. Or we want to have the right people doing the right things in the right way, that's probably the better one. Then rather than going, okay then well let's do a proxy measure and let's have engagement. But that doesn't measure whether the people are doing it the right way. So what we do is, we say okay then, what are the things, what are the initiatives that you need to do to actually ... enable that ... that means all sorts of people and workforce issues you would work on to attain that objective. So they are the initiatives that you are going to commit to doing. And what's the evidence that you are actually going to bring to the table in terms of proving that one of those initiatives is being done and that you know you do believe that is where you are at. Say, say it's about having it aligned ... so you might say well, right people, right place, doing the right thing. Then the way we are going to do that is have an aligned people strategy, business strategy, so that might be the measure. And then when you are looking at how you are rating yourself on that measure, it's about, you know, all implemented or not implemented. And then you go back to your initiatives and your evidence. So it's actually about the strategic discussion that you are having around what you are doing rather than, yeah I got to tick on that box, tick on that box, it's what are we doing, what are we seeing shift, what are the initiatives that we are embedding, what are the things that we are not doing that we actually could be doing, so it's about... the richness is in the discussion, not in the measurement (Leanne).

There are some clear strategist correlations in this quote, such as *contexts within contexts within contexts*. For example, it considers proxy measures but moves to contextualising this through what Leanne argues is a better approach of the group proving it's delivering through demonstrating it believes what it is stating. From a floor perspective, this is subtle concepts being contextualised with subtle thinking.

Arena, from the same company, offers a related viewpoint. She describes translating a specific organisational aim into a range of subtle benefits - what the Earth Hour program could do for company image, employee and customer engagement. However she also describes the importance of delivering this in a manner that makes sense to a specific group, an intervention which requires the corporate office to be very specific about

potential concrete outcomes - financial savings. That is, this quote illustrates *principle and judgment, not just rules and exceptions*. It *contextualises and prioritises*, integrating what could have been a *polar pair* (we're focused on our bottom line versus group priority) in a manner that meets the needs of the whole organisation and the specific group, as well as longer-term goals.

So I think the challenge is realising obviously that our audience is varied and broad. Our stakeholders are varied and broad. We all know that and we have to communicate differently with different people and find the hot button for that audience.

So, you know, recognise that if we are talking to a particular group of employers or stakeholders that are very focused on the environment, that be sensitive to that you know, and give them assurance that that's still a major priority, but also gently trying to sort of getting them to broaden the perspective, but for frankly... For Earth Hour, right, great example, we have committed to Earth Hour this year again and you know, we did the business case for Earth Hour, which was - I mean there was one division in particular that just yeah, they are so focussed on their under-performance right now. They are in quite a dire situation that they basically said, we are not doing anything, but turning around the bottom line. Right, we don't want any noise about anything else, you're distracting our people and we said look, we don't mean to do that, we realise that's your priority, but this is an important initiative Earth Hour from the group perspective and here's why it's important for our employees, for our customers, but yes, there is also business case and let us tell you that, you know, if you turn off this many branches and this many. And it's not a huge amount but we translated it into the numbers and said you will save X-thousand dollars. Why would you say no? There's no downside (Arena).

The stages outline a clear progression. This starts with dealing with very physical concepts such as melting glaciers and avoiding conflict between the perspectives of others and yourself. It progresses to considering the relative merits of multiple perspectives around different broad audiences and the usefulness of measuring outcomes as being in the rich conversation that surrounds such perspectives.

Conclusions and Discussion

Correlating action logics descriptions with statements related to sustainability offers some distinct advantages and the potential to better address these topics. Within the interviews many different issues and viewpoints were discussed - from action to reasons to change, as well as sources of motivation, values and structures or attitudes that can enable change.

The research shows that these individuals are discussing such subjects in different ways.

Consequently, knowledge of this should help overcome differences that can inhibit change.

To the best of my knowledge, action logics have not been correlated with sustainability statements in the manner presented here by other researchers apart from the description of this work with Barrett Brown (Divecha & Brown, 2013b). However, several potential related applications of this are already in development, have been researched and/or are being actively used. Demonstrating that we can empirically model spoken perspectives on sustainability helps to validate these approaches, offers a research base to assist and opens potential new uses for such work.

For example, being able to distinguish action logics levels, at least as they are correlated to sustainability statements, adds evidence that it may be possible to program computers to recognise developmental levels from text. Development of a system such as this could enable interventions based on an approximation of the developmental centre of gravity with respect to a particular organisation (Metaintegral Foundation, 2014). The proponents of such a system argue that it opens up potential for more effective conflict resolution and, I would argue, it could enhance the likelihood of success for sustainability interventions.

Many sustainability interventions involve conflict or differences of perspective. There are

illustrations of levels of conflict throughout the chapter (for example see Dean's quote in the *Initial Results* section).

Models may also be developmental. Learning can be viewed as a 'dialectical process', that is, with cycles of action, feedback and reflection and inquiry (Stein, Dawson, Rossum, Hill, & Rothaizer, 2013; Torbert et al., 2004 pp18,19). Learning can occur with and through enquiry into developmental levels - an individual can make a focus on themselves, and their awareness of themselves in any given situation, the subject of developmental inquiry (Torbert et al., 2004 pp18,19). Clearer modelling of expressions related to different action logics should assist this work. For example, Stein (2008) argues that developmental assessment systems are best understood if they are considered to be "rational reconstructions" of an intuitive competence. That is, assessments can create and be intuitions that are related to understanding the relative developmental complexity of thought, and language capabilities, in ourselves and others. Individuals engaged in understanding these developmental frameworks may assist change (both for themselves and others). Extending this further, the sustainability assessments and correlations outlined in this chapter may assist with development and consequently be part of answering a demand for late stage action logics leaders (see the *Introduction* section).⁴²

Practitioners advocate using action logics style frameworks for effective communication and addressing key motivating factors for sections of a community or group (e.g. B. C. Brown, 2010b; B. C. Brown, Geselle, & Perera, 2005; Divecha, 2009b; Owens, 2005b). To date, this

⁴² My personal experience mirrors this theoretical proposition. As outlined in the Integral on Integral section of Chapter 2 my measured action logic has shifted stages over the course of this thesis research. Arguably, and experientially, there feels to be some truth to this. The immersion in understanding stage models and sustainability action correlations, plus engaging in practice that realises some of the effectiveness of such work, may be related to assisting this development.

either has to be based on broad assumptions about the group and/or analysis of its policies etc., SCT assessment, or experiential assessment by the individual. That is, action logics correlations have been, and are being made. Individuals, when asked, readily volunteer that they will make such assessments from interactions with others and, at the very least, these are useful for those individuals - if not additionally helpful for improved outcomes. A more robust empirical framework, that is modelled by the research here and that could be further developed, should help to ensure such appraisals are more accurate, help others who may be interested in the effectiveness of such tools and/or enhance the usefulness of these assessments.

There are some balances to be mindful of with this work. As predicted by the theory (see *Action Logics Model* section) individuals will demonstrate a range of action logics when discussing concepts. In coding this data, no one person's individual statements are purely linked to a singular action logic. While resonance of a particular concept, or highlighting different ways in which people make sense of a sustainability problem differently, can create agency to address such issues, these action logics correlations cannot be taken to imply that the individual's action logic is at a particular stage (should it be assessed with SCT or another metric). Therefore, I would sound a note of caution about assuming a person's action logics from any presentation, statement or interview they make.

Similarly, the reverse can hold true. Having determined a person's action logics through an SCT does not necessarily mean they will approach sustainability issues in a way tightly linked to the SCT score. The context in which they are operating, interpersonal interactions and other factors may impact that person's discussion of sustainability with others. Thus an

ability to assess action logics correlations from the model presented here is likely to be useful even if those who are interacting all have, and have shared, recent SCT results.

There are other differences. The SCT is a written, reflective, exercise. Interpersonal conversation, such as in my research interviews, could mean that within an organisational context analysing individual's statements provides as valuable insights as do formal tests. That is, understanding action logics relevant to an organisational sustainability context may be assisted through the type of analysis explored in this chapter - especially if the manner in which people relate in the organisation diverges from an SCT context.

I would also note that people might consciously choose to present concepts so that they appeal to discrete worldviews. It is possible to communicate in a specific action logics style that is not representative of the individual's action logic (B. C. Brown, 2010b; B. C. Brown et al., 2005). People familiar with the model may tailor interaction to resonate in the most effective way with an audience. An illustration of the effectiveness of working across stage views is provided by Arena's quote at the end of the *Final Results* section. Group needs were translated into concrete terms and this, Arena relates, validated Earth Hour for the group concerned. Choosing to consciously communicate, in a style appropriate to the audience's action logic, could assist in similar circumstances to ensure those who need to act are engaged and enrolled more fully in the process.

Correlations, however, do not need to be exact to be effective, useful and have impact. The material presented here is an action logics model as it relates to sustainability. That is, it is not a detailed metric, such as one calibrated with quantitative correlations to a specific human psychological trait or worldview. Models, without metrics, are highly influential and useful. For example, Eric Erikson's eight stages of maturity is a model of life long human

development. Erikson's work directly influenced Bill Torbert's theory and is used to investigate transformational interventions, including those made by Martin Luther (Protestant Reformation) and Gandhi and Indian independence (Stein & Heikkinen, 2008; Torbert & Kelly, 2013).

On a practical daily basis the action logics model is already used, in formal and informal inquiry. For example, as discussed in the sections above, many people report using action logics correlations that they consciously arrive at from interpersonal interactions with others or through written material. This chapter argues that, for sustainability, you can model such assumptions, perceptions or intuitive or logical deductions through analysis of conversations.⁴³ I further suggest that the more explicit we are about such correlations, and the better these models are, the more likely it is that such application will be skilful. The analysis through this chapter can add to our capacity in this regard.

A promise of explicit action logics framing is that an individual or group can explicitly choose to engage on sustainability interventions in manners most aligned with individual and group action logics, communicating advantages effectively and designing programs that consequently have far greater ownership and engagement. Such outcomes raise the likelihood of individual successes as well as long-term strategic delivery. That is, I believe

⁴³ The action logics differences I have been discussing are strong enough that the usefulness of such observations was apparent during and immediately after interviews. For example, I noted that people's reflections on government and what such institutions should do can be quite instructive. People expressing expert style stage views about the role of government would tend to focus on the need to simply regulate or enable the types of changes the person saw as desirable. This would occur without reference to any of the systems or contingencies that could make it possible (or difficult) to actually make such a regulatory change. Working with such perspectives, as they resonate with the groups and specific individuals during any particular engagement, is something I would argue is valuable. Moreover, in my experience, it can be highly effective for enabling sustainability.

this is relevant for localised short-term project success, as well as broad, longer-term, future oriented directions and interventions.

Chapter 5

Common Pool Resources

Introduction

You would not be reading this article if it were not for some of our ancestors learning how to undertake collective action to solve social dilemmas. Successive generations have added to the stock of everyday knowledge about how to instil productive norms of behaviour in their children and to craft rules to support collective action that produces public goods and avoids "tragedies of the commons".

Elinor Ostrom, A behavioural approach to the rational choice theory of collective action (1998).

The next chapters examine the collective group contexts within which individuals, discussing sustainability in the two multinational companies comprising this research, are operating. In this chapter, I specifically draw on principles seen in the creation, or maintenance, of successful sustainable systems. That is, I look for evidence of such principles within the studied organisations to consider the relevance of these principles to modern day companies and sustainability. The chapter following this one considers corporate, organisational and group stage models.

These chapters consequently build on the preceding one. The discussion shifts from a focus on how individuals may make sense of sustainability to how this might operate within a group or company, and the wider context of a company acting within society and forming part of these societies. That is, this chapter moves from primarily an individual focus to collective viewpoints. The action logics framework, developed in the last chapter, discusses how individuals describe sustainability from discrete and particular worldviews. An inference from this is that individuals might seek to create change from a particular distinct

understanding of a topic - we are discussing sustainability in identifiably different ways. However, these perceptions - alongside any actions that the individual may engage in - are shaped by the organisation they are working in. The perspectives and actions are also impacted by multiple influences from the groups around them and society more generally (e.g. see the discussion in Chapter 3).

The collective context is often seen as an overriding issue against which any individual's attempts to protect environmental values can be, and it is often believed are, negated by the impact of others. Such circumstances are collective action problems. Situations of this nature are described as "social dilemmas". This chapter examines these types of problems and company action on such dilemmas.

I particularly look at social dilemmas where action to protect common values is desirable. In such cases, action creates better outcomes for everyone, however others can choose not to cooperate. The result of this non-cooperation is short-term gain for the defectors and longer-term loss for everyone.

A wide range of work looks at such collective action challenges (e.g. Arrow, 1999; Axelrod, 1984; Darwin, 1874; Olson, 1965; Ostrom, 1990). A specific substantive area of this research seeks to address environmental social dilemmas and how groups may seek to - and in many cases have acted to - protect "common pool resources". These are resources that are shared, easily accessible and can be degraded through overuse. With multiple users it is possible for an individual to take more than a fair share of what the resource can sustain. If this occurs, the overall utility of the resource can be damaged resulting in it becoming less productive. A common example is fisheries - overfishing can dramatically impact future stocks. This reduces the productivity of the whole resource. These dilemmas characterise

many other common resources, such as the world's ability to absorb greenhouse emissions and the safe level of carbon dioxide and other global warming gases in the earth's stratosphere. These common pool resource dilemmas were outlined briefly in Chapter 1.

This chapter, in the section titled *Background to Common Pool Resources*, introduces the nature of such resources and discusses the factors and influences that may lead people to collaborate with others and protect resources. Such factors include internal and external motivations/drivers alongside measurable and subjective influences. Consequently, the integral theory quadrant framework is touched on to structure an outline of the common pool research.

The next section, *Common Pool Relevance*, considers how such research may be applied to my investigation. The first aspect of this is that these businesses operate within a complex set of overlapping institutional structures. The businesses both act on sustainability, are required to do so, and individuals within these organisations may act on opportunities (or otherwise) to reduce environmental impacts. Theory drawn from common pool research has been applied to such business circumstances. This is described in the *Polycentric and Business* section.

Design principles have been derived from the extensive analysis of such common pool resource dilemmas. These principles are the foundation for the *Scaling Up Design Principles* section. The section discusses principles that are commonly present when a group creates the conditions for such resources to be used in a sustainable manner. The research shows, among other outcomes, that government led programs are not necessarily more effective than those organised more directly by resource users (Ostrom, 2010a; Poteete, Janssen, & Ostrom, 2010). Quite commonly, self-governed resources enjoy better protection than

similar systems with external government intervention. Systems based around such principles have successfully protected resources over decades and centuries in regional situations.

With this substantive regional and local foundation there is a challenge posed to assess the relevance of such work if it is applied to global issues. Such issues include transnational boundary pollution or climate change. The design principles have been drawn from a wide range of research and a significant part of this are case studies - for example, Nepalese irrigation systems or forests worldwide (Ostrom, 1990). The studies look (in part) at subsistence societies that have evolved rules to sustainably self-govern resources (Cox, Arnold, & Villamayor Tomás, 2010b; Dietz et al., 2003; Poteete et al., 2010). However, a range of work has sought to apply such research and principles to larger global issues or company sustainability. There is evidence that the principles are applicable to global problems - although this is less well researched (Dietz et al., 2003).

A focus of both of these sections (*Polycentric and Business* and *Scaling Up Design Principles*) is on the intersections between businesses and global sustainability issues. These sections develop the arguments for applying this work to my case study material. Links between such research and corporate sustainability are examined.

A range of work has validated, tested and modified the original design principles. The adaptations are relevant to my thesis material and described in the *Critiques and Developments* section.

The section after this, *Principles In Research*, looks for evidence that these common pool resource principles can be identified in the research's two businesses case studies.

Statements and questions answered by the individuals interviewed from these companies are coded and analysed against the principles.

The initial conclusions drawn from this research are discussed in the *Conclusions and Discussion* section. I argue there is clear evidence that the design principles are correlated with how leaders in these two companies conceptualise successful sustainability initiatives. The principles are also aligned with how these individuals view and discuss the creation of such initiatives. This last section also draws from the brief integral theory analysis (in the *Background to Common Pool Resources* section) in order to provide a basis for considering the relevance of conclusions from this chapter against findings across the other areas of this thesis.

Background to Common Pool Resources

Our ability to organise cooperation on a scale considerably larger than predicted by theory based on unconstrained selfish rationality, or by most evolutionary mechanisms, is one of the most striking features of our species.

Peter Richerson, Robert Boyd and Brian Paciotti, *An evolutionary theory of commons management* (2002 p432).

The concept of common pool resources is used throughout this chapter to define a general type of resource that a number of people can access (Dietz et al., 2002). These resources provide humanity's goods and services and can be local or regional - such as a shared pasture or use of irrigation water - or a global commons such as the ability of the world to absorb humanity's greenhouse gas emissions.

It is useful to conceptualise the resources as goods to look at how these resource systems are managed. Such 'goods' can be thought of as having subtractability similar to private

goods - that is, they can be used up. At the same time, access to the resources is public - it's difficult to exclude people from using them (Ostrom, 2010a). Under such circumstances, it's not surprising that individuals and groups could take or use more than their share. This causes a decline in the resource, creating a so-called 'tragedy of the commons' (Dietz et al., 2002, Hardin, 1968 #144).

We see situations similar to such a tragedy of the commons across the world today. These include the overuse of carbon for energy, which produces greenhouse gas emissions and leads to impacts on the climate and associated consequences (including reductions in ability of the biosphere to sustain life). Overexploitation of fisheries, leading to fish species becoming commercially extinct, is a similar example.

To protect such resources we commonly assume that government intervention, or privatisation of the commons, is necessary. Common pool resource research however demonstrates that individuals and groups can, and do, generate systems, behaviours, structures and standards that answer such dilemmas. Hundreds of studies document self governed systems that manage such resources more effectively than government intervention or privatisation although, equally, there are many cases where these efforts fail (Dietz et al., 2002; Dietz et al., 2003; Ostrom, 1990).

Successful, self-governing systems are characterised by formal and informal rules, norms and customs to manage the commons. Under such systems, community and group processes sustainably manage common pool resources (Ostrom, 1990, 2010a). The research highlights the ability of groups to self-organise and protect their own resources (Bardham & Dayton-Johnson, 2002; Ostrom, 1990; Pinkerton, 1999). It shows many groups organise on

small and regional scales to develop enduring solutions to these social dilemmas (Dietz et al., 2003; Ostrom, 2009; Poteete et al., 2010).

The social dilemma represents the difficulties faced by anyone wishing to act on such issues. For example, if an individual user is seeking maximum returns over the long-term, the user needs the resource to remain optimally productive. For goods of this type, this means that multiple users need to act collectively so that the resource is not degraded. However, the individual's dilemma is that incentives to collaborate are removed should other users exploit the resource beyond sustainable limits - they could overuse the resource as well and may lose out if they do not. Consequently, there is a conventional view that without externally imposed regulations, it is impossible to achieve the benefits of collective action (Ostrom, 2009).

Hardin (1968) illustrates the dilemma with a pasture open to all. He argues, in a stable society, any rational herder would continually add to his [sic] flock or herd thus creating the tragedy:

Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons.

A significant range of real world situations and cases contradict this logical theory. Hardin is specific - a commons open to all cannot be sustainable in today's world. There are multiple cases contrary to this logic and it is consequently important to understand under what circumstances exceptions occur. The prediction that the system will force users into a

headlong rush to deplete it is contradicted particularly when trust, communication and reciprocity can be established (Ostrom, 2009).

In summarising common pool resource research over 15 years, Paul Stern et al. (2002) concluded that the tragedy of the commons analogy is, in fact, only valid in very limited special circumstances - when resource users cannot communicate and develop trust. They find three conditions are necessary, but not sufficient, for effective management of common pool resources. Firstly, the resource must be important and prominent enough for the users to create new managing institutions. Secondly, the users must not be constrained from creating and setting their own rules (for example by external governance institutions). Thirdly, at least some of the users must be able to communicate with each other and bargain.

This research is significantly based in two major fields: common pool resource experiments in controlled settings - usually based on games and game theory and also tested with agents (computer simulations); and analysis of real world common pool resource systems such as irrigation, fisheries or forests (Ostrom, 2010a; Poteete et al., 2010). In the context of my thesis, it is useful to briefly outline these fields from an integral theory quadrant perspective (see *Integral Theory* section in Chapter 2).

Collective action is widely researched from an objective (upper and lower right quadrant) perspective. Examples include the game theory research and computer simulation (Poteete et al., 2010) as well as there being a significant focus in the case study work around describing the conditions and systems related to success. Game theory in the field or classrooms/laboratories can look at conditions under which people are more likely to cooperate (e.g. MA Janssen, Holahan, Lee, & Ostrom, 2010; Vollaard & Ostrom, 2010). An

example of this is when they can impose sanctions, a fine, on other players who don't cooperate (Gürerk et al., 2006; Henrich, 2006).

From a subjective perspective, values of players in such games are investigated (e.g. Meyer, 2006 upper left). Additionally, as can be seen from the conditions around failure (communication and trust development, P. C. Stern et al., 2002) the overall research investigates subjective and intersubjective (upper and lower left quadrant) factors. The work researches individual behaviour and choices (upper right), such as actual actions in a game (see above) and infers models and seeks data on group collective rules, norms and the evolution of these (lower left).⁴⁴

Overall, with a focus on researching the conditions under which physical systems are sustained by groups and governance, there is an understandable emphasis, although clearly not exclusive, on objective considerations. These measured parts of common pool resource research are reflected in many of the principles describing this work - see *Principles in Research* section. The *Conclusions and Discussion* section, at the end of this chapter, discusses the importance of this observation for my research.

Common Pool Relevance

Businesses, groups, organisations, in fact most institutions existing today, are linked to common pool resources as users. These groups are also reliant on the health of such systems. An obvious example is climate change, see the *Introduction* section to this chapter,

⁴⁴ Cooperative behaviour is not limited to humans. Animal cases include fish in coral reefs protecting smaller fish even when under threat, blood sharing among vampire bats, and monkeys alerting a wider group of danger (Okasha, 2003).

however there are more tacit types of resources. For example, at a business scale, there are industry, sanction and reputation commons where the behaviour of one firm impacts others. In more detail, a sanction commons, such as a boycott applied to a whole group of similar industries for the environmental practices of only a subset of the group, creates an incentive for self-regulation. This exists as a response to the social dilemma posed by the risk of one or two businesses damaging all others (Berchicci & King, 2007). The 'resource' in this case is the ability of the businesses to trade without being sanctioned for the poor practices of others. Thus, common pool research describing successful management of dilemmas is relevant.

There are two main relevant aspects of this work for my thesis. The first is the ability to consider a business as part of a polycentric (multiple scaled) response, to global or regional commons problems, and its sustainability initiatives as encountering social dilemma type problems while contributing to such a polycentric response. The second is the use of common pool research to look at global issues such as climate change.

Multiple and different scaled institutions are relevant for addressing common pool resource issues and the *Polycentric and Business* section discusses the use of such research with companies. It outlines further the treatment, in this chapter, of a company as an institution that forms part of a polycentric approach to addressing resource issues. The section also reviews the application of common pool research to more subtle business resource issues such as sanction commons. It does this to establish the precedent for applying this research, mainly based on physical resources, to a business's sustainability efforts.

This discussion leads to consideration of how principles, drawn from successful common pool resource protection, could be relevant for action on a range of scales. Researchers

have investigated if there are common principles, in addition to the conditions discussed in the preceding section, that can be discerned from the broad range of research. They have looked to generalise from the conditions and cases under which human societies, and specific groups, successfully overcome common pool resource dilemmas (Ostrom, 2010a). The *Scaling Up Design Principles* section outlines this work.

Polycentric and Business

Elinor Ostrom (2009) proposes *polycentric* approaches - that is, action across institutions at multiple levels - including local, regional and national, acting across a range of geographic, group and differing timescales - for managing global commons such as climate and greenhouse emissions. She argues that consciously adopting and encouraging action at multiple scales is better than waiting for only a global synthesised approach. There are multiple drivers at different scales - many of which have been touched on in the introductory chapter and energy efficiency meta theory discussion. Multiple benefits exist for institutions engaging in reducing greenhouse gases and it is unsurprising that significant effort occurs across such groups including sub-national governments (such as states, cities) and businesses (Ostrom, 2009).

The polycentric approach has been developed recognising that today's collective action problems are characterised by a diversity of intersecting assets and services we value (Ostrom, 2009; Poteete et al., 2010 e.g. p243). Effective sustainability requires managing across the different geographic and time scales that are inherent in interrelated and interacting social and ecological systems. This intersecting mesh of systems leads Ostrom, Poteete and others to present evidence that multiple scales of governance - management

from a diversity of institutions - are more effective than any singular approach. With respect to climate change it can result in multiple small groups sanctioning non-compliance and enhancing cooperation on international agreements (Vasconcelos, Santos, & Pacheco, 2013).

Businesses, being small to large groups using common pool resources, can be treated as institutions and researchers have examined the intersection of theory around social dilemmas with businesses actioning sustainability initiatives. An overview of this field is presented below to provide context for the use of this research with business. In this regard, the social dilemmas can be considered as specific types of commons including industry reputation, innovation, and cooperative commons.

An industry reputation commons, with respect to businesses and common pool resources, occurs when the activities of an individual (or sub group of businesses) can be of benefit to all and there are concerns some may not contribute (thus not bearing any associated costs but still profiting from the advantages). For example, Blanco, Rey-Maqueira and Lozano (2009) argue voluntary environmental self-regulation for tourist industry firms is viable. They draw on common pool resource voluntary collaboration research while discussing how to overcome *tragedy of the commons* style issues, such as those from free-riding tourism businesses.⁴⁵

⁴⁵ This is not meant to imply that corporate regulation could necessarily be replaced by self-governance. There is an extensive literature, beyond the focus of my research, on the need for government regulation. Ostrom (2010c), for example, acknowledges the appropriateness of such regulatory activity and a significant range of this research argues for engagement from multiple institutions. This includes governments at many scales. Cox et al. (2010b) point out that the applicability of design principles drawn from common pool research (see *Scaling Up Design Principles* section) is not meant to imply local governance alone can solve such global issues. With respect to tourism, for example, authors such as Ponting and D. O'Brien (2013) call for government

Similarly, reputation, in the form of social capital can enable corporate social responsibility (Habisch & Moon, 2006; Muthuri, Matten, & Moon, 2009; Weisband, 2009). This analysis draws on Ostrom and Ahn's (2009) argument that "trust is the core link between social capital and collective action". Trust in transactions, such as many of those that characterise modern day life including business exchanges, is inherent in commercial exchanges over periods of time. Ostrom and Ahn argue that collective action theory is foundational for understanding such social capital issues.

Industry reputation commons can also be framed as risks. Berchicci and King (2007) highlight common pool resource research and industry commons around tuna businesses. Tuna companies, fishing in a dolphin-friendly manner were caught up in a boycott of tuna and unable to differentiate from the businesses catching porpoises as bycatch. The whole group of industries had a shared reputation around this commons and a collective incentive to self-regulate to address it.

A knowledge commons is similar - that is non-physical corporate assets such as culture, institutional learning and tacit knowledge within a business are a social dilemma. Individuals could free-ride while contributing little to these collective values. Osterloh, Frost and Frey (2002) contextualise this against common pool resources research. Choi et al. (2005) argue knowledge in multinational companies is analogous to public goods, with multiple researchers discussing the role such tacit knowledge plays in corporate sustainability

regulation to address social dilemmas (in this case associated with surf tourism in Fiji) in the absence of a comprehensive shift in environmental values. Others see successful systems are only likely under quite limited conditions (Pintassilgo & Silva, 2007), while some argue that government regulation crowds out the potential for voluntary initiatives (Blanco et al., 2009).

achievements (e.g. Branco & Rodrigues, 2006; Cornelius, Todres, Janjuha-Jivraj, Woods, & Wallace, 2008; Menguc & Ozanne, 2005).

Innovation commons are related to the role played by social norms and the importance of this for environmental entrepreneurship. Common pool resource theory can address the evolution of such social norms relevant to understanding action by individual, or groups of, businesses (Meek, Pacheco, & York, 2010; Ostrom, 2000). Related to this, entrepreneurialism (as a force for sustainability) can require addressing collective sustainable development goals and consequently common pool resource research is used to examine this circumstance (Pacheco, Dean, & Payne, 2010). For example, with respect to clean energy, it is used to look at Netherlands' firms that are collaborating to overcome barriers faced by the sector (Pinkse & Groot, 2013).

Cooperative commons terminology is used here to refer to strategies that challenge conventional competitive-only business models. The high tech sector, for example, has collaboratively developed markets and profited from engaging in improving the internet for everyone including competitors. Collaboration research into this cooperative business strategy draws on common pool resource work and theory (Saveri, Rheingold, Pang, & Vian, 2004). Similarly, decentralised value creation, and the challenges this poses to conventional business, draws on such theory (Bollier, 2007).

In a wider sense, a cooperative commons could be thought of as any businesses engaged in voluntary actions that address social dilemmas such as those related to climate change.⁴⁶

⁴⁶ There are a range of manners in which business drivers around environmental action are framed including profitable opportunities, self-governing groups and enlightened self interest. For an overview see Prakash (2000a) and Berchicci (2007). In addition, Chapters 3 and 6 of my thesis look at such drivers from a meta-

Research drawing from common pool analysis includes voluntary business actions that deliver environmental and/or social benefits under specific conditions (Potoski & Prakash, 2005; Prakash, 2000a, 2000b).⁴⁷

Thus, there are a number of fields within which common pool resource research has been applied to companies where a social dilemma exists. The research has also been used with non-physical resources such as knowledge and reputation. A company's sustainability initiatives can also be regarded as such a social dilemma as groups could choose to free ride on benefits created from these efforts. Additionally, these initiatives have aspects of knowledge, sanction, innovation and cooperative commons discussed above.

Companies can, additionally, be considered to be institutions. The corporate entities are groups that organise, structure and govern interactions related to sustainability. The multinationals in this study, for example, conduct such action within the business, as well as across supply chains and customers. This influence also extends to the use of the company goods and services.

These circles of influence illustrate the nature of corporate sustainability. A company can be part of any country or region's response. Influences to consider include those internal to the business to create sustainability shifts as well as external impact through marketing,

theory perspective, identifying relevant theoretical conceptual lenses relating to organisations and sustainability.

⁴⁷ Other major corporate examples, not specifically referencing common pool research work, include: net zero emission (carbon neutral) business policies of major transnational corporations such as Google (Hoelzle, 2007; The Climate Group, 2007), PricewaterhouseCoopers (2008), and HSBC (HSBC, 2004, 2008); and, coalitions of business groups calling for governments to regulate greenhouse gas emissions (e.g. Business Leaders Roundtable, 2006; Kleiner, 2007; PricewaterhouseCoopers, 2010) as well as creating sustainability markets, such as the Chicago Climate Exchange, Forest or Marine Stewardship Councils (O. R. Young, 2007).

advocacy and purchasing. The company can engage on many scales and some of the institutions it creates (co-creates, or is part of) operate over wide geographies. These can be long and short-lived, local initiatives as well as globally oriented. That is, there are many centres to the organisation's interface with resource impact and a company can thus form part of a polycentric approach to resource sustainability. Consequently, with precedents applying common pool research to business contexts, parallels between company sustainability and social dilemmas, and considering the polycentric nature of these organisations, further investigation of links is worthwhile.

