

Green Chrysalis

Small and medium sized enterprises:
innovation and transformation towards
Australia's low-carbon economy





Green Chrysalis

Small and medium-sized enterprises: innovation and transformation towards Australia's low-carbon economy

by

Joanne Chong, Sally Asker,
Anastasia O'Rourke and Stuart White

Institute for Sustainable Futures © UTS 2012

A report for the Australian Business Foundation

April 2012

© Copyright 2012 by the Australian Business Foundation.
This document is not to be reproduced, copied, or distributed without the
written permission of the Australian Business Foundation.

April 2012

ISBN 978-0-9871347-3-8

Published by the Australian Business Foundation Limited
ABN 56 067 381 999
Level 12, 83 Clarence St, Sydney NSW 2000, Australia

Phone: +61 2 9350 8126
Email: foundation@abfoundation.com.au

To order Australian Business Foundation publications or download individual
reports, go to: www.abfoundation.com.au

Designed & typeset by: Kim Webber, Southern Star Design
Cover design by: Mandos Design Pty Ltd

Acknowledgements:

This research would not have been possible without the contributions from many SME owners, managers and employees. The authors gratefully acknowledge the interest and time donated by: Alan Davis, Ben Kent, Bruce Jeffreys, Catherine Marshall, Chris Bosse, Chris Warren, Craig Osborne, Craig Riddle, David Fuller, David Gravina, Duncan Underwood, Gary Price, Greg Whiteley, Gillian Corban, Julian Lee, Leah Callon-Butler, Lester Tan, Nic Moodie, Sarah Mandelson, Stephen McCulloch, Stephen Standish, Wally Patterson, Walter Radovich and Xanthe Mendoza.

We would also like to extend our thanks to the researchers and government representatives who shared with us their insights and expertise as leaders in the field including: Professor Beth Walker, Dr Janice Redmond, Dr Luke Hendrickson, Professor Ross Chapman, Professor Roy Green and Dr Greg Redden.

We would like to thank Narelle Kennedy, Phillip Allen and Clint McGilvray from the Australian Business Foundation for their direction and guidance; and our colleagues from the Institute for Sustainable Futures, Tim Brennan, Ceridwen Dovey, Alana George, Caitlin McGee and Ainsley Simpson, for their research support.

Please cite this paper as:

Chong J, Asker S, O'Rourke A and White S (2012) Green Chrysalis – Small and medium-sized enterprises: Innovation and transformation towards Australia's low-carbon economy.

Report prepared for the Australian Business Foundation by the Institute for Sustainable Futures, University of Technology, Sydney.

Disclaimer:

While all due care and attention has been taken to establish the accuracy of the material published, UTS/ISF and the authors disclaim liability for any loss that may arise from any person acting in reliance upon the contents of this document.

Contents

Executive Summary	5
PART I – CONCEPTS	9
Chapter 1. Introduction.....	10
Chapter 2. Australia’s low-carbon economy.....	15
Chapter 3. Innovation	20
PART II – SME CASE STUDIES	30
Chapter 4. A framework for case study selection and analysis.....	31
Chapter 5. Case studies	33
PART III – KEY FINDINGS	68
Chapter 6. Key Findings	69
Chapter 7. Recommendations.....	75
Chapter 8. References	79
Appendix A – Discussion forum summary	82
Appendix B – Green innovation concepts	87

Executive Summary

With climate change firmly on the international and national agenda, attention has turned to how economic systems will be created that facilitate a positive low-carbon future. The concept of the “low-carbon economy” has emerged as symbolising economic growth decoupled from growth in carbon emissions, in which a vibrant and strong economy also leads to reduced risks from climate change. To achieve large shifts in practices, innovation will be needed: innovation in products and services, as well as in operational and management systems. Nearly every sector of the economy could be affected by a low-carbon future, and a dynamic, uncertain and widespread period of change will afford new opportunities as well as challenges.

In Australia, small and medium-sized enterprises (SMEs), those companies with 200 or less employees, are significant contributors to national and local economies. SMEs make up 99% of employing businesses¹, employ 42% of the total Australian workforce (with 5.1 million being employed by small businesses and 2.2 million by medium businesses)², and contributed approximately 46% of GDP in 2006³. However, most studies of the low-carbon economy have focused on large companies in industry sectors with great economic value at stake, such as the energy and mining industries, or on companies with high-tech solutions, such as providers of renewable energy or energy efficiency technologies. Somewhat overlooked is the more heterogeneous world of SMEs, whose risks and opportunities in the low-carbon economy vary greatly, and whose responses will likely take different paths. Innovation among SMEs also tends to be different to that of large companies, given their small base of resources, but also their organisational flexibility to act nimbly.

THIS REPORT

The Australian Business Foundation commissioned the Institute for Sustainable Futures at the University of Technology, Sydney to investigate the ways in which SMEs currently respond to the opportunities arising from a low-carbon economy and the extent to which the low-carbon economy influences businesses to innovate or transform and to gain a competitive advantage. We investigated:

- what is the low-carbon economy?
- what innovations are being made?
- what are the key constraints and opportunities it presents for Australian SMEs?

¹ ABS (2010 c)

² Australian Government DIISR (2010)

³ ABS (2006)

As the low-carbon economy is a relatively new concept and one that is rapidly evolving, we investigated what sources and types of knowledge are most useful to SMEs, how do they access it, and what role should universities be playing as 'suppliers' of this knowledge. We aim to shed light on what is needed to support and enable SMEs to capitalise on their opportunities and boost their innovation capabilities.

The research undertaken for this study consisted of:

- a literature review (on the low-carbon economy, SMEs and on innovation systems)
- expert interviews (on SMEs, innovation and sustainability)
- a facilitated discussion forum held with SMEs on the topic
- 12 case studies of Australian SMEs of different sizes and spanning several different sectors.

The research focused on a wide range of SMEs (and not on high-tech start-up companies) in order to better understand SMEs' experiences in the low-carbon economy.

The material gathered is analysed in terms of the type and scope of innovations found, the "active ingredients" that tended to make innovations successful, the business-value and competitive advantage being achieved and the challenges and barriers faced. Recommendations to different stakeholder groups are then made, and some of the broader implications for the growth of Australia's low-carbon economy are discussed.

FINDINGS

The core concepts that were investigated in the literature review and expert interviews brought to light some useful typologies of the low-carbon economy and innovation. Low-carbon innovations include technological solutions such as the installation of renewable energy systems, as well as the more prosaic transformations such as changing suppliers to favour local producers, or operating in a more energy- and fuel-efficient manner.

Indeed, innovation in general goes well beyond the high-tech radical inventions or novel products that often symbolise "innovation"; innovation also includes incremental process changes, organisational structures, routines and innovative management systems. Innovation is conceptualised as a "system", that includes many actors, feedback loops, and progress that happens in fits and starts. Given this, the enabling environment needed to stimulate innovation also goes beyond funding R&D and technology development, into facilitating the transfer of knowledge, making connections between stakeholders, and ensuring market incentives.

The research unveiled a wide range of **innovative responses** by SMEs to the low-carbon economy spanning the four types of innovation highlighted by the Australian Bureau of Statistics (ABS) (new products/service, new marketing methods, new operations and new management processes). These innovations were found to have the following characteristics:

- For the most part, the types of innovations being made by the case study companies were more incremental than radical, consisting of new variations of existing products and services or new operational and management processes. There were some exceptions however, with more radical re-visioning of products and services, such as new construction techniques, new ways to distribute food, and new modes of transit such as car sharing. Often the SMEs that took this path also inspired change and innovation throughout their industry.
- In many of the cases, there were innovations in marketing methods that drew on local communities and outreach via networks to other businesses also operating in the low-

carbon economy. Even on low budgets, several of the case study companies used their innovations to differentiate themselves and their goods.

- In order to accomplish sustainability goals, many companies introduced innovations in their operational and managerial processes. Some of the innovations were prosaic, while others required radical rethinking and reorganisation.

Motivations driving the changes being made were not limited to environmental consciousness or an ethical stance, but were often also mixed with or at times led by, an expectation of **business value** and **competitive advantage** being created. Reducing an SME's carbon footprint is not only good for the environment, but can also lower costs, which can in turn significantly impact the bottom lines of businesses. We found that many SMEs that have adapted to or harnessed the conditions of the low-carbon economy have created opportunities for competitive advantage. For example, companies achieved cost savings, increased sales, attracted and retained staff, and differentiated their products. Some have gained access to free public relations benefits and to premium markets. Indeed, the business benefits achieved by these businesses lent credibility and momentum to innovation efforts, and tended to spur new actions.

Other innovative responses to the low-carbon economy identified in the cases included founders/managers being personally motivated and gaining access to knowledge via personal connections and networks. Other innovative responses by SMEs had a multiplier effect by educating both their suppliers and customers on their innovations. Those SMEs who were able to measure and monitor their progress and outcomes were able to use the information in their communications and marketing. Many SMEs 'learnt by doing' rather than by formal knowledge acquisition, and they therefore valued highly the information and knowledge gained by other 'doers'. Those who had progressed further in their efforts gained prestige and PR by sharing their experiences with others, and helped to shape and transform their industry sectors.

Some of the **challenges** experienced by SMEs are common to any organisation implementing innovation or change. These included limited access to financial resources, the perceived costs of making changes and serious time constraints. In the context of the low-carbon economy, these challenges can be compounded due to the policy uncertainty, knowledge-intensiveness, and the difficulty of accurately measuring change. Some SMEs found information and knowledge on 'whom to talk to and what to do' difficult to find, and when found, difficult to adapt to their circumstances. The knowledge that they themselves had gained was hard to codify and therefore share. An overall lack of coordination and mixed messaging between governmental agencies on policies and programs caused confusion and tended to slow down the change process. The experiences SMEs had with governmental programs varied depending on their sector, the types of innovations being pursued, and the local government area in which they operated.

RECOMMENDATIONS FOR INNOVATION IN A LOW-CARBON ECONOMY

Specific recommendations to **government agencies** at the local, state and federal level are made in light of these findings. In general, we recommend that governments improve coordination between agencies and give clearer, more certain policy signals. Local governments should act as "portals" for SMEs seeking to make low-carbon economy innovations – a resounding theme from the research is the value of government programmes that provided personal points of contact for advice and information. Other government actions could also be considered, such as encouraging the markets for low-carbon innovations by introducing green and local purchasing policies, and continuing to fund technology and research and development programs vital to Australia's long-term low-carbon future.

Organisations that are already in regular contact with SMEs such as **service providers** (including banks, law firms, accountants, utilities) and **industry associations** or business clusters also have important roles to play in enabling networks, in recognising and celebrating success, and in providing tailored information for their SME constituents.

Universities as knowledge providers can assist SMEs of all types by facilitating the transfer of knowledge, by setting and maintaining standards, providing applied and tailored training for SMEs, by better communicating their research findings for non-academic audiences, and by being seen to open their doors to non-technology-orientated SMEs. More specifically, they can help quantify the achievements of SMEs in contributing to the low-carbon economy, and they can document the business value being created by low-carbon innovations.

For their part, **SMEs** are encouraged to reach out to other SMEs and leaders who are either connected locally or who are familiar with their sector. Clustering with other companies offers SMEs a means of overcoming the disadvantages of their limited resources. The results achieved can pay dividends in customer and supply-chain loyalty which in turn creates a competitive advantage. Verifying “results” (e.g. claims about environmental benefits) where possible, seeking recognition (e.g. industry green awards) and sharing experiences with others also helps to build business value by opening up new avenues for marketing, and celebrating success provides motivation for sector-wide change.

Given their prevalence in the Australian economy, SMEs are a core component of any economic reorientation in preparation for a low-carbon future. In aggregate, their responses are likely to have a profound net effect. The research found the opportunities of a low-carbon economy are akin to a new green ‘chrysalis’ – a space where exciting innovative transformations can, and are, taking place. To encourage innovation, an open, networked and entrepreneurial approach is called for that both inspires change and celebrates success. Given support to innovate, SMEs can become the backbone of an internationally competitive Australian economy in the years to come.

PART I

CONCEPTS

Chapter 1. Introduction

Australia's small and medium-sized (SME) businesses are facing changing operating conditions as a result of climate change, natural resource constraints, increasing environmental regulations and other sustainability drivers. The concept of transitioning to a "low-carbon economy" that is mindful of these operating conditions includes the interrelated government, regulatory, market, business and community responses to reduce greenhouse gas emissions and address the above challenges. A low-carbon economy seeks to reconcile economic development with ambitious climate protection. Transitioning to a low-carbon economy involves ongoing structural transformation across sectors towards lower-emissions industries, markets and economic systems. A low-carbon economy, both now and in the future, presents businesses with new risks, challenges and uncertainties – but also with opportunities to transform the ways in which they do business to enhance their competitiveness, efficiency and profitability.

Much of the policy debate and research on the low-carbon economy to date has focused on large businesses, businesses with significant resources and/or high-tech solutions. However, almost half of Australia's economic activity is generated by small and medium-sized enterprises. Given their prevalence, their responses to the low-carbon economy are likely to have a profound net effect. In response to this gap, the Australian Business Foundation commissioned the Institute for Sustainable Futures at the University of Technology, Sydney **to investigate the ways in which SMEs currently respond to the opportunities arising from a low-carbon economy and the extent to which the low-carbon economy influences businesses to innovate, transform and gain a competitive advantage.** The research found the opportunities of a low-carbon economy akin to a new green 'chrysalis' – a space where exciting innovative transformations can take place, and are already taking place.

Innovation is often equated with invention, implying the creation of new technology or new products. However innovation also encompasses new business approaches, processes and activities. Innovation in a low-carbon economy spans more than just the invention or adoption of new "eco" or "clean" technologies.⁴ Innovative transformations can also be seen in the creation of new business practices and processes, in customer and supply-chain relationships and in marketing and brand management. Low-carbon and sustainable innovation create something new and they create value to society at large. As the chrysalis metaphor suggests, a green chrysalis can be a company, industry, value web or even economy in metamorphosis towards more low-carbon or sustainable forms of value creation.⁵

⁴ Fagerberg (2004)

⁵ Elkington (2001)

ABOUT THIS RESEARCH

This research explores the key ingredients that have enabled Australian SMEs to add value to their business based on their responses to, or actions around, the low-carbon economy. It reviews these key ingredients and asks how they can be strengthened to enable more SMEs to innovate and transform their practices.

The research process involved collaboration between SMEs, the Institute for Sustainable Futures, and the Australian Business Foundation. The SMEs profiled in the case study section were drawn from a wide range of industry sectors, with a focus on businesses that are not directly involved in the commercialisation of renewable or low-carbon energy technologies as their core business, but who nonetheless face a range of risks and opportunities from a low-carbon economy. The capacity to absorb and use new knowledge is a critical enabler of innovation. Particular emphasis is therefore placed on the important role of knowledge sharing networks and the role universities can play as knowledge partners to SMEs.

The overarching research questions guiding our assessment are:

- What is the low-carbon economy and what are the key constraints and opportunities it presents for Australian SMEs?
- How are SMEs innovating/transforming themselves in response to the low-carbon economy drivers and opportunities? What types of changes are being made, and how do these changes create value for the business concerned?
- How do SMEs seek knowledge in order to innovate effectively in this context and what sources and types of knowledge are most useful? What is the role of universities as 'suppliers' of this knowledge?
- What is needed to support and enable SMEs to capitalise on the opportunities of a low-carbon economy, including to boost their innovation capabilities?

Different components of the research included:

- **Document analysis** – a review of policies, programs and literature from Australian academic, government and international sources including the OECD on the low-carbon economy, on SMEs, and on innovation.
- **Expert interviews** – six leading academics who have conducted research in the field of SMEs, innovation and/or sustainability issues were interviewed in the early stages to assist in framing the research.
- **SME discussion forum** – participants from ten SMEs attended an interactive networking forum, hosted by the Institute for Sustainable Futures, to discuss their experiences of operating in the low-carbon economy. See Appendix A for a summary of the discussion.
- **SME case studies** – owner/managers from fourteen SMEs were interviewed about their experiences of innovation and operating in the low-carbon economy; their business responses and the value created from the responses. Twelve of these cases are incorporated into this report in Part II.

This research deliberately considered issues relevant to a wide range of SMEs, rather than focus on a specific sector; however, it does place emphasis on SMEs in urban and metropolitan areas. While SMEs are very diverse in size, structure and scope, this research sought to capture some of the shared issues that SMEs face in harnessing the low-carbon economy. The research intentionally did not focus on high-tech start-up companies, but aims to provide a strong foundation and cross section for further investigation and understanding of SMEs experiences in the low-carbon economy more generally.

While some research already exists in each of these fields of inquiry, this report focuses on combining the theory, practices and experiences of a range of SMEs to understand how the low-carbon economy is influencing SME innovation in the Australian context. The research contributes empirically-based insights into the experiences of owner/managers of Australian SMEs, how they are innovating for a low-carbon economy, and what resources are needed to further support their transformation.

REPORT STRUCTURE

PART I offers an overview of the theoretical concepts and frameworks informing this research. It includes a discussion of what the “low-carbon economy” is (Chapter Two), the related concepts of cleantech and eco-innovation, the role of SMEs in the Australian economy, and an introduction to SMEs and innovation (Chapter Three).

PART II presents the core empirical research. Chapter Four introduces the research framework and Chapter Five presents case studies of the twelve SMEs spread across a range of sectors and of different sizes and locations.

PART III provides the key findings from the empirical case and workshop research. Chapter Six outlines the types of innovations being made, the ‘active ingredients’ SMEs need in order to innovate, the value they create, and some of the challenges they face. Based on this research we make a set of recommendations on how to enable SMEs to benefit from the low-carbon economy. Some we make for SMEs; others are for policy makers, universities, service providers and industry associations. A discussion of the broader implications for the Australian economy concludes the report (Chapter Seven).

BOX 1: WHAT IS AN SME?

SMEs are a vital component of the Australian economy. Some 98.3% of all businesses in Australia are SMEs and they span all business sectors.⁶ SMEs are incredibly diverse in products and services, size, location, business structure, and many other variables. They range from small local family businesses to businesses that are highly organised and export goods and services internationally. Despite this diversity, some of the challenges and opportunities facing SMEs are widely shared.

Definitions of a SME

A globally accepted definition of a SME does not exist. The term “small and medium-sized enterprises” is commonly used interchangeably with other terms such as “small businesses.”

The Australian Bureau of Statistics (ABS) defines SMEs as those enterprises employing less than 200 people, and breaks them down into the following categories:

- 1–4 employees – Micro Business
 - 5–19 employees – Small Business
 - 20–199 employees – Medium Business
 - 200+ employees – Large Business
- } SMEs

The ABS definition is most commonly used in Australian business circles. Other definitions vary widely across different countries and continents, specifically in regard to the upper limit of

⁶ Australian Government DIISR (2010)

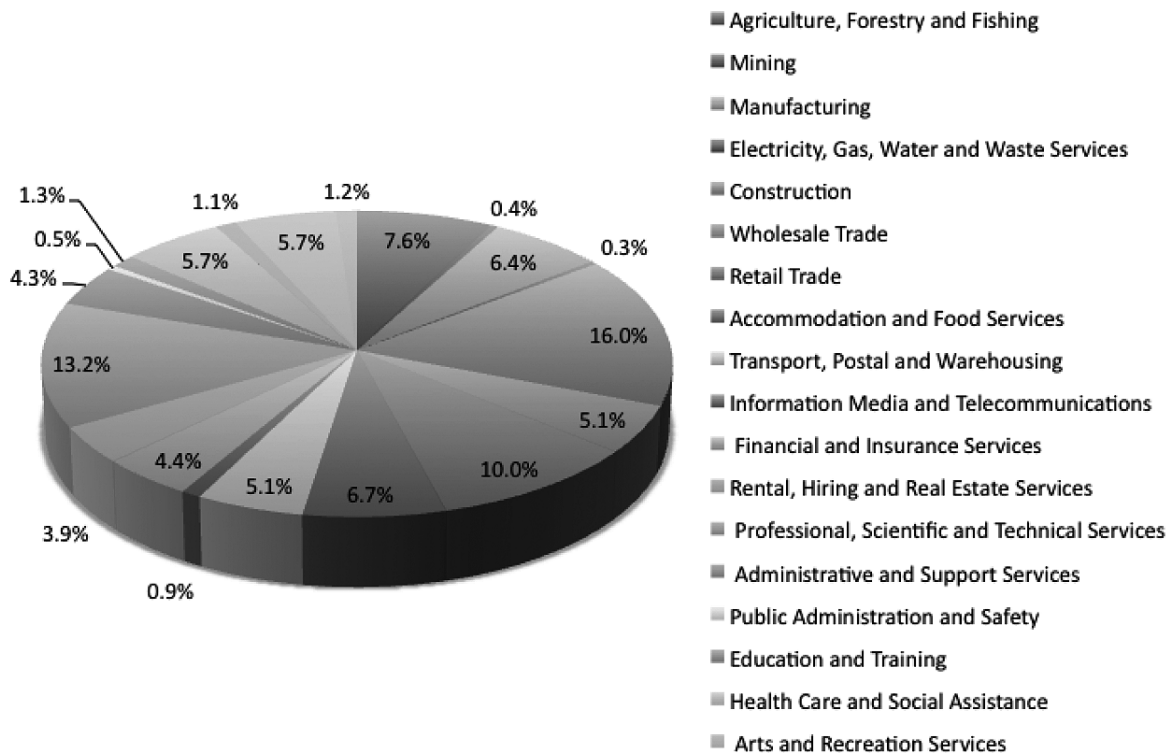


FIGURE 1: SMEs by industry sector (Australian Bureau of Statistics 2002)

employee numbers considered to comprise an SME. For example, in the United States the lower limit for a large business is 500, while in the European Union it is 250.⁷ One of the most widely recognised definitions is used by the European Union. It states that an SME must have “under 250 employees; an annual turnover of less than 50 million Euros (or an annual balance sheet total of under 43 million Euros) and that no single other private entity owns more than 25% of the enterprise”.⁸ Using employee numbers and business turnover is by far the most common method of classifying SMEs, however this approach is not without its critics. An OECD report⁹, analysing the European Union definition, found that many larger enterprises were split into a number of smaller legal entities and thus were able to be considered as SMEs despite the fact that they existed solely to undertake part of the operations for a larger group.

Common characteristics of SMEs

SMEs are similarly diverse in their purposes and organisational structures. In general, as businesses become larger, their structure and activities tend to become more standardised and driven by procedure. Accordingly, companies that are at the larger end of the SME spectrum may have many more characteristics in common with large businesses than with micro or small businesses.¹⁰ The following characteristics are commonly identified as being prevalent across many SMEs:

- Key staff, and particularly business owners, have a much stronger influence on the activities of SMEs than they do in large business. This is particularly relevant when SMEs choose to engage in innovation and/or are environmentally focused.¹¹
- SMEs, especially small and micro businesses, are often focused on local markets and exist for long periods in a single location serving a local clientele.¹²

(Continued)

⁷ OECD (2005)

⁸ European Commission (2005)

⁹ Hauser (2005)

¹⁰ Allen Consulting Group and St James Ethics Centre (2008)

¹¹ Vickers, Corr, Kasparova, and Lyon (2009)

¹² Grayson and Dodd (2007)

- SMEs are commonly family businesses, in many cases passed on through multiple generations, and are driven by 'lifestyle' choices.
- SMEs face many resource constraints, including time, finances, skills and knowledge.¹³
- SMEs are, in general, less connected to communication channels than larger businesses. In 2007, over half of Australian SMEs lacked a web page and a quarter lacked internet access.¹⁴ As a result, some SMEs are unaware of government programs from which they could benefit.¹⁵

Types of SMEs

It is useful to describe or classify SMEs according to attributes other than the number of employees. Some alternative ways to develop a SME typology is via:

- Their ownership structure, such as owner-operated, family or non-family businesses as well as whether they are home or non-home based.¹⁶
- Their attitudes towards growth. Some SMEs do not plan for large growth and are content with their small size and local focus. By contrast, a "gazelle" is a term increasingly used in the US to describe an SME which is currently small but has big plans for expansion. Gazelles commonly include, but are not limited to, start-ups based around a new invention or innovation.¹⁷
- Their stage in the business lifecycle – for example start-up, high growth or mature. Interestingly, this type of classification has been criticised as many businesses do not follow a linear growth pattern. More recent work has focused on classifying businesses according to how they are responding to a series of non-sequential problems. These problems include people management, obtaining finance, market entry, operational improvement and others.¹⁸
- Their level of technology (low-, medium- or high-tech). High-tech companies may focus on the initial development of a technology or its commercialisation, however the majority of companies will not utilise a technology until it becomes relatively mature. For example, the European Commission's Eurostat describes high-technology SMEs as being involved in computers, electronic and optical products, air and spacecraft and pharmaceuticals.¹⁹ Medium-technology businesses tend to engage in industries such as manufacturing plastics, minerals and metals, manufacture of transport (including cars) and machinery. Low-technology industries are considered to be involved in the manufacture of food, textiles, furniture and many other products.

Contribution of SMEs to the Australian economy

While SMEs make up the vast majority of the Australian business population, their impact on the overall economy, whilst vital, is not as large as might be expected. They are estimated to have contributed around 46% of Australia's Gross Domestic Product in 2006²⁰ and employ 42% of the total Australian workforce (with 5.1 million being employed by small businesses and 2.2 million by medium businesses).²¹

The majority of Australian businesses (58%) are non-employing, owner-operated businesses. Of all employing businesses, the vast majority, 90%, are small businesses employing less than 20 employees. Australia is a more SME-intensive economy than other key OECD nations: 98.3% of Australian businesses are small businesses (including non-employing), compared to 94.6% in the United Kingdom and 87.4% in the United States.²²

¹³ Walker, Redmond, Sheridan, Wang, and Goeft (2008); Vickers, Corr, Kasparova, and Lyon (2009); Potts (2010)

¹⁴ ABS (2010 c);

¹⁵ Walker, Redmond, Sheridan, Wang, and Goeft (2008)

¹⁶ Hauser (2005)

¹⁷ Grayson and Dodd (2007)

¹⁸ Phelps, Adams, and Bessant (2007)

¹⁹ Eurostat (2009)

²⁰ ABS (2010 c)

²¹ Australian Government DIISR (2010)

²² Australian Government DIISR (2010)

Chapter 2. Australia's low-carbon economy

WHAT IS THE LOW-CARBON ECONOMY?

Climate change is a critical and high profile challenge that confronts Australia and the world. The concept of the 'low-carbon economy' focuses on de-coupling economic growth from a growth in carbon emissions that lead to climate change. Nearly every sector of the economy could be affected by a low-carbon future and a dynamic, uncertain and widespread period of change will afford new opportunities as well as challenges.

The transition to a low-carbon economy is already happening at global, national and local scales.²³ The physical impacts of a changing climate are already starting to influence change towards a low-carbon economy. For example, declining water availability creates economic drivers for improved water efficiency, which in turn saves energy, resulting in reduced carbon emissions. In addition, increasing scarcity of resources such as fossil fuels, petroleum, minerals and land is also driving actions to improve overall resource efficiency and cut costs. Since energy is a productive input in all industries, there are opportunities in nearly every sector for activities to achieve lower-carbon outcomes. Many Australian businesses and households are actively reducing their carbon emissions, driven by personal motivations and forecast rises in electricity prices as well as current and anticipated policy and market responses aimed at reducing their impacts. Often-times other environmental and social benefits are also achieved by reducing carbon emissions. These "co-benefits" include decreased water-use, increased resource efficiency and reduced waste.

Regulations and policies have influenced businesses and sectors to improve their environmental management practices. The low-carbon economy presents a new and complementary set of regulatory influences that will continue to change the ways that businesses operate. Foremost amongst these drivers is the possibility of a national framework for reducing carbon emissions, such as a carbon tax or an emissions trading scheme which would in effect set a price in carbon, in turn affecting the price of energy (see for example, the Victorian Government Climate Change Green paper.²⁴)

Despite Australia having one of the highest per-capita rates of carbon emissions worldwide²⁵ there is still a high degree of uncertainty around what policies and regulations will be implemented. Due to uncertainty over this and the physical impacts of climate change, there is no precise picture of exactly what a low-carbon economy will look like in Australia.²⁶

²³ Kauffmann and Less (2010)

²⁴ Victorian Government (2009)

²⁵ World Resources Institute (2007)

²⁶ CEEDR (2009)

Ongoing uncertainty in the policy environment has arguably already negatively affected business investment in low-carbon initiatives, and has slowed Australia’s early lead in implementing advanced carbon-trading markets. Nevertheless, expectations of a carbon price or other carbon-related policies, continue to shape the operating conditions of a low-carbon economy.

OPERATING CONDITIONS OF THE LOW-CARBON ECONOMY

Because of the pervasiveness of drivers such as increases in energy prices and increasing requirements from major buyers with low-carbon requirements, there is potential for SMEs operating in all sectors to be influenced by the low-carbon economy. Current operating conditions for a low-carbon economy are influenced by many factors, including:

1. Government investment in programs designed to help households and businesses reduce their carbon emissions, through promoting renewable and alternative energy sources and energy efficiency solutions. There are a number of national, state and local government initiatives in this area. Examples of current and recent Australian federal government programs include:

- The Renewable Energy Target Scheme: the Scheme encourages investment in renewable energy to reach the goal of 20% of Australia’s energy from renewable sources by 2020.
- The Clean Energy Initiative: the Initiative provides funding for industrial-scale carbon capture and storage and solar projects as well as other renewable energy projects.
- Climate Ready: this is a grant program providing up to \$5 million for R&D or commercialisation of innovations in response to climate change.
- Re-tooling for Climate Change: offers up to \$500,000 to manufacturing SMEs to improve water efficiency or energy efficiency.
- The Green Building Fund: provides assistance to owners and operators of commercial office buildings to improve the energy efficiency of their buildings.
- Renewable Energy Bonus Scheme: replaces the Home Insulation Scheme and provides rebates for the installation of solar hot water systems and home insulation by registered assessors.
- Green Loans Program: provided free sustainability assessments for 960,000 homes across Australia.

There is a wide variety of Australian and state and territory government programs designed to target SME innovation, particularly in relation to energy efficiency. Nonetheless, consultations have revealed an overall low participation in government programs for environmental innovation by SMEs.²⁷ Some programs such as Enterprise Connect, which connects people face-to-face, have been more successful:

*A lot of SMEs don’t like the concept of going into a website and selecting things and then filling in forms. They prefer to have a name and a phone number they can ring up and talk to. Enterprise Connect did that quite well. ... it is a step forward because it does provide a human face that provides a staged process of accessing services, assistance with filling out forms for grants etc.*²⁸

Better integration and implementation of the various policies and programs is needed to have a more substantive impact on SMEs. As Rennings (2000) observes: “Policy fostering eco-

²⁷ Walker, Redmond, Sheridan, Wang and Goeft (2008)

²⁸ Leader in innovation research, Interview, 2010

innovations cannot be reduced to technological support programs nor to conventional environmental policy measures, but has to find intelligent combinations of both.”

2. Standards relating to carbon emissions, including green building codes and building sustainability ratings and awards (e.g. the Australian Building Council's GreenStar initiative), minimum standards for energy efficiency and carbon emissions reporting requirements (e.g. NGER, the National Greenhouse Energy Reporting System, administered by the Australian Government). Examples of both mandatory and voluntary standards geared towards reducing energy consumption and/or carbon emissions can be found across many sectors and product categories.

3. Changing Australian and international markets. Changes include increasing demand for new products, services, technologies and for processes that improve energy efficiency. Another change is the increased demand for changes to supply-chains which lead to improvements in carbon and sustainability outcomes.

4. Energy market restructuring. The low-carbon economy is expected to result in significant structural change in the energy sector²⁹ and growth in sectors such as renewable energy, clean coal technology, advanced manufacturing and materials, design, ICT, financial, legal and risk management, carbon markets and energy efficiency.³⁰ These changing market conditions are driven in part by rising energy and resource costs and by changing community, investor, consumer and workers' expectations about the role and responsibility of businesses in managing carbon emissions. Structural changes in energy and other industries will have wide-ranging effects on all businesses, including SMEs.

5. The emergence of a 'green' labour market and workforce, including the emergence of jobs that help to reduce energy, materials and water consumption and waste through resource efficiency. 'Low-carbon jobs' are commonly identified in design and construction, renewable energy and alternative transport sectors. Australian and state/territory governments have developed strategies and/or business advice regarding new jobs – see for example the *National VET Sector Sustainability Policy and Action Plan 2009–2012*³¹ and the Victorian Government's *Green Jobs Action Plan*.³² Growth in these sectors will also result in transformations across a wide range of skills, educational backgrounds and occupational profiles, and in industries involved through supply chains, including in traditional trades, supplier and service industries.

CONSTRAINTS AND OPPORTUNITIES OF THE LOW-CARBON ECONOMY FOR SMEs

There is extensive literature and analysis of the opportunities, challenges and barriers that businesses face in responding to economic drivers, whether these are related to climate change or other factors. Due to extensive competing demands on time and resources, many businesses find that making changes can be a confronting, challenging and costly exercise. One interviewee observed that, in the current operating conditions, most SMEs simply do not have the time to consider carbon or sustainability issues, even if addressing them could create value for the business:

Until you really see [the two drivers of regulatory and consumer demand], it's going to be the smaller number of companies where sustainability issues are front of mind. That's not to say that one couldn't look at any number of companies and say, gee, these people should

²⁹ Australian Government (2010)

³⁰ Victorian Government (2009)

³¹ National VET Sector Sustainability Action Group (2009)

³² Victorian Government DIIRD (2010)

*really be thinking about the long-term implications for their business because of sustainability issues. At the moment there are usually other issues which are more pressing.*³³

The Australian Bureau of Statistics³⁴ reports on SMEs' uptake of environmental management initiatives and environmental performance, but not at this stage on the extent of business response to sustainability drivers. Nevertheless, if the data collected is considered a proxy indicator, the figures suggest that SMEs are presently less responsive than large companies to the low-carbon economy and other sustainability drivers. As such, SMEs are less likely than larger companies to undertake environmental management activities; conduct energy usage audits; set energy performance targets or indicators; operate renewable energy systems; undertake energy efficiency or energy reduction measures; prepare for a proposed Carbon Pollution Reduction Scheme; or purchase GreenPower.

Although SMEs tend to under-invest in environmental management compared to large companies, there are some SMEs that have adapted to or harnessed the conditions of the low-carbon economy to create opportunities for competitive advantage. This may have resulted from internal motivators, including determined owner/managers, or it may have been driven by external factors, such as pressure from supply chains to improve environmental performance.

There are a number of reasons why SMEs face constraints and challenges in responding to the drivers of the low-carbon economy and/or improving their carbon performance. Research into corporate social responsibility (CSR) performance (low-carbon or environmental performance could be viewed as an element of CSR), identifies many of these constraints and challenges. Frequently stated constraints and challenges include:

- **Perceived or actual costs of change, combined with limited financial resources**, due to immediate cash needs that prevent small businesses from building up adequate financial reserves to implement initiatives.³⁵ This is often exacerbated by lack of knowledge, and a lack of time to pursue knowledge about how or where to apply for external grants.
- **Lack of time, and lack of managerial and organisational capacity for change**,³⁶ including reluctance and/or uncertainty about where to seek external advice and help.³⁷
- **Uncertainty relating to climate change mitigation policies**³⁸
- **Absence of value drivers for change, due to low or uncertain market demand**, particularly changes in the procurement and investment decisions of large organisations and government; and limited customer acceptance of paying a premium for improved environmental performance³⁹
- **Impacts of climate change**, as nearly every sector of the economy may be influenced, from healthcare, to insurance, tourism, water and property sectors⁴⁰
- **Lack of supply-chain pressure** for improved environmental/sustainability performance in the absence of other efficiencies⁴¹
- **Lack or organisational network support** for sustainability focused initiatives for SMEs.⁴²

³³ Leader in innovation research, Interview, 2010

³⁴ ABS (2010 a)

³⁵ Allen Consulting Group and St James Ethics Centre (2008); ABS (2010 b)

³⁶ Green (2009)

³⁷ CEEDR (2009); Walker, Redmond, Sheridan, Wang and Goft (2008)

³⁸ CEEDR (2009); AFS and Netbalance (2010)

³⁹ CEEDR (2009)

⁴⁰ CEEDR (2009); Parry and Canziani et. al. (2007)

⁴¹ CEEDR (2009)

⁴² CEEDR (2009)

On the other hand, there are many characteristics of SMEs that can make them well-placed to respond to sustainability and low-carbon drivers. There is potential for SMEs to:

- **Be adaptable and nimble**, having the flexibility to change and respond quickly
- **Have less hierarchical structures and more open and fluid communications** between staff and owner/managers
- **Be immediately aware of benefits and value added from actions** undertaken when compared to their larger counterparts⁴³
- **Respond to community attitudes** as they are more likely to be embedded and connected in their local economies and communities, and they rely on this position and on building reputation and trust within it for business transactions.⁴⁴

⁴³ Jenkins (2006) cited in Allen Consulting Group and St James Ethics Centre (2008)

⁴⁴ CEEDR (2009)

Chapter 3. Innovation

WHAT IS INNOVATION?

Although innovation is recognised as critical to a sustainable and productive economy, the concept itself defies simple definition. Common to all descriptions of innovation is that it involves a degree of novelty, and explicitly or implicitly that this “newness” generates value. The Review of the National Innovation System⁴⁵ notes that “innovation is commonly described as ‘creating value through doing something in a novel way’. From an SME and low-carbon economy perspective, this added value could primarily be about enhancing competitive advantage and/or increasing profitability, but also involves advancing other objectives and goals of the business and the owner/manager.⁴⁶

Innovation is critically important to Australia’s prosperity, economic growth and productivity. The recent Australian Government review of the National Innovation System was driven by concerns about Australia’s fall in OECD rankings of productivity growth since 2002, declining rates of Australian Government support for science and innovation since the 1990s, and rapidly changing patterns of global production, particularly the economic transformation of our regional neighbours China and India.⁴⁷

Innovation is also recognised as integral to achieving *sustainable* growth of global and Australian economies, as stated by the OECD and the Australian Government:

The OECD is working towards the completion of the OECD Innovation Strategy, a comprehensive policy strategy to harness innovation for stronger and more sustainable growth and development, and to address the key societal challenges of the 21st century. Innovation will be a key factor in turning the vision of green growth into reality.⁴⁸

Addressing the causes and effects of climate change will require major changes to how industries and households operate Australia can meet these challenges without compromising living standards or imposing an unfair burden on any one part of the community by developing new and better ways of doing things – by investing in information, science, research and innovation.⁴⁹

⁴⁵ Cutler and Company (2008)

⁴⁶ Green (2009)

⁴⁷ Cutler and Company (2008)

⁴⁸ OECD (2010)

⁴⁹ Commonwealth of Australia (2009)

Innovation is a complex and multi-disciplinary topic with a broad body of literature, and in what follows we summarise some of the key concepts and most pertinent aspects of innovation of relevance to SMEs and the low-carbon economy.

Innovation extends beyond invention and technological changes, to the ways in which businesses are managed and organised. Recognition of the diversity of innovative activity is reflected in the Australian Bureau of Statistics' definition of innovation as "the process of developing, introducing and implementing a new or significantly improved good or service or a new or significantly improved process," which is further extended in the OECD definitions to include "new marketing methods, new organisational methods in business practices, workplace organisations or external relations".⁵⁰ Innovation in management, operations, people and performance is critical to the successful operation of a company⁵¹ including its ability to respond to opportunities and stresses.

Currently most of Australia's public expenditure on innovation is directed towards supporting innovation in technology and science rather than towards strengthening innovation in management, including leadership and culture systems.⁵² The Cutler Review identified the "successful adoption and diffusion of high performance work systems in both the public and private sectors"⁵³ as both a key challenge and a priority.

All companies on the spectrum from 'high-tech' to 'low-tech' have the potential to innovate. The development and commercialisation of new technologies and processes is a key element of innovation, as is the adoption of new ideas in traditional sectors. Innovation can take many forms, including new ways of dealing with customers and suppliers, transforming product lines and services or introducing new business models and suites of offerings to customers.