The promise of the common pool resource research field is that it is an extensive base of work, that documents real world conditions, under which successful outcomes have ensured sustainable resource use over long periods of time. It synthesises case study and experimental investigation and argues that applying the research is not only relevant, but essential - for example in enabling climate change action across multiple scales (Ostrom, 2009, 2010a, 2010c). The next section therefore considers how common pool research can be applied to global and larger scale regional issues.

Scaling Up Design Principles

To consider the application of common pool research, this section looks for principles that describe conditions that may be correlated with success - with respect to today's global or larger regional social dilemmas. Combined with the arguments from the previous *Polycentric and Business* section, these principles can be considered relevant to a business's sustainability efforts. The section following this, *Principles in Research*, consequently examines the extent to which these principles typify sustainability outcomes, or opinions on

what enhances the ability of organisations to achieve such outcomes, in this thesis' two case study multinationals.

From theory and research Elinor Ostrom (1990) developed a set of eight design principles to account for institutions successfully protecting common pool resources. Ostrom did not, initially, describe conditions that are necessary for success but developed a starting point from which such essential principles might be derived. The eight have been analysed, expanded on and critiqued over the intervening decades. In evaluating work since 1990, Cox, Arnold and Villamayor Tomás (2010b) analysed 91 studies. They found good evidence these principles are characteristic of success or failure. They are more often present than explicitly absent in sustainable common pool resource systems. Two decades later, however, the principles are not viewed as a set of deterministic laws that must exist for successful governance. Rather, the principles are core elements against which the likelihood of success can be gauged (Cox et al., 2010b; Ostrom, 2010a).

The research around these design principles includes applying them to climate change. Dietz, Ostrom and Stern (2003) develop strategies for addressing larger scale problems, such as climate change, drawing on this common pool research. The authors describe governance requirements for sustainable use of global common pool resources and examine how the eight design principles may assist meeting these requirements.

These principles, as framed by Dietz et al. (2003), were a substantive piece of theory shaping my case study research. This work occurred at the start of my thesis research (2006/2007). Since this time there has been ongoing refinement of Ostrom's (1990) principles and it is consequently appropriate to update the Dietz et al. strategies for addressing larger-scale problems.

To synthesise these changes, Table 5.1 summarises development of the principles for robust common pool resource systems and Figure 5.1 presents the updated principles, as they may be globally relevant.

<p>Design principle associated with successful protection of common pool resources. Source: Ostrom (1994) drawn from (Ostrom, 1990)</p>	<p>Original as interpreted by Cox, Arnold and Villamayor Tomás (2010b)</p>	<p>Design principles as revised by Ostrom (2010a principles on page 13) after adopting and modifying Cox, Arnold and Villamayor Tomás updates (2010b)</p>
<p><i>1 Clearly Defined Boundaries:</i> Individuals or households with rights to withdraw resource units from the CPR and the boundaries of the CPR itself are clearly defined.</p>	<p><i>A. Clearly Defined Boundaries:</i> Individuals or households who have rights to withdraw resource units from the common pool resource must be clearly defined.</p> <p><i>B. Clearly Defined Boundaries:</i> The boundaries of the common pool resource must be well defined.</p>	<p><i>A. User Boundaries:</i> Clear and locally understood boundaries between legitimate users and non-users are present.</p> <p><i>B. Resource Boundaries:</i> Clear boundaries that separate a specific common pool resource from a larger social-ecological system are present.</p>

<p>2 <i>Congruence between Appropriation and Provision Rules and Local Conditions:</i> Appropriation rules restricting time, place, technology, or quantity of resource units are related to local conditions and to provision rules requiring labour, materials, and/or money.</p>	<p>A. <i>Congruence Between Appropriation and Provision Rules and Local Conditions:</i> Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions.</p> <p>B. <i>Congruence Between Appropriation and Provision Rules and Local Conditions:</i> The benefits obtained by users from a common pool resource, as determined by appropriation rules, are proportional to the amount of inputs required in the form of labour, material, or money, as determined by provision rules.</p>	<p>A. <i>Congruence with Local Conditions:</i> Appropriation and provision rules are congruent with local social and environmental conditions.</p> <p>B. <i>Appropriation and Provision:</i> Appropriation rules are congruent with provision rules; the distribution of costs is proportional to the distribution of benefits.</p>
<p>3 <i>Collective Choice Arrangements:</i> Most individuals affected by operational rules can participate in modifying operational rules.</p>	<p><i>Collective Choice Arrangements:</i> Most individuals affected by the operational rules can participate in modifying the operational rules.</p>	<p><i>Collective Choice Arrangements:</i> Most individuals affected by a resource regime are authorised to participate in making and modifying its rules.</p>
<p>4 <i>Monitoring:</i> Monitors, who actively audit CPR conditions and appropriator behaviour, are accountable to the appropriators and may be the appropriators themselves.</p>	<p>A. <i>Monitoring:</i> Monitors are present and actively audit common pool resource conditions and appropriator behaviour.</p> <p>B. <i>Monitoring:</i> Monitors are accountable to or are the appropriators.</p>	<p>A. <i>Monitoring Users:</i> Individuals who are accountable to or are the users monitor the appropriation and provision levels of the users.</p> <p>B. <i>Monitoring the Resource:</i> Individuals who are accountable to or are the users monitor the condition of the resource.</p>

<p><i>5 Graduated Sanctions:</i></p> <p>Appropriators who violate operational rules are likely to receive graduated sanctions (depending on the seriousness and context of the offence) from other appropriators, from officials accountable to these appropriators, or from both.</p>	<p><i>Graduated Sanctions:</i> Appropriators who violate operational rules are likely to face graduated sanctions (depending on the seriousness and context of the offence) applied by other appropriators, officials accountable to these appropriators, or both.</p>	<p><i>Graduated Sanctions:</i></p> <p>Sanctions for rule violations start very low but become stronger if a user repeatedly violates a rule.</p>
<p><i>6 Conflict Resolution Mechanisms:</i></p> <p>Appropriators and their official have rapid access to low-cost, local arenas to resolve conflict among appropriators or between appropriators and officials.</p>	<p><i>Conflict Resolution Mechanisms:</i></p> <p>Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.</p>	<p><i>Conflict Resolution Mechanisms:</i> Rapid, low cost, local arenas exist for resolving conflicts among users or with officials.</p>
<p><i>7 Minimal Recognition of Rights to Organise:</i></p> <p>The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.</p>	<p><i>Minimal Recognition of Rights to Organise:</i> The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.</p>	<p><i>Minimal Recognition of Rights:</i></p> <p>The rights of local users to make their own rules are recognised by the government.</p>

<p>8 <i>Nested Enterprises</i>: Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organised in multiple layers of nested enterprises.</p>	<p><i>Nested Enterprises</i>: Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organised in multiple layers of nested enterprises.</p>	<p><i>Nested Enterprises</i>: When a common pool resource is closely connected to a larger social-ecological system, governance activities are organised in multiple nested layers.</p>
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Table 5.1: Design principles correlated with successful institutions protecting common pool resources.

Adapted from Cox et al., (2010b) and Ostrom (1990, 1994, 2010a).

Cox, Arnold and Villamayor Tomás (2010b) recommended modifying Principles 1, 2 and 4. These recommendations were adopted by Ostrom (2010a). Figure 5.1 (on the following page) incorporates similar modifications where appropriate. It also reflects the emphasis placed in this later work on parties being *authorised* to act. To reflect this, Principle 3 is modified in the figure.

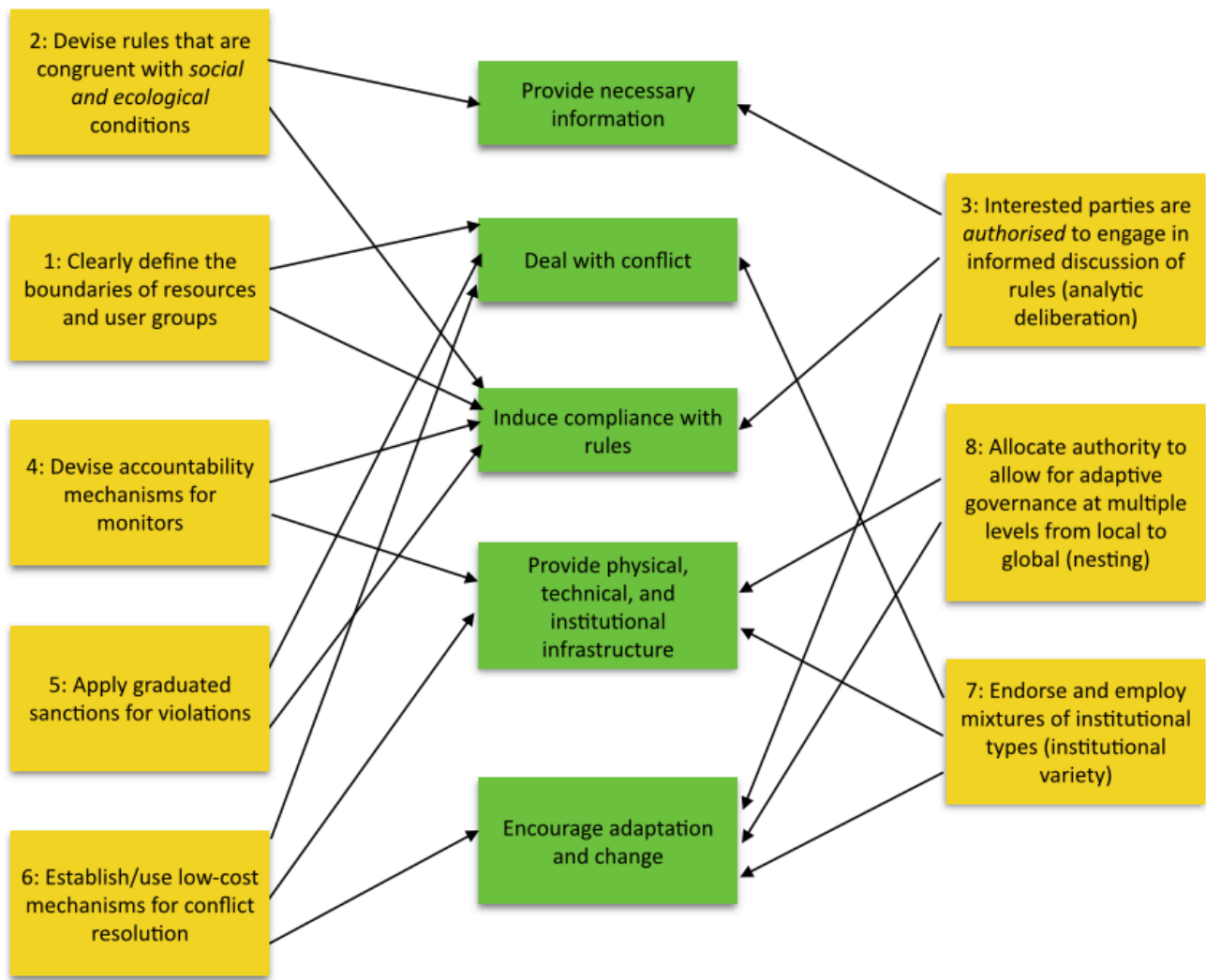


Figure 5.1: Global common pool resources – principles and requirements. Requirements for strong governance of global common pool resources (green boxes in middle of diagram) and design principles that are likely to support such governance (yellow boxes). Yellow boxes on the right are particularly relevant (developed from Dietz et al., 2003, italics highlight modifications).⁴⁸

In applying this work to global scale resources one of the obvious challenges is whether principles, based on regional and localised common pool resources are relevant for worldwide commons issues. The critiques and cautions around scaling up are discussed below, however many of the eight principles appear to be relevant. Dietz, Ostrom and Stern

⁴⁸ From Dietz, Ostrom and Stern (2003). Reprinted with permission from AAAS and Stern (corresponding author).

(2003) build this case treating such issues as complex systems requiring adaptive governance. The green boxes in Figure 5.1 summarise the five broad requirements they identify, for such complex adaptive systems, with arrows indicating which design principles may support such requirements. Three such principles - analytic deliberation, nesting and institutional variety (Principles 3, 7 and 8) - are highlighted by Dietz et al. as particularly relevant for global issues.

Scaling up these principles - with the substantive local scale case study base - clearly poses challenges. Dietz et al. (2003) argue many of the principles are applicable to global issues although the evidence base is smaller. The next section examines such issues around scaling up as well as other critiques of these principles.

Critiques and Development

Cox et al. (2010b) classify critiques of these design principles into three major categories.

These are:

1. That the principles are incomplete particularly given the interconnected nature of the modern world.
2. Issues around scaling up, and applying these principles beyond the range of the systems typical of case studies from which they are fundamentally drawn, are substantive.
3. Whether the focus should be around design principles or diagnosing the organisation/group/institution's core characteristics.

These critiques have, in part, led to some of the updates outlined above. I discuss the implications of them, and the bearing this has on my analysis, below.

1 - Incomplete

The first critique centres on arguments that important factors are either poorly considered or absent from the principles. Such factors include social conditions, society, values, economic links and environmental conditions. This also encompasses perspectives that, it is argued, such factors are underpinning or driving reasons for the success within such common pool resource systems. That is, it is suggested that the design principles are structural or objective measures present thanks to underlying enabling factors.

Types of conditions illustrating this underpinning factor argument include Singleton and Taylor's (1992) view that group values and vulnerabilities are some of the central factors determining success. Social factors, such as trust, legitimacy and transparency, may be "real glue" in such systems (Harkes, 2006).

Others highlight the importance of environmental variables. For example, soil condition can lead to better forest conditions and this, in turn, is positively correlated with sustainability (Tucker, Randolph, & Castellanos, 2007).

Economic, geographic and market considerations were also not explicitly considered within Ostrom's 1990 design principles. Researchers argue that such issues (e.g. the proximity of irrigation communities to urban areas, relationship between common pool resource users and markets outside of the boundaries of this use, or extent to which individuals within such communities buy and sell produce) are important drivers (Bardhan, 2000; Cinner & McClanahan, 2006; Klooster, 2000). This market proximity may also reduce a community's

dependence on the resource - an effect that could weaken its governance (Pinkerton & Weinstein, 1995 p183). Similarly, resource users willing to sell their rights bring pressure to bear on these systems (Pinkerton & Weinstein, 1995 p183). However, these later proximity and sale issues could be considered as part of design Principle 1 (as it was originally conceived by Ostrom, 1990 pp91-93) with a sufficiently broad interpretation of its meaning. Cox et al. (2010b) argue for additional clarity with this.

Such market links are not necessarily negative. For example, Gibson (2001 pp. 84-85) discusses the development of local agriculture for market income. This farming was dependent on an irrigation scheme resulting in the protection of common forest resources (which is important for the water supply).

This first group of critiques is centred around a class of factors and the way that they influence the system. Taken further this logic results in the argument above - that design principles merely reflect underlying conditions and are driven by underpinning factors from the conditions. In reality both broader society and the institutional design will interact - that is, institutional design can influence culture and broader social conditions can impact the design of institutions. For practical purposes there is a complex interplay - causality - between social and environmental values and economic elements. Consequently, many researchers continue to use and argue for the utility of such design principles (Cox et al., 2010b; Dietz et al., 2003; Ostrom, 2010b).

The principles are facets of a system - they represent accessible factors that can be analysed on a relatively large scale and enquiries can be based on them. With a caution that the principles are not deterministic - if being used to intervene or design institutions, a deeper integration of theory and system conditions is needed in working with such principles - they

remain useful (Klooster, 2000; Ostrom, 2005, 2010b). For the purpose of my research this broader system analysis is reflected in the thesis' methodology.

This first group of critiques is significantly related to the third set. With a broad diversity of systems, and the type of interplaying factors discussed above, all such principles cannot be important all of the time. Some may be only marginally significant, or could be irrelevant, in different situations (O. R. Young, 2007).

2 - Scaling up

Scaling up from localised common pool studies work presents a range of difficulties. There are obvious questions about whether a set of principles, substantively drawn from community and local scale case studies, can be applied to global common pool resource issues.⁴⁹ However, there are significant similarities between the environmental issues faced by global society and local systems that have self governed common pool resources. For example, in both groups of cases there is an absence of a nation state acting as the responsible regulator. There is an evolution of governance systems through negotiated practice as well, such as in recent times for international regulation of global problems (O. R. Young, 2007). The same could be said for many business sustainability initiatives, such as carbon neutral policies and the implementation of this into practice. Such initiatives have usually been set in the place without overt state involvement.

Differences across the scales are clearly important. These include that at a relatively local scale, one is more likely to encounter a high degree of homogeneity – at the very least a reasonable number of people from a similar cultural background (Ostrom, Burger, Field,

⁴⁹ For a typical list of cases studies see Cox, Arnold, & Villamayor Tomás (2010a).

Norgaard, & Policansky, 1999; O. R. Young, 2007). International issues clearly will not share the same cultural homogeneity as those set at a local scale and, additionally, have obvious communication challenges. Decision-making, rights and indeed many of the factors described in the design principles will be more difficult. For example, connecting resources users - communicating individuals are more likely to support sustainable use of resource when they have a self interest in it and understand others will act as well - is challenging on a global scale. At the very least it involves a set of overlapping interconnected individuals and institutions influencing other's perspectives across global geographies. Similarly, monitoring (Principle 4B) on a global scale necessarily involves several steps - at least two from international to nation state (O. R. Young, 2007).

A range of issues arises from the interlinked nature of global common pool resources. For example, climate and biodiversity have close and interdependent links. This is additionally complicated in today's world with the rate of change these environmental variables are experiencing being very fast compared to those in more traditional systems. Just one illustrative aspect of this is that learning by doing is consequently harder - there is less time. A further obvious illustration of scale difficulties is that the challenge of reaching a unanimous agreement across a globe, rather than a community, has clearly frustrated sustainability efforts. Finally, we have one world - locally, if resource protection institutions failed, communities may have had a chance to go somewhere else and get it right (Ostrom et al., 1999).

Clearly such issues highlight the challenges of providing supporting structures for strong governance of global common pool resources. Ostrom's design principles revolve around trust, reciprocity and communication and across a global scale this calls for unprecedented,

but feasible, changes to address this (Ostrom et al., 1999). Young (2007 pp26-28), while noting that environmental and resource issues have substantial similarities between the international scale and local communities scale, argues there are real barriers. Users and rule makers at a global scale have very little direct connection, which poses significant impediments to working with such principles on a broader scale. Others argue that it is quite plausible to apply such work at larger scales (Cox et al., 2010b; Rowland, 2005). Cox et al. (2010b) highlight the same principles as Dietz et al. (2003) plus Principle 5, as likely to be relevant on global scales and Costanza et al. (1998) list six principles for global sustainable ocean governance that have many similarities to Ostrom's eight principles.

While this discussion centres on scaling up from local and community case studies, there is a significant range of work - outlined in the *Background to Common Pool Resources* section - addressing global issues from other perspectives. This broader work is largely not testable in my thesis and thus not covered to any significant extent. However, such research cumulatively suggests there are other factors at play that aid robust governance of global systems. These include altruistic motivators, market and first mover advantages, conditions under agent-based simulations leading to robust governance and individual preferences for sanctioning systems. This is a body of work that helps explain why local communities may successfully protect common resources and thus supports using these principles on a larger scale.

3 - Diagnose or Design?

With any set of broad principles there are discussions and arguments about the lack of specificity or the generality associated with such an approach. The more inclusive such approaches become the more details are homogenised to derive overarching descriptions

that hold true across multiple cases and situations. Unsurprisingly, a range of authors argue that these eight principles are too general and the reasons for robust governance of common resources are much more specific to particular circumstances. An extension of this argument is that, instead of applying theory generalised from specific cases, the resource systems should be diagnosed in detail.

There is a significant range of discussion around generalising theory and the usefulness of this - appropriate parts of this discussion are covered in the *Methodology* section. I argue that at the scale of this thesis - which is focusing on explanatory theory to assist our understanding of successful sustainability approaches a higher level - a more abstract approach is valid. When trying to determine common factors within robust sustainability governance cases similar reasoning lead Ostrom (1990) to analyse and describe the design principles. This occurred as she was met with an extraordinary multiplicity and diversity of rules present between common pool resource cases. Attempting to identify commonality in rules relevant to specific ecological, social and economic environments across widely differing circumstances proved impossible. However, understanding the broad general regularities between the institutions governing such systems led to the development of these design principles (Cox, 2008; Ostrom, 2010a).

A design principle approach does not exclude working at greater detail to analyse, diagnose or design institutions that are successful governance structures for common pool resources. The two approaches - principles vs analysis and diagnosis - are not mutually exclusive. A demonstration of this is in Ostrom's work (e.g. Ostrom, 2005). When it is appropriate and useful more detailed variables can be, and should be, analysed. An example of this could include using a set of mutually dependent variables incorporating these design principles as

a point of analysis. However, reverse engineering from these design principles alone, given there is a broader influencing context, should be done with caution (Cox et al., 2010b; Ostrom, 2010c). Ostrom's framework for this systematic and more detailed analysis is, in part, Institutional Analysis and Design (IAD).

This study does not use an IAD style investigation of the two corporations. Such an investigation would be at a level of theoretical and practical detail that is not an appropriate match for the other components of this thesis. The design principles, at a greater level of abstraction and generality, fit well with the scale of detail examined.

Thinking about the system boundaries provides an illustration of the differences of approach. The corporations have a high degree of control over aspects such as greenhouse gas emissions from corporate sources. Company policy has less control, but retains influence, over embodied emissions in the products or services it uses. Similarly, the corporate organisations have some degree of control and influence over the manner in which consumers use businesses products and services and to what degree customer use generates greenhouse gas emissions. However, by far the greater impacts are related to such customer use and the supply chain. The IAD framework could be applied to these overlapping sustainability issues and sets of institutions. This level of detailed study is beyond the scope of this thesis - while it is quite likely to be an insightful piece of work, it is a whole research program in and of itself.

This research is looking for congruence between the principles and case study material for insights, and correlated similarities, between these business institutions as resource users protecting common pool systems. Within the context of this thesis the design principles are a discrete point of analysis on a scale matching and complementing other investigations,

and thus allowing for comparisons. For the design principles alone, Cox et al. (2010b) show that they are correlated with robust and successful common pool resource systems. The principles do not have to be used as absolute factors - that is, determinant of success only when all are present - to be useful and valid. It is within this context that this thesis applies the design principles and looks for evidence they may occur within the two leading sustainability businesses.

Principles In Research

This section discusses the case study company's sustainability actions and correlations to the principles, as described previously in Figure 5.1 and Table 5.1. I have coded statements, made by company individuals, to look for confirming or unsupportive evidence that these design principles have assisted sustainability outcomes. In undertaking this, I am treating the principles as elements describing the likelihood of success. That is, these are not deterministic laws (see the *Scaling Up Design Principles* section).

To correlate these principles with company sustainability outcomes or policies, the organisation is considered an institution that is contributing to a polycentric approach addressing resource issues. The institution's sustainability actions assist with broader outcomes for the resource in question.

In order to understand this polycentric application, it is important to note that the principles were originally described from the perspective of all users with access to the resource. For example, Principle 2 is:

Devise rules that are congruent with social and ecological conditions [of the particular resource].

When applied to a company's sustainability actions this becomes:

Devise rules that are congruent with social and ecological conditions of the sustainability initiative(s).

In turn, the company's sustainability initiative contributes to the overall condition of the resource. As discussed, in the *Scaling Up Design Principles* section, these principles can be considered relevant to global as well as more localised resource issues. Additionally, that section and the *Polycentric and Business* section outline the case for localised action on global issues. Thus, in correlating these principles to company sustainability actions, I am considering the extent to which the localised action mirrors common pool resource principles in its design or implementation.

For example, with respect to climate change, if the company is devising rules that are congruent with local conditions (Principle 2), there should be evidence that it was deliberating on the diversity of approaches required to enable successful policies within individual subunits of the multinational. The rules would be appropriate to specific business unit activity and the costs of implementing such policies would be likely to be considered worthwhile, as a result of beneficial outcomes to that sub-unit. Additionally, the policy or action in this example, would be likely to contribute to a reduction in greenhouse emissions.

Similarly, if the topic of discussion is a regional resource problem, such as fresh water, the company's actions may be part of a wider sustainability response. Again, the company is treated as an institution within which principles could correlate to successful initiatives.

These initiatives are then assumed to contribute to wider outcomes.

Negative examples are also apparent from analysing the case study data. In areas of difficulty individuals describe issues that are the opposite of the design principles. They discuss resolutions of such problems in manners that are aligned with the principles. Again, the principle is relevant to the company as an institution - that is, the conditions within the sphere of influence of the company's policy are compared to the principle.

The specific links, between global and broader regional resource issues with implementation at business and sub-business product and service scales, are briefly discussed in each of the eight principle subsections below. Where relevant, the principle is expanded such that it is clearer how it is applied on the business's scale.

The discussion in each subsection also identifies crossovers with, in many cases, examples from the two corporate case studies supporting several of the principles at the same time.

Principle 1 - Boundaries

Clearly define the boundaries of resources and user groups:

A. User Boundaries: Clear and locally understood boundaries between legitimate users and non-users are present.

B. Resource Boundaries: Clear boundaries that separate a specific common pool resource from a larger social-ecological system are present.

This principle, out of all eight, has the least evidence to support it.

To apply this rule to a company I was looking for evidence that there were specific conditions under which some groups would act on a particular sustainability initiative but other company groups, or company individuals, were excluded from such actions - condition A, user boundaries. I was also looking for clear delineation that environmental activities

were separated from the broader social and economic impacts - condition B, resource boundaries.

In general, there was surprisingly little discussion of the scope of each organisation's activities. For example, the interviews do not contain discussion on the relevance of a set of sustainability conditions applied to housing with respect to company subgroups that are not involved with such decisions or the implementation of them. It is possible roles are implicit in the activities of the organisation and consequently did not feature in these conversations. Equally, it is possible those interviewed viewed these sustainability rules or policies as relevant for everyone who interacted on a given program, product or service.

To illustrate this further, both companies engage with rules to influence consumer use of products and services to reduce the environmental impacts of this use. The companies also address supply chain and contractor activities. An example is Mel's description (*Principle 2 - Devise Rules* subsection) of the smash repairer program. This program influences the company's suppliers' environmental practices. Mel did not describe it in terms that separated it from others in the company engaging with it, and she argues that it does consider broader social and economic contexts.

Individuals are aware of the scope of each organisation's impact across spheres of influence and the potential that is inherent within this for creating more sustainable outcomes. However, my study was not designed to determine how well such knowledge is distributed across the corporate organisations. Nor was it designed to determine the effectiveness of, or need for, such a distribution of knowledge across the organisation for successful sustainability initiatives.

Contrary to this principle, both organisations publish material that aims to explain the environmental and sustainability activities undertaken. Physical descriptions of the purpose of these activities are present in corporate literature, such as sustainability reporting. Both organisations, and interview participants, describe clear cases - such as a specific residential development or office building, or a program addressing sustainability across suppliers contracted to work for the insurance organisation. They do not, however, tend to identify individuals or groups within the relevant business units that would have no interactions with such rules - condition A, user boundaries. In fact, the contrary position tends to be supported. When discussion focuses on individuals who feel these initiatives are irrelevant, it is usually in the context of convincing them the effort is worthwhile and that they need to participate. For example, see Lakshmi's quotes, *Principle 6 - Conflict Resolution* subsection. Similarly, on the boundary between an environmental action and the larger social system - condition B, resource boundaries - interviewees tend to see the opposite as true. That is, it is important for everyone to be engaged and to understand the broader benefits beyond just direct environmental outcomes. For example, see Arena's quote in the *Principle 2 - Devise Rules* subsection.

Overall, the case studies suggest that everyone engaged by the company is a 'legitimate user' and that, for sustainability, the larger social-ecological (and economic) system is relevant. However, this investigation was not targeted enough to conclude the condition is contrary to sustainability practice in business. A reasonable summary would be to conclude that it is hard to see the relevance of the principle, as currently described, for business application on sustainability.

Principle 2 - Devise Rules

Devise rules that are congruent with social and ecological conditions:

A. Congruence with Local Conditions: Appropriation and provision rules are congruent with local social and environmental conditions.

B. Appropriation and Provision: Appropriation rules are congruent with provision rules; the distribution of costs is proportional to the distribution of benefits.

To apply this rule to business sustainability, I am looking for evidence that rules are appropriate for specific conditions within subunits of the business or across particular products, services or initiatives. The summary principle has become:

Devise rules that are congruent with social and ecological conditions of the sustainability initiative(s).

In this case, local conditions include social acceptance and support. Benefits include acceptance by stakeholders or internal understanding that broader organisational benefits are relevant for a specific business unit.

Understanding this principle, within a business context, requires some examination of its historic development. At a local scale, successful common pool resource systems can be quite specific and tied to local infrastructure, social or environmental conditions. For example, in four water use cases in Spain one, with a dam, meant that users knew exactly how much water would be available. This allowed decision-making through auction bids for an hour's worth of allocation. In another local Spanish area, without the dam, water uses were rationed on a timed basis - the knowledge about how much water was present was not available in the absence of knowing dam levels. An auction system would not have been effective (Ostrom, 1990 p92). Such knowledge is found to be important as individuals need to know that the rules work. *"Individuals must feel that the benefits to be obtained from*

participation in the co-management arrangements, including compliance with rules, will be greater than the costs of such activities” (Pomeroy, Katon, & Harkes, 2001 p204).

Analogous localised conditions are reflected in both corporate organisations. That is, the company divisions and individuals within them are engaged in sustainability rule creation such that it is relevant for local division, product or policy conditions. It is common for individuals to highlight the importance of sustainability rules that are congruent with the social fabric of the organisation as well as external stakeholders. For example, in the quote below Arena is discussing sustainability actions in one of the company’s insurance divisions that sells directly to customers:

I think because they’ve always felt closer to a lot of those levers, community, you know and customer against, because they have that direct interaction, so I think the pull for them or the rationale for them is in their face all the time (Arena).

Arena believes that the business subunit can see the benefits as these are made obvious (on a continuous basis) to it. The levers (sustainability rules in this company) are relevant to the subunit, particularly as it sells directly to customers. It consequently values a company sustainability approach that emphasises supporting the community. That is, the rule is congruent with the subunit’s local conditions with benefits seen as outweighing costs - parts A and B of Principle 2.

Karl, from the development company, talks about similar concepts when they are matching policies with stakeholder views outside of the organisation. For Karl, it is not possible to create a successful program if these external groups (not just those responsible for direct regulation of the development) are not supportive:

Before we get much further down the detail planning [we need to know] who are the players we need to bring on board, the stakeholders which are going to determine whether we can deliver that set of outcomes or not? ...we have learned, over time, through experience that unless you can convince yourself that the stakeholders are going to be with you then you might as well not start (Karl).

That is Karl believes the company's sustainability rules will be effective if they are seen as relevant to the local social and environmental conditions - part A of Principle 2.