Innovation is about change that creates value. Innovation includes, but goes far beyond, inventing new products, processes or services. Businesses can innovate by adopting existing technologies and processes into their operations. Importantly, these changes do not have to be new to the world, the sector or the locality to be considered innovations. What is important in defining innovation is the value that it creates in terms of competitive advantage for the business.

Innovation is not just about big breakthroughs, but also smaller, incremental changes and transformation over time. Studies show that most innovations by businesses are changes which unfold somewhat incrementally, rather than fundamental changes in processes or products.⁵⁴ The importance of the compound effects of numerous, smaller or "incremental" innovations is widely recognised by Hoffman and Bessant.⁵⁵

The innovation process spans organisational boundaries and is non-linear. A linear model of innovation, in which innovation arises from research and development by discrete, isolated breakthroughs, fails to recognise the complexity of the ways in which businesses and knowledge providers operate and interact with each other, and the influence of government policies.⁵⁶ Similarly, the idea that innovation is a uni-directional knowledge flow from basic science to applied technology to commercial use is now recognised as inadequate. Innovation is more complex and typically involves several important feedback loops between different

⁵⁰ OECD (2009)

⁵¹ Allen and Consulting Group and St James Ethics Centre (2008)

⁵² Green (2009)

⁵³ Cutler and Company (2008)

⁵⁴ Hughes (2006)

⁵⁵ Hoffman, Parejo, Bessant, and Perren (1997)

⁵⁶ Hughes (2006); Lundvall, Johnson, Anderson, and Dalum (2002)

stages. For example, applied technologies can themselves enable breakthroughs in basic science, and customers often use products in an innovative way that then leads manufacturers to redesign their products.

Innovation is a risky activity which needs effective management, both in the environment in which the organisation regularly operates, and in uncertain and emerging conditions. Management structures, policies and processes are instrumental in enabling innovation within a business. However, for a business to continue to innovate and maintain a competitive advantage, it also needs to be sufficiently agile and flexible to detect and respond to changes in its operating environment. Such changes can be driven by political, market or technological shifts. As Bessant et al. (2005) emphasise, effective management approaches recognise the emergent and evolving nature of social and economic systems, and embrace experimentation, rapid learning, and tolerance of failure.

There are many interrelated drivers encouraging companies to innovate, ranging from the motivations of the owner/manager, to customer demand and supply chains, to new knowledge generated by universities and other providers. In general, businesses endeavor to innovate in response to a perceived need in the marketplace, and/or to gain a competitive advantage of some kind. For example, a recent study of innovation by SMEs in the Australian residential building and construction sectors revealed that for some businesses, design innovations were driven by the desire to maintain good customer relations. For other businesses, the desire to “lead the industry in a sustainable-development direction” led to the incorporation of innovative sustainable practices into everyday business activities.⁵⁷ Drivers will vary widely depending on the industry sector, the position of the company in the supply chain, and the degree of competitive pressure being faced by the business.

Innovation happens in the context of “innovation systems”. Innovation occurs within broader contextual shifts in society and communities. Innovation “systems” are enablers of change as much as breakthrough inventions. Innovation systems approaches understand innovation as an interactive process involving a network of businesses and other economic agents, who together with the institutions and policies that influence their innovative behavior and performance, bring new products, new processes and new forms of organisation into economic use.⁵⁸ Learning and knowledge on the part of businesses and policymakers are essential to the evolution of an innovation system’s response to new challenges such as climate change and the desire for an internationally competitive low-carbon economy (see Box 2 below for an overview of National Innovation Systems concepts).

National Innovation Systems (NIS) can be broadly defined as all the economic, political and other social institutions affecting learning, searching and exploring innovative activities in a given nation.⁵⁹ Universities and research bodies, financial systems and monetary policies, as well as the internal organisation of private businesses and how they all work together to influence the development and use of new knowledge and learning define a nation’s NIS.⁶⁰ The NIS approach is now a widely applied concept in modern innovation research, and enjoys growing acceptance by policymakers in industrialised economies including Australia.⁶¹

⁵⁷ Thorpe and Ryan (2007)

⁵⁸ Lundvall (1992)

⁵⁹ Fagerber (2004)

⁶⁰ Feinson (2006); Roos, Fernström and Gupta (2005)

⁶¹ Edquist (2005)

An NIS emphasises the interdependencies between the historically developed designs of institutional frameworks on the one hand, and patterns of innovative activities in the economy on the other.⁶² Because contemporary thinking places much more emphasis on collaborative models of innovation, networks and support systems, and feedback mechanisms between different actors stages of the innovation cycle, an 'Innovation Systems' approach analyses all the organisations and components that are involved in innovation and the interactions and relationships that occur between them. The approach can be applied at a national, regional or sectoral scale; and means that government investment in innovation goes beyond funding basic science and technology research to creating and enabling the whole innovation "ecosystem".

Key features of an effective NIS

A key insight of the innovation systems approach is its emphasis on interactive learning.⁶³ Interactive learning is oriented toward seeking improvements in routine activities and finding solutions to existing problems within a business and between different actors. The focus is on improvements to processes and organisational structures and incremental technology innovation rather than on high-tech, hard science fields that are often the focus of innovation policy.⁶⁴ The innovation systems approach suggests the following factors are important at a national level:

- a strong, supportive and responsive higher education sector to improve links with science and industry
- job security so that long-term interpersonal relationships can be built
- businesses that are willing to engage in long-term collaborations as this is necessary to build inter-business trust⁶⁵.

In addition, the following factors are considered minimum requirements for an effective NIS:

- an economy that is flexible and adaptable
- customers who demand innovative products and services
- a diversified base of R&D with a high level of networking across robust sector clusters
- a supportive financial sector with high investment in education, research and innovation.⁶⁶

Australia's NIS

Over the past quarter century, both public policy and private sector initiatives have transformed Australia from a classical "imitator" to a second tier innovator economy⁶⁷ but the Australian Government has been criticised for its perceived inertia in transitioning from a mediocre NIS to a more effective one. While Australia has improved its innovation capacity, it has not done so as fast as its key international competitors.⁶⁸ A study comparing Australia's NIS to the highly-ranked Swedish and Finnish NISs identified the following factors as problems:⁶⁹

- low and falling business expenditure on research and development as a proportion of GDP
- poor system linkages among public and private agencies, particularly research institutions and industry
- the large number of SMEs in Australia and their low investment capacity for research and development

(Continued)

⁶² Balzat and Pyka (2006)

⁶³ Andersen, Lundvall and Sorrn-Friese(2002)

⁶⁴ Lundvall, Anderson and Dalum(2002)

⁶⁵ Andersen, Lundvall and Sorrn-Friese (2002)

⁶⁶ Roos, Fernström and Gupta (2005)

⁶⁷ Roos, Fernström and Gupta (2005)

⁶⁸ Gans and Stern (2003)

⁶⁹ Roos, Fernström and Gupta (2005)

- poor commercialisation of technologies developed through public sector research and development
- relatively low managerial capacity to develop and sustain innovation strategies and cultures within organisations.

The Review of the National Innovation System⁷⁰ and the Australian Federal Government's response *Powering Ideas*⁷¹ have attempted to develop a systematic strategy for Australian innovation that encourages integration between businesses and public research organisations to facilitate the spread of knowledge and innovation to industry.

A mounting body of literature affirms that growth in the world economy will be increasingly dominated by knowledge-intensive goods and services.⁷² Accordingly, a key element to competitiveness in a knowledge-based economy is "interconnectedness" or linkages which can be brought about by an effective NIS. Countries that foster an infrastructure of linkages (networks) among businesses, universities and governments gain a competitive advantage via their ability to diffuse information and deploy new products or services more quickly.⁷³ In short, nations need an effective NIS to perform well on the global stage.

If the contribution of SMEs to Australia's GDP is to rise, those SMEs trading goods and services in international markets will need to be highly supported by the NIS. Universities will need to contribute relevant research and communicate it in an appropriate manner. All levels of government can contribute policy and regulation that takes Australia forward into innovation-led prosperity in a low-carbon future.

MEASURING INNOVATION

There are many different ways of categorising innovative activities in order to measure innovation. Agencies involved with collecting innovation data, out of necessity, tend to use narrow definitions of innovation rather than a more complex systems-approach. The Oslo Manual of Innovation⁷⁴, provides a framework for internationally comparable data collection on innovation that acknowledges the complex interactions that constitute innovation systems and the "critical importance of parts of the innovation process other than R&D".

Several of the Australian Bureau of Statistics Innovation surveys on innovation draw from the concepts and measurement methods outlined in the Oslo Manual, focusing on business-level innovative activity. Innovation is defined by the ABS as the introduction of any new good or service; marketing methods; operational processes or organisational/managerial processes.⁷⁵ We used the ABS definition and typology for business-level innovation to analyse the SME case studies of innovations which have been introduced in response to the low-carbon economy. The four types of innovation tracked by the ABS are as follows:

1. **New goods and/or services** wherein characteristics or intended uses of the new good or service differ significantly from those previously produced by the business. This may include significant improvements in technical specifications, components and materials; incorporated software; user friendliness; or other functional characteristics.

⁷⁰ Cutler and Company (2008)

⁷¹ Commonwealth of Australia (2009)

⁷² Roos, Fernström and Gupta (2005)

⁷³ Carlsson, Jacobsson, Holmen and Rickne (2002)

⁷⁴ OECD (n.d.)

⁷⁵ ABS (2010 b)

2. **New marketing methods** wherein new modes of communication are implemented such as changes in product design, product packaging, product placement, product promotion, product pricing, or sales methods. Marketing innovations are aimed at better addressing customer needs; opening up new markets; or newly positioning the business's goods and/or services on the market, with the objective of increasing the business's sales.
3. **New operational processes** wherein a business's methods of producing or delivering goods and/or services are significantly changed, such as their methods of manufacturing, logistics or distribution methods, operational processes and supporting activities.
4. **New organisational/managerial processes** wherein the strategies, structures or routines of a business that aim to improve the performance of the business are significantly changed. Such changes include knowledge management processes; new business practices; new methods of organising work responsibilities and decision making; and new methods of organising external relations with other businesses or public institutions.

SMEs AND INNOVATION IN AUSTRALIA

Surveys undertaken by the ABS show that Australian SMEs do innovate, but the extent of innovative activity is on average greater in large businesses. In 2008–09, two-thirds of large Australian businesses surveyed stated they were actively innovating, compared to 58% of businesses with 20–200 employees and less than 50% of businesses with fewer than 19 employees.⁷⁶ These differences in levels of innovative activity between SMEs and larger businesses mirror the situation for SMEs across the OECD on average.⁷⁷ As Table 2 illustrates, larger SMEs (of 20–199 people) tended to innovate more around operational and organisational/managerial processes than did smaller SMEs – a result that makes intuitive sense given the greater need for coordination and codification as businesses get larger.

TABLE 2: Types of innovation in Australian companies⁷⁸

Employment size		0–4 persons	5–19 persons	20–199 persons	200 or more persons
Businesses which introduced or implemented any new or significantly improved:	goods	% 7.2	13.3	14.3	15.6
	services	% 10.4	15.0	15.0	19.5
	goods and/ or services	% 14.8	23.2	24.1	30.4
	any operational processes	% 11.1	22.5	30.3	42.4
	any organisational/managerial processes	% 14.0	26.3	32.1	41.9
	any marketing methods	% 14.4	20.8	24.1	26.4

The barriers to innovation in SMEs are well documented. In many ways, these barriers are similar to those affecting other aspects of SME performance and productivity:

“I think the important issues to look at in any discussion or analysis of innovation are: the capital issue, skills issue and management competence.”⁷⁹

⁷⁶ ABS (2010 b)

⁷⁷ OECD (2010)

⁷⁸ ABS (2010 b)

⁷⁹ Leader in national innovation research, Interview, 2010

“And there are, of course, barriers to innovation in SMEs. In addition to access to finance – a traditional concern of small businesses – the statistics show that a key obstacle is lack of suitably qualified personnel, both scientific and managerial.”⁸⁰

The barriers to innovation identified by the ABS in “innovation-active” businesses (as seen in Table 3) reflect the scarce financial, human and knowledge resources available to SMEs, and uncertainties over the demand for new goods or services in the marketplace.

TABLE 3: Barriers to innovation in Australian companies⁸¹

		Innovation-active businesses				Total
		0–4 persons	5–19 persons	20–199 persons	200 or more persons	
Lack of access to additional funds	%	29.9	30.4	26.3	18.1	29.5
Cost of development or introduction/implementation	%	19.1	23.7	18.5	19.0	20.7
Lack of skilled persons:	within the business	18.3	22.9	20.4	17.2	20.3
	within the labour market	13.6	18.8	22.2	13.7	16.6
	in any location	23.7	30.5	30.8	21.4	27.1
Lack of access to knowledge or technology to enable development or introduction/implementation	%	4.1	3.7	3.6	4.0	3.9
Government regulations and compliance	%	15.9	12.6	18.5	13.1	15.0
Adherence to standards	%	4.1	6.0	6.2	3.6	5.1
Uncertain demand for new goods or services	%	19.2	16.7	14.3	12.5	17.6
Any barriers to innovation	%	58.7	61.6	57.6	45.0	59.6
No barriers to innovation	%	41.3	38.4	42.4	55.0	40.4

Despite the barriers to SME innovation highlighted by numerous theoretical and empirical studies, there is no doubt that across sectors SMEs are applying leading-edge business practices and many small incremental innovative solutions adapted to their local contexts. A recent study of the Australian residential building construction industry is one of the very few empirical Australian studies on innovation and sustainability issues in SMEs. It highlights the commitment of a group of businesses within the sector⁸²:

This research into the SME sector of the Australian residential building construction industry has shown that firms in this sector can be quite innovative, particularly at the practical level, when responding to business needs or customer requirements, or else when they desire to achieve a particular outcome such as industry leadership. The commitment by this group of firms to innovation and long-term gains, and their generally positive view regarding sustainable design and construction practices, demonstrates that, in the residential building construction industry, there are indeed leaders committed to take the sector to higher levels of sustainability.

THE IMPORTANCE OF KNOWLEDGE FOR INNOVATION IN SMEs

The ability of a business to create, own, protect and use knowledge is one of the most critical factors influencing its performance, its innovative capacity and its ability to sustain a competitive advantage.⁸³ Across the economy, knowledge flows thus form “the quintessence of an innovation system”.⁸⁴

Activities like science and R&D are very important sources of new knowledge and innovation, but are not the only ones. Knowledge exchanges between different types of producers and

⁸⁰ OECD (2010)

⁸¹ ABS (2010 b)

⁸² Thorpe and Ryan (2007)

⁸³ Scott-Kemmis, Jones, Arnold, Chittravas and Sardana (2008)

⁸⁴ OECD (2010)

users are important sources of specific knowledge that cannot be generated by scientific research alone.⁸⁵ Not all technological knowledge is codified in blueprints, manuals, and sets of instructions; much knowledge remains tacit (un-codified) in the form of personal or institutional knowledge, skills and experiences. Generally, new knowledge tends to be less codified and articulated, which makes it difficult to reproduce, memorise and learn, and therefore harder to transfer to others.

For SMEs knowledge is gained mainly through day-to-day experiences and “learning by doing”, rather than from “purposive learning” through formal training or other activities to source specific information.⁸⁶ Smith (2006) identifies that the reality for most non-high-tech companies is that innovation occurs through incremental changes and by drawing on “non-scientific and non-R&D based knowledge such as creative design, marketing, organisational improvement and tooling up”.

The codification (or writing down) of this type of accumulated knowledge by SMEs is often hampered by a simple lack of time. As a leader in innovation research noted:

You've only got to go into small businesses and watch them for a few days, or even watch them for a few hours and they're making things and doing things that the rest of the world don't know about everyday. But they won't take it to the next step because there's too much paperwork and they haven't got the resources or the time ... It might be able to help another 2000 businesses but it just never gets there because they move on to the next job.⁸⁷

Nonetheless some form of codification of knowledge is very important to promoting innovation in an economy, as this is how others learn and build on what has already been achieved. For SMEs, the accumulation of new knowledge often happens informally. In order to learn from this knowledge and then apply it to their own situation, the prior experience of owners/managers and even staff becomes important. This is because “to cope with scattered information ... a certain degree of previous knowledge [is necessary] to receive, process and synthesise the available information”.⁸⁸ Similarly, managerial capability is required to “identify, assess, acquire, integrate and adapt knowledge”.⁸⁹

Engaging in **business clusters** is commonly suggested as an effective means for small (and large) businesses to collaborate on innovation, commercialisation of research and marketing.⁹⁰ Clustering with other companies offers SMEs a means of overcoming the disadvantages of their limited resources to engage in collaborative innovation. The wine industry in South Australia is an example of the success of this form of collaboration, as it has reported higher levels of collaboration and has outperformed wine SMEs in other states with regard to training, product development and process innovation.⁹¹ The effectiveness of clusters depends on many factors. For example, local networking is important in the early stages of a business's lifecycle but becomes less so as businesses become more established:⁹²

A cluster that's developed with a government facilitator will target a whole group of firms, structured industry or perhaps in a geographical area. The firms will come along and will discuss things about if I start up how do I get this, how do I get that, how do I get the basic services organised Then they get to a phase where they're actually operating

⁸⁵ Lundvall (1992)

⁸⁶ Thorpe, Holt, Macpherson and Pittaway (2005); Scott-Kemmis, Jones, Arnold, Chittravas and Sardana (2008)

⁸⁷ Leader in innovation research, Interview, 2010

⁸⁸ OECD (2010)

⁸⁹ Hall (2005) cited in Scott-Kemmis, Jones, Arnold, Chittravas and Sardana (2008)

⁹⁰ Roberts and Enright (2004)

⁹¹ Aylward and Glynn (2006)

⁹² Tagar and Cocklin (2010)

*officially... they're making money at last, they're developing new ideas, new products, and they sort of drop out of the network. ... They come back again maybe in two to three or four years time where they've reached a stage where they... no longer can develop the business further So they might rejoin another cluster where there's more experienced businesses and will pick up ideas how they make that next step from a small family business to a larger business that's professionally managed ...*⁹³

UNIVERSITIES AS SOURCES OF KNOWLEDGE FOR SME INNOVATION

Universities and other public research organisations are recognised as increasingly important supporters of SME innovation, including through the transfer of knowledge to support R&D activities in technology-intensive sectors. This type of knowledge transfer, however, is only the “tip of the iceberg” in terms of the potentially productive ways in which universities can engage with businesses.⁹⁴ The Review of Australia’s National Innovation System identifies four broad contributions universities can make when working with and for SMEs:

1. developing human capital
2. adding to knowledge production (for example technical literature, patents, software and hardware prototypes)
3. increasing local capacity for scientific and technological problem solving
4. providing space for open-ended conversations about industry development pathways and new technological and market opportunities.

SMEs are less likely than larger companies to collaborate with universities; and all businesses, particularly SMEs, are more likely on average to obtain ideas or information for innovation from sources other than universities, including customers, competitors, government agencies and industry associations.⁹⁵ There are a number of reasons for the currently limited collaboration between universities and SMEs. Evidence suggests that many SMEs do not regard tertiary-trained staff as valuable to their operations, which in turn is a barrier to effective management.⁹⁶ The relatively low levels of tertiary education, on average, amongst SME owner/managers is often cited as a key barrier:

*I think it's a lack of recognition of the value of education and connection to education... the other one is that it's difficult for [many] SMEs is to actually contact and make contact and interact with universities... Many SMEs don't have those [alumni] contacts and they don't tend to see any great value in going along to network meetings or product launches, or (technological) innovations coming out of universities is simply beyond them.*⁹⁷

The limited accessibility of research findings to the broad public and SMEs is also a key barrier. University performance frameworks which focus on metrics such as peer-reviewed publications and postgraduate degree completions might further limit the relevance of university research to SMEs and the ability of universities to work directly with SMEs.

To date, when universities do work with SMEs, it is usually on product innovation rather than process innovation. The value of relationships between universities and SMEs for process innovation has not widely gained traction from the universities or SME perspective and as such is not commonly on the radar of either as something of value to offer or to seek. The

⁹³ Leader in innovation research, Interview, 2010

⁹⁴ Cutler and Company (2008)

⁹⁵ ABS (2010 b)

⁹⁶ Allen Consulting Group and St James Ethics Centre (2008); Green (2009)

⁹⁷ Leader in innovation research, Interview, 2010

opportunities for universities and research institutions to engage with SMEs go far beyond the licensing and commercialisation of research. They should include assisting SMEs to create and execute new business models where the firms meet unmet market and customer needs with competitive, imaginative business offerings that are superior to those of their competitors. Universities can do this by assisting with specialised training, knowledge exchange and opportunities for collaboration. For example, depending on the circumstances of each SME, universities can provide customised courses, technical assistance, use of facilities, problem-solving consultancy services, ideas labs, interns, researchers-in-residence and the like.

GREEN INNOVATION

The concept of green or eco-innovation is critical to policy priorities for enabling “green growth” (that is, as the OECD states, “fostering of economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies”).⁹⁸ The two concepts of “eco-innovation” and “cleantech” are often used to buttress discussions of facilitating green-growth or the low-carbon economy – both “cleantech” and “eco-innovation” are described in more detail in Appendix B.

Put simply, eco-innovation helps to decouple growth from natural capital depletion.⁹⁹ The concept spans a diverse range of innovations, going beyond technology into managerial and organisational changes. Cleantech is a more specific concept which pertains to a collection of technologies that “optimise our use of natural resources and minimize environmental impacts”.¹⁰⁰ Cleantech has been heralded as a major contributor to making progress towards a low-carbon economy and fast growing, venture capital-backed cleantech companies often draw media attention. However, importantly for this research, it is not only the emerging cleantech sector that can drive the low-carbon economy; other types of low-tech, managerial and organisational innovations are also important. Such eco-innovations leading to a low-carbon economy are explored in the case studies, and are of relevance to Australian SMEs more broadly.

⁹⁸ OECD (2011: 9)

⁹⁹ OECD (2011: 9)

¹⁰⁰ Van Passel (2008)

PART II

**SME
CASE STUDIES**

Chapter 4. A framework for case study selection and analysis

The overarching framework for case study selection and analysis that was applied to this study draws on the extensive body of theoretical, empirical and policy work outlined in Chapter Three. Each case study explores how SMEs have responded to the opportunities presented by the low-carbon economy, through addressing three themes:

1. Business responses that result in innovation
2. Knowledge flows and networks that support innovation
3. Value created – for the SME, and for the wider community and economy

1. Business responses that result in innovation

The proceeding case studies explore the individual journeys of 12 SMEs, particularly focusing on innovative or transformative responses undertaken while describing the low-carbon economy drivers or key enabling ingredients of these changes and the value creation brought about by the changes. The broad approach to describing SME innovations are distilled from ABS typologies for business innovation (product/service; process; organisational and managerial; and marketing). Consistent with the OECD Eco-innovation frameworks, “accidental” eco-innovations are also explored with a focus on interrogating whether innovations are “steady-state” or incremental innovation, or to what degree the low-carbon economy has inspired more radical or dynamic forms of innovation.

2. Knowledge flows and networks that support innovation

The ABS typology for business innovation has been extended to recognise the networks and relationships involved in innovative activity, and each case study includes a description and analysis of how SME staff individually and collectively acquired and used knowledge to make innovative changes or to promote innovation by customer and supply-chain organisations.

3. Value created

As outlined in Chapter 2, innovation is more than doing something new – to be innovative, the new action must also create value in some way (e.g. competitive advantage, new products). Therefore, measuring the extent to which the case studies reflect this aspect of value creation is an important component of this analysis. This was measured through business outcomes and perceived benefits to the wider community.

SELECTION OF CASE SMEs

The types of SMEs involved in the research were broadly guided by the following scope:

1. Includes SMEs across all industry sectors of the economy with the exception of primary industries including mining (ANZSIC Division A 2008), agriculture, fisheries and forestry

- (ANZSIC Division B 2008).¹⁰¹ This decision was consciously made as these industries are subject to natural resource management issues that are generally not as relevant to other SMEs.
2. Includes only SMEs in urban areas and metropolitan areas. Whilst SMEs in rural and regional areas are an important part of the Australian economy their challenges and opportunities are often very different from those in urban and metropolitan regions who make up the majority of SMEs.
 3. Includes both businesses who started with a specific sustainability focus as a key part of their business model and those who have transformed, or are transforming, in response to the low-carbon economy.
 4. The research does not focus on high-tech start-up companies. Most research into innovation has focused primarily on this type of business whereas the challenges and opportunities that innovation presents mainstream SMEs, particularly in the transition to a low-carbon economy, are still little understood.
 5. Size – a range of company sizes were chosen from micro (2 employees) to medium-sized (100 employees).
 6. Longevity – some companies have been in business for well over half a century, while others started only recently. This is to reflect that different aspects of innovation may apply at different phases in a company's lifecycle.

TABLE 5: Case Study Companies

Company Name	Sector	Number of Employees
Corban and Blair	Lifestyle products design, manufacture, wholesale and retail	10
Crystal Creek Country Meadows Luxury Cottages & Spa Retreat	Accommodation and tourism	2
Digital Eskimo	Design and web services	14
Dynamic Property Services	Property management	41
Endless Solar	Alternative energy systems	10
Focus Press	Printing	100
Food Connect	Sustainable agriculture / social enterprise	15
GoGet CarShare	Transport (car-sharing)	14
Living Green Designer Homes	Building and construction	13
RMB Lawyers	Legal services	93
Serendipity Ice cream	Manufacturing and retail – food	18
Whiteley Corporation	Manufacturing – medical and industrial cleaning products	50

¹⁰¹ ABS (2008)

Chapter 5. Case studies

1. CORBAN & BLAIR

Corban & Blair is a creative design and stationery company that has been in business for 23 years. They have a retail shopfront in Sydney's inner west which currently employs 10 people and sells stationery and lifestyle products to wholesale, retail and corporate customers. This case study is based on an interview with Gillian Corban, co-founder and co-owner.

Their story – creative products that honour the past and embrace a sustainable future

Corban & Blair's core business philosophy is to design high quality, useful products which bring beauty and meaning to people's lives:

Our products are about the human qualities of things. We want them to be decent products ... that look good, feel good and create a certain environment. We want them to be meaningful.

Social and environmental sustainability is not considered a separate, discrete goal for Corban and Blair; instead, a commitment to environmentally responsible design and practice has long been embedded in the company's vision of creating a "decent product" for its customers.

Corban & Blair consistently selects materials to reflect the sustainability principles that are an integral part of the company's commitment to "honour the past". This commitment has become an important part of their brand strategy. Over 20 years ago, before recycled paper was available in Australia, they designed and produced stationery that was made from re-used kraft paper. Many of their current product lines are made from recycled materials, from "floppy disks to circuit boards to old cartons to bonded [recycled] leather". Corban and Blair has also undertaken specific initiatives to source wood for picture and photo frames from sustainable plantations in New Zealand, and purchase carbon offsets to compensate for the carbon used in producing and transporting the frames. From these actions they have created new products, accessed new markets and importantly carved themselves a competitive niche in the stationery market.

Innovative responses to the low-carbon economy

Corban & Blair's commitment to the low-carbon economy is integrated in all they do, and as pioneers in the field, this manifests in several ways in changes to their business practices. It influences their online business practices. It motivates them to work closely with their supply

chain, and to constantly renew their product lines. And it means they listen to the market, supported by active participation in learning and communities of practice. These changes have not been directly driven by the low-carbon economy as much as their collective passion for creativity and ‘honoring the past’.

The stationery industry is carbon intensive. Corban & Blair are aware of this and by using products which contain recycled materials and by marketing online they have been able to offer new value.

Corban & Blair has incorporated an innovative online marketing and online transaction mechanism, moving away from a reliance on traditional marketing and transaction opportunities (which often involve carbon-intensive travel and transport). Importantly, as a business they decided not to employ an in-house IT staff member, but to reconceptualise IT services to get what they needed from sources that are freely available and widely utilised by their core market. Corban & Blair chooses not to transport its products to trade shows and instead reaches customers with marketing via online social media including websites, blogs, twitter and other social networking sites. While this is not a direct response to the realities of the low-carbon economy, the company’s decisions in the marketing space have resulted in improved sustainability outcomes, increased efficiency and sustainable demand for their lifestyle products. They consider their role in innovation for the low-carbon economy to be largely in their contribution to knowledge networks which assist other businesses in the sector.

A second key area of Corban & Blair’s brand innovative approach is its dedication to introducing product lines with unique or limited-edition releases. The main driver for this is to create individualised, specialty products, but there are ancillary environmental benefits: the products are usually made from unusual recycled materials and are manufactured in Australia reducing the company’s carbon and waste footprint while enabling it to stay true to its creative vision. Customers’ drivers for purchasing the products vary from environmental to design-based choices and a combination of both.

Knowledge flows – raising the bar on the supply chain

Living a sustainable ethic through its business practices, Corban & Blair has been trying for several years to work with companies in its supply chain to promote environmental sustainability. Gillian reports that there have been frustrations with this process, but hopes that these efforts have been able to sensitise some of the wider business community – suppliers, retailers and customers – to the importance of environmental sustainability actions in general:

Because we’re a sophisticated, educated business working with oftentimes uneducated, less sophisticated suppliers and customers, we lift the bar, I suppose. Sometimes we get very frustrated.

Since the company started business, Corban & Blair has been highly selective when choosing suppliers:

In the beginning ... I gave them a report card on a number of criteria. This is 23 years ago so things have changed. That was before total quality assurance and all of that. If they didn’t come [to a seminar we organised] and respond, we just got rid of them.

Corban & Blair continues to give suppliers feedback on their environmental performance (among other indicators) and expects them to respond or change if Corban & Blair is dissatisfied with any aspect of their performance. The company has also tried – often without success – to convince retailers and their representatives to market Corban & Blair product lines

as 'sustainable products', part of the company's wider strategy of leading by example. In this way Corban & Blair are educating other businesses about environmental compliance and exposing others to what businesses sustainability looks like beyond basic compliance.

Corban & Blair acknowledge that their experiences of sharing knowledge with other design businesses within the industry have been far more fulfilling and successful than the frustrations of greening their supply chain. In their early days, they were supported by others in the industry:

When we first went into business, people helped us. We didn't have any idea what we were doing even though we'd done various courses ... I believe you get more by working together ... the message we got when we first started was that there's plenty for all of us, actually, and if we work together you can often make it bigger.

Today, Corban & Blair is actively involved in a number of business sustainability networks, such as Target Sustainability @ Marrickville (a free and voluntary program run by Marrickville Council in which local businesses commit to sustainability targets). Among other capacity building activities, Gillian shares her knowledge and experience by mentoring Indigenous artists who are establishing their own businesses. Being proactive in the environmental sustainability space has helped Corban and Blair add value to their business and it has helped them differentiate their products from others. They now seek to give back to the wider business community, which while not motivated by self-interest, does not hurt in furthering their outward image and internal dedication and commitment to social sustainability.

Creating value – an enduring space for creativity

Corban & Blair has sought to develop and maintain a business model which ensures them the space and time to be creative. The company's emphasis on re-using and recycling materials, reducing marketing-related travel/transport, and the expectation that suppliers and retailers will behave in an environmentally responsible way dovetails well with their business philosophy. In this sense, the company has truly embedded sustainability within overall business operations and goals. Corban & Blair is financially stable (which allows it to attract and retain talented staff), but does not make further profit growth a priority. This has freed up the company to prioritise creativity and sustainability above all else:

The basic principles that we had, was to form a culture that was creative, that was sustainable. I suppose the position we've got to 23 years later, is that we're not on about new growth, we're a particular size. We're happy with that size. We're happy with the number of people we employ; we're happy with our profitability. We don't need any more once you go in too hard and too fast, it's quite hard to be creative.

Corban & Blair's success is made possible by their ability to be environmentally focused as part of their corporate culture and product lines. As such the changes they made to their business practices were not all in direct response to the low-carbon economy but were aligned with their business vision. Accordingly they placed themselves as a sector leader in environmental sustainability long before it came on the radar for many other stationery businesses. This placement was enabled by a clear vision and purpose that complemented the forthcoming low-carbon economy, and since the societal focus on environmental sustainability has accelerated, they have been able to keep at the forefront of the transition through their forward-looking approach, favourable position and desire to stay at the forefront of efforts to achieve sustainability.

People and timing played a key role in enabling Corban & Blair to be flexible and proactive and to extend its focus to peer education through 'giving forward' to the business community

and the wider community. This further strengthened their position as a leader in the sustainability space.

2. CRYSTAL CREEK MEADOWS LUXURY COTTAGES AND SPA RETREAT

Crystal Creek Meadows Luxury Cottages and Spa Retreat is located in Kangaroo Valley, NSW, and comprises four self-contained B&B cottages. This case study is based on an interview with Chris Warren, who established the business with his wife in 2003. The business does not currently employ any other staff, but engages several local subcontractors for cleaning, maintenance and other services.

Their story: implementing sustainability in tourism

Chris Warren and his wife came to Australia in 2003 after living in the Middle East for over a decade and holding a range of positions in the private sector. Shortly after arriving in Australia they purchased two cottages in Kangaroo Valley, and renovated them to create self-contained B&B cottages. Over time, they have implemented a number of sustainability initiatives, including:

- a grey water re-use system, with the grey water collected and used to irrigate an onsite orchard
- a solar energy system, which was built onto a rainwater-collecting structure
- a food waste re-use system – waste is fed to their chickens.

Their efforts have extended beyond these environmental management initiatives. Of key importance, they have developed extensive exchange and business network links with the local economy in the Valley, reflecting Chris's personal views on SMEs striving to embrace the low-carbon economy:

It's not about doing business differently, it's about doing business better. In tourism this means a focus on greening the supply chain.

Innovative responses to the low-carbon economy: local collaboration and embedding sustainability into the visitor experience

Crystal Creek Meadows Luxury Cottages and Spa Retreat strives to embed sustainability in everything that they do, and while their transformations are not necessarily unique within the tourism sector, a lot can be learnt from their case study. The business has gone above and beyond to give guests a sustainable experience, to value add by adding products to services (rather than other way round which is common among SMEs), and to orient the pattern of their business model toward sustainability, while offering a superior tourism product.

A core innovative feature of Crystal Creek Meadows Luxury Cottages and Spa Retreat's business model is integrating quadruple bottom line sustainability into a wide range of business operations, which has (albeit subtly and seamlessly) enhanced the guest experience while contributing to the vitality of the local community. Their multi-faceted approach to working with and for their local community stems from integrating sustainability into the visitor experience and from using locally sourced products and services.

Rather than talking about sustainability or making it a key selling point, Chris aims to enable guests to 'experience' sustainability. In this way, business ethics based on 'principle' – as opposed to a product without a principle – is what Chris believes is an important point of difference for his cottages (which are solidly booked out). For example, environmentally friendly

aromatherapy oils and bath products are placed in cottages for guest use. The products are made on-site using ingredients from the orchard (which is irrigated by greywater). These same products are for sale to guests should they wish to take the experience and memories home with them. In this way value can be added to the original product (accommodation).

Chris deliberately avoids imposing an 'environmental' message on his guests; rather, these elements are subtle and through their experience, guests behave in an environmentally sensitive manner. Chris thinks that a commitment to sustainability should enhance the value of that product (in this case the guest experience) and while it can form part of a unique selling point, it does not need to be in the form of a lecture. Guests are welcome to feed the chickens with food waste and gather and eat the fresh eggs. These initiatives thus indirectly act as an innovative marketing device to attract guests to have a rewarding hospitality experience.

Chris believes that currently the impact of transport is missing in tourism industry dialogue about carbon footprints, and that the focus is too strongly on change in individual businesses rather than on "greening the entire supply chain". Crystal Creek Meadows Luxury Cottages and Spa Retreat leads by example by sourcing products from the local area and marketing to domestic tourists to reduce their own transport-related carbon footprint.

Creating value: moral responsibility for sustainability in the leisure sector

Chris's business approach is ultimately driven by his personal values and desire to "do the right thing" and his commitment to a holistic sense of moral "responsibility rather than sustainability". This distinction is important given that his business operates in the leisure sector, and Chris acknowledges climate change and other environmental challenges can be depressing for guests who do not want to be confronted with these issues while on holiday. Crystal Creek Meadows Luxury Cottages and Spa Retreat is creating value through its approach by integrating sustainable and morally responsible principles into its entire business operations so that they constitute a seamless but meaningful part of the visitor experience. In turn, these sustainability considerations generate a point of difference for the company in the local tourism market:

People spend lots of money on marketing to try and decide what the point of difference is for their product or service. Sustainability can be that point of difference that makes you stand out from the crowd.

The importance of recognition and scoping financial assistance options for environmental initiatives

Chris deliberately chose to pursue a Qantas award to finance their solar energy system:

When you're looking at a small business like us, our main collateral [to obtain finance] is your house ... and you have to pay \$2000 to your bank even for them to consider whether they will give you a loan or not ... All the time involved and so forth ... awards are helpful as we're not having to put up any collateral. So I deliberately went into this award in order to raise capital without the stress of having to go to the bank.

Chris noted that they actively practice energy conservation rather than offsetting emissions. This standpoint is closely aligned with his personal sustainability ethic and is within the financial scope of the business.

Knowledge flows: sharing knowledge through a network of local SMEs

Chris describes the Crystal Creek Meadows sustainability journey as one of "learning through doing" and slowly seeking out information and help whenever possible:

When we started the business we had no skills or experience in how to be sustainable, but as we renovated the cottages and the business, we gradually learnt how to be sustainable

A locally innovative element of the business model which adds value to the tourism product is Chris's decision to collaborate with other businesses in the local area. Crystal Creek Meadows Luxury Cottages and Spa Retreat participates actively in regional sustainability networks such as the Green Kangaroo Program (which has a voluntary membership of one-third of local businesses, all of whom pledge to meet sustainability targets). They also innovate by keeping their supply chain resolutely local and by making this a proud part of their business branding: 60% of the business's total expenditure is spent in their local village area of just 346 people.

Crystal Creek Meadows's involvement in a network of local SMEs through the Green Kangaroo Program has been instrumental in enabling the business to access knowledge about sustainability, and to share its own knowledge with others. Combining forces, local businesses are able to start to position themselves to gain a collective competitive advantage through being a sustainable or 'eco' destination and the community may be able to gain a reputation as a location of choice for this reason. Chris, however, noted the difficulties that many small businesses face in responding to the drivers of the low-carbon economy:

For many small businesses the challenge of transforming in response to the low-carbon economy is a massive mountain to climb. They don't have the knowledge and time to know what to do.

According to Chris, these difficulties are compounded by the generally fragmented nature of information about sustainability, which is not conveyed in a way which can easily be translated into business benefits. He believes that planning and development regulations have the potential to provide information or guidance for sustainability, but instead often pose significant barriers to transformation for the low-carbon economy.

Chris is currently studying towards a Masters of Sustainable Tourism Management at a United Kingdom university, however in terms of his business practices has had only limited interaction with universities and research outputs and has actively sought to make these links. He believes there are significant gaps between academia and real-life small business practice which limit the relevance and usefulness of university research for small businesses:

I've offered our businesses as a source of information to the local TAFE in Wollongong because they run a tourism course. We run field trips for the students here and we provide our property for the local schools to come and do a carbon audit on our business and a carbon sink audit on our trees and so forth. But in terms of acquiring information from universities, I've only used the [Sustainable Tourism] CRC website in Australia. With no disrespect ... it's true of everywhere in the world, I think there's a gap between the academic world and the practical real life world

Chris shared his thoughts about communicating research outcomes in a way that is accessible and empowering for small businesses:

I think it's got to be that rather than an academic approach e.g. of saying what the definition of sustainability [is] and here's a lot of academic background material ... it's just that people don't have time to read academic reports. So we need to use a professional writing resource ... [who are] able to distil the academic information in a motivating manner in order to help SMEs take the next steps

Chris has been active in seeking relationships with universities to use his business as a case study for innovation and emerging research in sustainable tourism.