In a similar way, matching rules with specific attitudes and differentiated product and service environments is also important across specific company divisions. For example, Arena argues that sustainability initiatives fail if individuals and groups within the organisation do not see the relevance of the effort:

It's not core business... [for some] central services that looks after property ... they don't really see it as part of their core responsibility. Their responsibility is dealing with customers and the day to day which is why the community resonates with them or yes, than the environmental side and as I said, I think our focus even on the environmental side has been more around raising that climate change awareness, thinking about our own operating model to reduce our carbon footprint, but where we haven't gone far enough is translating climate change into changing the way we do business, so not in terms of our operating model, but in terms of the products and services that we deliver and our ability to influence customer behaviour (Arena).

That is, when the rules around sustainability goals are seen as not congruent with a specific business unit (part A of this principle), it is hard to create change and effort around it. From the opposite perspective, Mel describes how a sustainability program (rules), developed with users and particular to local conditions such as relevant regulations, can generate significant engagement:

We're working... with the supply chain in particular the smash repair network, in collaboration with the Department of Environment and Climate Change and the preferred smash repairers, looking at some standards to develop for smash repairers to manage their environmental footprint with the intent of, one, in the longer term, generating some cost savings for them but, two, making sure that they remain relevant and up-to-date from a regulatory perspective so that we ensure that the industry is sustainable. So, from that perspective we see it as a really important initiative, it's the first of its kind that I'm aware of, from the insurance industry, if we are able to educate them and translate obviously they use a lot of materials that are damaging... making sure that their policies are up to date, that process and handling, looking at air, waste water, almost every aspect of it... And there was an appetite from suppliers, we did initial pilots to see what the interest levels would be and there was (good interest). They saw that as benefit to their businesses so, given that we have that supplied by, given that we have the support of the Department of Climate Change, it was just a no-brainer for the business (Mel).

From a subdivision to the whole of a company's policy, individuals also express the importance of seeing how their group's action may fit with the bigger picture. For example, Drew discusses cutting energy use and the importance of local actions being congruent with company focus. In this case the benefits of the action are related to making a difference:

When there is a project or a series of work that, you see that how it fits into the bigger picture whether it would be the goals of the company or whether it would be how we can fit in with the strategy, an overall strategy something else That's seeing yourself playing a role and that's very satisfying, sometimes daunting too. You think because some of the problem are long term things, so you get, do I ever make a difference on this? Will I make in big way? Or, am I actually achieving something (Drew)?

In summary, when company sustainability is seen as relevant for external stakeholders and internal divisions - that is, the rules are congruent with localised social and environmental conditions - the initiatives appear more likely to succeed. Similarly, when these groups understand the benefits of such rules, there is a positive impact. Consequently, the case

study data supports both parts A and B of this principle. The data provides evidence that sustainability rules are more likely to succeed when congruent with the localised and specific social and ecological conditions, for a given initiative or policy, in the context within which it is operating.

Principle 3 - Analytic Deliberation

Interested parties are authorised to engage in informed discussion of rules (analytic deliberation):

Collective Choice Arrangements: Most individuals affected by a resource regime are authorised to participate in making and modifying its rules.

To apply this rule to a business context, I look for evidence that those affected by a sustainability rule (policy or practice), internal and external to the business, are authorised to engage with it and interpret it. By engaging in the sustainability rule, for its effective implementation, these users influence the resource.

Within both companies, individuals consistently emphasise the importance of discussing rules with groups that are affected - internally and externally to the organisations. An individual's perspective on this varies from describing circumstances under which interested parties are explicitly authorised to design rules (within boundaries) to more implicit recognition of the importance to the organisation's sustainability activities of engagement and broad discussion. This includes broad discussion outside of the traditional hierarchies of the company. It can also be a somewhat one-way design where stakeholder's views inform company policy. These engagements can, therefore, range from consideration of interested parties' opinions on rules to co-creation of sustainability outcomes. The latter is more

aligned with this principle, which argues individuals are authorised to make and modify rules.

For example, Arena describes a cross-company debate on buying carbon credits. It is important for Arena that the impact of its sustainability policy, seeking to reduce company carbon, is achieved in ways that have multiple benefits (as opposed to simply buying carbon credits). However, Arena clearly describes the participation involved in creating rules around cutting company carbon emissions:

Around carbon neutrality... there's been an internal debate around okay, well if we actually didn't reduce our footprint any more, how much will it cost us to buy offsets because we have committed to it and we know we have to be carbon neutral... and the estimates are not huge. It's one to two million dollars, you know, and for some people it's like fine, just buy it... We are pushing back and saying no, no, no, for us that's the last course of action (Arena).

Arena also believes that there is implicit recognition of the influence from a broad spectrum of the company's staff. That is, it is not just senior management whose views are important for influencing the creation of sustainability rules. The 'interested parties' comprise a much broader group:

But I think the interesting thing is there is always, there is always more of a wave of support for these things bottom up. A lot of time they get stifled top down from senior ... when you actually get through senior management the bottom up sort of you know, emotion is quite strong, you know and some of those people in the business would say great idea, want to be part of it (Arena).

Analytical deliberation and informed discussion of sustainability rules extends, for both organisations, both internally and externally with structures that cut across hierarchies. The

quotes below illustrate the importance of both internal and external groups for project formation and determining the sustainability outcomes achieved by them:

We have a lot of disciplines in-house that other developers don't have, like educationalists and marketers and those soft elements of community which certainly most other developers don't have, and if they seek to consider those factors tend to engage consultants to do it... we have pursued this collaborative approach... we need to involve, you know, governments in that process, and researchers, whoever as required (Karl).

The classic examples... working... with our... civil contractors, our environmental contractors and consultants, is that really understanding the type of things we should be targeting for retention... you can save as many trees inside a residential lot as you like, but as soon as you sell it to somebody, the first thing they want to do is knock them all down [while building their home]. But if you save some of the smaller ones in strategic locations, you've got a much greater chance of being able to retain them within the environment (Redman).

In these examples contractors, governments and in-house developers are all collaborating around sustainability resources (such as tree retention). That is, the groups are making collective choices - engaged in analytic deliberation.

Additionally, there is evidence that management seeks to specifically authorise groups to participate in modifying and making rules. Arena, in the quote below, highlights the need to explicitly authorise engagement and ensure people understand that they should discuss and debate such actions:

We started a new... energy water action group... that spans the businesses and pulls all the - a combination of people that are focussed on sustainability and the property, facilities, people and pulls them altogether to really try to tackle the electricity and energy issue and water, because water has always kind of escaped us in terms of our ability to get our arms around it... the energy and electricity side continues to be challenging in terms of finding all the right alternatives.

Consequently, both companies discuss the importance of users being engaged in making sustainability rules. That is, the case studies support analytical deliberation, Principle 3, as being important for success.

Deliberations, in both companies on appropriate rules, commonly involve individuals across the organisation and structures. Given this mix of nested group types there is a significant crossover between this principle and others. Examples of analytical deliberation parallel and support Principles 7 and 8 (institutional variety and nesting) as well as Principle 2 (previous subsection).

Principle 4 - Accountable

Devise accountability mechanisms for monitors:

A. Monitoring Users: Individuals who are accountable to or are the users monitor the appropriation and provision levels of the users.

B. Monitoring the Resource: Individuals who are accountable to or are the users monitor the condition of the resource.

This principle, within a business, reflects the accountability of the business for the implementation of sustainability. That is, the organisation is implementing a sustainability initiative but how is it monitored and how does it hold itself accountable? Are its actions effectively judged? The principle, with respect to a business, is better expressed as:

Devise accountability mechanisms for the company monitoring its initiatives.

Ostrom (1990) argues that, in the long run, shared norms and reputation alone are insufficient for robust sustainable outcomes. Monitoring, along with sanctions for non-

compliance, is consequently important. Nonetheless, it is quite striking how prominent reputation issues are for the individuals interviewed. Such concerns are viewed as significant in both companies, especially around attracting and retaining talented staff. For example, Carrie discusses reputation as an accountability mechanism for the company with regard to its sustainability actions:

A strong component of why a lot of people came to work and why a lot of people decided to stay with [the company]. ... as an organisation we see the benefit that that brings in terms of attracting and retaining some of the best staff (Carrie).

Arena, similarly, highlights some broader reputational dangers that may hold the company accountable:

...we weren't delivering in terms of offering products and services. So I think, yes, that was a huge reputation risk for us.

These reputational risks are also internalised within business assessments:

I've just got to do a site inspection that looks at health and safety risks, that looks at environmental risks, that looks at reputational risks, that looks at community risks... it's just those same fundamentals of just doing the right thing (Malcolm).

Additionally, these companies clearly value internal monitoring - the accountability of business units. Leanne discusses how accountability is a mix of 'meaningful' measurement and shared 'embedded' care for the outcomes.

How you embed it actually is made up the whole lot of things. You know - from resistance to attitude, to wrong people in the wrong jobs and all that sort of stuff. So it's, it's you know, embedding any strategy ... will determine the success or otherwise in an organisation... it's not just how we embed things that way. Yeah we have a very clear strategic alignment model which we have a stuff that's mandatory to occur in the business and we measure that

to an inch of its life. But in a way that's meaningful... In terms of strategic alignment we have developed a model that goes from board right down to the operations, so that we mix the alignment of governance and management, in a way that makes sense, to help drive the right strategic outcomes... It's actually going to be done in a way that helps the business achieve what it needs to achieve in the markets in which it operates... So the way, say the UK will respond to the community and the environment driver will be different say to how [company business unit] will, because of the markets in which they operate. So we are very clear about mandating intent. So the intent is this has to be delivered. How you do that has to be aligned to what you are actually trying to drive in the markets in which you drive that. And that's why we need good quality CEOs and executive teams because business has to drive that (Leanne).

That is, the two companies in this study appear to regard reputation and norms as strong drivers for company accountability. Internal accountability is clearly important. In this context it may appear to contradict Elinor Ostrom's (1990) view that this is insufficient for robust outcomes. However, the specific circumstances need to be explained. The companies in this study are regarded as sustainability leaders. The organisations are commonly thought of as acting on sustainability issues beyond what is required by government regulation. Consequently, it is possible that reputation is more important for these organisations.

In addition, public reporting around sustainability has been formalised with non-government institutions engaging to encourage compliance. This includes the Carbon Disclosure Project (PricewaterhouseCoopers, 2010), the Global Reporting Initiative (2006) as well as sustainability, annual reports and some legislated reporting requirements (Ioannou & Serafeim, 2011). Recognition of corporate sustainability occurs with public acknowledgement from sustainability indexes and ratings, as well as awards. The impact of such influences crosses into the next principle and is discussed further in the subsection below.

For Principle 4, accountability, there is a range of internal and external accountability mechanisms with respect to each company's sustainability initiatives. Norms and reputation are important and there is some degree of monitoring external to the organisations. That is, the evidence from these companies supports this principle to some degree.

Principle 5 - Graduated Sanctions

Apply graduated sanctions for violations:

Graduated Sanctions: Sanctions for rule violations start very low but become stronger if a user repeatedly violates a rule.

To consider the relevance of this principle, for a company acting on sustainability, it is applied with respect to the business's voluntary initiatives. I look for sanctions related to sustainability claims made and internal compliance mechanisms requiring action on company sustainability policy.

Externally, legal responsibilities and sanctions exist for businesses with respect to sustainability. Legal consequences may result for false statements. Mandatory reporting of sustainability exists in many jurisdictions around the world (Australian Competition and Consumer Commission, 2008; Ioannou & Serafeim, 2011).

There are graduated consequences relating to such leadership positions. For example, false statements about products, in Australia, are subject to legal action that can be initiated by the Australian Competition and Consumer Commission (Australian Competition and Consumer Commission, 2008). Practically such action, if it occurs, is likely to result in sanctions that are likely to be more severe for repeated violations.

Internally, accountability mechanisms include the organisational hierarchy and manager responsibility for sustainability policy. For example, in the insurance company it is not acceptable for a division not to act across each of the five broad areas of the insurance company's 'sustainability levers'. Executives are required to discuss goals set within these areas and justify activities. Arena outlines these boundaries:

They said: how much freedom and flexibility do we have to go down a different path? And I said well, if you said to me you were going to eliminate the environment piece of the - in the environmental league and said we will only focus on these four, then I'd say no, you've gone too far. You have to fit - you have to have breadth across all five of these areas (Arena).

Leanne, in the *Final Results* section of Chapter 4, also discusses accountability and implied sanctions related to acting on sustainability.

In summary, with respect to sanctions, even for voluntary sustainability initiatives, there is a range of relevant sanctions. Internally, companies work to ensure compliance across divisions.

Principle 6 - Conflict Resolution

Establish/use low-cost mechanisms for conflict resolution:

Conflict Resolution Mechanisms: Rapid, low cost, local arenas exist for resolving conflicts among users or with officials.

In applying this principle to companies, I look for discussion on how sustainability problems are resolved. This includes when individuals view sustainability as of low importance, in contrast to company policy. Users, in this case, are the company divisions and individuals that implement sustainability policy.

In many cases - as seen in some of the quotes addressing the other principles - the level of engaged discussion could be taken to imply that such discussion can resolve conflict. In other cases, many of the eight principles describe necessary steps to resolve conflict - for example see Arena and Leanne's referenced quote in the previous subsection (*Principle 5 - Graduated Sanctions*). However, direct evidence from the case studies on rapid or low cost conflict resolution is limited. This does not necessarily reflect views that conflict resolution is unimportant, but the topic is rarely addressed directly.

As an example, at the insurance company, individuals describe the difficulty of a sustainability approach that some see as not relevant to their group's activities. Lakshmi, in the company's central office, highlights some of the limitations. The background is in making a centralised approach relevant:

[We] always understood that we were on a limited life... that running a central kind of think-tank which is essentially what we were for two years was always needed. But you know, by necessity to have a limited life because if we didn't get out of being a smallish think-tank function into genuinely changing the strategy - and the products, services delivered by the company - then we would have failed. We were always very, very clear about that (Lakshmi).

Lakshmi describes some of the difficulties and engagement that might have overcome this:

The problematic people... thought it was all a bit of a waste of time... I remember having a big fight with the head of sales about this... So our challenge - as advocates for corporate sustainability - was, of course, to get better and better and more and more skilled at making the business links about sustainability with very-very obvious and practical examples that related to insurance products sales and service...

In fact there was a whole lot of business opportunity potentially in adaptation as well... I think it got missed because [we] were all much more familiar with - and tended to prefer - the big picture strategic advocacy and just didn't think it through enough... we would have had more success and more runs on the board with product and services within the company if we thought a lot earlier about the adaptation side of things as well...

You know looking back on it, that was an error, I mean we could have been a lot smarter about that... that's where some of the really exciting points of engagement were in the business, I mean... and some really interesting things happened (Lakshmi).

Disagreements around the importance and priority of sustainability policy may have been assisted by conflict resolution mechanisms. The discussion here, however, emphasises the importance of the other common pool principles with regard to company sustainability success and successful conflict resolution. In particular, the sustainability initiatives (rules) needed to be relevant to the different divisions (*Principle 2 - Devise Rules*). The central group, engaged in strategic advocacy, also needed to make business links to products sales and services, such that sustainability was relevant to local conditions in other divisions.

In summary, there is limited evidence around the importance, or otherwise, of low-cost conflict resolution mechanisms for effective sustainability initiatives in companies. Conflict may have been resolved through the application of the other common pool resource principles.

Principle 7 - Institutional Variety

Endorse and employ mixtures of institutional types (institutional variety):

Minimal Recognition of Rights: The rights of local users to make their own rules are recognised by the government.

In examining the company case studies for this principle, I am looking for internal and external structure variety. This includes how the company considers and implements sustainability policy through engagement. It also includes communities of practice -

structures that cross traditional organisational boundaries by bringing together peers across different company divisions around common topics.

Both the businesses engage with wide variety of different institutional types - internal to the organisation and externally. Arena describes an internal group and some of the advantages from such groups:

They've kicked off an initiative around the financial sustainability and what that means for them and where they need to focus and they were sharing, you know, some of their thoughts, at their Community Practice Meeting about they're doing everything to maintain the environmental side, but also trying to - you know, trying to pick up on one that resonates particularly with them right now...

The objective would be to have a community that you know, not only shares knowledge and ... leadership ... the Community of Practice pulls us all back in terms of people ... focussed on that topic and driving that agenda ... it also broadens... mindsets by being able to share knowledge across the business because everyone's focused on different areas at any one point in time (Arena).

The companies also engage with external groups in a mixture of ways. A number of the *Principle 2 - Devise Rules* subsection quotes illustrate such variety. In Karl's and Mel's quotes groupings of stakeholders and smash repairs can be regarded as institutions. That is, these groups are different institutional types and are crafting the application of rules.

The corporates also engage externally for sustainability rule changes. Lakshmi describes one such cross organisational institution the company was part of:

So the Australian Business Leaders Roundtable Group was an incredibly important piece of leadership work and at a critical time; because really no one else's business was saying things that group said. From a leadership perspective no other leaders had had the courage to say those things until then. And it was an absolutely fundamental time; it was about a year out from a federal election. And there was a good cross-section of business and industry involved. So it was a very powerful group in them (Lakshmi).

In this case the roundtable was advocating for Australian climate change policy.

In summary, effective sustainability outcomes are described as being enabled by a variety of organisational structures, such as cross company grouping. The companies create coalitions with others that are viewed as necessary for successful outcomes and this extends to business groups directly influencing national sustainability policy.

The principle has a strong overlap with other principles - particularly *Principle 2 - Devise Rules*, *3 - Analytic Deliberation* and *8 - Nesting*. Institutional variety appears to be particularly relevant in this context to enabling rules that are appropriate for particular conditions - *Principle 2*. Additionally, it engages disparate groups and individuals in analytical deliberation to designing initiatives - *Principle 3*. Moreover, it allocates authority to smaller groups - such as communities of practice - and larger groups external to the company - *Principle 8*.

Principle 8 - Nesting

Allocate authority to allow for adaptive governance multiple levels from local to global (nesting):

Nested Enterprises: When a common-pool resource is closely connected to a larger social-ecological system, governance activities are organised in multiple nested layers.

In applying this principle to the companies, I am looking for evidence the sustainability initiatives are governed within subunits and divisions of the organisations - the local scale of this nesting principle. For a more global engagement, the corporates engage with entities

beyond company boundaries - such as the roundtable example described in the subsection above.

Both companies organise sustainability activities within subgroups at multiple levels. Arena describes this for the insurance company and how governance is reflected in decision making power, at localised scales, in the subgroups:

The business units' CEOs have the ability to tailor the implementation [and]... Our mandate in the corporate office is not, especially with our new devolved model, is not to mandate anything. So we really have no ability to tell any of them to do anything.⁵⁰ We have to find ways to influence them and try to draw them in and get them to agree to do things (Arena).

An externally example is given by Karl. He discusses the difficulties that may occur operating in the absence of such a design principle:

You had governments that were open to fresh ideas and wanting to seek better outcomes but, were so entrenched in their solid approach that they struggled to work collaboratively with anybody because sooner or later you would find a bureaucrat who would feel threatened by that process and the moment someone was threatened they tend to retreat into their cocoon, which is pretty solid and impenetrable. ...

I think that all changed in the 90s as a consequence of the recognition by governments and governments couldn't do it on their own. Both business and recognising that if you want to bring about a change in order to get the mandate to bring about change or to innovate you had to deal with government policy. And if you had to deal with government policy, the best way to deal with government policy was to work collaboratively with government rather than, we are going to do this, this is your policy, you have got to change it then (Karl).

These nested systems, overlaid by institutional variety, are very similar to the polycentric approaches advocated by Ostrom (see *Polycentric and Businesses* section). There are

⁵⁰ The context here is with regard to detailed activities as opposed to requirements to act on the organisation's five sustainability levers.

multiple groups within both businesses. Such groups act to implement sustainability, and/or climate change activities, on scales (e.g. customer group, near and longer term future) that are appropriate for the group, its influence and its markets.

There is also strong evidence, from the insurance company, that a singular unified approach was problematic - e.g. see Lakshmi's quote in the *Principle 6 - Conflict Resolution* section.

The company modified this approach. It changed it so that it was creating conditions under which localised interpretations, of overarching principles, could be acted on. It did this without stopping all centralised efforts, aiming to maintain coherent environmental and other sustainability outcomes for the whole corporation. Divisions, however, are explicitly supported to act within the broader sustainability outlines.

Nesting, consequently, appears to be well supported by the case studies. It appears to be effective with regard to the organisation's sustainability endeavours. Moreover, it appears to be problematic when initiatives are not conducted in a nested manner.

Conclusions and Discussion

There is good evidence that many of the theoretical design principles, drawn from common pool research, are correlated to the manners in which these two companies act on sustainability. When the company's sustainability initiatives are compared to the design principles, the case study interviews describe outcomes enabled through applications that mirror such principles.

In addition to positive confirmation - when the manners in which company staff describe effective sustainability activities are aligned with these principles - the evidence also

extends to describing difficulties encountered when structures, action, attitudes or policies were less effective. The most obvious of such circumstances describe hierarchies or centralised control where there is not explicit authorisation to design the initiatives, within subsections of the corporate group, so that these sustainability policies or efforts are relevant to localised conditions. Overall, the descriptions are particularly supportive of *Principle 2 - Devise Rules, 3 - Analytic Deliberation, 7 - Institutional Variety* and *8 - Nesting*.

This evidence supports the Dietz, Ostrom and Stern (2003) analysis (see *Scaling Up Design Principles* section) that *Principles 3, 7 and 8* are likely to be relevant to global resource issues such as climate change. In addition, it argues that rules interpreted to be congruent to local circumstances may be important - *Principle 2*.

The relevance of *Principle 4 - Accountable, 5 - Graduated Sanctions* and *6 - Conflict Resolution* is less clear. Further research would be required to establish this, such as around the strength of reputation issues for accountability (*Principle 4*).

Furthermore, another of the principles seems contradictory. It is unclear if boundaries related to resources and user groups, *Principle 1*, is relevant to company sustainability initiatives. Moreover, within the companies, sustainability effectiveness is usually described in integrated ways - social and economic is important alongside ecological. The second half of *Principle 1* may not be relevant for companies and is possibly, with today's globalised world, difficult to apply in many other circumstances. Further research, around this principle, may reveal how successful systems are transcending the conditions of it.

The institutional variety and nested responsibilities principles (*7 and 8*) have significant overlaps with the concept of a governance holarchy. In many ways, it could also be argued

that these two principles are necessary for the effective enactment of *Principles 2* and *3*. That is, these principles, as seen in the organisational case studies, describe a set of layered responsibilities within which clear areas of responsibility, and limits, add to an overall whole. The sorts of governance structures described by these principles, and reflected in the case studies, can be regarded as a holarchy (see *Holons and Hierarchies* subsection of Chapter 2 for a discussion of these). Wilber, similarly, describes such social system holarchies (e.g. lower right quadrant, Wilber, 2000c p70). As a method of conceptualising the importance and influence of these principles, against other theoretical structures, this correlation is drawn on and discussed in chapter 7.

Applying these principles in a business context may be assisted by such meta-framing. With the origins of common pool resource research there may be a tendency to view this work as primarily about common pastures or fisheries. Consequently, in addition to looking for parallels at a case study scale, demonstrating the alignment and points of commonality through a framework like integral theory - to link with key areas of business practice - may assist. Being able to make big picture, mid-range theory and case specific links should create stronger foundations for the application of such work.

Chapter 6

Groups, Loops and Stages

Introduction

In the preceding chapter, I argue that successful sustainability initiatives are correlated with principles derived from Common Pool Resource theory. The theory outlines conditions under which social dilemmas are often addressed thus overcoming the so-called Tragedy of the Commons scenarios. Company sustainability is related to such social dilemmas - for example, voluntary effort on reducing greenhouse gas emissions interacts with a shared common resource: the world's atmosphere and its capacity to regulate global climate. I drew from common pool research, particularly the principles that are characteristic of resource protection, finding these are positively correlated with strong sustainability initiatives. That is, the company executives and staff who describe sustainability success, and the barriers to it, do so in terms that mirror the concepts described by these common pool resource principles.

My analysis is complemented by many other researchers who view organisational sustainability through different theoretical perspectives.⁵¹ These often describe the physical

⁵¹ For example, this can be viewed from the perspective of a business case for sustainability and related developed concepts such as natural capitalism, eco efficiency and social capital (e.g. see Dyllick & Hockerts, 2002; Hawken et al., 1999; von Weizsäcker et al., 2009). Others take a complexity approach (Espinosa, Harnden, & Walker, 2008), highlight ecological parallels (Mebratu, 1998) or approach it broadly through Integral Ecology and philosophy/complex thought perspectives (Esbjörn-Hagens & Zimmerman, 2009; Mickey, 2010; Morin & Kern, 1998), from a *Limits to Growth* perspective (D. H. Meadows & Club of Rome, 1972), a sustainable development approach (World Commission on Environment & Development, 1987) and highlighting transformational opportunity in an era of revolutionary change (O'Brien, 2012; Schellnhuber et al.,

and systems conditions that are associated with success. Such sustainability models and theories include stage and step models - discrete developmental hierarchies, a foundational concept within Integral Theory (see Chapter 2). Taking this into account, as well as my work in Chapter 4 on individual worldviews and the recognisably different ways people express sustainability, such stage models are relevant to consider within my thesis.

Stage development models are common in the sustainability literature. They are used to examine corporate action that may be associated with some level of environmental and/or socially beneficial outcomes. These types of models include Hart's (1997) environmental stage development moving from pollution prevention through product stewardship to clean technology; Mirvis and Googins' (2006) expanding corporate responsibilities; Zadek (2004) 5-stage organisational development; McEwen and Schmidt's (2007) stage and integral model; Beloe et al.'s (2004) systems, financial and society; Dunphy, Griffiths and Benn's (2003) transformation and phases; Maon, Lindgreen and Swaen's (2009) consolidative and stakeholders; and, van Marrewijk and Werre's (2003) which is a matrix model incorporating a growth hierarchy.

The *Organisational Sustainability Stages* section outlines the literature and research across this developmental level sustainability theory. To illustrate relevant theories, it details two models. The first has a predominantly systems focus based around financial and societal connections. This leads, at the later stages of the model, to a more holistic recognition of the need to re-engineer products and services. At the final stages, the company policy is more grounded in being a part of the society around it and co-developing sustainable

2011; Senge, 2008a). Meta theory approaches (Edwards, 2009 see chapter 3), integral and stage models are topics of this thesis.

outcomes. The second model is partially based on a individual growth hierarchy known as Spiral Dynamics (Beck & Cowan, 1996; Graves, 1966). The sustainability model focuses on group motivations and integration beyond the company. Ultimately, at the final stage, activities are grounded in everyone's (individual and organisation) universal responsibility to all beings. In addition to these two models, there is a wide range of such sustainability stage maps described in research and practitioner literature. This section draws on reviews across these different frameworks, as well as briefly discussing a number of further models, to cover this diversity.

As mentioned above, development frameworks are a basis for integral theory. A key part of this theory is developmental holarchies - discrete stages of growth that transcend and include previous steps in a hierarchical manner.⁵²

Integral theory's developmental stages have a clear correlation with the models outlined in the *Organisational Sustainability Stages* section. Consequently, to assess the sustainability stage model research in the context of my PhD, the *Integrating Sustainability Stages* section discusses an approach to analysing such models. Using a consolidated sustainability stage model (Maon et al., 2009), that draws from 9 other models and adds stakeholder theory, I illustrate how an explicit subjective and objective framework (integral theory's quadrants) may assist our understanding. This brings some clarity to the diversity of sustainability stage models and, as additional theories are added to address gaps, modifications of these.

⁵² In this chapter, these are referred to as both developmental holarchies and/or hierarchies. Formally, a holarchy draws on the concept of holons, with each stage transcending and including the previous step. A hierarchy may not necessarily be thought of in these terms but for the purposes of my thesis when a developmental hierarchy is referred to, unless explicitly noted otherwise, it refers to the same holonic developmental model. See Chapter 2 for more details.

The *Beyond Sustainability Stages* section contextualises this work. There is a substantially wider theoretical base, beyond stages, through which organisational sustainability actions are analysed. This is illustrated in the *Integrating Sustainability Stages* section by the introduction of an explicit stakeholder theoretical lens (Maon et al., 2009). There are other such theories and I use Edward's (2009) organisational transformation meta-theory, plus my Chapter 3 energy efficiency meta-theory review, to clarify the scope, intersections and overlaps that could be investigated. These analyses describe a large number of conceptual lenses through which aspects of sustainability could be viewed.

These numerous lenses present practical and real difficulties. For example, looking through any one particular conceptual lens it is difficult to weigh the relative importance against assessments made from other lenses (over 25 are identified). In addition, there is a significant amount of lens overlap present. For example, Torbert et al.'s action inquiry (2004) is described in a way that incorporates several of these conceptual lenses.

Consequently, the *Loop Learning* section outlines and proposes single, double and triple loop learning to analyse the relationships between lenses.

The following section, *Loop and Lens Analysis*, examines the theoretical concepts identified around sustainability, through the meta theory methodology, for organisational transformation and energy efficiency. Structuring these concepts using integral theory quadrants and loop learning, I argue that one of the underpinning concepts shown by this analysis is developmental levels (holarchies/hierarchies).

Holarchies appear to be a foundational structure and so the *Constructive Development Theory and Organisations* section investigates broad organisational developmental hierarchies. There are a number of authors who view organisational sustainability in distinct

stage model steps. I outline this and focus on Torbert's model (2004), a theory that mirrors the individual action logics stages described in Chapter 4 of my thesis. Torbert (2004 p7) argues action logics, on organisational scales, is explicitly linked with sustainability and the organisational development model described in this book has been correlated to sustainability (McCauley et al., 2006).

To examine the links, the *Stages and Study Companies* section analyses interview data from the two major corporations in this study. I find there is good support for the concept of organisational stages, as described by Torbert, being applied to understand sustainability within organisations. Moreover, individuals within these companies express the desirability of change in manners that are correlated to a shift in the organisational stage of development. They view such a change as necessary, or positive, for effective sustainability actions and/or policy across the groups.

Following this, the *Conclusions* section draws together the main findings from this chapter and outlines key questions for the next chapter.

Organisational Sustainability Stages

Over the last decades, as environmental and social pressures associated with major corporations have become prominent, practitioners and scholars began to analyse and characterise company responses to such pressures. This research includes the consideration of a wide range of factors including ethics and responsibilities - for leaders, staff and the collective groups (De George, 1987; Joyner & Payne, 2002). These analyses and arguments developed alongside the concept of Corporate Social Responsibility - the public responsibility of business and management. Such concepts are apparent from at least the

mid 1950s (Joyner & Payne, 2002; Schwartz & Carroll, 2008) and underpin many classification systems that describe environmental management and sustainability (Kolk & Mauser, 2002; Maon et al., 2010).

As company and society operating environments became more complex, along with the demands to avoid environmental impacts, researchers conceptualised and tested models describing how such issues were managed and extended this across other areas of what they argued were a company's sustainability responsibilities. This research labels and categorises responses, strategies and performance and many models adopt differentiated level systems to delineate sustainability steps (Kolk & Mauser, 2002; Lindgreen, Swaen, & Johnston, 2009; Maon et al., 2010).