3. DIGITAL ESKIMO

Digital Eskimo is a human-centred design firm driven by a commitment to create change towards a sustainable future. With a core competency in communication design, Digital Eskimo also works on a broad mix of innovation and strategy projects. Set up in 2001, the Sydney-based company now employs 16 staff. This case study is based primarily on an interview with Digital Eskimo's Director David Gravina. It also draws on conversations with Director of Operations and Sustainability Duncan Underwood and Studio Coordinator Catherine Marshall.

The story – walking the talk

Digital Eskimo is an organisation with an agenda for change. Founder and Director David Gravina describes himself as an “ad agency refugee” who decided to create an organisation committed to “projects that progress humanity towards a sustainable future”. The company's product and process and people are driven by a sustainability ethic.

Digital Eskimo differs from the typical design agency in its strong ethical stance and its focus on collaborative methodologies for design. Although Digital Eskimo works on a commercial basis, the agency seeks to find work that aligns with its values and uses an approach similar to the ethical investment screening process to avoid projects considered unethical or strongly counter to the goal of sustainability.

A whole chunk of client work is making a positive change in the world. We have some commercial work which should probably fall into a more neutral place ... [however] anything that promotes mass consumption or that affluenza sort of culture, we wouldn't be involved in.

Digital Eskimo also undertakes self-funded and in-kind projects with a sustainability agenda and will occasionally sponsor or subsidise projects for NGOs.

When Digital Eskimo was founded in 2001, the original idea was for a cooperative network of freelancers. This proved difficult to manage, and over time the organisation moved towards a typical agency model. Much of Digital Eskimo's early work was for NGOs, however the company also took on more ‘mainstream’ clients to survive and fund NGO work. Over time the agency has built up the size and diversity of its portfolio, moving increasingly to website design and specialising in a process-based discipline called ‘user experience’.

Digital Eskimo's internal operations, and main distinctive innovation for the low-carbon economy, also strongly reflect their commitment to sustainability. The agency has undertaken a comprehensive sustainability footprinting exercise to assess its impact and identify areas for improvement. The Digital Eskimo studio is expressly designed to have a low environmental impact and good indoor environmental quality. It includes natural and recycled furniture, indoor plants, natural ventilation, energy and water efficient appliances, and facilities for cyclists. However the focus does not stop at the fitout; Digital Eskimo also has a pushbike fleet and a car share membership, a sustainable procurement policy for office goods and services, and very innovative work-life balance measures for staff. These include a 40 hour week policy, a time in lieu plan, and the provision of pastoral care beyond the imagination of other SMEs.

Innovative responses – carving a niche through commitment to people and place entirely reflected in approach and innovation branding

Digital Eskimo's strong commitment to sustainability has presented some challenges in an industry largely based on marketing that actively encourages consumption. The agency is

essentially working against its industry's dominant paradigm, and seeking to change it from within.

Digital Eskimo's strong culture of innovation in service provision has helped the agency to survive in a competitive industry. One example is the niche Digital Eskimo has carved in design process innovation, based on a collaborative and human-centred approach called 'considered design' which has proven popular among clients.

Certainly in each of the challenges we've faced we've innovated and we try new things constantly, and we're always open to changing them and improving them. There's our design process which is a real amalgam of many disciplines and it changes over time and we bring new things in. All living, vibrant design processes should be moving forward.

Having built up expertise in its human-centred "Considered Design" method, the agency looks for ways to apply this thinking to the "messy problems" of sustainability and social change.

Design thinking and design process is a path towards that holy grail of ongoing innovation.

Innovative practices can also be found in the agency's internal operations. Attracting and retaining talented staff in a competitive environment can be a significant challenge. Digital Eskimo's strong focus on work-life balance and creating a learning environment for staff has helped to address this. The focus on sustainability and 'making a difference' is also a drawcard for many would-be employees, and Digital Eskimo tries to attract talented staff whose values align with its own.

People are here because they want to make a difference in the world, and we take on projects outside of our client work that are making a difference in the world.

Knowledge flows – an 'open source' approach

Digital Eskimo has consciously positioned itself as a thought leader in the Australian design industry, with a regular roster of outreach, public speaking engagements and alliances with educational institutions. This positioning forms an important part of their value adding through innovation for a low-carbon economy.

People come to you, not so much for your process but for how you implement it and for the culture and the experience and what you're able to do. I think giving [ideas] away is the smart way to do it, and being open, very open.

Digital Eskimo also hosts a series of informal industry networking events such as greenUps, DE Flicks and DE Talks, and runs an internship program for design students. They use their website to promote these events, further coupling their events with marketing of their brand and ethic to prospective clients.

One of our goals is to help engage with design students early enough to move them away from assuming the only thing they can do with their career is consumption based marketing work.

This engagement is focused on inspiring the design industry and design students to be agents of change. Digital Eskimo has initiated a project called the 'Change Agent' that will be delivered in partnership with the UTS Creative Industries Innovation Centre:

It's about saying, 'If you're genuine, take a seat at the table and let's work together to work out how you can become a change agent ... How can you use your influence, how to influence people through design ... what tools do you need?'

The balance between being collaborative and retaining a competitive edge and point of difference is a challenge for many SMEs. Digital Eskimo's strong change agenda necessitates a focus on sharing information to seed industry transformation. The agency acknowledges that this comes with its own challenges:

We try to inspire others and be an example and to share with people ... one of our objectives is to create more competition for ourselves. But it does test your mettle when new people are coming into the area and winning work you'd like to do. There's a few new agencies popping up ... doing great work and they're now competing with us. That's cool but I admit I haven't invited those ones to the studio to learn everything that we do.

In principle, collaboration is a better way to work, especially if you've got a mission that's not about maximising your own profit as a company, then there's a balance there. But at the same time we can't obviously go too far the other way (giving away ideas) and go out of business.

Creating value – agents for change

Digital Eskimo is an example of an SME that leads through example, opening up new possibilities for the sector they operate in. Whilst communication design is strongly associated with marketing and consumption, Digital Eskimo uses its creative skills to promote a cultural shift towards more sustainable living.

For small creative industry organisations, it's an incredibly exciting time, we should be taking this tool we have which allows for rapid creative innovation and we should be helping all the different sectors of society use it. We're one small agency in a tiny part of the world and I think the only chance for humanity is if we get very creative very quickly and innovate at an unprecedented rate to try to move to this low-carbon economy. To do that we have to become far more creative and break out of these old patterns of behaviour. That's only going to happen through a massive cultural shift and designers have a huge role to play.

The cultural shift spans both external and internal operations. A significant focus for Digital Eskimo is the wellbeing of staff. Talking to staff, there is the sense of a collaborative, genuinely nurturing working environment. An explicit part of the studio coordinator's job description is to look after staff.

Sustainability is often talked about as a really inadequate term ... we talk about nurturing rather than just sustainability (Director of Operations and Sustainability).

I'm responsible for the physical space in the studio, making sure it's an inspiring and creative place to work in. One of the biggest parts of my role is wellbeing, so I organise internal company events and just make sure everyone's happy. If I can tell someone's having a rough day then I make a bit more of an effort for them. I cook lunch for people a lot of the time as well [incorporating produce from Digital Eskimo's herb garden] (Studio Coordinator).

Digital Eskimo sees a lot of scope for SMEs to be innovative and lead the transition to a low-carbon economy:

Small companies are really well placed to innovate and try local solutions. Because we're nimble enough to do it and the cost of changing isn't as high. We can see the local opportunities because we're in and of the places, more so than a larger company.

4. DYNAMIC PROPERTY SERVICES

Dynamic Property Services provides tailored services in the management of strata and community schemes, building management committees and company title properties. Dynamic Property Services also provides expert advice to major precinct developers in the early stages of planning on a range of issues – including the consideration of sustainability outcomes in the design, operation and management of properties. The company employs 41 staff and has been in business for 30 years. The inspiring objectives of its work combined with flexible work arrangements contributed to the company being ranked fifth in Business Review Weekly's 2009 review of the top 50 Australian companies to work for. This was the highest ranking for an Australian-owned company. This case study is based on an interview with Wally Patterson, Chairman of Dynamic Property Services.

Responses to the low-carbon economy

Within their own offices, Dynamic Property Services has implemented a range of environmentally sustainable initiatives – including paper recycling, double-sided printing, automatic lights and heating. The company supports working from home to increase flexibility and reduce travel costs. Dynamic Property Services stands out from other businesses which have reduced the environmental impacts of their office operations by using sustainability developments within their own building to demonstrate to their clients the benefits of such initiatives. Dynamic Property Services provides a sound example of environmentally responsible changes that can be achieved by SMEs in the property sector.

During last 20 years Dynamic Property Services' operations have focused largely on the management of multi-owner properties, such as community schemes, strata buildings, and commercial-residential properties. Through their advice on budgets, they have a substantial influence on how existing buildings are managed, including improvement of carbon performance relating to energy efficiency:

We work with the owners' corporations trying to identify areas where there might be alternative ways of spending some of the capital; in some cases to refurbish rather than replace, or to replace with more energy efficient products, or to accelerate the planned maintenance with a reasonable payback period if it's an energy upgrade.

As owners and strata managers of the building within which their office is situated, Dynamic Property Services has influenced decisions to install zoned airconditioning; water-efficient retrofits in bathrooms; and showers and bicycle racks to encourage cycling to work. Dynamic Property Services calculates the payback periods and financial benefits of energy-efficiency and water-efficiency investments and relays this information to their clients when advising on the allocation of capital budgets. The company also provides anecdotal evidence of improved work performance from their own building as well as testimonials from the owners of other major commercial buildings who have also installed, for example, facilities for cyclists. They find that there is a growing interest in considering factors other than immediate dollar returns – such as workplace productivity – when corporations weigh up refurbishment options.

Dynamic Property Services also distinguishes itself from other businesses in their sector through their consulting work with developers. Wally Patterson is sought after by developers to advise on complex titling issues in the early stages of planning:

We do a lot more consulting work with developments than most of our competitors, and we've been fortunate to work with developers that are concerned about environmentally sustainable issues and so on ... I guess they're corporates that have a social responsibility mandate, rather than just driving the maximum dollar out of each individual development.

Wally says that unlike 30 years ago, there are some major property developers who are now interested in building a brand and reputation to attract repeat customers. This means that they have a medium-term (5–10 year) interest in the development, including an interest in how livability and amenity affect ongoing sales rates. Dynamic Property Services gets involved in developments as early as possible, at the stage of assisting developers in their negotiations with councils. This assistance includes input into negotiations to get better approvals for sustainability initiatives. In other cases they work with developers throughout the development process to identify the financial implications of initiatives such as blackwater recycling, tri-generation, car-share facilities, and enhancing natural airflow to reduce dependency on air conditioning.

Transformation – spreading change for a low-carbon economy from practice to policy

Dynamic Property Services' consulting business with developers is built upon the strength of the reputation of their chairman and staff and participation and networks in the industry. This service to developers is a key transformation – an expansion of the services normally provided by property managers. As trusted and proven providers of multi-owner property management services, Dynamic Property Services is in a unique position to be able to advise developers on the value of sustainability initiatives – specifically the implications on cost, selling price, reputation, branding and marketing.

Dynamic Property Services also takes a new approach to its main business, the management of existing multi-owner buildings. They work collaboratively with owners' corporations to find new and tailored solutions to co-management issues. They have been successful in many residential apartment buildings in encouraging water-efficient retrofits. As apartments are not individually metered, their only argument is that if you can cut down the water being used in all the apartments, the owners' corporation's budget will benefit. Another example is in a commercial building which had only one meter. They identified one business which was using extraordinary amounts of water. Dynamic Property Services negotiated with the owners' corporation to invest in sub-meters, which resulted in significant water and cost savings:

There was one fish shop where the guy used to open up at six o'clock in the morning, would turn the tap for washing down the fish, and it just ran continuously until when he left at 10 o'clock at night ... But the first [sub-metered] bill he got – we could hear the screams from here, but within three months he'd cut his water use to about 10 per cent, which was a 25 per cent reduction in the entire building's water use.

Dynamic Property Services played a part in influencing the wider operating environment of buildings management. They helped to change NSW legislation, which now makes it compulsory for all strata schemes to have a 10-year capital works (sinking fund) budget. This requirement is instrumental in facilitating longer-term investment decisions including sustainability initiatives with longer pay-back periods. Their negotiations with councils in the early stages of development not only create incentives for specific developments, but also create longer-term change.

Knowledge networks – industry groups, national standards, universities, web communities

Dynamic Property Service's extensive participation in knowledge networks is key to their profile, recognition and ability to promote change throughout the building development and management sectors. Wally Patterson has been actively involved in the Urban Development Institute of Australia for the last 15 years, and is currently chair of the Strata and Community Development Committee. Through this involvement, Dynamic Property Services sponsors the high density development award and this enables it to have input into the sustainability criteria the award uses. Wally has also worked with the Faculty of the Built Environment,

University of New South Wales, on various strata management issues. Dynamic Property Services also sponsored the Owners Corporation Network for the development of the “Green Strata” website, which is partly funded with a City of Sydney grant. Wally observes that this site is rapidly becoming a central resource for a whole range of issues.

Value for the firm – creating a workplace of choice

Wally reflected on their recent award as a workplace of choice:

We spend so much of our time here and we try and not only make it fun, but also provide opportunities for people who do have desires to make change happen, to be able to do it. Provided that's in a creative or a good way that's a benefit to society generally.

This attitude and drive from business leaders is key to the success and positioning of Dynamic Property Services in the low-carbon economy.

5. ENDLESS SOLAR

Founded seven years ago, Endless Solar is a leader in evacuated tube solar hot water systems for residential and commercial application. They have six full-time staff in Sydney and four part-time staff in Melbourne. This case study is based on an interview with Stephen Standish, Endless Solar's managing director.

Their story: Bringing evacuated tube technology back home to Australia

Endless Solar was founded in 2003 with the seed idea of entering the market for environmental products. In the company's early stages, they considered likely growth trends or precursors to what is now called the “green economy,” looking for viable products. In their research, Endless Solar found evacuated tube design to be the most versatile and robust solar thermal technology, and decided to bring the technology back to Australia for use in solar hot water systems. Evacuated tube technology was invented at the University of Sydney 33 years ago and there are now more than 90 million square meters of this technology installed around the world. Endless Solar operates across Australia, with the bulk of their customer base located on the southern-eastern seaboard.

Endless Solar decided to be a first mover and bring the technology back to Australia for use in solar thermal systems as an alternative to photovoltaic or heat pump technology. The company set out to build and improve a range of products for the consumer residential market, and they have now branched into the commercial and industrial markets. At first, they launched a broader range of products (including a water-saving pump to deliver hot water straight to the tap, PV and rainwater tanks), but over time they decided instead to become specialists in solar thermal systems. There is major potential for growth in this sector: the installation base of solar hot water systems across Australia is still less than 10% of all homes, and the industry applications of the technology are vast (from dairies to abattoirs to food processing plants to breweries and beyond).

Stephen Standish and the Endless Solar team are passionate about “*making a difference in the world and the areas we touch.*” The company's approach has been to try to encourage urban dwellers to make choices that have the best environmental outcomes:

We're trying to give people ... the most reliable product that we can so that they can then achieve their environmental goals... we're trying to come up with pragmatic, real solutions that deliver real results, but still fit in with the normal working environment.

Innovative responses – generating demand, focusing on savings, and promoting good quality and service instead of “greenwash”

Stephen describes Endless Solar as a small company that relies on innovation, hard work and diligence, with a strong passion for driving growth in the solar thermal market. However, the business does not make environmental or “green” messaging part of its brand marketing, preferring to stick to a practical message about cost savings, quality and service. One of its core philosophies is not to focus on environmental problems or “green” jobs and instead talk about renewable energies that have strong commercial outcomes. This has so far been a successful strategy:

Practical, pragmatic, sensible – we think there’s a desire out there for that practical answer. It has been proven. We’ve got good sales; we’ve been profitable for the last two years. We’re cash flow positive every month and we have no borrowings, which is quite unusual for a business at this fairly early stage of its development.

One of the company’s responses to the opportunities presented by the low-carbon economy is to generate demand for their product by building relationships with installers. In this way the installers have product preference for Endless Solar’s product through having personally been exposed to what it is about and how it can perform even in cloudy situations often deemed unsuitable for solar (a common perceived barrier to uptake). The business is part of the Master Plumbers group and the Australian Institute of Hydraulic Engineers. It sees its membership of these organisations as a way of building its legitimacy and accessing industry members. Stephen would like to collaborate more with other like-minded companies in the solar heating space, particularly in commercial partnerships with installation firms or building assessors. Endless Solar is also committed to implementing environmentally sound practices, including a move towards electronic marketing to reduce its reliance on paper and printing. They have a marketing campaign in northern NSW which is paperless and electronic; this has in part been made possible by support for the company from local environmental groups.

Knowledge flows: government rebates, commercial R&D partnerships and the role of universities in verifying the ‘real deal’ from the ‘cowboys’

All of Endless Solar’s solar thermal products (whether residential, commercial or industrial) are Australian Standards-approved and are tested rigorously. Part of the motivation for this is quality control, and part is to make sure the company complies with regulatory and evaluation requirements to qualify for all government rebates relevant to the solar thermal sector. Endless Solar went through an evaluation process to be eligible for Sustainability Victoria rebates and made sure their products met necessary requirements. They have also complied with the NSW State Government’s requirements so that their largest solar thermal products are now eligible for a minimum number of Renewable Energy Certificates.

Stephen does not believe that sector growth depends on more government support in the form of rebates, but rather on government recognition of innovative technology and approaches so that customers know which providers are legitimate and which are not. He suggests government could play a role by more rigorously screening access to rebates and by keeping the evaluation systems stringent. For example, he is trying to engage the federal government’s Department of Climate Change in relation to the rebate for installing solar hot water in aged care facilities (Endless Solar is partnered with Lend Lease Corporation, which manages many aged care facilities in Australia). In Stephen’s view, the government has to find better ways to support this trend towards the decentralisation of energy supply, so that homeowners are empowered to make the best energy choices.

Endless Solar currently has a commercially-based R&D project underway with the Department of Engineering, Computer Sciences and Engineering at the Australian National University (ANU) to use the heat output from evacuated tube collectors in a solar cooling device (a type of hybrid system). ANU is being funded to undertake the research, in part by a “Climate Ready” grant from AusIndustry. The business also has a commercial relationship with UNSW (the university did some initial testing of their products), and has relationships with several universities as the supplier of their solar thermal systems, which gives the company added credibility. Stephen would like to build stronger relationships with Sydney-based universities, particularly in terms of hiring new graduates, but he feels that universities need to work harder to demonstrate to industry the contribution they can make, both in terms of research and talent.

Stephen tries to attend “green economy” seminars and presentations whenever possible to get perspective on green or ethical investing and to keep up to date on trends within the sector as a whole.

Creating value: building a commercially oriented company with staying power

Endless Solar is commercially oriented (it has more than 20 shareholders) and its main goal is to build a company that is viable in the long term and can provide a return for its shareholders. While it is part of the company’s mission to innovate in the “green” products arena, Stephen feels that the best way it can contribute to the environmental movement is by becoming a strong, profitable business with a role to play in the future. The government rebates available in this field have meant there are a lot of “*charlatans and fakes*” operating unscrupulously, and for Stephen, the goal is to differentiate his business through providing quality products and becoming a leading brand that people can trust.

6. FOCUS PRESS

Focus Press is a printing company with two locations in Sydney. Established in 1994 with a staff of four people, they currently employ more than 100 staff. In addition to printing services, Focus Press also warehouses and distributes printed material for customers. This case study is based on an interview with David Fuller, CEO.

The story – creating a point of difference for business longevity

Given the nature of the printing industry, in which business tends to boom and bust cyclically, David Fuller (CEO and owner) believed from the outset that the key to his company’s survival would be finding a way to differentiate it from its competitors. After the first few years of operation, during which the company focused exclusively on establishing itself (“*making a living and finding customers*”), David developed a formal business plan. This plan reflected his vision that superior quality control and environmental management would give Focus Press a competitive advantage within the printing industry.

One of the first steps David took in implementing this business plan was to establish strict quality control practices within the company. Measuring and monitoring data associated Focus Press’s quality control performance was a critical step that allowed the company to benchmark and hence improve its quality performance over time:

Because we were a very small company with only about half a dozen people, I decided that we were probably too small to have somebody collecting data. So, we decided to go for quality – to do quality first and then environment because quality would give us a culture of collecting the data ... it’s about collecting benchmark data from your activities.