Unsurprisingly, there is a multiplicity of such stage models. These commonly address how businesses implement sustainability programs through describing conditions observed within companies and differentiating between levels of commitment and implementation as well as, to an extent, performance (Maon et al., 2010). With a wide diversity of models, it is useful to look for the similarities - especially in the context of my PhD with its focus on bigger picture theories and synthesis around a broad topic like sustainability.

Kolk and Mauser (2002) review 50 stage models focusing on environmental management and describing a company's environmental strategies. The review highlights the wide use of stage models for assessing particular aspects of a company's environmental response. It finds stage models are convenient structures used to improve understanding and progress environmental actions. However, the review highlights the structural nature of these models. They generally describe the process that can be undertaken, leaving either a gap between broad modelled principles or alternatively investigating specific cases in detail. The

authors see a difference between any given stage of action and specifically translating this into environmental actions for any particular company. A rough understanding of what different degrees of action may look like, with a match to a stage for a specific organisation, does not necessarily link with effective activity or outcomes. While this can be partially addressed by becoming more specific about how a model applies to a particular organisation, the models are regarded as a poor fit for actual operations.

The Global Compact (Beloe et al., 2004) typifies the usefulness of these models and illustrates such gaps. Its sustainability stage model is developed to analyse the extent to which corporate initiatives may drive broader sustainability. It describes how companies develop and integrate environmental and social approaches into corporate decision-making, process and products. The Compact addresses what could motivate or drive change and proposes that corporate sustainability is developed in stages, higher levels of which represent greater integration, engagement and internal and external outcomes. Beloe et al. present this as a 5-stage model - 'gearing up' for corporate responsibility. The gears are: *comply, volunteer, partner, integrate and re-engineer*.

The first stage – *compliance* – characterises a company viewing its responsibilities as those that address the country's laws, and that is motivated to comply through a combination of government regulation, media exposure and activism. External engagement is philanthropy.

The second stage – *volunteer* – sees actions that are 'beyond compliance'. Broader social and environmental issues are starting to be acknowledged and viewed as legitimate corporate concerns with the focus on impacts directly attributable to business operations.

Voluntary standards are evolving with a business case for sustainability activities focused on risk management and efficiency.

The third stage – *partner* – has more proactive risk management and a business case for sustainability emphasising reputation, solutions developed through wider engagement with society, and this engagement forming partnerships.

The fourth stage - *integrate* – embeds sustainability objectives throughout the organisation and the business in connecting long term corporate objectives with broad society challenges.

The authors see the fifth stage – *re-engineer* - where a company is advocating change in markets for reasons beyond a conventional view of shareholder value, acting responsibly and profitably now while looking to drive broader societal change that makes such responsible activities the more profitable ones in the future.

Beloe et al. argue that such a model addresses internal and external sustainability needs. That is, the company needs to connect its sustainability initiatives with its core business activities and leverage them to develop new business models. External to the company, society, economies and governance must change to encompass such sustainability. The authors argue the stage model reflects the process through which these challenges are addressed – gearing up, as appropriate, to greater engagement, outcomes and influence. They argue their fifth stage will often be required to protect common pool resources.

Beloe et al.'s model was developed in 2003 in response to the UN Global Compact asking how corporate responsibility can help promote sustainable development. In part, it is a discussion about how businesses can connect sustainability with core activities. While it maps a path for greater business engagement, at the same time the report demonstrates an issue that Kolk and Mauser focused on: these stage models are very weak for

operationalising sustainability (Kolk & Mauser, 2002). In discussing challenges, Beloe et al. highlight that businesses “*will often need to take extraordinary steps to be seen to be more accountable and build necessary legitimacy*”. They outline a set of questions that could assist business action. Others discuss similar operationalising difficulties - for example Maon, Lindgreen and Swaen’s (2009) review argues that the frameworks don’t address implementation into structure, culture and strategy. Siebenhüner and Arnold (2007) highlight an empirical research lag with respect to such conceptual advances - particularly with regard to effecting change.

For the purpose of my thesis, the gap outlined is instructive. It suggests that a more connected framework, or an understanding of the interrelationship of stage and change factors, may be useful. The *Integrating Sustainability Stages, Beyond Sustainability Stages, Loop Learning* and *Loop and Lens Analysis* sections of this chapter develop this further.

There is also an argument related to those discussing the operationalising gap above. This is that sustainability needs to fit the organisation’s context with respect to development, awareness and ambition levels of the entity (van Marrewijk, 2003). To address this van Marrewijk and Werre (2003) present a set of sustainability stages related to structures and values. The authors propose their stage model as a matrix tool for an organisation setting sustainability goals and actions. It is based on spiral dynamics (Beck & Cowan, 1996; Cowan & Todorovic, 2000), a hierarchical individual development framework with many similarities to action logics (described in Chapter 4).⁵³ van Marrewijk and Werre argue that the internal and external aspects of corporate sustainability can be differentiated into six separate levels

⁵³ Spiral dynamics is based on the work of Clare Graves (1966). Graves describes human development in unfolding and emerging steps, sequentially passed through, with each having “acts, feelings, motivations, ethics and values, thoughts, and preferences for management” all specific to particular stages.

that mirror individual spiral dynamics developmental stages. Given the similarities - that is van Marrewijk and Werre's model is sustainability specific and it is drawn from an individual growth hierarchy - these organisational stages are described in Table 6.1 below:

<i>Corporate Sustainability (CS) Levels and Spiral Dynamics</i>
1. Pre-CS (Red): At this level there is basically no ambition for CS. However, some steps labelled as CS might be initiated when forced from the outside (e.g. through legislation or buyers strike). Close monitoring and constant reinforcements will be required.
2. Compliance-driven CS (Blue): CS at this level consists of providing welfare to society, within the limits of regulations from the rightful authorities. In addition, organisations might respond to charity and stewardship considerations. The motivation for CS is that CS is perceived as a duty and obligation, or correct behaviour.
3. Profit-driven CS (Orange): CS at this level consists of the integration of social, ethical and ecological aspects into business operations and decision-making, provided it contributes to the financial bottom line. The motivation for CS is a business case: CS is promoted if profitable, for example because of an improved reputation in various markets (customers/employees/ shareholders).
4. Caring CS (Green): CS consists of balancing economic, social and ecological concerns, which are all three important in themselves. CS initiatives go beyond legal compliance and beyond profit considerations. The motivation for CS is that human potential, social responsibility and care for the planet are as such important.
5. Synergistic CS (Yellow): CS consists of a search for well-balanced, functional solutions creating value in the economic, social and ecological realms of corporate performance, in a synergistic, win-together approach with all relevant stakeholders. The motivation for CS is that sustainability is important in itself, especially because it is recognised as being the inevitable direction progress takes.

6. Holistic CS (Turquoise): CS is fully integrated and embedded in every aspect of the organisation, aimed at contributing to the quality and continuation of life of every being and entity, now and in the future. The motivation for CS is that sustainability is the only alternative since all beings and phenomena are mutually interdependent. Each person or organisation therefore has a universal responsibility towards all other beings.

Table 6.1: Multiple levels of corporate sustainability.

Source: van Marrewijk and Werre (2003).⁵⁴

To use the van Marrewijk and Werre model the authors propose that the organisational stages are assessable through an audit based on individual values, organisational values and ideal core values (as perceived by employees) for the group. They argue sustainability policy needs to fit the corporate sustainability level. The difference between what employees may aspire to and current values provides an opportunity for change (and requires engagement to do so).

Other Models

Other stage development models also describe an organisation's transformation as it progresses through stages. Many models have significant overlaps with the two described above - a brief overview is below.

Mirvis and Googins (2006) discuss the growth of corporate citizenship on a macro scale as businesses developed an enlarged role in society. They cite Hart (1997) who describes classic environmental change as moving from pollution prevention through product stewardship to clean technology - that is, a shift to manufacturing products that avoid the creation and generation of waste in the first place. Hart discusses the limitations of such a transformation. For example, if we were to produce cars that emit no pollution, without

⁵⁴ Used with permission.

considering the social context, and millions of new cars were added to a city (with no infrastructure to cope) there would be sustained and ongoing problems (like congestion). The fact that a non-polluting car has been produced does not mean that the consequences of that production have been fully addressed. Hart therefore argues that development must understand ever-increasing complexity – the corporation has a role in shaping wider society solutions. This is similar to the widened role and scope of what comprises the business described by both Beloe et al. and van Marrewijk and Werre at late stages.

Mirvis and Googins argue that company responsibilities are more complex, reflecting the enlarged role for business in society and successive stages of development as the company addresses this complexity. Such stage change is also illustrated by Zadek (2004) who maps a 5-stage organisational development. These stages describe corporate learning as the company progressively addresses more complex challenges. In particular, Zadek illustrates this development with experience drawn from Nike. The stages show increasing complexity, as well as the expansion of the company's relationships. These boundaries are described for Nike as *"...including companies such as US retailer the Gap and UK retailer Asda, NGOs such as Oxfam International and AccountAbility, labor organizations such as the International Textile, Garment and Leather Workers Federation, and multistakeholder initiatives such as the ETI and FLA and the Global Compact – to explore how such an alliance could help address the challenges of a post-MFA⁵⁵ world"* (Zadek, 2004).

Mirvis and Googins consider why such step development may occur. They argue that when internal capabilities are applied to environmental challenges, shifts are triggered as problems within current practices become apparent.

⁵⁵ MFA is a trade agreement that defined country import quotas for the USA garment market.

McEwen and Schmidt's (2007) stage model is based on Beloe's et al (2004). It compares 10 cases of organisation stage development with human development. The ten global companies (1 to 100 billion USD annual revenue) are rated as sustainability leaders by the Dow Jones Sustainability Index and Global 100 Most Sustainable Corporations lists. The research compares these organisations to the sustainability levels described by Beloe et al (2004) and discusses the organisational sustainability levels in comparison with levels of leadership action logics. The research finds that the sustainability stages are clearly evident in the businesses surveyed. Additionally, it finds evidence the companies are actively attempting to shift to higher stages.⁵⁶

Dunphy, Griffiths and Benn (2003) also describe a sustainability stage development model. This is a 6-stage model with the earlier stages describing company approaches to sustainability up to the point labelled as 'compliance'. Organisational boundaries change at late stages. Dunphy, Griffiths and Benn do not assume that a company must move progressively through the stage model and present this model as a tool to guide corporate change.

In general, the Dunphy, Griffiths and Benn model describes organisational sustainability as an external observer might view the systems, activities and structures of that organisation. This is in contrast to other approaches (e.g. van Marrewijk & Werre, 2003), where values and internal motivation for sustainability feature more prominently. Despite this the Dunphy, Griffiths and Benn model is similar to others with the final stage mirroring the final stages of Beloe et al. (2004) and Mirvis and Googins (2006). This is particularly evident with respect to the boundaries of the organisation expanding. For example, the Dunphy, Griffiths

⁵⁶ The research does not describe the underlying motivations for such a shift.

and Benn final stage encompasses values such as companies developing a shared vision with non-profit organisations.

Other stage models include the Natural Step for Business (Bradbury, 1998; Natrass & Altomare, 2002) and Social Venture Network's Standards of Corporate Social Responsibility (Goodell, 1996) from which some of Dunphy, Griffiths and Benn's model is sourced (Dunphy et al., 2003 p304) and The Next Sustainability Wave (Willard, 2005).

Model Summary

Common features of these models are increasing scope and complexity for organisational concerns at higher stages and the description of three distinct phases of sustainability - pre-compliance to compliance and beyond compliance - and a more encompassing approach where the organisation is integrated with broader society. This last phase represents a shift in organisation boundaries similar to that described by Driver (2006).⁵⁷

In addition to the operationalising issue discussed above, critics of stage models can argue they are a poor fit when the authors attempt to classify companies. The models can be seen as not sufficiently multi-dimensional – that is, they are a poor representation of the complexity of internal pressures and external influences/institutional pressures (Schaefer & Harvey, 1998). The next section, *Integrating Sustainability Stages*, examines this - explicitly considering such perspectives.

⁵⁷ Driver (2006) discusses an ethical versus economic stalemate and how such a polarity may be resolved. If the company is viewing itself as part of society acting to develop responsible, sustainable outcomes at an organisational and society wide level, it may shift past a perspective that sees ethical action only through a conventional business case lens.

Integrating Sustainability Stages

As outlined in the previous section there are numerous different stage models.

Consequently, integrating models may be useful and this section discusses how an integral theory framework may assist to bring clarity. I undertake this as there are many different conceptualisations of sustainability stages. Beyond a specific sustainability stage model there are also organisational stages as well as consolidative models and comparisons (Edwards, 2009 p236; Kolk & Mauser, 2002; Maon et al., 2010). Further, there are arguments, such as Maon et al. (2010), that key deficiencies can be answered through specific theoretical additions - stakeholder perspectives in the case of Maon et al. In order to manage this, and in light of the discussion in the previous section about gaps, internal and external foci, the current section tests an integral theory analysis of a consolidated model.

From an integral theory perspective, stage models described in the above section are primarily addressing structure, opportunity, risk and strategy issues for the organisation (a lower-right integral theory quadrant concept - for example, the Global Compact with a focus on how social challenges are recognised). In addition there is sometimes more explicit recognition of individual, group and society concerns (usually lower-left quadrant concept - for example, as present in the Global Compact as considerations about group motivation or reputation).

When multiple models are summarised, the short descriptions of steps often reduces the viewpoint to objective measurable aspects - although the detail is sometimes more nuanced (e.g. Kolk & Mauser, 2002; Maon et al., 2010). For example the Maon, Lindgreen and Swaen (2010) model is a 7-stage consolidated model partially based on 9 other stage models

(including Dunphy et al., 2003; Mirvis & Googins, 2006; van Marrewijk & Werre, 2003; Zadek, 2004 - see the section above for brief descriptions of these). Maon et al.'s stage names are relatively neutral - both objective and subjective connotations could be derived from the names:

1. Dismissing
2. Self-protecting
3. Compliance-seeking
4. Capability-seeking
5. Caring
6. Strategising
7. Transforming

However, a short perspective is associated with each stage. These could be said to bias external and/or objective factors. For example, the perspective that is associated with *Capability-seeking* is *Stakeholder management* which could be regarded as a set of management practices to be measured against a set of outputs (meetings, representative groups and sectors to be engaged with such as government, local government and community non-government organisations). The Maon et al. perspectives, summarised for each stage, are listed as:

1. Winning at any cost
2. Reputation and philanthropy
3. Requirements
4. Stakeholder management
5. Stakeholder dialogue

- 6. Sustainability
- 7. Change the game

Maon et al.'s model is, however, an instructive illustration of an approach that describes subjective characteristics alongside structures, as well as measured concerns (although the model is not differentiated in these terms by the researchers). These aspects are summarised in table 6.2 below.

Maon, Lindgreen and Swaen (2010) Consolidative model	Subjective aspects	Objective aspects
Phase 1 - Corporate Social Responsibility (CSR) cultural reluctance phase	CSR appears to be a constraint; self-regarding culture of concern only for itself	Ignore environmental impact; contest stakeholder perspectives; short-term interests; focus only on honouring stakeholder contracts; winning at all costs
Phase 2 - CSR cultural grasp phase	Sensitivity to CSR issues increases; social risk consideration; enlightened self interest emerges; management recognises potential advantages in learning from stakeholders	Acknowledgment of CSR concepts and rationale; focus on minimising operational and environmental risk with tangible results; management for regulatory compliance; CSR principles translated to management practice

Phase 3 - CSR cultural embedment phase	Stakeholder engagement deepens with a focus on pre-emptively addressing concerns; intrinsic, but pragmatic, morality with respect to all stakeholders (i.e. beyond shareholders); stakeholder collaborative relationships; critical reflection on “new relationships with society, nature and technology”	Enduring alliances with stakeholders; innovation leads to new products and services addressing new markets addressing product sustainability, consumption and production; creative core business initiatives
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Table 6.2: Consolidative sustainability stages and stakeholders model against integral theory.
Drawing from Maon, Lindgreen and Swaen (2010).

This short example illustrates that an integral analysis may be used to explicitly check that subjective facets of an approach are recognised and not lost (see Chapter 3 for Integral Theory). In this context, I would argue that explicitly identifying such components in a model like Maon et al.’s is a useful exercise - it may help ensure important distinctions and meaning is not lost, especially at summary stages or for people interpreting from such short descriptions. It may also assist to manage some of the criticisms of these models outlined in the previous, *Organisational Sustainability Stages*, section. That is, the subjective considerations - such as those outlined in the table - appear to be easier to link to the types of attitude shift (e.g. through critical reflection) that may need to occur for the company to succeed around sustainability goals.

This analysis, however, still leaves open the question of whether any particular stage model may be more suitable than others. It is theoretically possible to analyse individual models against a set of companies, assessing fit and if individual stages are recognisable. However, the complexity of understanding if one or more of such models would have been effective

for an organisation implementing sustainability change (with the many subjective and external influences including the level to which alternative models may have been used or discussed) makes such an analysis problematic. Within the context of this thesis - given the unavoidable design and scope constraints - it is nonetheless desirable to try to assess appropriate models and theories. While the developmental stages concept forms a fundamental part of integral theory, this may be an insufficient reason to focus on such models.

One method to attempt to evaluate a model's usefulness is with the outputs from the meta-theory process discussed in Chapter 3. This discusses a set of conceptual lenses through which theory about energy efficiency is viewed. Related research has been undertaken looking at organisational transformation theories. Consequently, the next section, *Beyond Sustainability Stages*, investigates the use of such meta-theory in the context of these stage models with a view to identifying stand-out theories that may be appropriate for use here.

Beyond Sustainability Stages

Meta-theory analysis can be used to derive a set of lenses through which an issue, such as organisational transformation or energy efficiency, can be theoretically viewed. Its purpose, in part, is to help ensure that major concepts present in theories addressing the topic of interest are apparent - that is, to derive the conceptual lenses through which the theories address the issues at hand. In conducting this exercise for organisational transformation (as a window on sustainability challenges) Edwards (2009) identifies 24 different lenses broadly grouped under 6 categories. In Chapter 3, I conduct a similar exercise over organisational approaches to energy efficiency.

Many, but not all, of these conceptual lenses can be formally or informally structured within integral theory (Edwards, 2009 p217). However, my study was designed prior to Edward's broader discussion of organisational sustainability lenses that appear absent from integral theory. In designing the case study research, I was seeking to explicitly address individual and collective viewpoints of sustainability success, from the interviewee's perspective, on which objective and subjective factors were important influencers.

To consider what may be missing, Edward's organisational transformation lenses and my set of energy efficiency paradox lenses are outlined in Table 6.3 (on the following page). I use both Edward's meta-theory looking at Organisational Transformation and my Chapter 3 analysis of energy efficiency to ensure that a broad spread of possible sustainability related lenses - theoretical as well as practice-from-theory based - are included in this analysis. From the perspective of an individual observing the company - a predominant viewpoint in my interview material - organisational transformation is primarily a lower-left concept, while energy efficiency is mostly looked at as a lower-right concept. That is, the spread of theory across these two concepts is likely to give me a relatively broad base of theoretical lenses relevant to this study.

Lenses that are explicitly or commonly used in Integral Theory and/or often structured within quadrants, developmental scales, types or states (Blue - Edwards, Purple - Chapter 3)

- | | |
|---|--|
| <ul style="list-style-type: none"> • Interior-exterior (interior meaning-making and exterior behaviour, upper left vs. upper right quadrants) • Individual-collective (upper vs. lower quadrants) • Objective-subjective (cost and capital measured versus human cares driven, left vs. right quadrants) • Internal-external (relative to some key boundary) / Internal-external (boundary - upper right vs. lower right) • Perspectives (vantage points of 1st, 2nd & 3rd person quadrants) / Multi-level perspective taking • Agency-communion (agentic autonomy and communal relations) • Transformation-translation (radical and transactional change) • Inclusive emergence (cycles of inclusion and integration) / Emergent understanding • Exchange relations & relational exchange (interactions between entities and environments) • Transition process (dynamic transition between organisational states) / Transformation process | <ul style="list-style-type: none"> • Developmental levels/holarchy (a spectrum of organisational archetypes) & ecological holarchy (a multilevel system of social ecologies) / Developmental holarchy • Governance holarchy (a multi-level system of decision-making) / Governance holarchy (see Summary section Chapter 5) • Developmental lines (multi-dimensional differentiated organising concepts) / Multiple lines • States of consciousness / Enabling states • Types (ideal types derived from key organisational dimensions) / Types • Health-pathology (healthy and unhealthy types) • Deep structure (persistent features that define & underpin organisational characteristics) / Deep structure • Spirituality (ultimate purpose, deep meaning and relationship) • Physical structure • Future orientation • Time appropriate |
|---|--|

Conceptual lenses not formally included in integral theory (although sometimes discussed through extensions and application of this model)

<ul style="list-style-type: none"> • Social mediation (process of social communications) • Learning (cycles of learning and knowledge acquisition) / Learning • System dynamics (feedback systems and equilibrium dynamics) • Alignment (concordances between separate domains) / Alignment 	<ul style="list-style-type: none"> • Stakeholder (a standpoint of multiple stakeholders) / Stakeholders • Leadership • Decentring (post modern - contest between socially constructed views) • Evolutionary process (cycles of innovation, selection and reproduction) / Evolutionary innovation • Information to capacity
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Table 6.3: Set of theoretical lenses through which sustainability, in this thesis's two study companies, could be viewed.

Key: Blue from Edwards (2009 pp125, 130, 188 & 217), purple from Chapter 3 - see *Consolidated Conceptual Lens Set* section of that chapter for short descriptions.

Table 6.3, drawing on Edwards' (2009) argument and Chapter 3's *Integral Meta Discussion* section, shows that there are a number of conceptual lenses that are not formally included in integral theory or where the correlations are unclear. As Edwards (2009 p216) highlights, there are three principle reasons why such gaps may exist:

1. Integral theory is missing important conceptual depth.
2. The additional theoretical lenses do not add a level of understanding that would not have been reached in any case through an integral theory analysis.
3. Integral theory is yet to be adequately described.

Many scholars, including Wilber, while not necessarily taking a position on the first two reasons agree (at least partially) with the third explanation (Esbjörn-Hargens, 2013; N. H.

Hedlund-de Witt, 2013, Esbjörn-Hargens, 2010 #1425; Wilber, 2000c p140; 2003). For the purposes of this chapter I will consequently use reason 3 as an organising hypothesis.

While the analysis in Table 6.3 finds that some conceptual lenses are not formally or informally included in integral theory other researchers have integrated such concepts into a descriptive model. For example, Maon et al. (2010) structured stakeholder theory and stage models into a single consolidative model - a developmental hierarchy. Stakeholder theory is identified above as one of the concepts that is not formally, nor informally, include in integral theory. Similarly, Kupers (2008) works with organisational learning theory to drive an integral map of learning within, and by, organisations.

It is also important to note that there is considerable overlap between such conceptual lenses. For example, Edwards (2009 p118) highlights a main facet of Torbert's action logics as a developmental stage holarchy. There are additional relevant theoretical lenses. Action logics (Torbert et al., 2004) has aspects of development and integrating the change (the inclusive emergence lens in Table 6.3) and it is substantively based within the perspectives lens. Similarly, Dunphy, Griffiths and Benn's (2003) sustainability stage model (developmental hierarchy) is also an example of relational exchange - a lens describing motivating forces derived from environmental and social systems driving change between these stages (Edwards, 2009 p120).

Summary

This section set out to examine sustainability related theories in an effort to clarify if there were particular conceptual approaches, beyond sustainability stages and outside of an integral theory framework that should be examined. However, there are significant overlaps

between theories and the theoretical lenses represented within them. Additionally, other researchers integrate concepts across the lenses described above (whether formally, informally or not included in integral theory) to formulate their theories related to sustainability. Consequently, this meta-theory lens review requires an additional approach to achieve its purpose - some level of confidence that integral theory and sustainability stages are a strong organising concept.

The next section, *Loop Learning*, examines if single, double and triple loop learning can help to achieve such a result. Immediately after this, the *Loop and Lens Analysis* section applies loop learning to the meta-theory perspectives above and also clarifies areas that are difficult to examine in the context of this thesis.

Loop Learning

As discussed in the preceding section, a number of different lens concepts may often be seen within any single sustainability theory - that is, such a theory may incorporate several conceptual approaches. This creates some difficulty for the application of these meta-theory lenses beyond an analysis (the original intended purpose) of theory. In addition, the large number of concepts from Table 6.3, in the preceding *Beyond Sustainability Stages* section, are difficult to work with. For example, unlike the integral theory quadrants, it is hard to conceive how practitioners would be able to assess change initiatives from so many multiple diverse perspectives. A flat list, without some organising synthesis and model, is likely to be unwieldy. While such an exercise is obviously theoretically possible, a practitioner would need to weigh and contrast the multiple factors arising from an analysis that explicitly incorporates most of these different conceptual frameworks.

These difficulties are partially about the desirable level of abstraction - how general or specific theories and principles should be. A similar discussion occurs in Chapter 5 on protecting common resources. This is in respect to the need for detail as opposed to broader principles (see *Critiques and Developments* section Chapter 5). The appropriate level of detail is also a criticism of sustainability stage models - see the discussion in the *Organisational Sustainability Stages* section in this chapter on mapping a model to a particular organisation. However, these concerns are not limited to just the level of detail and the consequent usefulness of a model in a particular organisational context.

There is an additional question concerning the robustness of any analysis that relies on a limited set of viewpoints and does not incorporate or consider a relatively full range of different perspectives. Table 6.3 highlights this with respect to integral theory and the conceptual lenses that are not formally included in the theory. A consideration is that parsimony and simplicity may have been deliberately adopted when describing integral theory. Parsimony is the concept that the minimum number of explanatory factors is used with meta-theory. The balancing perspective is that this simplification could be at the expense of defining a meta-theory (integral theory in this case) with respect to its full range of contributing concepts. The limited analysis, if it did indeed exclude a key conceptual lens or lenses, may lead to sub-optimal results (Edwards, 2009 pp216-218).

My thesis inquiry was guided initially by integral theory. Consequently, to partially alleviate the issues described above, and to try to identify stand-out theoretical lenses, I propose to use the concepts of single, double and triple loop learning. These concepts have been used in connection with integral theory analysis (Edwards, 2005; Küpers, 2008; Starr & Torbert, 2005) and provide some structural clarity across the multiple lenses in Table 6.3.

Argyris and Schön (1978) helped to develop and popularise the concept of single and double loop learning.⁵⁸ Single loop learning describes changes that do not affect the underlying values – for example a desired change results in a stalemate and/or decision based on the relative power of the players – as opposed to double loop where the outcome may have been a new strategy. The greater depth described by double loop learning is associated with a range of innovative outcomes and broader decision making capability. Illustrating this, Argyris and Schön correlate these two loops with types - a model I and model II style of operations. These models are not exclusive: model II sees better reasoning and a greater ability to deal with complexity and change, building on the model I strategies. Typically, double loop change requires re-evaluating values that govern how theory is applied. Model I strategies, in comparison, are characterised by reduced choice, action and more defensive interactions (Argyris, 2004; Argyris & Schön, 1978)

These steps, model I and II, and the development from single and double loop learning capacities have strong similarities with the types of greater and more holistic understanding described with later stage action logics. Consequently, to consider the appropriateness of using this loop learning concept with the material in this thesis, the next paragraphs outline its links with integral theory and sustainability.

Researchers have applied single and double loop learning to sustainability stages.

Siebenhüner and Arnold (2007) address the research lag they identified - discussed in the *Organisational Sustainability Stages* section of this chapter - with a structured analysis based on single and double loop learning. Changes correlated to a double loop learning

⁵⁸ Argyris and Schön credit Ross Ashby's *Design for a Brain* (Ashby, 1952) for the original distinction between single and double loop learning.

process have some similarities to structural shifts seen in organisational sustainability stage steps - e.g. as synthesised by Maon et al.(2010) or Kolk and Mauser (2002). Others who address similar gaps with single and double loop learning and recognise stage transformations include Stone (2006), van Hoof (2014), Jackson and Michaelis (2003) and Spitzeck and Hansen (2010).

These learning loops are related to action logics by Torbert (1999) who develops the single/double concept by adding a third loop. With this refinement, triple loop learning addresses:

1. First order learning and feedback that changes specific practices.
2. Second order learning that changes the whole method of strategising and what is defined and measured as results.
3. Third order learning that reconceptualises one's vision.⁵⁹

For example, Torbert et al. (2004 pp50-53) discuss socially responsible investment. The description illustrates a triple loop shift where the industry has created a new vision and fundamental reconceptualisation for investing that is not simply based on financial return. This is described as occurring through deep inter-relationships with employees and clients. At the double loop level new investment strategies have been developed, yielding profitable returns in ways that were unexpected and counter intuitive to many prior to the advent of the industry. Also, at this level, it is leading to the creation of new standards and measuring tools for assessing socially responsible performance (such as the Global Reporting Initiative).

⁵⁹ Note that this is portrayed as a multi-level change. That is, there can be a double loop learning from changes in a set of practices to shifting strategy and then a double loop leading from a shift around strategies to a change in vision. For clarity, this is simplified here to one triple loop incorporating these steps (Torbert et al., 2004; Torbert, Livne-Tarandach, McCallum, Nicolaides, & Herdman-Barker, 2010).

Torbert et al. relate this development back to multi-level organisational stage development. Challenges, such as employee behaviour, eventually lead to reconceptualising organisational relationships - a triple loop learning shift correlated to a shift in organisational stage/action logic.

Triple loop learning - learning new ways of understanding, mental maps and facilitating structures - is a concept used to understand the complexity of change, as well as being applied to integral theory conceptual maps and stages of development (e.g. Hardman, 2009; Romme & Van Witteloostuijn, 1999; Stone, 2006). For example, Romme and van Witteloostuijn (1999) use such concepts examining organisational design. They argue that the depth represented by triple loop learning is a key competency for making well informed choices. Siebenhüner and Arnold (2007) acknowledge triple loop learning as changing learning capabilities.⁶⁰

Practitioners in corporate change also conceptualise learning with such models.

Interkonnektions Inc., a key Japanese consultancy that has worked extensively with major corporate transnational organisations, use an integral model with single, double and triple loop learning (C. Stewart, 2010). The levels of influence across integral theory quadrants are:

- Single loop impacts are seen as individual changes in actions and competencies. For groups this is structures, systems, processes and protocols. These are external observable influences.

⁶⁰ Siebenhüner and Arnold (2007) list single, double and deuterio learning as distinctly different steps, i.e. deuterio is not double loop despite the similarities of names. While the deuterio (triple loop) concepts are integrated within the study they are not assessed in detail for sustainability implications.

- Double loop acts on the individual assumptions, mental models and perceptions influencing organisational norms and rules, mindsets and collective consciousness - internal subjective changes.
- Triple loop learning is acting at an individual's emotional and values/beliefs level with Stewart identifying a fourth level - individual capacity. This loop of learning is acting on the group climates, collective values, beliefs and capacity.

Note, however, that for the purpose of my thesis this capacity change, the fourth level in Stewart's model is regarded as a triple loop learning influence to align it with published literature.

Stewart describes these loops as a dynamic process - collective and individual, internal and external structures, influencing each other. Figure 6.1 (next page) illustrates such interactions in a model matching organisational and personal development and identifying single etc. loops of learning.