After it had established its initial quality control management systems, Focus Press turned its attention to developing its environmental management system. The first step David took was to reach out to external organisations for guidance, engaging the help of an external consultant who assisted him in developing an ISO 14001-accredited environmental management system. David also contacted the then Environmental Protection Authority to seek advice on how to improve the environmental performance of the company's printing operations. This led to Focus Press participating in the Industry Partnership Program:

I called the EPA – anonymously, actually – and told them that I was interested in issues facing the industry in the future and what to do about them. I spoke to somebody ... she said, 'Look, we don't care what you're currently doing, we just want you to get better – and by the way, we're looking for a print partner: do you want to join a cluster?'

Through this program the EPA and its successor agencies provided direct technical assistance to Focus Press and created opportunities for David to build networks and share knowledge with other businesses, both from within the printing industry and from other sectors.

Through implementing various process innovations, Focus Press set and achieved a number of environmental performance targets relating to energy use, water use, waste minimisation and materials selection. A significant personal financial commitment was required for David to invest profits into the establishment and implementation of the environmental management system, knowing that the payback period would be several years:

I ended up spending about \$100,000 altogether ... I didn't start to get that back until after the first couple of years, but I get that back annually now. So we had to show a bit of commitment, especially as that was all our profits. It was instead of buying a car or getting the house fixed.

Today, sustainability considerations including carbon neutrality are at the core of Focus Press's operations and services and are integral to its marketing and branding strategies.

Innovative responses – from quality to sustainability

From the early introduction of quality management processes, to the development and application of environmental management systems, Focus Press's business history is characterised by a range of interrelated innovations, including:

- **Process innovations** – Focus Press made changes to all aspects of its print operations as part of its ongoing commitment to better environmental management. These included changes to raw materials, such as switching to non-toxic, vegetable-based inks, ceasing to use alcohol and replacing non-recyclable ink tins with recyclable ink tubes. Alterations to processes were also made, such as the enclosure of heat-producing equipment to reduce the need for air-conditioning in summer; this heat is redirected into the factory in winter to reduce the need for heating. Waste stream management was also a primary focus, with waste stream separation processes put in place early on.
- **Organisational innovation** – The abovementioned procedural innovations were enabled by the CEO's belief that sustainability measures would set his business apart from its competitors and enhance the company's long-term stability and profitability. David was committed to introducing the ISO 14001 Environmental Management System to Focus Press's operations even though ISO 14001 had not yet been applied in any systematic way within the Australian printing industry. This is considered an organisational innovation more than a process innovation, as it involved considerable staff training, value reorientation and cultural change to put the processes in place and maintain them.

Knowledge flows – seeking and building knowledge-sharing networks

David's dedication to searching for new knowledge and for actively participating in knowledge-sharing networks has been instrumental to Focus Press's innovative business activities. An important early inspiration for David was a study that highlighted the potential profits for printing companies from improving environmental management:

When I did my research I actually found that ... printing has the highest return on investment for environmental initiatives. I thought, that's incredible.

Focus Press's decision to *codify* knowledge about quality and environmental performance through monitoring and review practices. This constitutes another form of innovation. David facilitated this process by actively engaging a wide range of potential knowledge sources, including customers, the environment agencies and universities:

- David's initial contact with the **EPA** opened up access to important avenues of knowledge. The EPA provided direct technical information to Focus Press, and perhaps more significantly, the EPA linked Focus Press with other businesses in printing and in other sectors who were also pursuing improved environmental outcomes.
- David approached a **customer**, Standards Australia, for advice on selecting a consultant to develop an environmental management system.
- David's attendance at a **university** research presentation on carbon management was also an important source of knowledge for Focus Press. The research discussed in the presentation helped Focus Press to develop its carbon footprint inventory in conjunction with its external consultant. An important element in this process of knowledge transfer was the researcher's direct involvement with Focus Press:

There's a guy over there [at the university]... we saw him one day talking about sustainability ... so we got in touch with him. He said 'Oh, great, I'll come out and see you'. So he came out and saw us and gave me a couple of journals. They applied to every industry ... I read through them and it was incredible. They're really starting to capture what's going on in a lot of industries, and to capture a lot of data ... Later on I meet people and they know him – so there's a lot of links.

Creating value – fostering a collaborative and rewarding business culture and becoming established sector leaders

David's conviction that better environmental management would make Focus Press more competitive and resilient in the long run has been validated. The cost savings from various energy, waste and water efficiency initiatives have been substantial. During the recent economic downturn in 2008–09, several "mid-tier" printing companies went out of business. During this same period, Focus Press expanded, acquired a new printing facility and was able to remove a volatile isopropyl alcohol from the printing process, creating savings of \$100,000 a year.

Encouraged by the Department of Environment, Climate Change and Water's Industry Partnerships Program, Focus Press has built its business profile by sharing knowledge about environmental management. This has led to value creation in terms of being in a rewarding business environment for current staff, and attracting new staff:

One of the things they asked us to do when we achieved something was to talk to the industry about it. So we took out ads in magazines and the next thing you know, we're building a profile ... they really helped our business to become recognised. All that worked really well with the staff and we attracted other staff ... it's kind of a snowball effect.

This also enabled Focus Press to expand its customer base and further enhance its product differentiation and hence competitive first mover advantage:

A few years later businesses started to look at sustainability in the supply chain, as print is pretty far down the line. Then we started to get a bit of traction with corporates like the semi-government RailCorp, which has helped us continue on our path. Responsible print procurement guidelines have now come in and everyone has started to see the sense in what we've done.

7. FOOD CONNECT

Food Connect Sydney is a social enterprise linking farmers with city dwellers. Founded in early 2010, it sources fruit and vegetable produce from local farmers and distributes the produce in Sydney via a weekly subscription box service. The produce included in the boxes is certified organic or chemical-free. It is seasonal, sourced directly from regional farmers, and has low food miles. Currently the company has 15 part-time employees (equivalent to about five full-time staff). This case study is based on an interview with Julian Lee, CEO and co-founder.

Their story: a social enterprise designed to challenge conventions about food and farming

Julian Lee co-founded Food Connect Sydney in February of 2010, after a couple of years of working to promote sustainable agriculture to non-English-speaking commercial market gardeners in Sydney. He was increasingly disillusioned by what he considered the inequalities of the system, with market gardeners being exploited by wholesalers, and consumers wanting to buy organic produce but finding the high costs prohibitive. Initially, he established a volunteer-run organic buying group which bought organic produce from farmers in bulk, bringing down the costs for customers. This buying group grew into three volunteer buying groups, but this still was not enough to bring costs down sufficiently, and Julian found that customers were still just as sceptical about the truth of “organic” claims.

Frustrated, Julian moved to his own farm property, established a commercial organic market garden and joined the Slow Food movement. Whenever he met other organic farmers, he asked them about the viability of their enterprise, and soon realised that the market climate made it very difficult for a small-scale organic farmer to survive. At this point, he gave up his own farming enterprise and contacted the CEO of Brisbane Food Connect, Robert Pekin, who was trying to inspire people around Australia to start up a Food Connect network in their cities. This is how Julian came to found Food Connect Sydney.

More than just a fresh produce delivery service, Food Connect considers itself a “social enterprise,” which means that social and environmental outcomes are included in the bottom line, and profits are reinvested in social and environmental projects and not handed out to shareholders:

Food Connect Sydney wants to challenge conventional, profit-driven food supply systems. We plan to become the thought leaders in the fresh food market, providing consumers with food with integrity. We will challenge people to think about where their food comes from, what food quality means to them, and the impacts of chemical farming on their health and that of the farmers and the natural environment.

While Food Connect's dual commitment – to pay farmers fair prices while making organic produce affordable for customers – is a difficult one to manage:

The business is a social enterprise before all else, and this is just as important as profitability

Food Connect's fresh produce is sourced from local farmers on average 250km from Sydney who farm organically or without the use of chemicals. Users can choose boxes of different size and types, ranging from \$35 to \$65, and other farm products such as eggs and bread are sometimes available to add to the order. Most subscribers agree to a four-week minimum subscription, but the business tries to make it as easy as possible for people to sign up and has started a direct debit service for users who do not want to commit to the one month minimum.

Innovative responses – supporting sustainable agriculture at every level

Trust and loyalty are core principles of the business, and Food Connect has innovated by trusting their farmers before they ask the farmers to trust them. They invite their farmers to set the "true price" for their produce throughout the season, with a tiered system for highly variable crops, and promises them that they will *"be part of an enterprise with integrity and trust."* The main goal of the business is to make sure that local farmers receive a fair and stable price for their produce; the farmers receive 40% of returns. Food Connect commits to taking a large share of an individual farmer's crop because they accept fruit or vegetables which do not conform to supermarket quality specifications in terms of size and shape.

The company organises seasonal events, such as the Winter Harvest Dinner or a Spring Equinox farm visit, where customers are invited to do farm visits (which often involve planting or composting) or to meet local farmers at urban events. They refer to their customers as "food connectors" as another way of trying to encourage people to connect not only with the food itself (i.e. through understanding how it is grown) but with the farmers who grow it. This is part of an education campaign to make people aware that wanting to buy produce that is out of season makes the whole agriculture system unsustainable:

People want food that's out of season ... [but they] have to accept.. .that you can't get certain things at all times of the year ... Everybody wants everything at cheaper than what they got it before ... It's largely about education.

The business is designed to increase community awareness and participation through having all the boxes delivered to a "city cousin" in the user's area each week. All subscribers then collect their boxes from the city cousin, which slowly builds a sense of community and awareness of being part of a wider network of people who care about these issues. Interactivity is a core principle of the business. This not only puts city dwellers in touch with farmers, but also encourages city dwellers with similar values to interact with one another.

They also encourage farmers to interact by setting up shared transport arrangements for growers in a similar region, and by having social events where customers visit the farmers to reduce the isolation and depression issues that are widespread for farmers. All of this is part of Julian's vision to support sustainable agriculture at every level:

For me, Food Connect [is] about ... being fair to both the consumers and the farmers and staff.

Knowledge flows: responding to consumer demands and challenges of the low-carbon economy

As the story of Food Connect Sydney's founding (above) illustrates, Julian was only able to start the company because of his many years of engagement in various related communities – urban market gardeners, his own organic farm and local buyers, and then by reaching out to Food Connect Brisbane's CEO because he admired the business's philosophy and approach. However, he has had to respond to the demands of the Sydney market (which are different to those in Brisbane), and carefully listen to customer feedback to understand how to shape the Sydney version of Food Connect appropriately:

Here in Sydney ... people's expectations of how it's presented are much higher than other areas of Australia ... So our marketing ...we want it to be really slick ... If we're here to make an impact and reach a lot of households and help make a lot more farmers viable then I think we need to go a bit more mainstream and make it look great.

Julian is aware of the shift towards a low-carbon economy and considers it important to stay informed both in terms of the business's philosophy and in terms of his personal ethical commitment to sustainability, but he just doesn't have the time or resources to design any formal plan or response:

This ... [is] the tricky thing for small to medium-size enterprises, is that you might know about it but you may not have the ability to actually plan for it ... The ability for us as an organisation, or me as the CEO, to stay across these issues and implement them within the organisation is woefully low.

While larger companies have the capital to invest in commissioning reports about the expected impact and the best and worst case scenarios, Julian feels that it is SMEs that end up actually taking action on these issues, based on the owners' personal beliefs, but without access to the same analysis. Food Connect has been successful in a few grant applications (which customers on their mailing list initially made them aware of), but they prefer grant applications that let them "invoice on outcomes achieved" rather than doing multiple quotes and then having to justify them.

In Julian's experience, it has been local councils that have been innovative and flexible in terms of the grants they provide, and a key benefit is being allowed to apply as a social enterprise (whereas many of the other grants are for not-for-profits only). He would like to see more funding opportunities for social enterprises which may not be not-for-profit, but which still have major social and environmental goals that have nothing to do with profitability. Food Connect Sydney has worked with local councils to create social enterprise clauses (similar to the ones that exist in the UK):

This meant that [the Council] was protected against funding private business but allowed essentially what is a private business that operates as a social enterprise to apply. Basically ... dividends to shareholders had to be either zero ... The thing is that with a social enterprise ... for every dollar spent ... the return is so much higher than with a charity.

Food Connect Sydney is currently participating in "UTS Shopfront," a gateway for community access to the University of Technology, Sydney. Shopfront links community organisations to UTS's knowledge and skill base to do community-engaged research with a social benefit. Though Food Connect was not directly eligible for Shopfront (as it is not a non-profit), Julian suggested that the company might be an interesting case study for research projects. As a result, a UTS researcher is now working on a project for Food Connect, contacting farmers to ask them about issues surrounding the viability of farming. The goal of this research for Julian is to be put in touch with farmers whom Food Connect might be able to help out financially through bulk-buying their produce. All Food Connect farmers receive 40% returns on produce, whereas major supermarkets often pay returns as low as 5%. There is also a psychological or social benefit provided by addressing some of the mental health issues prevalent for farmers as a result of isolation and financial difficulties.

Creating value: supporting entrepreneurship

Food Connect pays a levy to the Food Connect National Foundation to support entrepreneurship around the issues of soil fertility, appropriate-scale organic farming and small food enterprises. Entrepreneurial projects that are currently being considered include

setting up a “Small Food Enterprise Incubator,” a “Suburban/Urban Food Production Programme” and a “Farmer Participation Assessment Programme.” As part of the Food Connect network, Julian feels it is his responsibility to add value in this way, and to nurture innovative ideas that will build the sustainable agriculture movement as a whole.

Julian is also committed to creating a positive working environment for Food Connect employees:

We want ... [to create] the best workplace anybody has ever experienced.

The company invites satisfied customers to volunteer their skills or services to help Food Connect grow. For example, on their website, they invite supporters with graphic or web design or PR experience to volunteer on various projects. They also ask for any customers or interested parties to contact them if they have an idea for a collaborative project.

8. GOGET CARSHARE

GoGet is Australia's first and largest car-sharing company. Founded in Sydney's inner west suburb of Newtown in 2002 with just three cars and two staff, the company now employs 14 people and has a network of hundreds of cars and over 17,000 members in Sydney, Melbourne and Adelaide. This case study is based on an interview with Bruce Jeffreys, co-founder and co-director.

Their story: pioneering car-sharing in a car-congested community

GoGet's aim at the outset was to transform Newtown from a neighbourhood packed with cars and with very little public or green space into a neighbourhood dedicated to car-sharing:

The story really is Newtown residents ... who just were sick of being crowded in with cars ... [and having] no space for ... old people and for kids to cross the road and ... public transport [that is] inefficient because it's competing with the car ... It wasn't [about] a low-carbon economy, it was really about making our local streets better.

While the company's founders have “green values” and there are all kinds of environmental benefits to reducing traffic congestion and over-reliance on cars, these were at first incidental to the company's core mission, which was to foster happier and healthier local communities.

In 2000, Bruce Jeffreys and the company's co-founder, Nick Lowe, hired a stall at the Newtown Festival and asked people whether they would be interested in a car-sharing network. Ten per cent of the sample responded positively, at which point Bruce realised there was a large enough target market to make it work. They invested in a couple of cars he describes as “really old bangers,” and developed the necessary technology and marketing systems to allow users to navigate booking and dropping off the vehicles:

For the first couple of years ... [we had] a couple of cars, technology; we had a booking system, insurance, financing, membership plans and then we had people join up and then use it.

Bruce and Nick had to develop online booking software from scratch. Similar overseas systems were too expensive or the developers were not interested in selling it to “two guys in Australia”. They also developed their marketing and launch strategy. They relied initially on word-of-mouth advertising among users. Once there was a stable network of regular users, they started to focus on growing the network across Sydney. Now, eight years later, they are transitioning into “mainstreaming” car-sharing in Australia and growing their market share:

We are actually now seriously going after the 2.4 million owned cars in Sydney ... [and] 14 million privately owned cars [in Australia] ... We're going to get a chunk of that market.

Innovative responses: contributing to public policy debates to influence car-use behaviour

GoGet's software and technology innovations – while significant – are only 10% of the story. According to Bruce, 90% of the company's innovations are in the arenas of “behaviour change, marketing, creating excitement, brand and ... leadership.” Bruce and Nick were overwhelmed at the positive response from residents of Australian cities who have “voted with their feet” by participating in a car-sharing scheme because of their commitment to a low-carbon future:

When you're talking about [a] low-carbon economy, there's actually just massive untapped market potential in Australia. People just want [these] services and we are growing so fast because of this demand. It's not because we're creating the demand – we're not stimulating the market; we're just responding to the market.

Bruce believes SMEs are the true drivers of change, and that Australia can learn from Europe, where large multinational companies often buy valuable SME innovations once they've matured. In the new market realities of a low-carbon economy, SMEs like GoGet are nimble enough to react flexibly and to drive change as a result.

GoGet started out providing what Bruce describes as a “niche” service, with a car-sharing network of only 12 founding members. The company now has over 17,000 members, and in Sydney alone it has over 1000 corporate members (many of which are SMEs). They have doubled their membership in each year of operation and have a particularly high membership in densely populated inner city neighbourhoods (for example, in the Sydney suburb of Surry Hills, one in ten residents with driver's licenses are GoGet members). An interesting consequence of this increase in GoGet membership is increased bus transit ridership in those same areas. However, the uptake of GoGet services in western Sydney (e.g. Parramatta) has been limited. According to Bruce, this is because western Sydney lacks public transport options:

Car-sharing doesn't fix problems with the city, it complements cities that are working.

GoGet also sees itself as playing an innovative public policy role by building a company that is committed to changing the way cities are conceptualised and run. Bruce feels that it is increasingly the private sector and non-profit community organisations that need to step in and contribute to public policy efforts. By building a large customer base, GoGet is able to put increased pressure on the state government to address policy issues which affect the viability of car-sharing, for example investing in a healthy public transport system, encouraging people to make public transport a lifestyle choice (not just a weekday choice), reducing investment in roads and motorway construction, and reducing subsidies to car manufacturers. In this sense, Bruce is glad that other car-sharing companies exist in Australia, as they can collectively make the car-sharing industry more powerful:

The biggest ... competition is not car-share companies, it's not car rental companies, it's ... the private car.

Influencing behavioural change – creating a culture for the low-carbon economy

A major innovation GoGet is planning is to shift their mode of operating away from a “defensive culture” or closed system, to a form of open, “barter-based” service-sharing.

GoGet customers will be given the chance to become GoGet's suppliers – for example, architecture and interior design companies that use GoGet will be able to pitch for the job of redesigning the GoGet office; fashion design companies that are GoGet customers will be able to pitch for the job of designing the GoGet maintenance uniforms. Bruce describes this as a form of collaborative member engagement and a way of building an open model of service swapping with other SMEs.

Knowledge flows: From local to global engagement and collaboration

According to Bruce, one of GoGet's early mistakes was wasting time trying to engage with the state government. He believes that time would have been better spent signing up new members and growing the business. The company needed basic forms of support that they thought the state government might be able to provide, for example, information and policy guidance from the NSW Roads & Traffic Authority, but it took three years for GoGet to receive a policy response from the state government. Local government, on the other hand, was immediately responsive to the company's needs:

[Local government] was a different kettle of fish. They're much more responsive; they're closer to the needs of the residents and businesses.

The company has not forgotten its roots at the Newtown Festival, and returns there each year to gather feedback from the community and gauge how responses to car-sharing have changed over time. For the first few years of GoGet's operation, many community members were perplexed by the idea, but now Bruce is finding that people are already considering using the service and want more specific information tailored to their needs (for example, the availability of car seats for children).

GoGet has positive working relationships with three Sydney-based universities (UTS, UNSW and Macquarie), all of which approached GoGet to establish the connection. Masters or final-year students have collaborated with GoGet on various projects that – while they have not yet led to any practical product or service development – are still useful in terms of keeping GoGet's staff up-to-date on new developments within the industry, and the students benefit from the mentoring experience. For example, GoGet runs a yearly PR media programme for Macquarie University students who develop marketing and media campaigns for the company, which GoGet can then mine for ideas. They also run a user-interface design project with UNSW and UTS design students. For the past five years, the company has had a regular internship programme for students from Arcadia University (based in Philadelphia, USA). American interns spend up to 12 weeks at the GoGet office. Bruce stays up-to-date on car-share industry research: he recently accessed research by a team at Murdoch University in Western Australia showing that for the first time since 1970, car usage has declined in cities in the US, Canada and Europe. He expects Australian cities to follow this trend over time, and already sees a drop-off in car purchasing among Australians in the 18–28 age group.