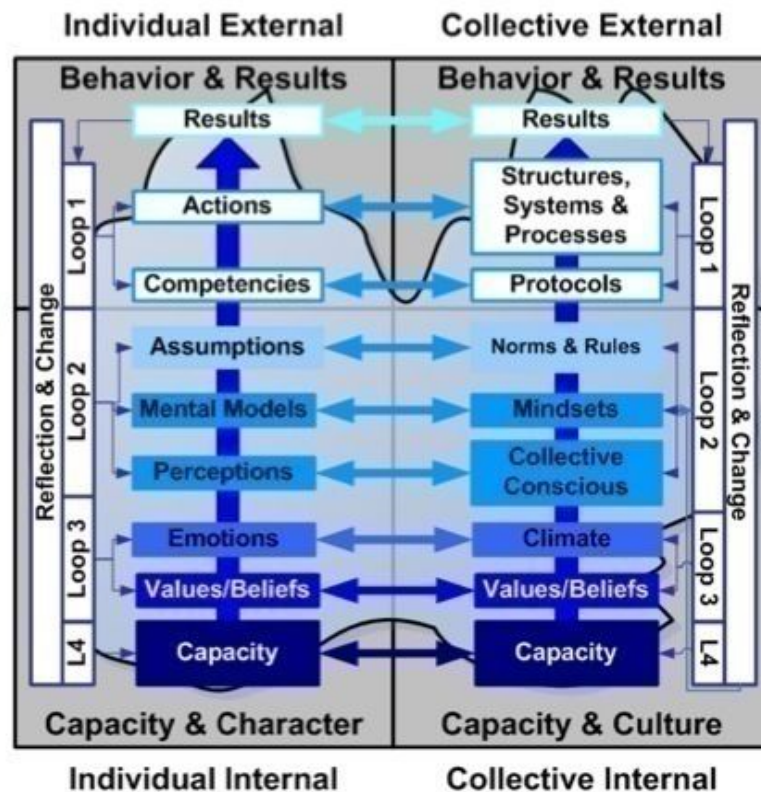


Figure 6.1: Tip of the iceberg, loop learning and depth.

Source: Leading Evolutionary Change - 3 day workshop presentation for Leaders Institute of South Australia Chad Stewart (2010).⁶¹ Note that in this example the quadrants have been rotated 90 degrees counter clockwise - e.g. individual internal is now on the bottom left as opposed to top left.

Torbert (1999) sees triple loop learning as occurring across four territories of experience.

These territories, from a first person view, are:

1. The outside world.
2. One's own behaviour as sensed by oneself.
3. One's thought/feeling.
4. One's "transconceptual awareness".

The fourth territory is where a person can register one or more of the other territories, as well as the changing nature of their own awareness. Torbert views such learning as

⁶¹ © Interkonnektions - used with permission.

occurring in first, second and third person fields of inquiry - that is there are similar territories for interactions, observing or describing groups and others. He argues this occurs with an ongoing recognition of the long multi-faceted, often ironic and/or paradoxical, developmental journey (on personal, group and public scales) prior to commitment(s) around such learning.

For the purposes of my thesis, Torbert's four territories along with developmental steps, and framing around different personal perspectives and introspection related to the commitment to learning, have significant similarities with integral theory. In many ways this is also a model (see the *Integral on Integral* subsection of Chapter 2) through which the developmental journey, and inquiry associated with it, can seek to validate and assess itself. For example, conclusions or suppositions can be checked in a process of inquiry with oneself, or through inquiring with others or assessed externally (first, second and third person). This triple loop model, four territory, first to third person inquiry, is a system capable of challenging itself on the conclusions it reaches (Bradbury & Lichtenstein, 2000; Torbert, 1999).⁶²

Summary

In summary, a range of researchers have applied single, double and/or triple loop learning to theory and concepts related to sustainability. This has also been applied with integral theory analyses considering interrelationships between quadrants and the object of focus of any given inquiry (e.g. looking at descriptions of sustainability from individuals working in

⁶² For example, developmental action inquiry into individual action logics perspectives can involve a sentence completion test assessment, personal inquiry and small group developmental action inquiry all to provide triangulated assessments of a person's action logic. See the *Integral on Integral* subsection of Chapter 2 for discussion on triangulation.

companies). In addition, the loop learning model, and reflective nature of it, can provide some level of assurance when dealing with complexity through action inquiry.

Consequently, for examining the largely second and third person data in my thesis (see the *Integral on Integral* subsection of Chapter 2), this triple loop structure has relevance and may assist to organise many of the conceptual lenses from Table 6.3.

The *Loop and Lens Analysis* section undertakes a comparison of the conceptual lenses using single, double and triple loop learning classifications.

Loop and Lens Analysis

The purpose of this section is to discern if there are standout concepts, differentiating patterns or underpinning structures amid the numerous theoretical lenses that can be drawn from the two meta-theory reviews (see *Beyond Sustainability Stages* section). Such concepts, or patterns, may warrant closer inspection. This is not intended to be a comprehensive analysis of each individual theory. For an analysis, from a meta-theory perspective on organisational transformation, please see Edwards (2009) and for energy efficiency Chapter 3 of this thesis.

To undertake the analysis, I have developed a model below relating the different lenses from the *Beyond Sustainability Stages* section to each other. To do this, the reach of each theoretical lens is considered - what the primary influence of the concepts outlined, within the theoretical lens, is likely to be on other lenses. Figure 6.2 illustrates this structure. In doing this, the analysis excludes some conceptual lenses relating to aspects of the organisations (and staff within it) that my thesis was not designed to address. These are spirituality, mediation, health/pathology and post-modern/decentring.

Three other structures - states of consciousness, time appropriate (states) and types - sit across, and within, all aspects of the quadrant model and learning loops used below for this analysis. Consequently, they are not shown in the figure below which would otherwise hold a great deal more detail and be difficult to interpret. In addition the case study research was not designed to inquire into these conceptual areas. For an examination of these see the *Integral Meta Discussion* section of Chapter 3. Additionally, the structures are considered in Chapter 8, *Further Research Directions*, and the *Figure Analysis* subsection of Chapter 7.

Figure 6.2 (on the following page) illustrates prominent single, double and triple loop relationships of the conceptual lenses.

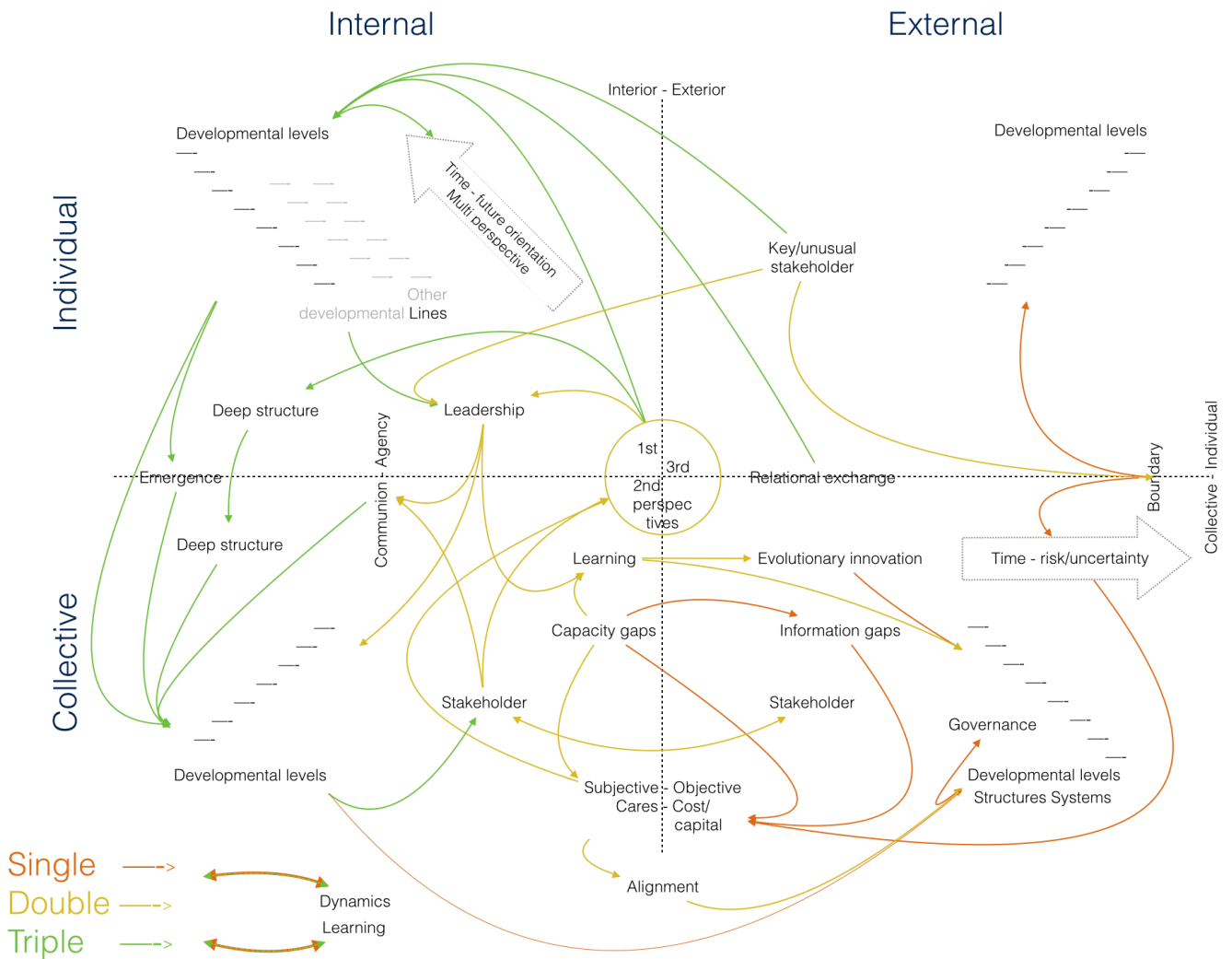


Figure 6.2: Organisational transformation and energy efficiency conceptual lenses assigned within Integral Theory quadrants. Arrows show primary influences.

Discussion of Analysis

The primary influences, as conceptualised in Figure 6.2, are outlined below. The descriptions draw on Edwards' (2009 p100-124) summary of theory encompassed within a lens and Chapter 3, unless otherwise noted.

Single loop learning influences are predominantly in the objective, right hand side, quadrants. For example, factors external to an organisation - such as the *Boundary* label in Figure 6.2 - can be pressures that highlight risks for the organisation, for example, financial. Thus, there is a single loop, such as a decision based directly on financial risk, leading to *Cost/capital*. While this can, in turn, drive new organisational strategies, such change would be characteristic of a double loop process. In the diagram, these double loops are shown as likely to involve taking a broader *Perspective* on what may be appropriate and/or *Leadership* for an organisational *Learning* and developmental level structure change (the double loop arrow leading to *Developmental levels* in bottom right). Thus the process loop diagram goes from *Boundary*, to *Risk/uncertainty*, to *Cost/capital* to subjective *Cares, Perspectives* and *Leadership* – leading to organisational *Learning*.

Clearly, relationships are interdependent. For example, *Boundary* pressures may lead to organisational hierarchy changes (e.g. change of CEO - *Developmental levels* top right). Potentially, there are impacts that are factors in deeper level shifts represented by the triple loops from *Perspectives* to individual development (*Developmental levels* top left).

Information and *Capacity* gaps, at the single loop learning level, are conceived as most directly influencing objective concerns such as financial pressures (*Cost/capital*). Similarly, the direct influence between *Governance* and institutions is reflected with a single loop arrow representing the developments of structures such as representative committees, consultative enquiries and intra governments/organisation working groups.⁶³ *Governance* as a holarchy, a ‘multilevel system of decision-making’ can also be thought of as creating structural changes. Examples of more complex decision-making structures are discussed in

⁶³ These factors were prominent in the stage shifts described in *Organisational Sustainability Stages* section.

Chapter 5 (e.g. *Principle 3 - Analytic Deliberation* subsection) and may result from an interplay of top-down management and bottom-up approaches changing the policy and actual practices of organisational governance. The deeper level structural change is represented as a double loop influence to *Governance* and *Developmental levels*, such as from *Learning* and *Alignment*.

Stakeholders can be regarded as a measured and objective factor as well as having more subjective quality descriptions around interactions (see the consolidative model discussion at the beginning of this *Beyond Sustainability Stages* section). As such, this lens can be viewed as sitting within lower left and lower right quadrants. The demands created by these considerations act to change strategy - that is changing the depth at which different *Perspectives* maybe to be understood. The figure also shows a triple loop from lower left group *Developmental levels* back to *Stakeholder*. This represents a step shift in the organisation's perspective on the value and role of (a wider diversity of) stakeholders. Standout individual influences are represented by *Key/unusual stakeholder* in the upper right quadrant. For example, in one of the organisations several individuals recounted positive stories about the influence of Al Gore on the potential to realise sustainability programs and projects. This may have influenced the capacity of individuals to effect change (represented in the diagram by a triple loop learning influence on *Developmental level*) and/or more directly their ability to lead (double loop to *Leadership*).

Organisational influences can be from individual leaders, for example the CEO's decisive vision. The impacts can also be from collective influencers from peers and networks. The *Agency and communion* lens represents these influences from leaders or peers and the tensions and interplay described within this lens is characterised by a double loop from

Stakeholder (peers and networks) or leaders (*Leadership*). Transformational change, which may result, is represented with the triple loop learning line to re-formulating organisational perspective/*Developmental levels*.

Alignment is co-evolution and congruence between entities within the organisation. As such, it is best classified as a strategic shift - double loop. It clearly can have many other interactions that are not shown in Figure 6.2. For example, questioning and considering disparities of approaches taken by different parts of the organisation involves leadership and could catalyse reconsideration of the very way individuals make meaning (see *Theory Underpinning Constructive Development* section Chapter 4, principle 6). The latter, if it occurs, would be best classified as a triple loop process.

The *Learning* lens can be described as a process involving single, double and triple loop learning depending on the depth of change (Edwards, 2005; 2009 p115-6; Küpers, 2008). At a conceptual level this is represented by the whole diagram, which incorporates single, double and triple loop learning across a matrix of theoretical lenses. There is thus a learning tag as a key below the diagram. However, for a common specific part of learning, individual to organisational learning and innovation (simplified within the diagram as *Leadership*, a collective *Learning* lens tag, and *Evolutionary Innovation* lenses), a double loop characterises the evolution of innovative capacities (strategy reformulation to prioritise successful innovative structures). Shown this way it is appropriate to conceptualise organisational *Learning* as a collective-subjective change. Consequently, the lens appears in the lower-left quadrant for this purpose. A double loop influence is shown leading to it when organisational specific parameters catalyse reformulating strategy and approaches.

Dynamic systems theory has a similar direct relationship, as the whole learning process does, to single, double and triple loop learning. Conceptually the lens represents how transformations may occur - from the perspective of system movements between thresholds, feedbacks, stabilisation, equilibrium, dynamics or self-regulation. Such movements may influence, for example, organisational structure directly. Similarly, at a triple loop scale, it could catalyse reconceptualisation of individual or collective perspectives. Consequently, the lens is shown next to *Learning* and single, double and triple loops.

Triple loop influences, partially by definition, flow towards the subjective structures representative of reconceptualising understanding. Consequently, many triple loop lines lead towards *developmental levels* such as action logics holarchies or spiral dynamics. A shift in individual action logic may change *leadership* capacity as well as being correlated with organisational *developmental level*. Thus, there are triple loops leading between these concepts.

Conceptually, the inclusive *Emergence* lens describes theories that look at such developmental pathways - transitions between one stage to the next one, where one transcends and includes that prior to it. It is argued these require greater integrative capacity - the emergence of higher complexity-organising/meaning-making capabilities, a triple loop learning. For example, the process of greater understanding, being challenged to make sense of circumstances, and incorporating complexity may see the emergence of a new order. The new order allows the organisation to handle a new level of complexity, in a more balanced way and “radically increases the capacity of a system” (Lichtenstein, 1997).

Deep structures are persistent underpinnings defining operational and human behaviours.

For example, in both of the organisations in this study, individuals commonly referred to the organisational roots. At the insurance company, this was commonly the way that it was setup over a century ago as a co-operative organisation for the benefits of its members. At the development company, the highly resonant social and environmental vision of its (now deceased) founder was often cited. Understanding the impact this may have on individual and organisational practice would require taking perspectives on oneself as well as organisational peers and organisation actions – hence the interactions are shown in the diagram as triple loop learning.

For clarity, the diagram does not show additional loops such as the interrelationships between *Developmental levels* (holarchies) across all the quadrants and cycles of *learning*. For example, a process of learning could be shown with the *Learning* lens in each quadrant describing a single loop cycle from individual understanding (upper-left) to behaviour change (upper-right), to systems change (lower-right) and on to shared values shifts (lower-left). Such loops would pass through each quadrant (Edwards, 2005; Küpers, 2008). Several direct links (i.e single loop influences), such as those between *Developmental levels* (the diagram shows one between organisational Development level in the lower-left and structure in the lower-right) or individual or collective subjective *Cares*, are also left out to avoid too much complexity.

From the figure, it is arguable that developmental worldview and organisational stage (the scale and complexity of context within which sustainability actions are attempted) may be some of the underpinning subjective factors. That is these lenses, which are often

unrecognised, may be significant frameworks through which sustainability change is mediated. Conceptually this is illustrated in Figure 6.3.

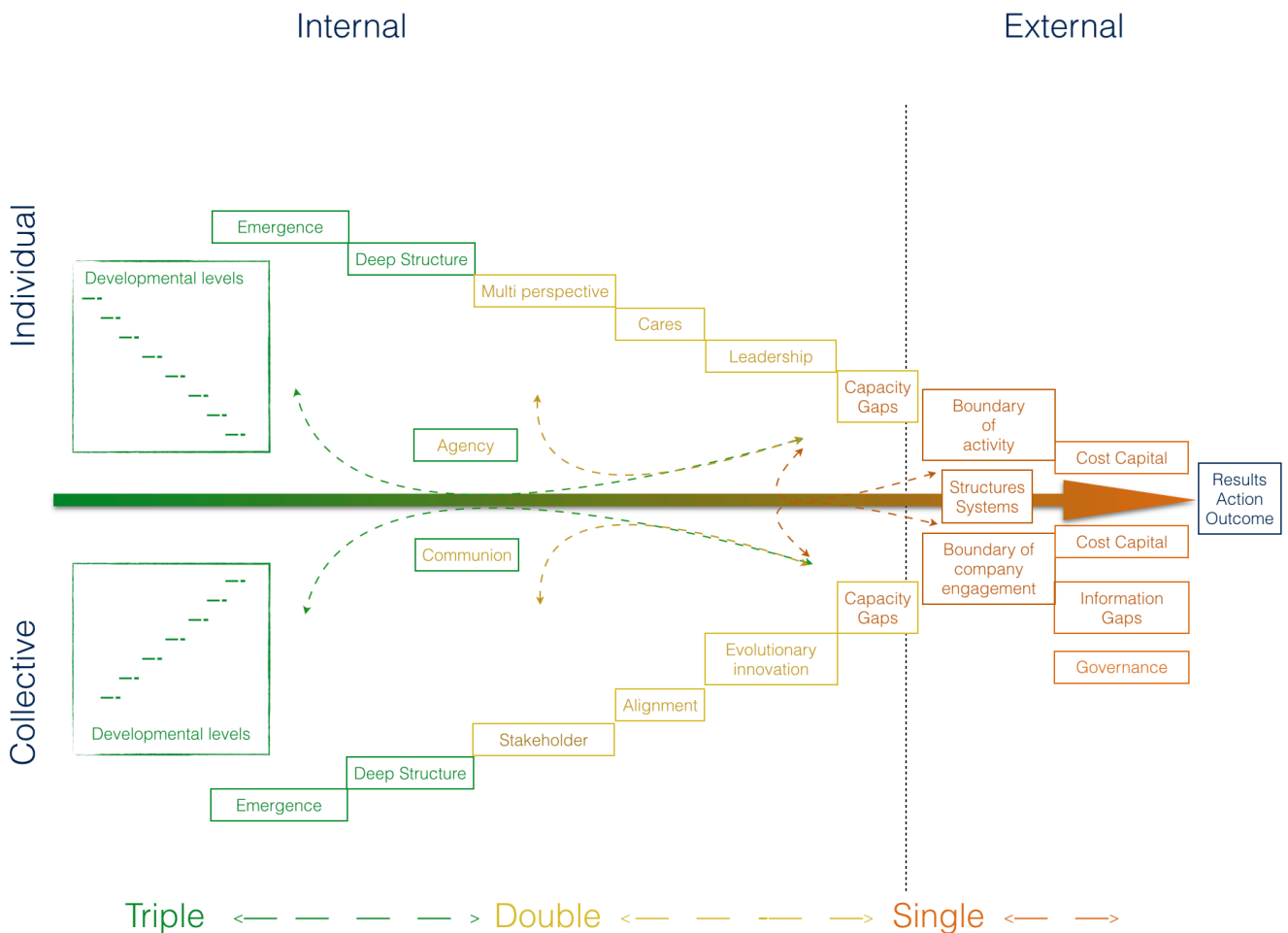


Figure 6.3: Conceptual relationship of sustainability related theories and change.

Figure ordered by cycles of most prominent style of single, double or triple loop learning, as well as individual or group focus and subjective versus objective emphasis.

On this basis - with *developmental levels* representing some of the key underlying structures - examining the evidence for the presence or absence of these concepts in the two study organisations appears to be worthwhile. Consequently, an organisational development structure correlated to action logics is outlined in the following *Constructive Development*

Theory and Organisations section. However, there are additional applications that warrant consideration and the subsection below discusses the analysis further.

Developing loop and lens analysis applications

This research - applying loops to conceptual lenses - has refined and synthesised the loop learning concept for application across theories. As the lenses are ordered by primary interactions (Figure 6.3), this structuring could bring further clarity to the relevance of theories considering phenomena, or application of specific models in discrete circumstances. Through distinguishing between single, double and triple loops levels it should be possible to enhance our understanding and effectiveness. For example, this can be used as a tool to consider the relevant importance of different models such as *developmental levels, alignment or governance* lens frameworks (or related theories) in a particular circumstance.

The potential from this type of lens and loop analysis is to deepen our interventions and examinations, in an interactive manner, through exploring the influences between theories and phenomena on a range of conceptual scales. To facilitate such an application, a revised summary, building on the descriptions in the previous section (*Loop Learning*), is as follows:

1. Single loop learning and feedback is acting to change specific observable practices (e.g. boundary of activity, depth of available information). For a group, it is shifting structures, processes and interchanges (e.g. the boundaries of engagement, procedures and protocols through governance).
2. Double loop learning and feedback changes the individual's capacities, works with their assumptions and cares, engages to consider more complexity and uncertainty (e.g. skilled leadership, capabilities to manage subjective and objective multiple

perspectives). At a group scale it is changing that group's relationships with others - what were norms - and reforming what that group may collectively see as possible (e.g. the whole method of strategising, aligning across boundaries such as through reconceptualising relationships with stakeholders, innovating new systems).

3. Triple loop learning and feedback reconceptualises one's vision and meaning-making systems, a relational step change to a new equilibrium (e.g. individual and group developmental levels, changing deep seated values structures, individual and group archetypes, conditions to shift to a new equilibrium, emergence).

These expanded loop concepts are further considered in the Chapter 7's *Integral Action Loops* section. That chapter, and its sections, develops the application of loop learning with layered theories, and the interplay between them, for sustainability effectiveness.

Constructive Development Theory and Organisations

The previous section found that developmental hierarchies are key underlying descriptive structures. Such models were introduced in the earlier *Organisational Sustainability Stages* section of this chapter, however holarchical models like these are not limited to the sustainability literature. Organisational development has been described as a process of creating deeper level change through which the organisation develops, redefines and learns - there is the emergence of a new order. The descriptions of this development encompass logic, intuition, serendipitous events, systems, chaos and chaordic systems and planning. Notably, transformation is seen that creates new understanding and transcends the previous level of complexity. The models describe the need for previous stages to be

understood or mastered for such a shift (Donovan, 1997; Lichtenstein, 1997; van Eijnatten, 2004).

Several stage model examples illustrate such shifts. For example, Greiner (1972) describes the development of increasing complexity and a broader, more collaborative and inclusive, view of the organisation, along with an expanding role for people within it, as the stages develop. Quinn and Cameron (1983) similarly describe organisational stages of development, reviewing nine separate models of such development to synthesise a 4-stage summary model. They find the 9 models are broadly congruent and contain similar developmental steps characterised by different forms and structures of operation. Change includes increasing complexity and diversification of responsibilities across the organisation. While Quinn and Cameron are primarily analysing management styles, their final stage (described in 5 of the 9 models they analyse) shows an expansion in how the organisation defines itself and its boundaries.⁶⁴ They argue the organisation is shifting its boundaries through external interactions, similar to the late sustainability stages, internal-external (boundary), perspectives and stakeholder lenses (described in the previous *Organisational Sustainability Stages* and *Beyond Sustainability Stages* sections).

In tandem with the individual action logics outlined in Chapter 4, Torbert (1974) describes a stage model for organisational development. This model has been developed over the following decades (D Fisher & Torbert, 1995; Rooke & Torbert, 1998; Torbert, 1987, 1991, 1994; Torbert et al., 2004). Its genesis was an analysis of four stage models, with Torbert's model compared to two of them.⁶⁵ It is based on individual development (as described by

⁶⁴ The 9 models include Greiner (1972) and the early version of Torbert's stage model (Torbert, 1974).

⁶⁵ Greiner (1972) and Lippitt and Schmidt (1967).

Erikson, 1959) and validated against four case studies (Torbert, 1974). The stages described by the model may characterise a meeting, project, or the whole organisation’s level over many years.

The 2004 iteration of this organisational development model details eight stages (Torbert et al., 2004). Later stages mirror some of the organisational shifts described by sustainability stage models (*Organisational Sustainability Stages* section). To illustrate these similarities Table 6.4 below details the stages.

Stage	Key Characteristics
Conception (Impulsive)	Dreams, visions, informal conversations about creating something new to fill need not now adequately addressed; interplay among multiple founders; working models, prototypes, related projects or business plans developed. Critical issues: timeliness and mythic proportions of vision.
Investments (Opportunist)	‘Champions’ commit to creating organisation; early relationship-building among future stakeholders; peer networks and parent institutions make spiritual, structural, financial commitments to nurture. Critical issues: authenticity and reliability of commitments; financial investment appropriately subordinated to structural and spiritual investments.
Incorporation (Diplomat)	Products or services produced; recognisable physical setting, tasks and roles delineated; goals and operating staff chosen. Critical issues: display of persistence in the face of threat, maintaining or recreating consistency between original dream and actual organisational arrangements.
Experiments (Expert)	Alternative administrative, production, selection, reward, financial, marketing and political strategies practised, tested in operation and reformed in rapid succession. Critical issues: truly experimenting, taking disciplined stabs in the dark, rather than merely trying one or two preconceived alternatives; finding a viable, lasting combination of strategy and structure for the following stage.

Systematic Productivity (Achiever)	Attention is legitimately focused only on the systematic procedures for accomplishing the pre-defined task; standards, structures, and roles are taken for granted; marketability or political viability of the product or service, as measured in quantifiable terms, is the overriding criterion of success. Critical issue: whether the organisation remembers earlier analogical concerns about congruity from mission through outcomes during this emphasis on deductive, pyramidal systems.
Social Network (Individualist)	Strategic or mission focused alliances among a portfolio of organisations, with strong value on maintaining distinctive traditions, craft-orientations, and relative financial autonomy. Critical issue: will the organisation regress or progress in economically adverse conditions.
Collaborative Inquiry (Strategist)	Explicit shared reflection about the corporate dream/mission; open interpersonal relations with disclosure, support, and confrontation of apparent value differences; systematic personal and corporate performance appraisal on multiple indices; creative resolution of paradoxes-inquiry/productivity, freedom/control, quantity/quality; interactive development of unique, self-amending structures appropriate for this particular organisation at this particular historical moment. Critical issue: will the organisation sustain collaborative inquiry as it grows through hiring, merger, or strategic alliances or will it revert to conventional systematic productivity.
Foundational Community of Inquiry (Alchemist)	Structure fails, spirit sustains wider community – appreciation of opposites; constant cycle of research and feedback covering visioning, strategising and performing. If timely, transformational action is undertaken. ⁶⁶

Table 6.4: Organisational development stages.

Correlated individual stage names in brackets. Adapted from Action inquiry, Bill Torbert, Susanne Cook-Greuter, Dalmar Fisher, Erica Foldy, Alain Gauthier et al., (2004 pp126-129).³³

⁶⁶ Rooke and Torbert (1998) suggest there are two separate organisational levels – *Foundational Community* and *Liberating Disciplines* that follow the *Collaborative Inquiry* stage. Torbert and Associates (2004) reduce this to one stage, the *Foundational Community of Inquiry* stage. As there are few organisations consistently operating at this level, these are theoretical stages based on assumed characteristics and referenced to a small number of cases.

Reviews of Torbert's organisational model find that while the research base is modest, it correlates with other descriptions such as Senge (1990) in describing how an organisation can transform to a new level of understanding and capacity (Lichtenstein, 1997). Torbert's model has been practically applied across a wide variety of organisations (Rooke & Torbert, 1998; Torbert, 1987, 1994). It has also been tested to determine if observers can reliably categorise an organisation at a particular stage (McCauley et al., 2006). A strong correlation can be identified between an organisation's level of development and the extent to which it combines social and financial responsibility and acts beyond immediate financial interests (Leigh, 2002 cited in Torbert 2004; Torbert et al., 2004). Leigh (2001), using a measure that includes, but is not limited to, the company's climate change activities, shows that increasing organisational development levels and improved social responsibility are correlated.

While Torbert's stage development model has been applied in significant case studies, the evidence base for organisational stage development models based on constructive development theory is modest. Despite the positive validation of these models to date, McCauley et al. (2006) caution that a significant amount of continuing work is needed. My study investigating two companies commonly regarded at the time as organisations with leading sustainability initiatives and practices may add to this evidence base.

Torbert's model, and its validation alongside the sustainability implications of it, makes it a prominent candidate to use in examining the evidence from my case studies to see if it supports such stage conceptualisations. In the following section I consider evidence supporting these organisational structures and examine whether the development of sustainability in these companies can be related to stages (*Stage and Study Companies*

section). When this is congruent with a triple loop type of change it, in turn, suggests these structures were correctly classified in the previous *Loop and Lens Analysis* section.

Stage and Study Companies

There is a range of evidence that the study organisations exhibit characteristics that can be correlated with organisational stages. At both of the two study organisations, individuals discuss the company systems and structures in ways that are associated with organisational stages. The responses from individuals in the interviews also lend weight to the concept that these organisational stages are associated with sustainability outcomes.

The two organisations are fairly distinct with respect to the organisational stages that can be inferred from the discussions of sustainability with senior employees. At the insurance company there is a range of conversations that suggests stages of *Systematic productivity* and *Social network*. Arguably, there may also be some vision and aspiration for *Collaborative inquiry* structures. At the development multinational many of the structures around sustainability are described in terms that parallel the *Experiments* stage with aspirations for *Systematic Productivity* (at least in respect to sustainability).

Insurance Company

At the insurance company a range of people discuss its operations in ways that are correlated to *Systematic productivity*. The discussion suggests that it has moved past the *Experiments* stage - its sustainability strategy has progressed past *finding a viable, lasting combination of strategy and structure* - to a focus on implementation.

The company has a clear set of rationales for its sustainability work. The company's procedures are explained around broad principles of sustainability - five levers - for which individual divisions have responsibility. Each division has to design and implement sustainability goals and actions that address each of these areas. The five levers are: economic; add value for customers; add value for staff; community engaged; and environment.⁶⁷ In explaining this approach, Morris, from his perspective of managing across the whole group, talks about how they are systematising the company's approach to sustainability:

Internally I think we've tried to line it up along those five levers that I talked to you about, whereas I don't think twelve months ago we actually quite thought of it in that way.

⁶⁷ In detail the five levers are (as described by Morris): *One - there has to be economic sustainability. You actually have to be able to demonstrate that what you are doing does create value, not just in the sense of profit for your shareholders, but clearly that's what you are there for, but also a wider concept of value that you are supporting other things that are of value to the community.*

Secondly, you have to have something that adds value or delivers for your customers, products or services that they value, experiences that they value, things that they can fall back on.

The third thing is, there has to be some value in it for your people. If people don't want to come to work in the day or don't feel that they are making worthwhile contributions, then you're not going to be a sustainable organisation or - and you are not going to be a sustainable society, I suppose because they are going to go do something else.

The fourth thing is around the community and the need to actually be involved in that community, not only having products and services that are of benefit to the community but also being involved in that community and for an insurer that's around trying to raise the awareness of risk mitigations and help people with their risk mitigations and things of that sort. As well as I guess making some form of charitable or philanthropic contribution back into that community.

And the final thing I think is, particularly for an insurer, we have to have regard to environment on two fronts. One is our own footprint, because it's pretty hard not to practice what you preach, but the other one is also just being aware of what is happening from an environmental point of view and making sure that the products and services that you have got or that you offer reflects that, not only from a pricing point of view, but also reflects the risks that are there and each of those is actually - each of those five things is actually interlinked.

It's no one or the other, it's kind of all of them and at various stages all of them have more or less emphasis (Morris).

We are trying to show our people that it's logical and how those levers actually fit with this devolved model as well.

Now we've got a lot of work to do, still on that front but I think people are starting to get it ... [but] you've just got to keep telling people about it, repeating it and repeating it and repeating it. And I find it fascinating when you do that sort of stuff I know that we are starting to get traction when I have people repeating it back to me in day-to-day conversations.

And we are not there yet, in terms of lining all those five levers up.... [But] I am starting to see it come through in documents that are written that go out into the business and other things and to me that then says, okay people get it (Morris).

Arena highlights the challenges inherent with systematising this across the group and how they are going about addressing this:

Frankly there is work to be done across all five of those areas, you know, and there's a lot of work to be done, so it's not like one of them is humming along so beautifully that we can kind of forget about it, you know, so that's the challenge...

I think we are spending a lot more time on the business case for sustainability, which shows that everything we do, while it may have a short term cost, you know, it's taking us down a longer term path that will benefit the company over time (Arena).

While Drew explains a business case as it is framed within/by the division he has responsibility for:

You can't just increase your [electricity] consumption at once ... you make the site unviable. So a lot of business cases for using energy more efficiently really weren't propped up by a concern in the rise of energy because it's relatively cheap, it was really around the need to preserve the life of a facility ... [power supply constraints mean] if we continue to install servers we are going to have to have a new data centre. I am avoiding \$40 million for a new data centre, put that in your business case and watch it fly... that was as simple as that, that I put to him. ... In a short term business case it's often hard to justify the longer term result in energy management but sometimes the shorter term will prop it up more and that's how you see, once again, [a] sustainable approach having many supports to it (Drew).

Such descriptions correlate quite well with the *Systematic productivity* stage characteristics (see Table 6.4) of *standards, structures ... taken for granted... marketability or political viability of the product or service*. The short and long term business case, and recognition of benefit over time, is one of these standards and structures for the company. In Drew's business case the political viability is what is required for capital expenditure at the existing data centre, with such factors measured in quantifiable terms - expenditure and costs. For Morris, while the procedures are not yet taken for granted, they are starting to be accepted across the organisation. This is similar in the discussion with Arena who highlights the work to be done. However, within this, the business case procedure appears to be taken for granted.

The potential for the *Systematic productivity* stage practices to enable sustainable outcomes is seen as Lakshmi discusses the change arising from structuring a question, into a whole of company feedback mechanism, to quantify sustainability awareness. In this example, the regular company employee survey asked whether sustainability was valued - it was highly regarded - and this structured process in turn was seen as assisting to convince managers who felt such issues should be a low priority. From the perspective of organisational stages it would appear that sustainability is no longer a discussion for most of the staff as to its viability (*Experiments*). Rather it is a standard close to being taken for granted as given with demonstrable marketability or political viability.

In addition, Lakshmi's view supports the argument that later stages are correlated to better sustainability outcomes. That is, when sustainability is reflected as embedded, in a way that correlates with the *Systematic productivity* organisational stage, it is influential on those who view this work as peripheral to business.

Lakshmi illustrates this, talking about a survey question that asked:

Do you value [company] sustainability?

And it had a surprisingly high response. It was in the 90% range. So that's what caught the cynics by surprise. There was this genuine and really quite committed desire ... if you tracked it in broad terms, the community of ... employees pushing this along... was what gave [the company] sustainability push power... [The impact] with absolute commitment and leadership [from CEO, board and chairman] plus this totally bottom-up push... problematic people were the longstanding middle management and senior management who sort of thought it was all a bit of a waste of time. But that got squeezed (Lakshmi).

The positive impact of *Systematic productivity* is reflected in other interviews. For example, Selene talks about the improvements arising from sustainability becoming part of other's delivery responsibilities - standard systems and structures:

It's definitely improved. I think as I mentioned earlier it's seeped through different parts of the business and one sort of thing that reflects that is the fact that we've gone from having three dedicated sustainability staff here to one and I mean that's I think attributable to the fact that many parts of our - what we used to be responsible for in our team have gone into other parts of the business now, like the reporting, sustainability reporting for example is done through our finance team. The monthly reporting, you know, the product development which was something that we were very much you know, researching and developing time, that's now sitting in the product development team. They've taken that on completely. Yes, so there's... procurement's the same sort of thing. You know the procurement team have adopted their own sustainability criteria... working with all suppliers and so you know, there is very little that I need to do with them on that front now (Selene).

Beyond Systematic Productivity

The insurance company also appears to structure its sustainability work in a manner correlated with the *Social network* stage. For example, the five levers approach - as discussed in the section above - is creating a set of *mission focused alliances* among the

portfolio of the company's business units. Each unit is responsible for implementing policy that addresses these sustainability levers. The impact of this (discussed with respect to the common pool principles in Chapter 5, see *Principles in Research* section) is to devolve operational and strategic responsibility to the multinational's business units. An aim is more effective engagement and delivery.

The link, in *Social network* organisational stage terms, is the company's sustainability lever approach and devolving responsibilities for *strategic or mission focused alliances among a portfolio of organisations*. At this organisation it means, within a strategic framework, there will be implementation of sustainability at a business unit level. The importance of *mission focused alliances* alongside *distinctive traditions* - features of this stage - is illustrated by Morris and Arena in the quotes below. In this analysis, these distinctive traditions are taken to mean the business unit's approach to engaging with its customers and stakeholders in a manner that is appropriate and relevant:

We talk about trying to get the overall experience and involvement that we've got as close to the end consumer of our product as possible, but it's within a framework, so what we try to do within this is say, "look here are the boundaries. We don't want you straying outside those boundaries, but where you position yourself inside that is entirely up to you". However, we also expect that we are - where there is something that we can do together that is not going to compromise us externally with our customers, we would do that together and you know, the research centre that we've got is a good example. We fund that across the whole company. Where we make contributions to some of the wider environmental debate. We actually pool resources from the various pieces of the business to come up with what the solution is, but we don't try to go and say, "oh that business will make its submission and this one will make its submission". So it's trying to say, where it makes sense, do it separately. But where it makes sense, collaborate (Morris).

I think on balance the feedback we have gotten with the refined strategy [devolved responsibility for implementation] is very positive ... I think the challenge is realising

obviously that our audience is varied and broad. Our stakeholders are varied and broad. We all know that and we have to communicate differently with different people and find the hot button for that audience (Arena).

In the third quote Arena describes the financial challenges and how such an approach around sustainability may help address a critical issue - if the organisation will *regress or progress during economic adversity*:

New Zealand is heavily into a recession and so, of all of the businesses in the portfolio, they are probably hurting the most in terms of their external economic climate. So for them, they've kicked off an initiative around the financial sustainability and what that means for them and where they need to focus and they were sharing... the path they're going down with the rest of the group... because they're... leading the way on the thinking there ... they're doing everything to maintain the environmental side but also trying to... pick up on one [of the levers] that resonates particularly with them right now (Arena).

The portfolio approach and some of the challenges are also illustrated in the next two quotes from Leanne:

I spoke about it at the time and I said to him [the CEO] you need to go on a full devolved model, but the organisation isn't ready for it just yet. And the organisation wasn't at that point in time. The fact is at the end of the day we had no option; and even when we did do what we did arguably the organisation wasn't ready, but we just had to do it (Leanne).

So what I see my responsibility is and what my time spent in is how do we ensure that it's not a program that's run alongside the operation, but actually how do we ensure that it's really embedded in what we do across those five levers and that it's not seen as an isolated activity, that is something that we push aside because it's too hard or we are not profitable or and-and-and. So ensuring that the whole focus on business sustainability for us, and the economic and the climate and the community and the work force and the customer, are all embedded in what we do (Leanne).

Within the company there is also some evidence that managers are thinking about *Collaborative inquiry* structures. In the following quote, Dean and I are discussing collaboration and its advantages, boundaries, limitations - how this is perceived across the company and by us. Dean discusses explicit shared reflection around corporate dream/mission with the implication this could be structured at an organisational level. A part of this discussion then focuses on the limits to collaboration. Dean's response is illustrated in the quote below:

Absolutely right. And the limit becomes, for me, becomes at what point does it stop being about a benefit to our core business, and if it stops, if it goes over some line that says, which is actually more academic or altruistic or away from the core reason, then ... and where that line sits is, ... I haven't thought about it enough to but I would do it intuitively. I'm sure there'd be some criteria you could develop actually about how/where that line sits but I haven't done it.

If you step over that line then, really then you are spending the shareholders money making decisions for them about where they want to spend their money, right. Just like you would on political donations. And it's actually no different, right I mean how do you do that? I can debate that. Yeah the ethics of that as well. So the question is at what point is its targeting too remote from the impact on our profit and loss of climate change events... (Dean).

A structure reflecting *Collaborative inquiry* stage characteristics, on organisational collaboration and company *dream/mission*, may have developed post this interview. Unfortunately, this is outside the limited timescale of my thesis. That is, we don't know if the organisation, or the subgroup represented by Dean, did progress to *Collaborative inquiry*. In the example above the "criteria" could equally become *Systematic Productivity* structures as opposed to the *Collaborative inquiry* stage - the group and its interactions may not evolve to resemble *explicit shared reflection... and confrontation of apparent value differences*.

Discussion

The insurance company example illustrates a number of concepts from earlier chapters in this thesis. These include stages transcending and including previous steps, common pool resource principles and action logics. These linkages are briefly discussed below.

There is a degree of crossover between each organisational stage. The levers approach is a good illustration of this - it was a clear point of discussion within *Systematic productivity and Social network* stages. Developmental holarchies are characterised by stages that transcend and include each other. Each later stage represents a greater level of complexity and sophistication however, the characteristics of the previous stages are still present (see Chapter 2 *Integral Theory* section). That is, it should be expected that there will be concepts relevant to the *Social network* stage that also correlate to earlier stages.

The common pool resource principles discussed in Chapter 5 include a number of principles that appear to relate closely to *Social network* and later organisational stages. The portfolio of mission focused alliances, along with *Collaborative inquiry's* explicit shared reflection, appears to be linked with such principles. As touched on above, the *Social network* structure appears to enable/be enabled by some of these principles.

With respect to action logics, different individuals discuss sustainability at quite different system scales. The viewpoints range in scope from energy related business cases at a facility, to levers across the whole multinational corporation. This diversity is also apparent across other people's interview responses. These differentiated foci are classifiable into two distinct sets. One is to group the perspectives that are of a direct organisational context nature. The second is to look at this from a worldview perspective lens approach. These

classifications are not mutually exclusive - the context and the worldview can both be different at the same time.

Direct context differences are seen across the types of activities, divisions and responsibilities the individual has. For example, systematic productivity is expressed around sustainability appropriate within the context of the issue and/or the individual or their division. In the quotes above such viewpoints are respectively organisational levers, business cases, a specific business case around power supply thresholds and energy costs, and employee sustainability engagement.

Development Company

At the development company structures around sustainability are described in terms that reflect efforts to systematise procedures but are often more closely aligned with the *Experiments* stage. For example Carrie, in the quote below, describes the state of play, as she sees it, in terms that are about practising what may become a consistent approach:

Our aim would be to have a consistent approach that would sort of capture a broader range than some of the other mechanisms have sort of managed to do. So that's sort of rule number one is to capture the broadest sector that you can and provide them with a consistent framework within which to work (Carrie).

Carrie also describes some of the advantages of sustainability reputation and efforts to define what works. This suggests the practices, benefits and downsides related to sustainability are being tested - a structure with more similarity to *Experiments* than *Systematic productivity*.

I certainly think it helps in terms of just a basic market and branding - brand profiling - for us, in that market understand that it's a core deliverable of our projects, and that helps when you're going for large tenders and bids around projects.

...HR the general feedback that they had was that it was a strong component of why a lot of people came to work and why a lot of people decided to stay.

... Part of their new programs is about developing better indicators around some of these aspects, and my understanding is that, yeah that's being sort of worked into that process (Carrie).

Carrie is working to identify, understand and articulate what sustainability benefits may be.

She describes undertaking and trialling a number of strategies in a manner that suggests the company is *looking for a viable, lasting combination of strategy:*

Part of my role, often in trying to convince and create change within the organisation, and inform and educate, is about trying to work out what those drivers may be for different people, and talk to those drivers, so they do make that personal connection, and you know, for some it may be the simple point of pointing out that they've got children and they may have grandchildren, or whatever the case is, and that connection of leaving the world a better place at the end of the day, for them; it may be enough to engage them at another level.

For others it may be facts and figures, and statistics around, whether it's studies that have been done in terms of the impact of healthier indoor environment quality on reduced absenteeism and that sort of thing.

But I must admit that wasn't a very successful argument in Singapore where they just sort of thought that people should work 110% as an automatic. So, who cares about that benefit?

But, yeah it's different drivers for different people, absolutely (Carrie).

There are earlier structure stages that are also relatively prominent in the discussions with this company. Investments, where *'champions' commit to creating the organisation*, and the impact of this, is quite commonly referred to for the sustainability legacy from the founder.

Sandy, for example, talks about how the company is looking to act on sustainability from

what he sees as the initial founder's, and subsequent (previous) CEO's value set, which created expectations. Referring to these roots, he says:

Sustainability, I really think sustainability has been part of a culture and a value set at least for a long, long time - albeit the definition and the richness of expression and approach has probably changed, significantly changed (Sandy).

At an *Experiments* stage, that seems to reflect current practice. He describes multiple approaches, *disciplined alternatives* explored (based on client needs, collective expectations and/or common sustainability principles for construction) as the company aims to overcome barriers:

Oh there's every example every day you come across them really every - my whole career is about moving projects forward or businesses forward... Oh there's heaps. We won't go back too far. A previous project I was working on ... which was a new development model that we were taking on and there was a million reasons that we couldn't do what we thought or what our strategy had set whether it be a shopping centre without a roof or whether it be a infrastructure that was centralised or whether it was working with the Woolworths and the Coles Groups to implement environmental initiatives in their store.

Or whether it was the use of a new material in cladding or whether it was you know there was just thousands of little examples. Could you land sustainable project homes in an environment that was really very much McMansion focussed and driven that way? Could you reduce the lot size to make it more sensible and efficient for the way builders were presented? Could you design the development with most houses with more north facing roofs and aspects? Could you get a balanced cut and feel to the development; it just goes on and on and on... (Sandy).

These experimental frames - trying systems and solutions out, arguing the merit of otherwise and remodelling across the business - are present across the people interviewed from the development company. Senior management describes sustainability in similar ways.

The sustainability challenge - shifting from the founder's vision - also appears with standout case examples (leading awarded sustainable buildings and developments). In the quote below, May is talking about a standout environmentally performing corporate building the company constructed in Sydney. This appears to be a perspective on the company at an *Incorporation* stage for sustainability (*products or services produced; recognisable physical setting*).

It was probably one of those things that flew under the radar a bit to be honest, I think [management] I don't think they really knew what was going on with a lot of it. So I just think it flew under the radar a bit to be honest...

They were engaged to a point, but I think it was a little fortuitous and I think the way the thing came together was probably a little fortuitous as well to be honest (May).

Jules, similarly, refers to the advantages and challenges these standout buildings create. He describes the need to find *viable strategy*, *Experiments* stage, from such cases:

Yeah, and I guess we've had lots of really good leadership projects. [Sydney, Melbourne buildings]... and whatever. But I found in Queensland, we were behind because we didn't have the same types of projects, we had government work and other things ... I was a project manager trying to link all the things together, and I could see there was a need to build our capacity, to learn from what's happening elsewhere, but also what we're doing on different jobs (Jules).

Both Companies

The differences between the two organisations appear to be substantive. It is hard to find a strong example in all the construction company employees' descriptions of systematised productivity. The closest are some of Karl's descriptions of what a sub-group of the whole company has learned through experience (e.g. see Chapter 5 *Principles in Research* section part 2 – devise rules). In comparison, the insurance company describes a clear structure

through which it is aiming to implement its sustainability goals. Similarly, at the development company there is no clear description of how any of the divisions that are acting on sustainability are adding to an overall strategy. Rather, when asked for motivation or action rationales in this area, the descriptions usually refer back to a set of shared values based on the vision of the founder.

Such roots are also present in the discussion around sustainability for the insurance company. Many people at the company describe the foundations of the organisation, as a mutual society, and the impact they believe this has in respect to the organisation adopting pro-society perspectives. This is also related, for some, to the nature of the business - engaging to support people who can be in various stages of the crisis that prompted the insurance claims. However, the insurance company and its rationales for acting on sustainability are significantly more evolved than just being based on historic input and legacy. It has a context for the overall actions it undertakes on sustainability, as well as discussion on purpose and boundaries. Additionally, it explicitly recognises the diversity of needs throughout its differentiated business divisions and sets strategy to work with this.

Conclusions

This chapter began by examining sustainability stages and the variety of frameworks that describe such models. The review of these models, along with meta-theory, integral theory and single to triple loop learning discussion, suggested that a developmental holarchy - based in action logics - was appropriate to investigate. The chapter consequently outlined Torbert's organisational stage model and sought to apply it to the two corporate organisations in this study.

This stage model highlighted apparent gaps and developmental opportunities between the organisations. With the insurance company's devolved model - and an often clearly articulated strategy about how this will enable and differentiate sustainability action appropriate for different divisions - the multinational appears to be in a stronger place to implement cohesive sustainability actions. Individuals in the company see this later *Social network* stage as essential for generating desirable outcomes. Similarly, the construction company identifies a need to systematise its sustainability activities. That is, the company's staff identify desirable changes that are consistent with the stage development model. Both company examples support the idea that the companies are attempting to shift to higher stages - noting that none of the participants in this study referred to sustainability in these types of theoretical terms.

The relative differences - and absence of any focus (as discussed by the individuals within the company) of a need for a *Social network* style structure at the development company - suggest that these stage models are a set of hierarchical steps. That is, the organisation may need to move sequentially through these stages. This could mean it is difficult, or impossible, to jump directly from a lower to a higher stage without passing through the intermediary steps. Such an inference supports the theoretical base for these progressions through stages.

My analysis has fitted this organisational stage model to a sustainability specific framework. This suggests that sustainability may be distinct - while related to the broader organisation, it may not always be the same as the overall organisational stage. Clearly, were it not for the devolved model being implemented by the insurance company, it may have been unlikely, or difficult, to have created a differentiated structure solely for its sustainability activities. It

may also be possible for a sub-division, business unit or part of a unit, to have a later stage implementation model for sustainability than may necessarily be the case for the whole organisation. Within this, it is difficult to imagine that the overall unit's structure would be at a stage less than that which reflects its sustainability. However, this study did not explicitly seek to find or identify organisational stages outside of the sustainability framework. Nonetheless, it is possible to say for the insurance company that its devolved model has a strong correlation with the *Social network* organisational stage.

This chapter also supports the notion that later organisational stages are likely to assist with sustainability. Both the insurance company and the development company reflect this. Structures mirroring later organisational stages are discussed as desirable. For the construction company this is *Systematic productivity* if consistent frameworks are implemented. At the insurance company the need for a *Social network* is described. Such transitions - if the later stages deliver the results the individuals believe will occur from the changes they view as desirable mirroring such a stage shift - support the notion that later organisation stage action logics, with respect to sustainability, promote desired sustainable outcomes.

The perspective shifts can also be thought of through the sustainability action logics lens discussion developed in Chapter 4. The way an individual perceives sustainability and the way that they express organisational structure appear correlated. This is not unexpected and Chapter 8 touches on further research around how such action logics perspectives may shape these types of understanding.

With respect to loop learning, the individuals describe barriers and desirable changes in manners that mirror organisational stage shifts. The next chapter looks at these in the

context, considers a range of change factors and differentiates between single, double and triple loop orders.

Chapter 7

Parallels and Conclusions

Introduction

What started out as the right thing to do [sustainability] very quickly became clearly the smart thing as well. We are leaner. Our costs are down, not up... Our products are better than they have ever been because sustainability has proven to be an unimagined source of inspiration and innovation... Our people are galvanised around a higher purpose... And for those who think that business exists to make a profit, I suggest they think again. Business makes a profit to exist, and surely it must exist for some higher, nobler purpose than that... That is that we are each and everyone part of the web of life, a continuum of humanity for sure, yes, but also in the larger sense, the web of life itself. And we have a choice to make during our brief visit to this beautiful planet. To hurt it or to help it. And for every human being it's her or his individual choice. It's your choice.

Ray Anderson, Mid-course correction (2005).

This chapter draws together the research from the preceding chapters. The discussion, to this point, demonstrates that the scope of enquiry required in order to understand sustainability and climate change is wide and deep. A casual view across the multiple frameworks through which just two aspects of this topic are conceptualised (conceptual lenses in Chapters 3 and 6) emphasises this point. Focusing part of the inquiry using meta-theory methodology, and correlating the research with integral theory, put some structure around this broad landscape.

The approach highlights some areas that may be fundamental mediating theories through which we can understand this topic. In particular, these are developmental stages - organisational and action logics - see Chapters 4 and 6. However, such stages are only one subset of a broad number of frameworks. To step between, and relate many of the

conceptual structures that theories apply to sustainability, I also developed the use of single, double and triple loop learning to analyse interactions and influences between conceptual lenses. This emphasises the underpinning nature of some concepts and also layers of interrelationship.

The complexity of sustainability drew my inquiry towards areas where there is a depth of research on successfully managed long-term sustainable outcomes - the common pool resources research covered in Chapter 5 of this thesis. This research produces useful principles that are associated with robust outcomes and these are correlated to views on effective business sustainability.

This chapter picks up on all these approaches. Firstly, the *Discussion* section considers how this diversity can be grasped, particularly for practical application. It argues that an *integral action loop* framework may provide a useful map for practice as well as research.

The next section, *Integral Action Loops*, outlines the framework. This is followed by the *Integrated Analysis and Integral Action Loops* section that considers how it could be specifically applied to a subset of the research in this thesis. To do this, I focus on aspects of one of the case study organisations, the insurance company multinational, and look at what such a framework can offer through assisting us with catalytic uses of our knowledge and research. A challenge is to apply general principles, relevant in part because of the spread of understanding that goes into the consideration and development of such theory, to specific circumstances and discrete entities, phenomena or institutions. The section is an initial demonstration of how integral action loops could fill such a role.

The *Conclusions* section summarises research across the thesis. The section provides a synthesis of highlights. Additionally, it provides a short context for some of the depth that could be considered, for example in relation to points identified through mapping sustainability circumstances with integral action loops, for clarity around successful action.

Discussion

Science may be solving the mysteries of climate, but it is not helping us discover the meaning of climate change. We need new ways of looking at the phenomenal – and ideas circulating and mutating through our social world – and of making sense of what climate change means to us... I suggest we need to reveal the creative psychological, ethical and spiritual work that climate change is doing for us.

Mike Hulme, Why we disagree about climate change (2009 pp325,326)

Various aspects of the context in which individuals interact affect how individuals learn about the situation they are in and about the others with whom they are interacting. Individual differences do make a difference, but the context of interactions also affects behaviour over time. Biologists recognise that an organism's appearance and behaviour are affected by the environment in which it develops.

Elinor Ostrom, Beyond markets and states: Nobel prize winning lecture, Stockholm, Sweden, December 8, 2009 (from journal version: Ostrom, 2010a - citations omitted from quote)

This thesis started with a simple but deep problem. It outlined the compelling environmental need to shift our society such that the systems we rely on are not degraded at rates that risk sustained damage. Alongside this need is a very real possibility of dramatic step changes that will threaten major parts of the world's population. These issues are particularly stark with respect to climate change and the outline of this, in the two sentences above, frames the problem in a manner familiar to anyone reading Western media or climate reports (e.g. Climate Council of Australia, 2014; Lagarde, 2013; World Economic Forum, 2013). Humans are at the centre of the action, the cause and the solution.

Presented in this manner, humans are agents but seemingly separate intelligences acting on a world that is not necessarily a part of us. On reflection, what appears as an integrated loop - humans part of the solution and the cause - can also be a separation from the very systems we are part of. Others argue that the separation is problematic (Esbjörn-Hargens, 2006a; Hulme, 2009). The ecosystem, biosphere and the society around us are acting on us just as we are impacting them.

At the start of this thesis work, I proposed that we are more likely to see effective success if we integrate subjective aspects of our experience and that we do not necessarily preference the objective measured parts of our society, business interactions or environmental assessments - as related to a given phenomena. This initial proposal, I would argue, is well supported by the research in my thesis. A wide range of discussion and argument in the preceding chapters, some of it briefly recapped below, suggests this and supports the view that biasing objective factors can be problematic. However, integrating the subjective with objective measured research and practice, is also a limited approach in a manner similar to separating ourselves from the interactions of climate change on us - as touched on in the first paragraph.

The basis for this argument comes from all the parts of the thesis and is initially drawn from Chapter 3. In the meta-theory review, it is very apparent that a wide range of conceptual lenses, including subjective framing, is applied to understand and act on energy efficiency. Both subjective and objective frameworks are important if we are to address such an issue - the mere existence of profitable opportunity is insufficient - as evidenced by the continued existence of large efficiency opportunity gaps. The analysis reveals existing application and

arguments across all of the integral theory facets - quadrants, levels, lines, states and types.⁶⁸

While analysing the research for Chapter 3, it was apparent that the frameworks rarely offered coordinated structures beyond listing specific sets of criteria that were important (e.g. Heiskanen et al., 2008). Alternatively, such documents tend to compare approaches within a paradigm. For example, from a primarily capitalist perspective with governance considerations (Daley & Edis, 2011), or behaviour categorisation of individual outlooks (Chatterton & Wilson, 2012). These analyses often list a set of barriers or theoretical structures that should be considered. The researchers and practitioners may discuss key action points, but why any particular prescription may be appropriate, or with respect to a specific analysed case why other frameworks are not considered, is not necessarily apparent. Daley (2011), for example, presents a compelling analysis of the relative effectiveness of policy measures to achieve emissions reduction - as measured by the size of carbon reduction against the cost of such cuts. This is important work, however, a great deal of literature discusses economic drivers without considering social and individual

⁶⁸ A full range of integral theory perspectives are relevant, however the integral theory literature and discussion tends to emphasise quadrant and level perspectives. These, for many, may be the most accessible integral frameworks. Integral theory's acronym, AQAL, may reinforce this tendency. My initial approaches to integral theory also followed this pattern. Quadrant and stage frameworks were prominent and it was later work, such as the meta-theory reviews in this thesis (chapter 3 and 6), discussion on worldviews and values (Chapter 4), the collapse of the Wilber Combs matrix (O'Fallon, 2010), the Integral Theory conference in 2013 and its panel on types as a 'marginalised' part of this theory, plus discussion on the accessibility of integral theory through a starting point with quadrants (Esbjörn-Hagens, 2014a), that helped focus a broadening beyond concentrating on quadrants and stages. However, I would also note that the subjective, inter-subjective, objective and inter-objective - quadrant - framing can encourage such a stretch particularly if individuals and groups are encouraged to think about how such quadrants interrelate to each other and the feedbacks and influences of such linkages. This chapter expands on a framework to promote this type of consideration - see the *Integral Action Loops* section.

acceptance. Similarly, psychological papers on climate change actions will not necessarily seek to integrate the importance of these drivers with other society influences. This is not necessarily a critique of good research - the authors are often clear about the intent. However, examples integrating contextual factors with social change, an intervention program's characteristics, and with a structure for intervention, are rare (e.g. Breukers et al., 2011). There is an obvious space, open and seemingly under explored - more extensive research around how all these perspectives interact together. Additionally, there is a question as to how effective analysis can be if it fails to consider social acceptability and other factors - such as examples that primarily look at economic efficiency or technical evidence.

Integration, and the influence of different lens perspectives on one another, is clearly a challenge. It is one of the principle attractions of a framework such as integral theory. Integral holds the potential for broad application and provides a clear mental map to navigate tangled and interrelated issues - as discussed in the *Integral Theory* section of Chapter 2. As others have highlighted, an integral framework is important and offers better approaches beyond our current practices. It is essential to incorporate human dimensions and our perspectives into climate change considerations (Esbjörn-Hargens, 2010b; K. O'Brien, 2009; Riedy, 2005 pp443-449).

For a broad approach, an integral framework extends to considerably more depth than simply encompassing concepts - for example, as typified by a list-like approach to what might sit across each of four quadrants such as in Table 2.3 (*Holons and Quadrants* subsection of Chapter 2). As the meta-theory analysis of energy efficiency shows (Chapter 3), it is possible to derive a comprehensive set of lenses describing theoretical

underpinnings for action and examining what the relevant mechanisms, barriers or enabling phenomena and circumstances may be. The review consolidates many of these lenses against the integral theory framework across quadrants, levels, lines, states and types. This, in turn, helps to structure the relationship between them, as well as add clarity on the relevance and application of such groupings.

The Chapter 3 review also demonstrates that some of the conceptual lens sets are less easily viewed from an integral theory perspective. The *stakeholder* lens set, for example, could be placed in a quadrant structure. However, the importance of its interactions crosses all four quadrants. With other framing stakeholders are also conceptualised as types (see Chapter 3 *Integral Meta Discussion* section). Thus, a lens can have several facets and aspects.