The company is also part of an international knowledge-sharing network which it helped to found, the Car Share Association, which is allied with North American and Canadian car-sharing companies. Forty-two cities participated in its recent conference. This keeps GoGet up-to-date on international developments that might affect its business and also allows it to participate in a global movement dedicated to reducing private car use. GoGet hopes to host a future car share association conference in Sydney to encourage regional and national support for car-sharing.

Creating value: playing a global activist role while pooling resources locally

GoGet's business depends on the existence of quality public transport which enables people to make the choice not to buy a private car. Of course GoGet stands to benefit

from any initiatives to reduce private car ownership, but Bruce's belief is that *all* urban dwellers will benefit from having access to a convenient and affordable car-sharing service which allows people to live car-free, improves local air quality, removes cars from local streets and encourages people to live more active lives. In this sense, GoGet adds value to urban communities by engaging the government in discussion about making public transport a priority.

The company also plays an 'activist' role by engaging with global car-sharing communities to build support for car-sharing not only locally and nationally, but internationally. This creates value for the company by keeping GoGet informed about new technologies, trends and developments, but it also creates value for all urban citizens around the world who are committed to moving away from car-centric models of urban life:

We really see [ourselves] not as a Sydney company but as part of a global movement to transform our cities.

GoGet also adds value to the SME community at large by giving local SMEs an alternative to making a major investment in a commercial vehicle. Instead, they can use GoGet and invest that capital into R&D, market development, marketing or job creation. In this sense, GoGet contributes to a broadly innovative SME culture. The company's planned new "skill-sharing" business model (as described above) will also add value to the SME community as a whole by strengthening ties between small businesses in different sectors through pooling and trading services whilst capturing the opportunities presented by the low-carbon economy.

9. LIVING GREEN DESIGNER HOMES

Living Green Designer Homes (LGDH) is a residential housing design and construction company with nine full-time and four part-time staff (plus subcontractors). LGDH streamlines its construction process to reduce waste and designs homes that are climate-appropriate and built with environmentally low impact materials or recycled materials. This case study is based on an interview with Craig Riddle, owner and manager.

Their story: minimising energy use and waste in residential construction

LGDH's owner and manager, Craig Riddle, has over 20 years of experience working in the construction industry. About eight years ago, he realised he wanted to do things differently, and decided to change the way his business operated to reflect his ethical commitment to reducing waste:

I just realised that there was too much waste in our residential building process ... I thought there were so many places I could fine-tune it. It was just this disgusting sensation of waste ... an evolution of construction process that was driven by greed and not actually by a thought process.

After observing the wasteful and energy-intensive process of placing concrete slabs on-site (which involved the use of 17 vehicles and an assortment of machinery, trucks and pumps), Craig returned to his company's construction yard and set about looking for ways to reduce waste and streamline the construction process so that it would require fewer people, fewer machines and vehicles, and fewer material resources. His solution was to design a system which requires only one crew to complete the entire construction process. This meant eliminating most of the wet trades (concrete slabs, bricks and tiles) from the homes his company designed. This in turn reduced the resources needed and also meant the impact of the homes on the land was less severe: the new lightweight form of construction avoided the need for "cut and fill" construction approaches.

While Craig was not explicitly motivated to innovate in response to the new realities of a low-carbon economy, his personal determination to reduce construction-related waste meant that he was conscious from the outset of wanting to save energy and, as a result, reduce greenhouse gas emissions:

For me, minimising energy and effort is always how I've classed everything. I guess I somehow understood 'embodied energy' without really technically knowing what it meant ... I believe it's the way of the future because it's site-sympathetic and costs less.

Innovative responses: simplifying and streamlining construction through trial and error

Craig was committed to reducing the environmentally harmful impact of the construction process, but he also realised that streamlining construction was an innovative way to differentiate his company from mainstream residential construction companies. Craig stopped contract work and for 18 months he engaged in an intensive, hands-on trial and error period, leasing a large factory and experimenting with different manufacturing processes, models and test parts (such as roofs or parts of cabins). He funded this research and development process himself – even though at times he doubted himself and where the business was going – as he didn't have the cash flow initially to engage anybody with specialised knowledge. He did his own research into overseas prefabricated housing (using library and internet sources and trade magazines), then repeatedly trialled in the factory some of the concepts and ideas he'd come across. This is an ongoing process: the company is constantly seeking new knowledge and insights into how to construct a "closed loop" building with close to zero waste.

Inspired by a government report about energy use in the construction sector, he engaged a consultant to help calculate the company's greenhouse gas emissions footprint. Once again, Craig played a hands-on role in this process and, guided by the consultant, did much of the research himself. This took six months and included scrutinising the company's supply chain. As a result of this research, Craig managed to reduce the carbon footprint of the houses LGDH builds by an estimated 70% (when compared with the 'standard' referenced in the government report).

Not everybody in the building industry was receptive to these kinds of changes. Two major obstacles were the Building Code of Australia and the covenants on development sites that require homes to use slabs, bricks and tiles. Craig responded by avoiding these kinds of jobs and putting his energy into finding opportunities that would allow the company to showcase its innovative streamlined construction process. While the majority of LGDH's subcontractors responded well, a minority did not. Craig sees it as his company's responsibility to try to educate new subcontractors about the business philosophy:

We sat them down and said this is why we're doing it. Some of those guys were really sceptical and basically there were a couple of crews of subcontractors we lost. They basically said, 'Well, we're not doing any of that, we don't want to change.' I think probably 80% of them said, 'That's fine.' They all really understood that if they did their little part along the way, there was no great effort.

As part of this education process, LGDH wrote to companies in its supply chain asking for commitments in relation to packaging waste, recycling and transport. The response of some key suppliers was overwhelmingly positive: LGDH's kitchen supplier is so passionate about sustainability that they in turn went back through all their suppliers to ask for a similar commitment. Craig thinks that a formal price on carbon would be an effective way of shifting the sector as a whole towards mainstreaming these kinds of sustainability practices.

Knowledge flows: collaboration and healthy competition

Craig is not worried about mainstream builders imitating LGDH's innovative approach to home construction and in fact welcomes this competition as a way of driving further innovation in the industry:

If we're to be copied or followed, to me it's the biggest pat on the back and means we're on the right track. We're all individuals and I always bring my flavour to buildings. If the mainstream builders follow some of this it will only drive more innovation.

In the same spirit, Craig shares his knowledge with the community, speaking at local forums as well as to the media whenever he can (which has the side benefit of increasing the company's market appeal). He has started a competition for schools in his local area to design the home of the future.

While Craig did most of the research and development into this new construction process himself to save on costs, he did reach out at certain key points to external experts. He accessed free business mentoring support from a local government-funded business services centre. His mentor was a manufacturing specialist who helped him to speed up the process of establishing a manufacturing assembly line at the factory but had little input in terms of environmental impact. He also engaged a consultant to help calculate the company's greenhouse gas emissions footprint (as mentioned above), but undertook most of the research, carbon auditing, and carbon-reducing technical design himself. Craig has joined the Green Building Council of Australia even though the Council focuses on commercial building, as he hopes certain useful concepts might filter down to the residential construction industry.

He acknowledges that his company is struggling to adapt as it rapidly expands due to significant market demand, and would benefit from access to expert knowledge and funding support to grow sustainably. In the past, Craig has attempted to seek help from government sources but found the process unsatisfying:

I think they need a more personalised service where people can spend time with you and just absorb what you're doing. Because everything I'd done, if I was to write it on a form, either they wouldn't understand or would think it didn't have any legs. But someone with a better understanding of whether it's a low-carbon economy or whatever the Government thinks the future is, they could come out and say, 'You're working on this, and if you just steer it a slightly different way then we could help you.'

Craig singles out the federal government's Enterprise Connect programme for praise. The representative from Enterprise Connect spent time understanding the LGDH business and then gave Craig personalised advice on available grants, suitable R&D projects and appropriate research organisations to contact. LGDH has also successfully applied for Commonwealth funding via Enterprise Connect's "Researchers in Business" programme, which will part-fund university researchers to work face-to-face with LGDH on specific projects that will feed back directly into the company's product development and operations. A major motivation for Craig to work with university researchers is to ensure that his company's sustainability claims are robust and accurate, as he does not want to fall into the trap of "greenwashing" that he says is prevalent within the housing industry. He also wants to find a way to "mainstream" his company's innovations:

What I hope for is certainly to be tested on our process and the way we go about things first of all, then having a really good researched look at our product and seeing how it performs. We are really interested in trying to work out how we fit in the market and that will lead to better decisions on how we'll go forward. I want to be challenged, scrutinised.

Green rating or accreditation schemes are helpful in this regard, but in Craig's view they need to be independent rather than for profit, and there should be fewer of them to reduce confusion.

Creating value: staff pride and strong customer demand

LGDH's homes are now so popular that Craig has not once had to advertise in order to find new customers. The company's innovative, waste-reduced construction process is very much in alignment with current widespread interest in sustainability, and as a result the company is often covered in the media or wins industry awards, which in turn grows its business:

Every time we put something up in an area or street, we just grow in that immediate suburban area because lots of people want it. The less we give people, by taking out the complexities and costs ... they can relate to it. It's like having a really slick car at a really low budget. To this day, I haven't spent a dollar on advertising or marketing – it's all been from awards or news stories we're part of.

Like-minded customers approach LGDH because they appreciate the business's commitment to sustainability, which means that Craig never has to work with customers who do not already share the company's basic values. Industry awards (such as the Housing Industry Association awards LGDH won in 2007) boost the company's profile and are particularly meaningful when they recognise the company for taking an innovative approach to construction. Craig's customers also benefit from hiring a small company as LGDH can very quickly trial new and more efficient concepts or materials and offer them to clients.

The company has created value for its staff by fostering a workplace culture that is progressive, open to change and forward thinking. Staff members share a sense of pride in the sustainability achievements of the company and this means the company is able to attract and retain new staff who are committed to the company's philosophy of low-waste, low-impact home construction.

10. RMB LAWYERS

RMB lawyers is the largest regional law firm in NSW, providing advice and services from six offices in five local government areas across regional New South Wales. Commencing operations in 1885, the business has grown rapidly in recent years and currently employs 93 people. They have a range of public and private clients, both institutional and individual. RMB Lawyers has won several awards in recent years in recognition of their contributions to sustainability and the community. This case study is based on an interview with Craig Osborne, Managing Partner.

Responses to the low-carbon economy

The last three years have seen RMB Lawyers implement several initiatives both within their organisations and through their business activities in response to the low-carbon economy.

A crucial vehicle for change is their best practice system "Law 9000", through which the firm continues to improve its processes with a particular focus on reducing waste of material, electricity, fuel, and, importantly, time. RMB measure and report their environmental footprint and all staff members make pledges which are then audited against performance. They hold "green awareness" and learning days each year across their six offices, and carbon management is a key component of the internal business school they run for all staff. New video-conferencing facilities connecting their six offices have resulted in a substantial reduction in driving time and fuel use. Streamlining document production processes to

reduce the number of draft versions saves not only material and energy resources but also improves time efficiency.

RMB Lawyers are also actively engaged in sustainability initiatives in their business and local communities. Within its sector, the firm promotes and leads activities of the Environment & Planning Law Association (NSW) including through sponsoring the Association's major annual conference. In terms of the local economy, RMB's managing director is a key strategist for the revitalisation of the Port Kembla Quarter, which focuses on rebuilding the local economy in alignment with sustainability considerations and opportunities. Plans include the establishment of a hub of "green" affordable living, engaging Illawarra TAFE students to retrofit four commercial buildings to become a "green" tourist attraction, and working with major companies to creating industrial sustainability learning centres on the main street.

What are the drivers?

There are three main drivers that have influenced RMB's strategic response to the green economy.

Firstly, the environmental sustainability of the firms' operations and businesses is a key element of retaining talented staff, particularly junior staff:

A major driver for our actions is keeping our people proud of being here and giving them a reason to stay, other than just the pay and other conditions The current generation of employees, the young ones, tend to want to leave regional areas and go to the city for a while ... We've realised that to be profitable, we've got to keep our good employees as long as we possibly can and this means keeping them proud and happy.

Secondly, RMB predicted changes in the marketplace in that reputation and credentials in sustainability performance are not only preferred, but required by some clients. This prediction has materialised "very quickly in a big way", and responding to the low-carbon economy is therefore essential for RMB to maintain its competitive advantage:

We began to realise that now and in the future, there would be lots of businesses that would not trade with us unless we could show our green credentials. Now, the most obvious one is government ... but the less obvious one is Westpac and St George work, where [unlike many firms] we got through the gate to even be considered because we could show our green credentials

The third main driver relates to RMB's engagement with "mum and dad clients" and the community. Craig Osborne endeavours to change both the way that lawyers are thought about in the community, and the way that lawyers think about themselves and the services they provide:

We're looking at what is it that makes clients choose us over the firm down the road? ... It's what they're saying in the street and in the boardrooms about us. One of the things they can look at about our integrity and about our values is to see what we're doing to reduce our [environmental] footprint and to teach other people about it.

Transformation for the low-carbon economy for an office-based service provider

RMB Lawyers has transformed rapidly in the last few years, and has grown its business through expanding the range of legal products and services on offer, and by offering options for pricing. Craig describes their approach as "designing and repackaging large quantities of

small aspects of business every day in order to obtain competitive advantage,” spanning a range of products and areas including wills, Islamic law, sole director companies and loans.

This business growth has been enabled by substantial organisational and cultural changes across RMB’s offices that go beyond everyday marginal improvements. Craig describes the recent, dramatic evolution in the culture of the firm from a relatively conservative and process-oriented organisation, to one which encourages new ideas, leadership and flexibility from all staff, including on sustainability issues. Being an internally change-agile organisation is essential to RMB’s advantage in maintaining and growing their business in a rapidly moving external environment, and actions in the sustainability space are an integral part of encouraging innovation and dedication from all of RMB’s staff:

Some people are assigned a leadership role with green issues and that’s their portion of the leadership role ... It helps us engage with our people because they know that they don’t leave their brain at the door when they come to work.

In terms of their office operations, advances in their sustainability performance are often directly linked to saving both resources and time, leading to substantial cost savings and efficiency gains for the firm. This is further leveraged to market and promote the firm on the basis of its sustainability credentials and activities in the wider community.

Participating in research and investing in the local community

RMB Lawyers is currently working collaboratively with Dr Alan Pomeroy from the Faculty of Commerce at the University of Wollongong to test and develop theories of sustainability marketing through evaluating the success of RMB’s green marketing initiatives.

RMB’s commercial success as a firm, shared with all staff through a profit-sharing arrangement, also enables them to invest back into those factors – particularly reinvestment in the community – which fundamentally supports their commercial success. As Craig argues,

Profitability allows the firm more time and resources to give back to the community that supports us so that we can deliver our innovative skills publicly for the community’s advantage.

11. SERENDIPITY ICECREAM

Serendipity Ice Cream is a manufacturer and retailer of specialty ice creams based in Marrickville, NSW. A family-run business started in 1966, Serendipity Ice Cream has been a pioneer in the gourmet ice cream market. The company currently employs 18 staff. This case study is based on an interview with Sarah Mandelson, partner and CEO (whose mother, Alix Mandelson, founded the company).

Their story: a small business taking a moral stand on the issue of sustainability

As a small business manager, Sarah Mandelson feels her first responsibility is to her staff in terms of keeping the business up and running, but wherever she can she takes a moral stand on the issue of sustainability even when this involves difficulties and extra initial costs. At Serendipity, any sustainability measures are undertaken in the spirit of embarking on “a journey, rather than arriving at a destination,” leaving room for growth and improvement:

As a small business we didn’t really feel that there were any enormous things that we could do ... but if everybody plays a small part then it does change the world. So we’ve approached it from that point of view.

Serendipity has made a couple of key sustainability changes to business operations and followed this up with a host of smaller actions. Three years ago, Sarah made the decision to switch to 100% GreenPower, a decision made more difficult because the company's energy provider refused to allow the switch. Sarah persisted because she felt it was the right thing to do, and Serendipity initially absorbed the extra costs (these turned out to be less substantial than anticipated). Serendipity is expanding rapidly (they grew by 25% in the 2009–10 financial year), but so far they have managed to keep their increase in electricity consumption relatively low (only 3% in the same year).

Thinking creatively about 'closing the loop' while building a sense of community

Other sustainability measures the company has taken include using only newspaper wrapping at the factory shop, the company's retail outlet. Neighbours are encouraged to bring in used newspaper in return for ice cream, which encourages the community Serendipity works within to think sustainably. The company is committed to reusing or recycling all materials that enter the factory that might otherwise be considered waste. An example is re-using the plastic bags lining a supplier's cardboard boxes as garbage bags, a small sustainable action that also reduces the company's costs. All their ice cream packaging is recyclable and the water used in cooling the ice cream machines is re-used for pre-cleaning and rinsing equipment and machinery. The company donates to Greenpeace and Sarah is a member of The Wilderness Society.

Innovative responses: putting 'green' pressure on suppliers and reducing energy consumption

Sarah's persistence in switching to 100% GreenPower despite the contracted supplier's refusal is an interesting example of supply chain innovation: putting pressure on energy suppliers to allow small businesses to switch more easily and flexibly to GreenPower. After a protracted argument with the supplier Sarah changed suppliers, thereby breaching her existing contract. As a result, the former supplier sued for lost revenue for the remainder of the contracted period – a considerable sum as the company uses around \$60,000 worth of electricity per year. It was only when the Energy and NSW Water Ombudsman intervened on Serendipity's behalf, telling the former supplier that they were legally right but morally wrong, that the supplier relented.

Sarah is continually looking for ways to keep the company's growth in energy consumption low, or even to reduce overall energy consumption, as the business itself expands. A major change the company is considering is reducing energy consumption through investing in more efficient machinery. They are currently looking at having an anti-static material applied to their freezer condensers and to all their refrigeration equipment, an initiative which would be 50% funded by a state government programme. This would involve some short-term cost to the company as the freezers have to be shut down in order to have the anti-static material applied. The company is also eventually planning to use alternative fuels in their delivery vehicles.

Knowledge flows: participating in local business sustainability networks

Serendipity is part of Marrickville Council's Target Sustainability Programme, which means that the company's waste output and water and electricity consumption are monitored and analysed (a process the business itself does not have time to do). The business then uses this information to work towards sustainability and efficiency targets, has turned out to be *"really quite good for business"*. On behalf of the Council's Sustainability Programme, Sarah talks to local small businesses to share knowledge and experience, particularly around the issues of switching to GreenPower, waste reduction and energy efficiency. A key

component of these talks is re-empowering small business owners to feel they can take sustainable action:

A lot of the time people think that this problem is so big they have no idea where to start. So they just put their hands up and go, I give up already ... I think it's important to break it down into little bits and remember that the first step of any journey, or the beginning of any journey, is one step.

Sarah's persistence in demanding that the company's contracted energy supplier facilitate switching to 100% GreenPower and the fact that her dispute with the supplier was won on *moral* not *legal* terms – is another form of knowledge flow. By involving the NSW Energy and Water Ombudsman and by demonstrating the company's commitment to using GreenPower despite all obstacles, Sarah made a contribution to changing the culture of contracted energy supplier–business owner relationships. This comes back to Serendipity's core motivation to take a moral stand on sustainability and be a leader in this field through educating other small businesses as well as contracted suppliers.

Serendipity has not in the past engaged with or accessed university research or analysis relating to sustainability for small business. As Sarah says:

Only enlightened small business would be prepared to pay a charge to have this sort of thing analysed; realising that the more information you have the more you're able to make informed decisions.