There are other important lens sets such as *developmental holarchies* (action logics, see the *Introduction* section of Chapter 4 for the rationale on its prominence) and evidence from human practice that polycentric institutions, institutional variety and nested authority are relevant (see Chapter 5's *Polycentric and Business, Principles in Research and Conclusion and Discussion* sections). Undoubtedly, there are circumstances when a particular approach, using a set of interventions characterised by a subset of conceptual lenses, is likely to be crucial for success. Equally, it is likely there are other situations where the same and different factors may be, necessarily, medium to long-term strategies.

These considerations, and the other prominent structures in the chapters to date, suggest we need ways of not only checking that subjective perspectives are considered, but actively combining the interplay of these with physical factors alongside states, types, and lines. To illustrate the need a little further, the evidence and arguments in this thesis point to the

difficulty or limitations of arguments based on one or two quadrants of integral theory. In the case study material, for example, individuals argue that effective policy involves significant cross organisational linkages and deliberation. That is, it is a lot more than just putting in place a set of measures or goals (see the discussion in the *Principle 3 - Analytic Deliberation* subsection of Chapter 5 for specific quotes). On a meta-theory scale, this relative narrowness is also apparent in the *Energy Efficiency Theory* section of Chapter 3. A focus on just the objective does not explain observed outcomes. Similarly, the strength of subjective frameworks, mapping individual and organisational development, is discussed through Chapters 4 and 6.

Beyond just bringing subjective considerations to phenomena, theory and circumstances, it may also be important, and effective, to engage in a fuller and deeper range of integrating approaches. A quadrant analogy is a useful way to illustrate this. At a basic level, a problem can be considered from all four quadrants. Checking the approach has, at least, considered other quadrant frameworks and consciously choosing the focus - that is not necessarily addressing all four - could be a subsequent step. This could include making a list of factors across all four quadrants, such as the examples in Chapter 2's *Holon and Quadrants* subsection. As argued in that section, it is important to pay attention to all four aspects. However, although more complex, we should consider how each interplays with each other and the dynamic influences of a dialogue with such a system - the individually described pieces in each quadrant effecting others. Additionally, we are likely to be well served by thinking about the states, lines and types that are relevant.

The complexity of such an all quadrant, all levels, lines, types and states interplay is, sometimes, off-putting. However, it may be necessary and indeed could be far more

effective. For example, the insurance business has designed a set of nested responsibilities for delivery of its sustainability agenda (see *Principles in Research* section Chapter 5). It is very likely that assisting the success of initiatives in this organisation would consequently involve explicitly recognising this governance holarchy in interventions and theory.⁶⁹ Similarly, extrapolating success, such that other groups might adopt or value similar governance structures, could require a description of the conditions enabling or creating barriers to effectiveness particular to a given circumstance. Factors such as leadership, enabling states and action logics capacities of business leaders, and more, may be relevant. As a result, clear maps to enable us to engage with this dialogue, engage with the influence of multiple conceptual frames on an organisation or group, and evaluate theoretical and practice strands on the topics and phenomena against each other, society and ourselves, are likely to be valuable.

To reach towards such a framework, the chapters that took an overview perspective are drawn from first. Chapter 3 highlights a number of lenses, some of which were not immediately apparent with respect to how they fitted with the integral theory structures, with a majority that mapped into this framework. Chapter 6 structures these, and organisational transformation meta-theory conceptual lenses, against single, double and triple learning loops and integral quadrants. This work suggests that we can use loop learning and the integral theory framework to guide interventions and analysis.

⁶⁹ Additionally, although somewhat outside of the scope of my thesis as it was not originally designed to consider types, typologies provide a good illustration. For example, how likely is an approach that ignores types, relevant to innovation and energy efficiency, to engage practitioners and theorists that find such type structures useful and effective? The *Why, how, who, where, when and what* subsection of Chapter 3 provides a short list of such types related to the widely used diffusion of innovation framework.

A consideration, in reaching towards such a framework, is that it is desirable to use big picture theory that has derived common organising and sense-making principles from a mass of research, and see it applied to best effect in a given circumstance or examination of a set of phenomena.⁷⁰ It is difficult to envision how the large body of human knowledge could be cognitively applied, in any other way, except by using generalisation abstracted from such work. With this, clearly, a challenge is to engage in comprehensible and manageable consideration of multiple components. There is a need to do so in ways that the most appropriate parts are used. In addition, the circumstances will not be static and so how various factors interrelate to each other and change as one effects another - interplay - are important. I suggest a structure based on Chapter 6's lens and loop analysis, integral action loops, can assist in this task. The *Integral Action Loops* section below outlines this structure.

The need to cut through complexity is implicit and explicit in a range of the discussion from the case study companies - such as Stan discussing effective collaborations or Arena on meeting the challenges of a varied and broad audience (Chapter 4 *Final Results* section). In the face of this, some might argue, it is better to get to first base. That is, focus on directly addressing a bias for measurable factors through integral theory quadrants and arguments about the importance of subjective conceptual theory approaches. This could involve engagement to suggest considering human factors, with the measurable, will help craft better outcomes. In many cases, this may be the right approach. However, a practitioner engaged in such an approach might, as touched on above, focus on one particular quadrant as an effective leverage point in the conscious knowledge that the others have been

⁷⁰ For example see Geels' (2010) argument and the surrounding discussion in the *Integral Meta Discussion* section of Chapter 3.

considered. Similarly, the argument can be extended to consider the interplay between such areas, consider other conceptual lenses, consider theories better described and conceptualised from other facets of integral theory such as states and types. That is, decision-making is likely to be well served by deliberating around all factors before focusing on a subset of the whole.

Despite it being potentially challenging to manage multiple feedbacks, as described by the diverse theories and conceptual lenses outlined in the previous chapter, another analogy could be apt:

Why only run to first base? Didn't we see the flow that led to the home run potential?

Or rather, if we can help create systems that shift our capacity to interrelate with the problems and challenges around us, such that we enhance skill, leadership, capability and agility to craft elegant answers, why would we not do that? Reaching toward an integral action loop framework is this thesis's contribution to help manage that. It is also a response, to the argument in this section, that prioritising any particular singular set of approaches or theories is likely to be suboptimal. Additionally, it offers potential to address the separation outlined at the start of this section - integrating ourselves, and our understanding, with the physical and subjective influences around us to more consciously reach to what we maybe are becoming. The next section develops the integral action loops.

Integral Action Loops

We have got to meet folks where they are... I don't always lead with the climate change issue because if you right now are worried about whether you've got a job or if you can pay the bills, the first thing you want to hear is how do I meet the immediate problem? One of the hardest things in politics is getting a democracy to deal with something now where the payoff is long term or the price of inaction is decades away. What we've tried to do is continually find ways in which we can make progress, recognising that we're not immediately going to get people to abandon the old gas-guzzler [because] they can't afford an electric car.

Barack Obama quoted in Thomas Friedman, Obama on Obama on climate (2014)

This section is a proposition on integration to assist in the analysis and application of appropriate knowledge in a given situation or circumstance. It very much reflects the subtitle of this thesis “an exploration towards *integral action loops* to apply our knowledge for sustainability success”. That is, the proposed integral action loops are a product of the research and analysis to this point in the thesis, as opposed to being a destination around which the whole investigation is structured - this framework has emerged from the data and theories. Research in the chapters to date suggests that a full range of integral theory concepts are needed to encompass theoretical and practical approaches for enabling sustainability. Moreover, the dynamics and structures of learning and action tend to sit outside integral frameworks or, perhaps more accurately, run through multiple aspects of this meta-theory model. For understanding and implementing change, we are necessarily interested in such dynamics.

Consequently, this section proposes that the structure developed in Chapter 6's *Loop and Lens Analysis* section can be refined into integral action loops. Such an approach may give us a framework to manage, and work with, dynamics and interplays between the multiple theoretical conceptual lens that are relevant for sustainability interventions. That is, a

framework in which loop learning operates between concepts, as they are correlated across different parts of integral theory, can give us an integrated map for theory analysis and application.

For the loop learning aspect of this there is a substantial history where such mapping is influential. As discussed in Chapter 6, the single, double and triple loop learning clarification has a history of development and Chris Argyris and Donald Schön's single and double loop learning concept is a prominent model (Argyris & Schön, 1978).

The Chapter 6 *Loop and Lens Analysis* section discussion looks for underpinning structures. It summarises conceptual lens relationships using learning loops - see Figure 6.3 - analysing sustainability related theories and change ordered by cycles of single, double or triple loop learning, as well as individual or group focus and subjective versus objective emphasis - integral quadrants.

For the analytical purposes of that chapter, it looks for the deeper mediating structures, thus flattening its scope in the objective systems spaces (upper and lower right quadrants).

The loops are:

1. First loop learning and feedback is acting to change specific observable practices. For a group, it is shifting structures, processes and interchanges.
2. Double loop learning and feedback changes the individual's capacities, works with their assumptions and cares, and engages capacities to consider more complexity and uncertainty. At a group scale, it is changing that group's relationships with others - what were norms - and reforming what that group may collectively see as possible.

3. Third order learning and feedback reconceptualises one's vision and meaning-making systems, a relational step change to a new equilibrium.

In addition to that chapter's analysis, unpacking the objective system side (upper and lower right quadrants) is possible as well - a clear sustainability problem example is addressing industrial pollution. The conventional approach, for industry, is an end of pipe solution. The pollution, once it is created, is captured before being released into the environment with, for example, an exhaust gas scrubber or in a wastewater settling pond. The concentrated residue is stabilised and/or removed and treated, a process that is often problematic (Divecha, 1990; Thorpe, 1999).

These end of pipe solutions can be expensive and are not necessarily full solutions. Thus, to deal with pollution issues more efficiently, an alternative is clean technology. With clean technology the way in which the product is produced is reconceptualised resulting in a significant reduction in the amount of pollution created (Hart, 1997). For example, parts and manufacturing steps are redesigned so that toxic solvents are no longer needed. Therefore, there is a far smaller need, or none at all, for the end of pipe solution. However, it is not uncommon for the product itself to be toxic, problematic or difficult to dispose of. Clean technology alone does not deal with the created product's sale and use. Consequently, there is a third layer where the whole cycle of production and waste is changed such that the product is either no longer needed, or it is not toxic and part of a closed loop reuse system. This third step has been labelled as clean production (Divecha, 1990). Changes like these are observed in practice with companies, such as Interface, acting across the whole production system to redesign and reconceptualise its relationship with customers and shift from supplier to a servicing industry (Anderson, 2009).

The three steps outlined for addressing physical waste: 1 - end of pipe; 2 - clean technology; and, 3 - clean production can be thought of as a triple layer of change:

1. Single loop problem solving that deals with the issue and products.
2. Double loop problem solving that changes the production system.
3. Triple loop problem solving that reconceptualises the product and redesigns the system.

Learning, such as these physical, problem solving, orders of sustainability, is apparent in the case study material. For example, at the development company, Carrie describes how it is aiming to market and brand its products - see her quote in the *Development Company* subsection of Chapter 6. This is in the nature of first order (single loop) problem solving, dealing with the product directly. Jules, similarly, in the same section refers to the company's leadership projects - standout buildings and the marketing image this creates for the organisation.

As a second order (double loop) example, at the insurance multinational, Selene describes shifting the production system through working with suppliers and sustainability criteria - see her quote in the *Insurance Company* subsection of Chapter 6.

The orders are also present from a theory perspective. For example, the *Conclusion and Discussion* section of the common pool resources chapter (Chapter 5), touched on the correlation between institutional variety and nesting with governance holarchies (stages) and lines. As they are discussed in Chapter 5, these concepts tend to be first order physical structures dealing with responsibilities across different institutions and multiple layers of

allocated authority. That is, they were correlated to a first order holarchical structure dealing with the allocation of rules and responsibilities.

As a second order example, *Principle 3 - Analytic Deliberation* is formed around the notion that most individuals affected by the resource regime are engaged in co-creating and modifying its rules. This reaches towards changing the manner in which the users effect the system, second order. Theoretically, these discussions could reconceptualise how all users engage with the resource and impact on it (similar to clean production and a third order example). In short, such objective system parameters clearly exist alongside the subjective structures, theories and underpinnings.

Consequently, to create an encompassing map, loops of change need to conceptualise approaches within both subjective and objective spheres. I propose that these can be usefully organised across all quadrants, as well as lines, states and types. To develop this structure, Figure 7.1 (on the next page) illustrates it using quadrants, from the discussion above, and selected conceptual lenses from the *Loop and Lens Analysis* section of Chapter 6.

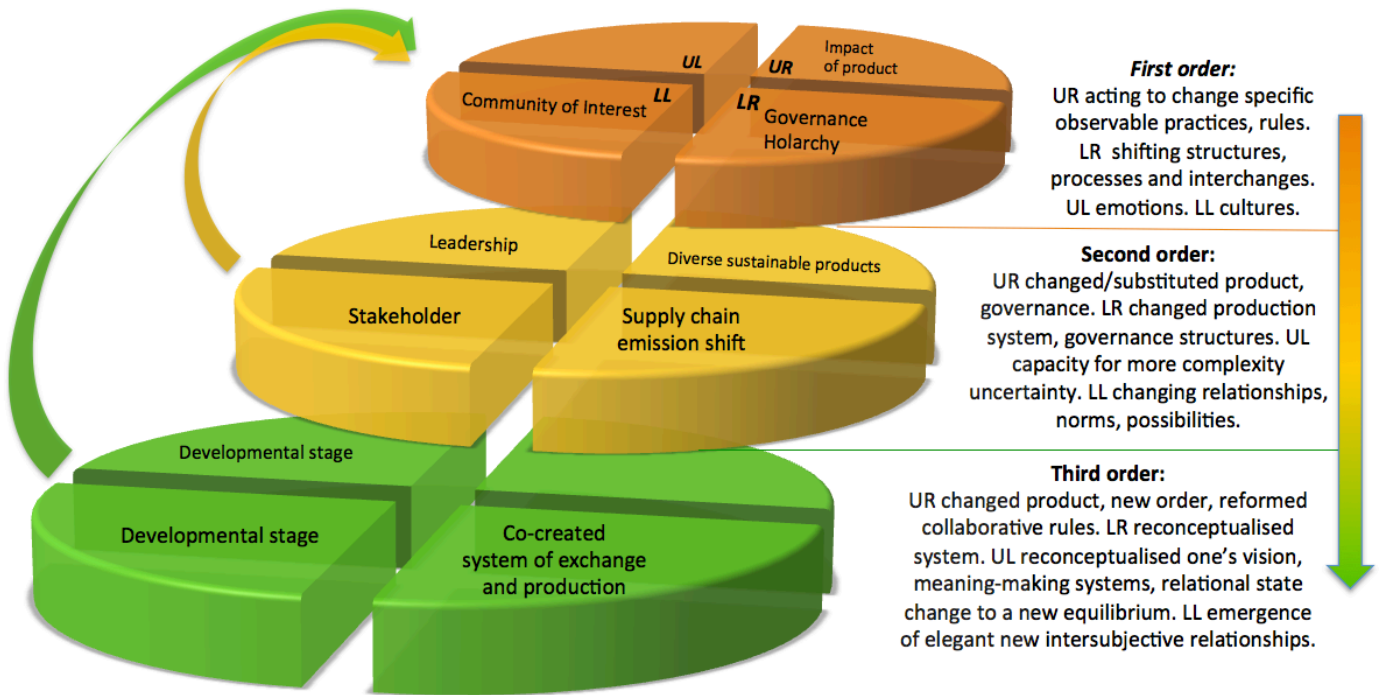


Figure 7.1: Integral action loops.

Figure 7.1 illustrates the arguments to this point. It orders key relationships by considering and analysing for interrelationships and underpinning influences. The ordering can assist the consideration of interplays and the influence of action in a particular area on other factors, and vice versa. For example, the insurance company multinational reformulated its sustainability policy around five levers. This is a distinct policy (first order governance holarchy - see above) but it also linked to an organisational developmental stage shift (third order - see discussion in *Insurance* subsection of Chapter 6).⁷¹

⁷¹ Note that the organisational development stages, as currently described in the *Constructive Development Theory and Organisation Stages* section of Chapter 6, have facets in both subjective and objective (lower left and lower right) quadrants. For simplicity, in this exploration of integral action loops these stages are just shown in the lower left. Similarly, as illustrated in the *Organisational Sustainability Stages* section of Chapter 6, a shift from early to late stage sustainability can involve reconceptualising the whole approach to production and systems. Physical holarchies are consequently considered here as outlined in the text above, see the governance holarchy example.

As already discussed, clearly multiple conceptual lenses and frameworks can be appropriate. A reasonable approach to the diversity is to recognise that this will always exist. If something is prominent, and resonates widely with a target group, it clearly may help to enable change. However, the consequences of such a focus, as well as analysis and thought related to inquiring into potential unintended outcomes, are also important.

The proposal here is that clarity around the interactions of theoretical and practical approaches may open opportunities for enhanced success within the groups engaged. Additionally, it may allow change to be more easily replicated - the generalised approach clarified through an overview with these integral action loops should allow learning around the more abstract concepts, theories and practices. In turn, this can be adapted to specific different situations using a model such as this. Clarity, around our own being and what we are becoming, as touched on in the section above, is aided through exploring how we interrelate to the systems and phenomena around us and the order of influences these might have.

The next section, *Integrated Analysis and Integral Action Loops*, explores further. It does this through considering the fit of such a model onto some of the prominent outcomes, aspects and theoretical correlations seen within one of the case study multinational companies.

Integrated Analysis and Integral Action Loops

This section considers the diversity and variety of conceptual lenses that may be appropriate to a company's activities at any given point in time. It does this to take a further step in developing integral action loops. As the research in this thesis is, in part, an

exploration towards this concept, the section also touches on topics for further research.

These are picked up on in the next chapter.

Discussion about the insurance multinational, in the section above, touches on actual outcomes and policies - objective measured sustainability related matters. Additionally, in the preceding chapters, significant aspects of this company's activities, or the way in which sustainability is conceptualised, are correlated to developmental stages. For example, there are aspirations for changed practice in line with organisational stages. Beyond this, the principles correlated with successful common pool resource protection are also seen mirrored in descriptions of what interviewees regard as effective sustainability.

Developmental stages and common pool resource principles are focused on in this research as they either appear to be underpinning mediating frameworks or form a deep case history around success that could be learnt from. The development in this section is to see how well all these concepts, subjective and objective, first, second and third order loop learning, might be integrated in a model.

In proposing integral action loops, there is an implicit promise that it can assist to make dynamic interplays clearer by ordering concepts vertically around the depth of shift as well as classifications across and within layers. To examine this in a practical context, Figure 7.2 (next page) draws out a few of the prominent themes and applicable theories derived from the insurance company discussions. This is followed by a short analysis below the figure to explain the points that have been highlighted and linked in this diagram.

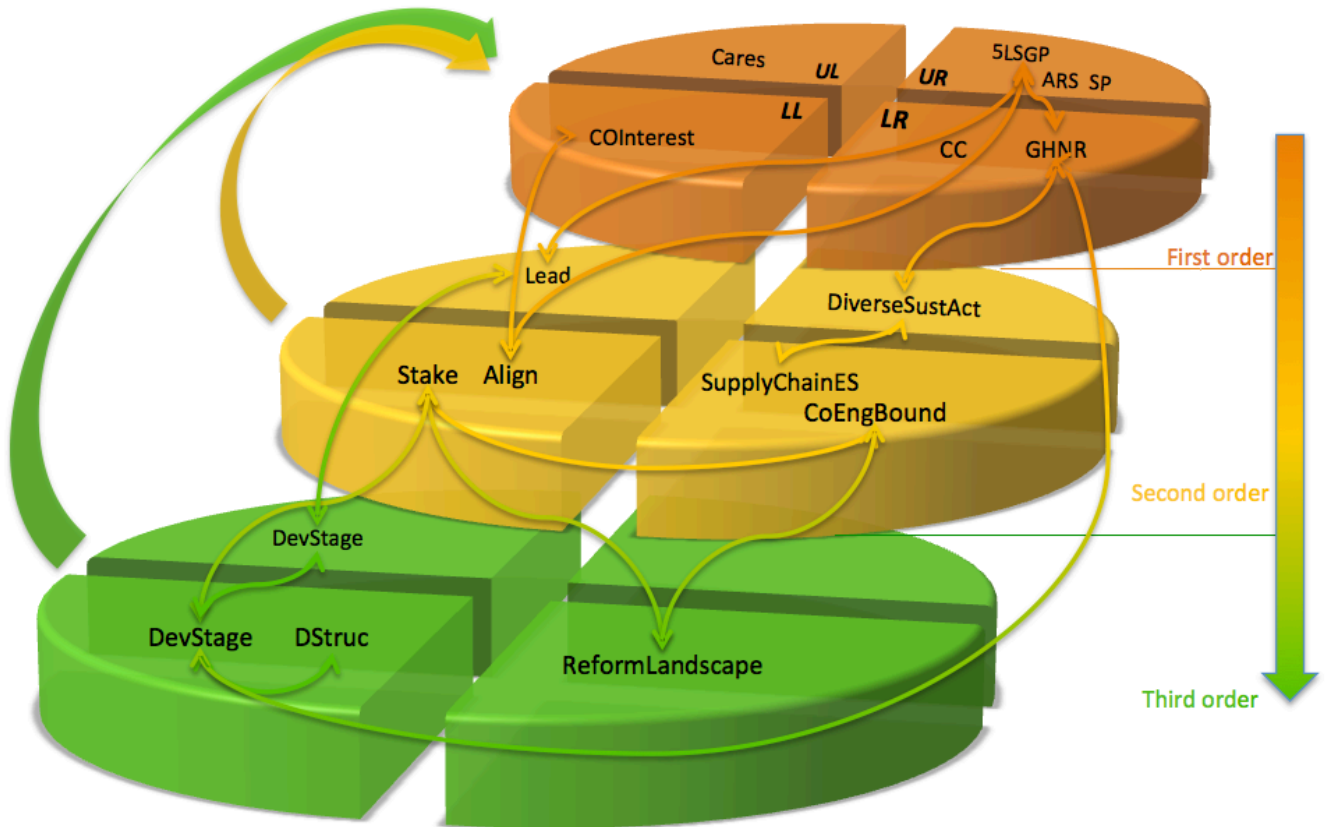


Figure 7.2: Integral action loops inquiry looking at some of the important priorities, actions and outcomes, as discussed by the insurance company interviewees, and the theories that characterise them.

Key:

5LSGP - Five Lever Sustainability Governance Policy; ARS - Accountability Rules Sanctions; SP - Sustainable Products; GHNR - Governance Hierarchy of Nested Responsibilities; CC - Capital and Costs;

Cares - Cares; COInterest - Community of Interest;

DiverseSustAct - Diversified Sustainability Actions;

SupplyChainES - Supply Chain Emission Shift; CoEngBound - Company Engagement

Boundaries; Align - Alignment; Stake - Stakeholder; Lead - Leadership;

ReformLandscape - Reforming Product and Market Landscape; DevStage - Development Stage; DStruc - Deep Structures.

This figure draws on quotes and discussion across the whole thesis and Table 7.1 lists key cross references for each highlighted point. As stated above, the aim of this section is to

illustrate the integral action loops. Comprehensive analysis is considered in Chapter 8 on *Further Research Directions*. With the aim of illustrating the integral action loops, the discussion, in the *Figure Analysis* subsection below, focuses only on the Figure 7.2 points linked by arrows.

Key	What	Discussion and/or person	Section and chapter
5LSGP	<i>Five Lever Sustainability Governance Policy</i>	Morris	<i>Insurance Company</i> subsection Chapter 6
ARS	<i>Accountability Rules Sanction</i>	Arena	<i>Principle 2 - Devise Rules and Principle 5 - Graduated Sanctions</i> subsections Chapter 5
SP	<i>Sustainable Products</i>	Carrie	<i>Development Company</i> subsection Chapter 6
GHR	<i>Governance Hierarchy of Nested Responsibilities</i>	Arena	<i>Principle 8 - Nesting</i> subsection and <i>Conclusions and Discussion</i> section, Chapter 5
CC	<i>Capital and Costs</i>	Subjective vs. Objective drivers	<i>Loop and Lens Analysis</i> section Chapter 6
Cares	<i>Cares</i>	Subjective vs. Objective drivers	<i>Loop and Lens Analysis</i> section Chapter 6
COInterest	<i>Community of Interest</i>	Arena	<i>Principle 7 - Institutional Variety</i> subsection Chapter 5
Diverse-SustAct	<i>Diversified Sustainability</i>	Morris/Lakshmi	<i>Insurance Company</i> subsection of Chapter 6 / <i>Principle 6 - Conflict</i>

	<i>Actions</i>		<i>Resolution</i> subsection of Chapter 5
Supply-ChainES	<i>Supply Chain Emission Shift</i>	Mel/Selene	<i>Initial results</i> section Chapter 4, <i>Principle 2 - Devise Rules</i> Chapter 5 / <i>Insurance Company</i> subsection Chapter 6
CoEng-Bound	<i>Company Engagement Boundaries</i>	Lakshmi	<i>Principle 7 - Institutional Variety</i> subsections Chapter 5
Align	<i>Alignment</i>	Leanne	<i>Final Results</i> section Chapter 4 and <i>Principle 4 - Accountable</i> Chapter 5
Stake	<i>Stakeholder</i>	Integrating Sustainability Stages	<i>Integrating Sustainability Stages</i> section Chapter 6
Lead	<i>Leadership</i>	Morris and Loop and Lens Analysis	<i>Insurance Company</i> subsection Chapter 6 and <i>Loop and Lens Analysis</i> section Chapter 6
Reform-Landscape	<i>Reforming Product and Market Landscape</i>	Organisational Sustainability Stages e.g. Beloe	<i>Organisational Sustainability Stages</i> section Chapter 6
DevStage	<i>Development Stage</i>	Leanne and Damara /Individual and organisational	<i>Final Results</i> section Chapter 4 / <i>Constructive Development Theory and Organisations</i> and <i>Stage and Study Companies</i> section Chapter 6
DStruc	<i>Deep Structures</i>	Fundamental set of views. E.g. formation as mutual society	<i>What, where</i> subsection Chapter 3, <i>Loop and Lens Analysis</i> section and <i>Both Companies</i> subsection Chapter 6

Table 7.1: Cross references for insurance company integral action loops analysis.

Figure Analysis

The starting point for Figure 7.2's illustration is from one of the substantial pieces of research in this thesis. In Chapter 6, I looked at organisational stages and how these describe sustainability action. There is a strong link between such stages and a physical policy, the insurance company's five levers policy and how it enables sustainability outcomes across the organisation - see the *Insurance Company* subsection of Chapter 6. This is the top item in Figure 7.2 - *five lever sustainability governance policy*. Morris's first quote in this *Insurance Company* subsection expands on the policy's nature and its application.

As a policy, it is a first order interaction and quite closely related to enabling decision-making at appropriate levels (*governance holarchy of nested responsibilities*).⁷² Arena, for example, explains this in action saying "*the business units' CEOs have the ability to tailor the implementation*" - see the table above for the cross reference. There is thus a direct arrow between the levers and governance holarchy in Figure 7.2.

The influence of this policy is related to second order interactions. It enables changed relationships and localised actions or, more specifically, decision-making in subunits of the company allows for the complexity of different situations to be incorporated - *Diversified Sustainability Actions* in the figure. For an example of the importance of this see Morris's second quote, around appropriate engagement "*as close to the end consumer of our product as possible... but... within a framework*" (see Table 7.1 for cross reference). A first

⁷² See the table, on the right hand side of Figure 7.1 Integral Action Loops above, for a consolidated list of first, second and third order change characteristics.

order application of sustainability policy might simply have tried to directly apply centralised rules and may have met the sort of difficulties described by Lakshmi in Chapter 5's *Principle 6 - Conflict Resolution* subsection.

The company individuals describe how this five lever policy has created latitude for second order redesign. For an example, see Selene's discussion about working with suppliers to shift more than just the products (introduced in the section above of this chapter). Mel also describes a specific case, creating a *supply chain emission shift*, a policy implemented with the company's smash-repair suppliers - see table for cross reference. As a collaborative co-designed venture it is of the nature of a second order shift - creating a changed production system.

On the second order subjective side the *leadership* implications of the five lever policy are clear. For example Morris, a company leader, highlights the task around "*trying to show our people that it's logical and how those levers actually fit*" and that differentiation is appropriate in specific circumstances "*it's trying to say, where it makes sense, do it separately. But where it makes sense, collaborate*" - a level of leadership complexity that is better described as a double loop like adaptive approach to complexity, rather than applying a one size fits all, single order, appeal. Others, in the *Insurance Company* subsection of Chapter 6, elaborate on this task (e.g. see Arena's quotes related to *Beyond Systematic Productivity*).

With this leadership, there is a focus on delivery through *alignment* as well. For example, Leanne describes a "*clear strategic alignment model*" and enabling outcomes, partly through shared belief. At a more direct level, the link from *alignment* to *community of interest* is described by Arena. She discusses how engagement across company individuals

may help to shift people through a collective focus on specific matters. The *community of interest* is represented as first order for this relatively direct intended outcome - shifting a structure for attitude changes. Further investigation might reveal deeper shifts - see Table 7.1 for the cross-references.

The cross-references to preceding chapters, in the discussion and table above, show that the first and second order foci also have *Developmental Stage* dependencies or interactions. Individuals and organisations correlated with later stages may enable, or could be essential, for changes. For example, see the *Introduction* section of Chapter 4, or the insurance company's aspirations for sustainability that correlate with the next organisational development stage (*Stage and Study Companies* section Chapter 6).

Similarly, viewpoints of the five levers are likely to differ across action logics correlated stages. For example, in a strategist correlated quote, Leanne explains subtle ordering of intangibles measures - such as belief - to gauge meaningful delivery of corporate policy (*Final Results* section Chapter 4). However, sustainability expressed in an achiever linked style (Damara, same section), is about a subtly better tomorrow but categorised against concrete outcomes for the generations to come. Sustainability leadership, on this basis, appears more likely to be successful if it is incorporating both the concrete and the subtle differentiations related to these perspectives. At the very least, broader action logics framing could resonate more widely, across differentiated people, within and external to the organisation. Consequently, there are feedbacks shown from the *Developmental Stage* to *Leadership* concepts and on to the five lever policy.

For the other components in the figure, the discussion in Chapter 6's *Integrating Sustainability Stages* section illustrates *Stakeholders* links with *Developmental Stages* - the

latter describing new intersubjective relationships as the very nature of how stakeholders are viewed, and the company relationship to society, shifts - third order correlated changes. Additionally, that section discusses the reframing of scale and scope related to how the organisation might engage. This is also described through a number of sustainability stage models in the same chapter's *Organisational Sustainability Stages* section. There is thus a link between the *Stakeholder* concept and *Company Engagement Boundaries*. The notion that this might *Reform Product and Market Landscape* is seen in Beloe's model, fifth stage (see table for cross reference) connecting this reform concept to *Stakeholders* and *Company Engagement Boundaries*.

Deep Structure's relationship, such as company perspectives based around its formation as a mutual society over a century ago - a fundamental set of views of relevance to *Developmental Stages* - are discussed in the *Both Companies* subsection of Chapter 6. There's some evidence, in this subsection, that such structures may be foundational at early organisational developmental stages. The relationships between *Developmental Stages*, *Leadership*, *Stakeholders* and *Deep Structures* also draw on the discussion in the *Loop and Lens Analysis* section of Chapter 6.

Summary

This short illustration demonstrates dependent interactions. There is clearly greater detail that could be investigated and the next chapter, *Further Research Directions*, touches on this. However, for the purposes of this chapter, many of the parts in these loops may be catalyst points. A simple example is the shift in company engagement boundaries could set the groundwork for a more fundamental reconceptualisation of products and markets (*Reform Product and Market Landscape*). The integral action loops could help practitioners

consider points of intervention, or priorities, appropriate to current circumstances. That is, it might be effective to focus on structures that integrate stakeholder views into company decision making with longer term product/market reconceptualisation aims. The *Analysis and Action Opportunities* section, of the next chapter, expands on how this could be applied to a range of institutional sustainability transformation topics and needs.

The proposal from integral action loops is that through mapping the layers of such interaction (mentally or as a structured practice), the dynamics are far easier to reveal, key points of tension or difficulty may become more apparent, and short and long term strategy for substantial shifts can be linked to such multilevel analysis. Knowing where theoretical structures may be relevant should help to focus investigation, position leadership or communication. Thinking about the complexity of change and sustainability lenses covered in this thesis through the orders, extent, depth and expansiveness of transformation, shines light into important interrelationships - a model to manage the complexity.

One other facet of an analysis like this is pointing to areas that are worth investigating more deeply. For example, stakeholders are shown in the figure in the lower-left for the feedback on group relationships and shifting what is regarded as normal. However, the influence, or importance, of such concepts broadens out across all quadrants. The integral action loops are a schema partly about deciding, or agreeing, on key areas of focus and investigation. Should this be stakeholders and sustainability, for example, it would then lead you to some of the mid-range theory depth outlined in Chapter 6's *Integrating Sustainability Stages* section.⁷³

⁷³ While this discussion has focused on the depth of change and quadrants, as outlined in Chapter 3, there are states in which such action may be appropriate, as well as multiple lines, alongside types, that are worthy of

That is, a point of this work is not, necessarily, to be reductionist. In the context of meta-theory, maximal simplicity might not be maximal generality (Nowland & Divecha, 2014). There is a danger that orientating generalisations, such as integral theory or these integral action loops, can become disorienting over-generalisations (Riedy, 2011b).⁷⁴ Despite this, we need to encapsulate work, and the dynamics of shifts, as we consider particular sustainability outcomes in a wider context of how this may assist (or not) larger group, company or overall society shifts (or other groups on a smaller scale for that matter). I would argue that making connections, deriving influences and understanding how the relative importance of particular approaches shift over time, and with any interventions, are essential in light of the nature of sustainability challenges. These challenges demand transformative change (O'Brien et al., 2013). Such transformations are needed at depth with mindset change. They may occur in response to ethical demands. They are structured with evidence on affordability, technical capability and much more, and the interplay between all of this leads us to move beyond envisioning new systems, alongside standout case examples - be they physical, social or personal - to mass implementation. I believe the integral action loops will be helpful to both create and understand what we are becoming, and need to be, for flourishing sustainability transformations.

inclusion. Some of the rationale for this is touched on in the opening discussion of this chapter. For example, it may be that some of these interventions are laying foundations such that the organisation can quickly respond when external or internal conditions meet a given state. This is an area for further research returned to in the Chapter 8.

⁷⁴ The issue of how general a theory is versus specific usefulness has been a theme throughout the thesis. For example, this occurs in Chapter 5 on abstracting principles around common pool resources, Chapter 6 critiquing stage models and that same chapter's loop learning section. The integral action loops are, in part, a framework arising from thinking about how to work with this tension.

Conclusions

This chapter has drawn together some of the key arguments from the thesis. Its focus is on what value this research could add to the dilemmas described throughout the research. Its major premise is that there are strong theoretical frameworks, to which this research adds, and that the application of any theory or group of sustainability models depends on specific circumstances. Meta-models, such as integral theory and integral action loops help to reveal connections and can aid the application of knowledge, alongside analysis, for best effect.

Each of the research chapters highlights key leanings revealed by the research and this is supported by further consideration as the concepts are used across the whole thesis. In brief the highlights, structured by the most relevant chapter, are:

Chapter 2 - Integrating meta-theory, including integral theory, with mid-range theory is an appropriate approach for a topic such as sustainability. This subject spans multiple physical, conceptual and time scales, issues that are present regardless of focus. For example, in this thesis, with two multinational companies regarded as sustainability leaders, even focusing on just one facet - such as climate change or energy efficiency - still requires broad scale consideration. Integral theory is useful for making sense of the topics being considered and triangulating across my own and other's meaning-making, as well as the theoretical structures relevant to these issues.

Chapter 3 - Energy efficiency, as a subset of sustainability, reveals a set of conceptual lenses through which this topic can be viewed. Integral theory, and its quadrants, levels, lines, states and types structure encompasses, and can assist to order, many of these lenses. A smaller subset of such lenses may be related to integral theory but need further consideration (in Chapter 6).

Chapter 4 – Action logics appear to be a fundamental mediating and underpinning theory through which we can help ourselves to understand how we make sense of sustainability. Statements about sustainability, correlated to different action logics stages have distinctly different framing. Consequently, the theoretical link between this framing and individual meaning making may offer the potential to overcome barriers and enable more successful action. This may occur, in part, through the recognition that a range of people may make sense of sustainability in markedly different but characterisable manners.

Chapter 5 – Common pool resources principles, drawn from decades of research into successful resource protection institutions, communities or groups, can be correlated with interventions and sustainability efforts undertaken at the two multinational companies. These principles resonate with what the individuals describe as, and associate with, successful sustainability outcomes. Additionally, these principles can be structured in an integral theory framework (particularly governance and social system holarchies), suggesting that this meta-theory will help to distinguish the structure and apply it in a business context.

Chapter 6 – Describes a hierarchy of interaction drawn from single, double and triple loop learning. Structuring key theories and concepts, using such loop learning and integral theory, opens a window into the interrelationships between theoretical lenses. The resulting map shows that organisational developmental stages are likely to be a significant underpinning consideration, similar to action logics, for describing individual meaning-making. The chapter investigates these organisational development stages finding that shifts described by these levels correlate to the companies' sustainability framing - including

interviewees describing the next steps, viewed as necessary for success, mirroring a developmental stage shift upwards.

Chapter 7 – This chapter suggests that a framework, integral action loops, can help us manage through greater complexity. This offers the potential for analysing different driving factors and theories to look at a set of interrelationships. The map of these may assist us to dynamically adapt to the interplay between such factors, and change, as sustainability initiatives are undertaken. For example, these integral action loops may help clarify when it is relevant, and appropriate, to explain and implement an intervention or analysis based around powerful fundamentals such as action logics. The analysis may help clarify the role of stakeholder interactions as engagement changes the views of the stakeholders - just as the organisational stage structure may shift, or be deliberately worked with, for capability and capacity.

Thus, I believe, this thesis helps to highlight where there can be deep effective changes and assists us to think about appropriate times to target different theory and practice foci. I do not argue for a singular focus or blanket application of any of the general powerful principles or frameworks discussed. However, I do suggest that a fuller capacity to understand the interrelationship and profundity associated with sustainability - such as through using a model like integral action loops - is necessary.

There are logical parallels. The belief that we need evidence to act, or more specifically will act with evidence of financial reward, is instructive. Throughout this thesis, there are many examples of where such evidence may be necessary but is not sufficient, or even not particularly relevant in the light of other society drivers.

Evidence, be it models proving humanity's greenhouse gas emissions are highly likely to change the climate or economic analysis demonstrating profitable low risk outcomes, should be applied to our broader experience - but these are only part of the picture. Moreover, we know such empirical evidence has been insufficient to shift society at rates anywhere close to optimal. This leads researchers of many persuasions, including those familiar with integral theory, to argue that it is imperative to include human subjective experiences in efforts to create sustainability change and transformation.

The same logic should also hold around any interaction in which we struggle to connect people and measures. More of the same, such as pointing out flatland, the need to consider subjective human perspectives or compelling action logics structures, may not be the best answer. A dynamic integral action loops analysis may help shift from this more static framework to one that assists working with the key catalysts in a given situation, or group, as well as to evolve long-term strategy setting.

Integral action loops also may offer us a way to reconnect with the dynamic discussed at the start of this chapter. The conceptual separation from climate change and what it can do for us, and is doing for us, could become a set of loops intersecting with climate, biosphere and society variables.

The next chapter explores further research that can build on, and operationalise, some of this potential.

Chapter 8

Further Research Directions

Introduction

In the Terrain of Systems, there are a number of well-established contributors to climate change. These include rampant globalisation, outdated political dynamics, ineffective education, poor regulation enforcement (e.g. of international treaties and national pollution laws), short-term policy formation, fragmented ecological analysis, politicised science, technological limits, international disputes, lobbying interests, legal barriers, an entrenched fossil fuel economy, disciplinary barriers, massive scientific complexity, very little global infrastructure, limits of climate models, social bureaucracy, and historical dynamics... The IPCC reports do a great job of mapping out many of these systemic causes. [However there are other perspectives to consider and] responding to climate change will require many people working in each of these domains for many years. An Integral approach allows us to begin to see this dynamic landscape and to begin to coordinate between and across variables.

Sean Esbjörn-Hargens, An integral overview of climate change (2010b).

This research has reached across a wide range of theory on its journey to the integral action loops model. As discussed in the previous chapter, these arose partly from the disconnects between human factors and measured approaches that quantify challenges and opportunities. The need for such a framework also became apparent in Chapter 3's analysis of energy efficiency and throughout the discussion of the multiple models that I, and others, use to consider sustainability changes (Chapters 4 to 6). In particular, the dynamics between different conceptualisations, or focuses that can describe effective sustainability change for a given circumstance at a particular time, raise important questions - for example, how and when, if ever, does the influence of key stakeholders and leaders result in an organisational or personal action logics stage shift?

Chapter 7 proposes integral action loops as a foundation to ordering and understanding relationships to answer question like the one in the paragraph above. Integral action loops should help us understand how different approaches, and theoretical focuses, play together and influence each other, aiming to assist intervention, investigation and practice. However, as outlined at the start of the last chapter, the integral action loops emerged from the thesis research. There are consequently a number of future research opportunities this short chapter discusses.

To consider these further research directions, the next section, *Analysis and Action Opportunities*, focuses on the integral action loops. It summarises research that can be considered and it illustrates opportunities by discussing gaps that became apparent during the course of my thesis work.

The concluding section, *Other Important Research*, outlines areas for future investigation identified throughout the preceding chapters of this thesis.

Analysis and Action Opportunities

A substantial proportion of my thesis has focused on some powerful underpinning frameworks - stage development holarchies - and other theoretical structures, particularly those related to integral quadrants. For example, with respect to quadrants, this research has covered the importance of subjective and objective disconnects, paradoxical responses and rational versus observed action gaps that run deep. Deep enough for some to conceptualise the gap, between social reality and technical potential, as a chasm (Shove, 1998).

These types of gaps have been apparent through a range of the texts. Chapter 7's *Discussion* section highlights the relative importance of such a disconnect, as well as the need to address sustainability through approaches that comprise more than a list of factors - that is, considering how such different perspectives may all influence each other. I will illustrate this further by considering a particularly important intervention and enhancement around prominent leadership cases. These became apparent throughout the literature reviews in this thesis and particularly during Chapter 3's meta-theory analysis - for example, some texts have a strong objective focus. As the quote that introduces this chapter illustrates, organisations such as the Intergovernmental Panel on Climate Change do outstanding work in the measurable systems space (the lower-right integral quadrant). An open question is the extent this leading work can impact more deeply through a broader consideration of human subjective factors. Similarly, global institutional approaches like the International Monetary Fund and International Energy Agency undertake vital advocacy and research on climate change (e.g. IEA, 2006; IEA, OPEC, OECD, & The World Bank, 2011; Lagarde, 2013; Lipton, 2013). I am suggesting that engagement, structured through processes such as integral action loops, may help to mainstream human and social considerations that are already initiated within these international groups (e.g. Chatterton & Wilson, 2012 ; Churchouse & Mahoney, 2012) such that the overall impact, of all the work, is enhanced.

Commentary, on the need for joined up research occurs from a broad range of areas such as calls for interdisciplinary approaches (Bhaskar, Frank, Naess, & Parker, 2010) and multidimensional investigations (Geels, 2011). In more specific areas limitations from a narrow approach are noted as well. For example, Abrahamse, Steg, Vlek and Rothengatter. (2005) review 38 psychological studies into behaviour change addressing energy efficiency.

They note *“Interestingly, most studies focus on voluntary behaviour change, by changing individual knowledge and/or perceptions rather than changing contextual factors (i.e. pay-off structure) which may determine households’ behavioural decisions... underlying determinants of energy use and energy-related behaviours have hardly been examined”*.

Similarly, Lorenzoni, Nicholson-Cole and Whitmarsh (2007) find that *“in relation to behavioural change, the literature focuses predominantly on energy reduction actions irrespective of the motives underlying these”*.

To widen the focus, considering the interplay between multiple factors may be useful in its own right. Additionally, by structuring theoretical and practical approaches in this way it may help to engage researchers and practitioners - raising the value and benefits of considering other bodies of work for them. My speculation here is that there is no simple ranking of what is right and most important - this is a dynamic, time and situation dependant, consideration. However, it is clear that there are different layers of influence - the orders from integral action loops. Thus, engaging around the influences between bodies of work, as opposed to definitive priorities, should create a container for more inclusive input and consequently more engagement from a diversity of practitioners. There are precedents including good examples where authors argue many different internal and external influences should be weighed (e.g. Burke et al., 2010; Swim et al., 2009). Research scans across a wide range of fields (e.g. Hirst & Brown, 1990; Weber, 1997) but multiple factor systems, considering important intervention points among such components, are less common. Highlighting key foci does occur in specific industry sectors. For example, Rohdin, Thollander and Solding (2007) research the Swedish foundry industry. They start at a broad base of individual and collective drivers, as well as considering subjective and objective,

ranking the importance of the various barriers and highlighting the two most significant. They conclude with a discussion of how this might influence one other important area (technical energy use information for foundries). However, a broader consideration or intervention around dynamic interplays of factors might assist to reshape and transform the industry.

An integral action loop approach is not the only structure for this. Some, such as Ulli-Beer, Grösser, and Wokaun (2011) test inter-subjective framing as a starting point for causal loop analysis modelling of systems dynamics. Similarly, others build integrating factors - such as catalysts, innovation, individual outlook, governance, social acceptance - into a multilevel framework (Geels, 2010; Verbong & Geels, 2007). However, using integral action loops to combine the depth - single double and triple loop orders - across quadrants will, I believe, assist to clarify action points and sift through the layers of approaches, factors and theories that may be relevant. It should allow us to consider what we are attempting to influence, within which specific context, and the scales (sizes and times) over which changes could be best targeted.

Two specific examples, of practical situations where the integral action loops could be applied, follow. Firstly, holistic perspectives appear lacking in very surprising places. For example, the IPCC Working Group III (2007c) has a significant focus on the technological and economic aspects of mitigation. Considering how this might interface with policy demands and social drivers, for effective action based on this evidence, would seem worthwhile. The history of world climate policy, and our efforts in Australia, illustrates the difficulty of generating success around technical arguments alone. As an Australian example, it is generally agreed that market mechanisms are economically efficient measures to cut a

country's carbon emissions at the least cost (e.g Garnaut, 2011). However, Australia's carbon price legislation is, as I write this,⁷⁵ set to be repealed despite ambition, from both of my country's major political parties, to continue to reduce the country's greenhouse gas emissions. There are analogous examples widely discussed in my thesis - such as paradoxes related to economics and rational action, or the lack of it. Consequently, I would argue it is vital to consider how human and technical factors play together - whether this is on national and international scales or a company basis.

Secondly, the discussion in my research touches on lines, states and types, as important structures, but without the space, time or research design to explore these properly.

Building such considerations formally into the model developed in Chapter 7 would be valuable. States, for example, were considered in Chapter 3. They are considered important by researchers and a very recent case may help to illustrate this. The state in question is the opportunity for positive change (some disagree) presented by recent political events in Australia. In June 2014, Clive Palmer - a coal and mining business billionaire whose party partially holds the balance of power in the Australian parliament - announced his party's climate policy with the ex vice president of the USA, and nobel peace price winner for his climate advocacy, Al Gore (Tingle, 2014). There may be a collective state related to such a meeting across apparent political divides. This suggests that considering dynamic opportunity, as well as structured change, is important. The integral action loop framework should be capable of extension to help model this.

The core of this integral action loop model is a framework engaging with abstracted generalities from research and providing analysis to consider how existing and developed

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theory is applied within a specific set of circumstances. Ordering with single to triple loop implications of theory and interventions, to consider the magnitude and profundity of change, helps to enable this. Further research in this area could, consequently, include:

- Action research on sustainability initiatives and interventions within a company. This could expand, and validate, the integral action loops framework while assisting to develop worthwhile organisational change.
- Action research, identifying how engagement around a framework, such as integral action loops, can help to engage a wider range of research practitioners. The engagement could measure, and discuss, the usefulness of multiple perspectives, through enabling sustainability results and impact from research efforts, when the interplay of subjective human approaches and measured environmental and economic assessments are combined. That is, does working with the dynamics between human motivation and behaviours, against environmental system models and economics, help to enrol multiple researchers in such a process? Moreover, does this engagement, validating the influence of each sphere on another, make for more impactful effective research (simultaneously addressing individual practitioner needs and constructive global outcomes)?
- An integral action loop analysis of climate leadership opportunities - such as those related to Intergovernmental Panel on Climate Change report releases. Investigations, designed as participatory research, may link the analysis with enhancing the effectiveness and impact from such a report.

- Practitioner engaged research, using these integral action loops, to explain success and assist others in replicating sustainability changes - change in a manner appropriately localised to their phenomena of interest, policies or institutions.
- Engagement to integrate important considerations related to lines, states and types within the integral action loop framework, along with the application of such research.

Any or all of these investigations could be conducted in combination with an exploration into personal human factors - our own and other's change and the multifaceted influences that may be assisting this.

Other Important Research

Throughout this thesis a number of further research opportunities were identified.

Chapter 4's *Conclusions and Discussion* section highlighted a range of applications that can be pursued assisted by the theory developed in that chapter. These include computerised action logics assessment, developmental action inquiry enhancement (including through more effectively validating stage assumptions) and more impactful communication.

Additional research in these areas should benefit our knowledge, as well as the programs, institutions or individuals engaged in any analysis.

Chapter 5 included a discussion on Institutional Analysis and Design (IAD) at the end of the *Critiques and Development* subsection. It would be valuable to look at a company supply chain, and its markets, alongside sustainability products and institutional design through this IAD framework. Such an analysis could deepen understanding and enhance the application of common pool research to corporate sustainability.

In addition, the *Conclusion and Discussion* section of Chapter 5 discusses three of the common pool research principles - numbers 4 - *Accountable*, 5 - *Graduated Sanctions* and 6 - *Conflict Resolution* where the evidence for use, in a business context, is unclear. Valuable insights may be developed for effective organisational sustainability from a research program developed around these principles. Additionally, the section discusses the relevance of the boundary principle (number 1). Further research, related to explicit boundaries, may reveal how today's common pool resource problems clearly define the resource, and if its users are able to separate this from wider social and economic conditions. A set of questions arise about application in today's globalised world. If the principle is not relevant, for example, how is this guideline being transcended such that common resource protection is effective? Similarly, the effective integration of broader social and economic factors may be what enables such protection in today's world.

Applying chapter 5's principles (2 - *Devise Rules*, 3 - *Analytic Deliberation*, 7 - *Institutional Variety* and 8 - *Nesting*), that were strongly correlated to company sustainability, would be worthwhile. In particular, such work could consider how the principles may help to catalyse organisational change. Such an examination could be part of a broader organisational engagement incorporating integral action loop work. Additionally, as discussed in Chapter 5, these principles are relevant for global climate issues. Therefore, similar research, and action related to this, could be developed on international and sub-international scales.

Chapter 6, in the *Conclusions* section, discussed the relationship between organisational stage shifts and individual action logics. This is an area for further research - for example, around the impact of later stage organisations on individual development. Additionally, the chapter suggests that, for sustainability, the entire organisation's developmental stage may

be crucial. It is unclear how an organisation's sustainability stage might lead a whole organisational stage. Moreover, it may be that a multifaceted sustainability outlook is fundamental to later organisational stages. These are areas worthy of further investigation.

Chapter 9

Afterword

Thesis Journey and Reflections

Some Concluding Comments and Suggestions for other Practitioner-researchers

It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet that an increase in the number of well-endowed men and an advancement in the standard of morality will certainly give an immense advantage to one tribe over another. A tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to aid one another, and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection. At all times throughout the world tribes have supplanted other tribes; and as morality is one important element in their success, the standard of morality and the number of well-endowed men will thus everywhere tend to rise and increase.

Charles Darwin, The descent of man (1874)

Everybody is right. More specifically, everybody – including me – has some important pieces of truth, and all of those pieces need to be honoured, cherished, and included in a more gracious, spacious, and compassionate embrace, a genuine T.O.E. (Theory of Everything).

Ken Wilber, A theory of everything (2000c p140)

This chapter is a short discussion of my thesis journey. I am writing it to help illustrate some of the advantages and challenges in working, part time, on a thesis over many years (while in full time employment). I hope, by discussing some of my pathways to this point, others will be assisted to inquire into similar areas.

A paradox, and the continuing deeper nuances and facets of this, have really catalysed this research. As Charles Darwin illustrates, in his quote at the start of this chapter, human society is founded on a lot more than survival of the individual fittest. We collaborate extensively and demonstrate widespread altruistic behaviours, yet a dominant perspective

appears to reach from this notion, around survival of the fittest, into today's defining challenges. For example, many believe we will not act in the group's interest at our own expense (e.g. see the paradox discussions in Chapters 2 and 3). However, we do this widely - our investment in police and governments are only a couple of many examples where we are willing to pay for upholding moral and physical standards that are in our collective interests. Yet, in the face of abundant environmental and climate change evidence that it is similarly in our interest to act, action has not occurred at anything like the rate that would make rational sense.

This paradox is reflected in my personal experience. For example, I was deeply involved in hazardous and toxic chemical waste issues during the early 1990s. The short clean production pollution example in Chapter 7's *Integral Action Loops* section is from this experience and research conducted during this work. The report referenced is a major submission to what was the Melbourne and Metropolitan Board of Works (now Melbourne Water) on industrial waste and alternatives (Divecha, 1990). It followed a Greenpeace action I was central to that closed a pesticide plant for 2 months (Divecha et al., 1990). However, the obvious shifts for systemic change were much harder to make (in the specific case this is growing crops differently so the pesticide produced at this plant becomes unnecessary).

It was clear we could articulate and demonstrate, backed by case successes and examples, how significant sustainability shifts can be managed. This evidence, and practice change expertise, has been apparent over the intervening decades (e.g. Divecha et al., 2009; Hawken et al., 1999; von Weizsäcker et al., 2009; von Weizsäcker et al., 1997). Change, however, is significantly slower. As a practitioner in the early 1990s, I would have valued

structures to analyse a wide range of approaches, create a dynamic map of fulcrum points and engage for best effect. At the time, the great difficulty involved in even having a discussion related to clean production with government or industry tended to reinforce polar approaches - a source of some frustration. It appears to me, in hindsight, that having effective models to map and conceptualise many of the interrelated variables relevant to the issue would have been of great assistance. It may have aided working within the art of the possible, smaller changes around end of pipe solutions, while strategically managing the groundwork for far wider reaching and necessary redesign. On the specific case just outlined we saw a sea-change in attitudes and approaches to industrial waste. This may have assisted later shifts. However, clearly more is always possible. In many ways, this is one of the formative experiences that led to this thesis.

Some pieces of this journey truly emerged from the data. A prominent example of this is the theory data. After the initial exposure to integral theory, at an early stage of this thesis, I expected to find quadrants and stages useful and relevant. The evidence of usefulness, as applied to sustainability, was already being developed (e.g. B. C. Brown, 2005a, 2005b). Quadrants and stages are prominent structures and seemingly conceptually easy for people to apply. Personally, I have a range of evidence for this including designing and running a business and carbon management course for the University that is fundamentally based on these integral concepts. The course attracts new graduates and has been at capacity, or oversubscribed requiring us to turn people away, for the last three years. As such, it seems to validate the approachability of concepts such as quadrants and stages from integral theory. This is reinforced by feedback from the students as well as other discussion (e.g.

Esbjörn-Hargens, 2014a). However, it was not until the late analytical stages that the importance of elements such as types and lines became particularly prominent.

The integral action loops themselves are illustrative of the thesis journey. There was no intention, at the start of this work, to develop such a framework. Nor was there an expectation that a synthesis theory and action structure might be an outcome from the research. The integral action loops thus emerged from the data, suggested by the analysis and structuring, queries and arguments that went into considering how a large range of concepts, all bringing great insight to our pressing challenges, could co-exist and create agency for us to grow from our knowledge, rather than be lost in its diversity. That is, in a grounded theory fashion, the theory really did suggest itself (albeit informed with other frameworks) from the data.

This is obviously one of my research's limitations. The thesis was never designed to test such a concept, operationalise its usefulness or engage in action research on its application. It could not be. Nonetheless, this is an appealing structure based both on the analysis in my thesis and personal experience. I hope it is an important piece of the truth, as Ken Wilber expresses in the second quote at the start of this chapter, that enables us to dynamically steer sustainability, facilitate more effective interventions and, to whatever extent possible, helps to holistically engage, and value, the input of many for sustainable futures.

As a reflective exercise, writing this chapter lets me consider the advantages of long term Ph.D. research. This thesis has taken 7 years and was carried out alongside my day jobs. In many respects, it is quite reasonable to add another decade to the thesis timelines - prior to starting this work I considered and discarded numerous topics. This occurred as I felt I would either not be able to sustain my interest in the field, or I could not sufficiently

envision how the work might be socially useful. My view is that I needed this time - capacity to create relevance with this work goes hand in hand, for me, with considering it over the years.

Part time research has meant that a great deal has developed, including theory from others, while the thesis is being written. Other parts, such as Chapter 2's *Integral on Integral* section and Chapter 4, consider the methodological and application advantages of this. Additionally, the part time nature of the work has also meant that many facets of this research have been trialled and used, sometimes to great effect, for creating sustainable programs and effective interventions.

On a more practical note, I'm physically unable to type for long periods. Much of this thesis is consequently aided by its part time nature. It has also been, to a very significant extent, dictated directly to my computer. Should anyone want an account of the long, useful (but highly detailed experiences) to help in a similar situation - you are welcome to email me!

Beyond the direct practical, however, has climate change, as Mike Hulme (2009 p356) puts it, become "*a mirror into which we can look and see exposed both our individual selves and our collective societies*"? Or, as Terri O'Fallon might express another aspect of this, "*and that's me*" to reflect on our own ways of reacting to another's approach? I have no doubt that the physical process of this thesis forms part of my own development. In some aspects, it also maps shifts of conceptual and intuitive understanding - what do I need to become, am becoming, through this work and to be effective with this work?

These stages over the years, grounded development, a topic aligned to personal purpose and societal need, my own change, theoretical understanding and practical applications, are

some of the advantages I see of long term thesis writing. That is not to say it does not have downsides. I am very much hoping to experience an unstructured weekend, without research expectations, in the near future. I am not sure what this looks like anymore!

Appendix 1

Participant Interviews

This appendix contains details on the semi-structured interviews. The information is added further context to the outline in the Semi-structured Interview subsection of Chapter 2. This subsection discussed the overall research aims in the letter to participants. In addition the letter informed them that:

- The interviews would involve simple questions (without hidden meaning).
- That by understanding more about how and why some companies respond better to the challenges of issues like climate change, and how that may be related to the development level of the organisation, we may gain insight into how to help organisations make contributions to global collaboration on management of shared resources, like clean air or a stable climate.
- That the information or views provided would be treated in confidence. The interview material would form part of generalised analysis and will only be quoted, with the person's real name, with permission.

Semi-structured Interview Questions

The semi-structured interview questions were:

Background questions

- Please tell me about yourself and your work; how long in this position and previous positions; how long with company?
- How would you describe sustainability – what does it mean for you?

Values questions

- Did you and/or why did you pick this position and/or organisation?
- Anything specifically that would lead you [present employees]/led you [past employees] to move position/organisations?
- Have you engaged with sustainability issues within [company name]? How would you characterise your involvement with such issues?
- How would you describe the company's activities around sustainability (over the years/timescale you have been aware of sustainability as an issue for the company)?

External & benchmark questions

- McKinsey says 60% of global executives regard climate change as strategically important with a majority also saying it is important to product development, investment planning and brand management. Where would you place [company name] in a spectrum of concern about climate change relative to other businesses you know?
- Can you describe how sustainability may have/has influenced organisational outcomes in ways that are tangible for you [modify if appropriate based on previous responses]?
- What have the sustainability initiatives done for the company?
- How has/will the introduction of carbon trading in Australia affect your business?
- What about global initiatives?
- How about other external influences? Are there any that you think are specifically important?

Perceived effectiveness of the issue and the costs and benefits of the involvement questions

- What did you get out of your involvement with sustainability issues?
- From your experience what would you consider to be the successful sustainability initiatives undertaken at [company]?
- What do you see as the principal problems for such initiatives? Solutions to these problems?
- Can you describe your motivations for working on sustainability issues?
- I'd like to show you a table on places to intervene in a system when you are trying to change it:
 9. Numbers (subsidies, taxes, standards)
 8. Material stocks and flows
 7. Regulating negative feedback loops
 6. Driving positive feedback loops
 5. Information flows
 4. The rules of the system (incentives, punishment, constraints)
 3. The power of self-organisation
 2. The goals of the system
 1. The mindset or paradigm out of which the goals, rules, feedback structure arise

Wrap up questions

- Looking over your involvement over time, can you describe how your perspective has changed?
- Where do you think sustainability issues will be in five years from now?

- What types of relationship can you see being developed (if different) for [company name] in the future?

While the interviews covered the full content from these questions, most were not asked explicitly as often the answers were given (volunteered) during the conversation.

Additional Questions

Some extra questions were used during pilot interviews, but found to be superfluous or confusing and not used during the main phase of interviews. These questions were:

- Thinking about your organisation, please have a look at the following diagram (John R. Ehrenfeld – MIT from Kim – Systems Archetypes - Give short explanation).

Shifting the Burden Examples

Problem / Symptom	Immediate Solution	Systems Solution	Potential Side Effects
Poor employee performance	Manager steps in	Skills training	Erosion of confidence & relationship
Declining sales	Increase marketing	New Products: culture change	Decline of R&D
Global Warming	CO2 Trading	Energy without carbon	Individual and organisational responsibility
Material Use Growth	Eco-efficiency	Industrial restructuring	Eco-system collapse

Adapted from Ehrenfeld, Learning and Change in the SoL Sustainability Consortium (2003)
and from Kim, Systems Archetypes (1992)

- Are the ideas presented – addressing immediate symptoms or addressing fundamental systems – appealing and/or do they resonate with your experience?
- In building more sustainable businesses, are you shifting from compliance, and incremental and process improvements, to innovation—new more environmentally sound products, new ways of bringing products to market, and new ways to create demand pull for such products?

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