For Serendipity, as for many small businesses, there is usually no time to take a step back and consider deep analysis of the issues or the future implications of current decisions. Furthermore, it is difficult to know what kind of research or analysis services (potentially provided by universities) are available to small business and it takes up valuable time to search for reliable information. The Marrickville Council's Target Sustainability Programme has been helpful to Serendipity by setting up networking opportunities and a website to enable small businesses to share information and access resources. Sarah also accesses some information regarding negotiating better contracts (in particular energy supplier contracts) through The Wilderness Society's website.

Creating value: taking a leadership position on sustainability for small business

The company uses its decision to switch to 100% GreenPower as a marketing tool but also to take a *"leadership position on this, as far as small business goes"*. They have won business from larger clients because of similarly held *"green"* values, which has created a virtuous circle reinforcing this mutually sustainable business behaviour. Likewise, while there have been small cost savings in diverting some materials from landfill to recycling, from reducing water use and from re-using plastic bags, overall it is still the moral commitment to sustainability – and not the cost savings – that motivates the company's efforts. Another tacit benefit of Serendipity's sustainability efforts has been improved morale within the company, as employees know they're *"part of working towards a solution, rather than part of continuing a problem"*.

12. WHITELEY CORPORATION

Whiteley Corporation is a manufacturer of medical and industrial cleaning products. Founded in 1933, the company distributes products throughout Australasia and holds patents in Europe and America. The company has half its business turnover overseas and about ten per cent of their overseas turnover is domestic export (made in Australia and

exporting from the plant). Whiteley has approximately 50 staff based across Australia with the majority based at their manufacturing site in the Hunter Region of NSW and an office in Sydney. It is a relatively small company given its global distribution. This case study is informed by separate interviews with Greg Whiteley, Managing Director and Xanthe Mendoza, Marketing Development Manager.

Their story: a long history of medical and industrial cleaning product development

Whiteley Corporation was founded in 1933 as the Australian Disinfectant Company. In the 1970s, Reg Whiteley took ownership of the company and invested heavily in R&D with a view to developing new and superior sanitation and cleaning products. This emphasis on investment in innovative R&D is still evident today. Whiteley Corporation's novel approach across the entire business aims to build strong relationships with the likes of business chambers, industry associations, and higher learning institutions for mutually beneficial outcomes and superior product development. Greg Whiteley started working for the family business in 1984 and took over ownership from his father in 2010. Today Whiteley Corporation has 188 products in the market and two divisions: the medical division which services hospital, government and aged care facilities, and the industrial division which provides commercial cleaning services including specialty hard floor care. The latter recently launched a new environmental range of products.

Innovative responses: across product development and fostering strong relationships with academic institutions

Greg believes that the low-carbon economy provides niche opportunities for SMEs, though such opportunities may not necessarily be driven by the 'new' conditions, but rather by the foresight to capitalise on those conditions. Innovative approaches highlighted in the interviews related to a new environmental product line, *EarthSmart*, and process innovation through utilising and investing in cutting edge research relationships and other network linkages. Greg outlined Whiteley Corporation's concept of innovation:

Our concept of innovation is in two basic platforms. The first platform is product related innovation which is pretty traditional. That's the white lab coat whole approach. The EarthSmart range is in that domain. We do a bunch of stuff in there that is product related.

In an economic sense, [innovation] is all related to sales. It is very much an accountant's approach to innovation. You feel like the divide is the two sides of the ledger. One side has got to do with sales and growing, maintaining or improving sales. The other side is innovation that actually affects the cost side. We do everything.

Greg shared his thoughts on the impact of the low-carbon economy on his operations and those of other SMEs:

The 'carbon economy' stuff is utter rubbish ... the big issue is controlling costs. We don't use huge amounts of power. We haven't been hit as hard as some sectors are going to be hit by the cost of power rise. Is that [rise in energy costs] really being driven by climate or is it driven by politics? Whatever view you take on global warming or climate variability, the reality is that costs are driven by the political process that's gone on and New South Wales is in a terrible position.

Any increase in costs will diminish global competitiveness for Australian exporters, particularly while the Australian dollar is high. We are really vulnerable. For us, because

of the nature of our manufacturing, we don't have a high input cost from labour. We don't have a high input cost from power that is proportional to our product range. The [electricity] cost increases will affect us, but not as much as some companies with less than 200 people.

It's really easy for the big multinationals to say, look it's become too expensive, we'll move offshore. It's really difficult for Australian family businesses because the dislocation impact is just enormous. How do you manage that? Where do you come up with the capital? As a family business, you usually have your house on the line. If you've got a holiday home or any investment property, it's also on the line. Every part of your asset is on the line.

Product innovation: a windy road of challenges, roadblocks and lessons

Whiteley Corporation made a strategic decision to launch a new range of environmentally friendly products based on feedback from their commercial cleaning clients coupled with shifts in the marketplace in terms of how environmental products are perceived. The product line is not highly sought after by all customers, however it serves a niche group of customers who started to ask about environmental products. Accordingly, the company saw an opportunity to innovate in this area.

“Green” cleaning cowboys

Many of Whiteley Corporation's competitors have products on the market that are touted as being “environmental,” and Whiteley Corporation feel some of these competitors may be making misleading claims about their products' biodegradability.

We deal with them [cowboys] all the time, particularly in the cleaning industry. The place is rife with them. The best-selling cleaning product with green claims on it in this sector had marvellous marketing. The guy that actually originally innovated it was a marketer. Unfortunately he has passed away and his family have sold the business only just recently. When new owners came they went and re-did the material safety data sheets and [found] all the green claims were completely bogus. The products looked fantastic. The labels looked fantastic. The products worked well, but it was completely non-green cleaning. There were solvents in there that were aquatically toxic and hazardous to health. Some of them were group three carcinogens In fact that's a big issue for our sector – how do you deal with green washing? I'm involved, as part of a network, in the global movement tackling it.

In response, Whiteley Corporation invests heavily in R&D to analyse the biodegradability of their own line of environmentally friendly, readily biodegradable, non-toxic, phosphate-free products. Xanthe Mendoza noted:

We've strived in our R&D Department to try to develop a range that is readily biodegradable according to Australian Standard AS4351 and believe it or not, this is quite unique in the market. Many products claim that only certain ingredients are biodegradable, but we've encountered examples where this is not actually environmentally beneficial – they can be quite harmful to the environment.

Greg added, *“Part of EarthSmart is trying to meet our customer generated demand. We traditionally have taken the view that a lot of it is not really going to benefit the customers in terms of product performance ... Because there are no government guidelines, we are developing a code of practice approach to making sure the product claims are matched by evidence.*

By doing this Whiteley Corporation has carved a niche in their response to the low-carbon economy.

Placing emphasis on R&D to ensure quality and credentials

The development of the new range was a three-year project from conception to launch with testing progressing through a number of iterations and redevelopment. Three products in this new range now have their “total” product life cycle biodegradability incorporated into AS-4351. The ingredients for the products in the range are sourced locally in Australia to reduce their carbon footprint and for quality control. Whiteley Corporation believes in stringent quality control and accordingly has ISO 9001 accreditation for its quality management systems.

Value creation through challenging suppliers and educating distributors

The company has faced obstacles in terms of prioritising environmentally friendly products as many of their distributors do not consider this a priority. Xanthe has found that distributors generally want the product to work reliably before they are prepared to think about its environmental impact, and Whiteley Corporation has found from its research that for clients, environmental factors only place fourth in terms of their priorities:

First the distributors want the product to be effective in its application, then I think its price, and then brand ... the environmental [benefit] is a bonus.

Distributors have been concerned that the more environmentally friendly a product is, the more expensive it is, which has hindered uptake. There is also some resistance to change from within the industrial sector itself:

The industrial segment is a very tight-knit, specialised group and some are less unwilling to change their ways. But they are also highly influenced by their peers. Recent end-user shifts towards ‘green-cleaning’ have seen some changes to our customers’ perceptions towards environmental products. We feel that there’s a responsibility to educate the market with our EarthSmart environmental range.

With their new environmentally friendly product range, Whiteley Corporation have shifted their approach to communicate directly to the end-user in an attempt to try and alter their preferences and attitudes towards environmental products, which would in turn shift the approach of distributors. They do so even though as a manufacturing company they struggle to communicate directly with the end-user, since they sell their products in large bulk pallets via various distributors.

The importance of being ‘novel’ in the eyes of knowledge networks

Key to Whiteley Corporation’s novel approach to business and harnessing the opportunities presented by the low-carbon economy, has been their standing in the cleaning sector and their approach to collaborative networks, research and relationships:

We’ve got actually a huge variety of networks and relationships we use, both directly in our sector and across broad arrays of areas. I’m involved in a bunch of different trade associations. We have a very eclectic view of how to grow a business and how business works. It is relationally driven.

Bridging the gap between SMEs and research institutions

Whiteley Corporation has been on the front foot for many years in growing and maintaining fruitful research and commercial relationships with higher education institutions within Australia. For example, the company’s medical division funds some universities for laboratory education and has built an alliance with several east coast universities. Greg is undertaking a PhD related to the healthcare industry:

My doctorate looks specifically at systems in health care, where we're trying to validate cleaning products.

Recognising the importance of solid research, Whiteley Corporation funds a number of PhD and other research grants through various universities around Australia. They also apply for federal government grants in collaboration with a number of universities.

Usually we are funding research however we are submitting a grant application in collaboration between us and two universities in the next month. There was one last year that was successful. The results have been so good that they are likely to roll it into a slightly bigger one.

When asked how important R&D grants and collaborative research are for growing the business, Greg commented:

It's critical, for a business like ours. Most businesses only grow in one of three ways. They can increase their existing product sales. Generally you are going to get three to five per cent above inflation if you work really hard and really cleverly. That will be limited by competition. You might get a couple of years of that and then competition takes over and you have to innovate to the next platform.

The next substantial way of getting growth in a business is to have a new technology platform which might be the white lab coat approach or it might be some other innovation. There's a new technology platform which increases your sales. That for us is our traditional growth pathway. The other way is acquisitions.

Nothing withstanding the company's positive R&D relationships Greg noted that it is difficult in the Australian landscape to build relationships between SMEs and universities:

The universities don't look truly enough to industry ... they don't know how to. It's very rare that the universities have the relationships and the people. They tend to only get involved from a commercial aspect.

When reflecting on why more relationships between industry and universities are not commonplace, Greg said:

Australian university researchers tend to de-value the concept of "selling". It's almost a dirty word. They don't see that it has any validity ... they fail to understand the skill set that's involved. It's very rare, therefore, that you can have a meeting of minds of businesses who would be massively benefited by intellectual involvement with a higher level of innovation support and technical support because there's this mismatch of goals and expectations. That makes it really hard for Australian universities ... The universities are often one dimensional - they need to see themselves less as the owners of the IP ... I think that the understanding of commercialisation and IP just isn't there. In the few cases where you get good meeting of minds or the project and the partnerships match, Australian researchers are as good as anyone else in the world.

Whiteley believes there to are many opportunities for SMEs in the commercial cleaning sector related to the low-carbon economy:

Innovation covers the entire business, it is everywhere. It's not constrained it one little bit. Are there product opportunities? Absolutely. The market is demanding. The irony of the [low] carbon economy is the biggest driver for us in our sector is actually the big users of

electricity which is largely the property sector. If you look at how much electricity the property sector uses proportionate to their costs, it's absolutely enormous.

As with other case studies, innovation for a low-carbon economy has to be driven in part by costs, as Greg summarised:

If you want to do well in business, sales up, costs down, profit in the middle. You take it home, what's left over after cash flow. That's what business is about. Everything in innovation, therefore, has to either push your sales up or your costs down. The carbon economy impacts – in terms of manufacturing in our sector – is probably not going to be huge because, as I say, in the chemical area, we're not using large amounts of power.

There are opportunities in the green economy, the carbon economy, for niche opportunities. That may be a short-lived thing because I think competition will level it out. Companies who are starting in Australia are going to be, potentially, dramatically affected, so if the carbon economy cost jumps up, they'll struggle.

PART III

KEY FINDINGS

Chapter 6. Key Findings

The 'Green Chrysalis' study sought to investigate innovative business practices being adopted by SMEs as they confront the push for a low-carbon economy as an increasingly important feature of the environment in which their businesses operate. Innovative business practices were broadly defined as actions where the enterprise creates and captures value from doing something new.

The key headline findings from the case studies can be summarised as follows.

- **Sustainability as a business goal**

In SMEs where sustainability is defined as a mainstream business goal for the enterprise, this emphasis invariably comes from the top. In the case studies in this report, it is evident that leadership has come from a business owner or chief executive who is passionate and personally committed to sustainability outcomes in their business. This leadership is motivated either by personal values and philosophy or because sustainability is recognised as a source of competitive advantage which creates both economic and social value simultaneously. This was particularly evident in the case of Digital Eskimo, Crystal Creek Meadows Luxury Cottages and Spa Retreat and Living Green Homes, among others.

- **Customers as key to business innovation**

Innovation from responses to the green economy comes strongly from efforts that are focused on the customer, but not necessarily from the pursuit of 'green' credentials per se. Some businesses, like Corban & Blair, respond to customer demands and preferences for environmentally sound solutions that provide their enterprise with first mover advantage. This was the case too for Whiteley Corporation which was alert to feedback from 'lead' clients and therefore had the foresight and capability to provide independently researched and accredited green products. Other innovations were designed to enhance customer experiences, to respond to previously unarticulated needs, to educate consumers, to generate demand, to grow new demand, or to serve new niches and segments of the market. See for example, GoGet Carshare, Food Connect, Crystal Creek Meadows Luxury Cottages and Spa Retreat and RMB Lawyers.

- **Innovation through business experiments and learning by doing**

Innovations through radical breakthroughs are rare. The more usual picture is one where SMEs experiment, improvise, adapt and learn through serial efforts to provide more sustainable and competitive business offerings that meet market needs better than their

competitors. They transform their businesses by making informed and incremental changes in their processes, organisational arrangements, supply chain and customer relationships, and in some cases their smart application of technology innovations.

For example, Endless Solar's stated aim is to be a strong profitable business, not by being green, but by differentiating themselves as a business with quality products and a leading brand that people can trust. They generated demand by forging strong working relationships with installers. Another example is the effort by Living Green Designer Homes through trial and error over 18 months to streamline and simplify manufacturing processes and materials. Similarly, Corban and Blair's approach was to lead by example with use of recycled materials, creative design and unique signature high quality products, and a conscious choice to make more effective use of online and social media instead of travelling to trade shows, bringing both 'cost' efficiencies and 'carbon' efficiencies. RMB Lawyers tackled innovation and sustainability jointly and their innovation practices span pricing and packaging of legal services, waste reduction initiatives, community-based projects, university research partnerships into green marketing, and becoming an 'employer of choice' in recruiting and retaining talented staff.

- **Reinventing business models**

Some case studies illustrate that SMEs can have pursued nothing short of game-changing business model innovation.

GoGet Carshare is not just a private transport-sharing enterprise with traffic congestion benefits, but sees itself as changing the way cities are conceptualised and run. Food Connect Sydney has established a social enterprise business model providing access to farmed organic produce for city dwellers. Digital Eskimo is a design agency with a screening process favouring ethical projects committed to sustainability and collaborative solutions to "messy problems". As such, these businesses all see their business model as "essentially working against their industry's dominant paradigm and seeking to change it from within". Dynamic Property Services generates entire new lines of business in sustainability consulting services to property developers and owners by applying its own accumulated practice knowledge and expertise on environmental sustainability and property management.

- **Leadership and learning in supply chains and networks**

In the quest for more sustainable business practices, many of the case study businesses concentrated on: 'greening', investing in and educating their supply chain; participating in and learning from knowledge-based networks; undertaking formal research with universities to advance environmentally sustainable technologies and practices; and bartering or swapping services with other stakeholders and partners.

Serendipity Ice Cream became a leader in sustainability by persisting and succeeding in efforts to switch to 100% green power in the face of opposition from their energy provider, and by using their experiences to inform and educate other small businesses and suppliers through a local community sustainability network. Related stories about educating suppliers and sub-contractors and engaging in knowledge-sharing activities are told by Living Green Designer Homes, Corban and Blair, Whiteley Corporation, RMB Lawyers, Dynamic Property Services, and Focus Press.

Some firms reported that their firm's leadership in innovation and sustainability boosted their reputation. This was shown by the recognition these SMEs received in the form of awards, positive media coverage, customer feedback and perceptions of being a good place to work.

- **Setting the benchmark for quality and sustainability**

Compliance with standards is often seen as the antithesis of innovation, but in some businesses, disciplined adoption of internationally recognised standards for quality and for environmental sustainability seem to be driving innovation. The prime example of this in the case studies is Focus Press which undertook the painstaking work of data collection, change management, benchmarking and subjecting themselves to external auditing and compliance testing to gain and keep their international accreditation for meeting standards for quality and for environmental sustainability.

Focus Press, and others like Whiteley Corporation, RMB Lawyers and Living Green Designer Homes, have used their compliance with objective standards to embed their green credentials and to combat the unsubstantiated environmental claims made by others in the market. This is an innovative response to the challenges of branding and market positioning and to the need for SMEs to differentiate themselves from their competitors.

In short, the experiences conveyed by the case study companies provide evidence of the 'Green Chrysalis' effect alluded to in the title of this research. There is a dormant but awakening power of innovative business responses being made by Australian SMEs as they deal with sustainability issues as part of their mainstream business operating environment.

Low-carbon economy as innovation driver

Whilst each case study and the workshop illustrated different paths taken by owners and managers in their interaction with the low-carbon economy, some general observations can be made as to what "active ingredients" are commonly part of an innovative response to the low-carbon economy.

Active Ingredient	Active Ingredient Unpacked
High owner/ manager motivation	<ul style="list-style-type: none"> ✓ Some SMEs are being driven by a sense of environmental responsibility while others are primarily motivated by cost-efficiency, market access or other drivers. Regardless of what the drivers are, SME owners and/or managers seem to be self-motivated, including in sectors where the external drivers to make changes are weak. ✓ Motivating staff and suppliers is important in making changes ✓ Setting goals – both immediately reachable and stretch – is motivating ✓ Celebrating success is motivating ✓ Seeking industry or other recognition and awards for changes achieved is beneficial
Access and openness to knowledge acquisition and sharing	<ul style="list-style-type: none"> ✓ Learn from others – face-to-face contact is invaluable ✓ Access knowledge through networks ✓ Codify knowledge where possible ✓ Mentor and share knowledge with others
Engagement with sector supply chains	<ul style="list-style-type: none"> ✓ Share, educate and communicate with consumers ✓ Share, educate and communicate with suppliers
Activating a range of networks	<ul style="list-style-type: none"> ✓ Grow and utilise personal networks (e.g. by knowing the right person, SMEs can be attuned to new business ideas and trends) ✓ Participate in formal networks facilitated by others ✓ When a network is absent, create a network
Learning by doing, and continuously improving	<ul style="list-style-type: none"> ✓ For existing SMEs, start with small changes and build on them ✓ For new companies, learn as you go ✓ Lead by example ✓ Buy green and local ✓ Focus on continuous improvement, not one-off isolated efforts

(Continued)

Active Ingredient	Active Ingredient Unpacked
Dedication to continuous progress measurement and monitoring	<ul style="list-style-type: none"> ✓ Track the business benefits of changes ✓ Measure and monitor results ✓ Promote and communicate results or changes to all stakeholders
Have an input in being a 'first mover' and shaping the drivers and operating conditions for a low-carbon economy	<ul style="list-style-type: none"> ✓ Participate in voluntary standard setting processes ✓ Influence regulation where appropriate

Knowledge networks and universities

Knowledge acquisition is not always planned, and is sometimes serendipitous. SMEs need to acquire the right gems of knowledge useful to their product/services and processes. In nearly all the cases, the SMEs' involvement in external knowledge networks was a key ingredient in enabling innovation. Since SMEs are usually small and owner-operated, it is often through these networks that they are able to access and share both tacit and codified knowledge, skills and information.

For some of the case-study SMEs, tentative, initial first contact with one or two key individuals or organisations opened up networks of information and service providers who were instrumental to their innovations. A range of required information types were identified – about technologies, suppliers of green energy, and about approaches to measure and monitor their environmental performance. The defining characteristic was the value of the tacit knowledge of “who to go to, and who to ask.” SMEs successfully accessed knowledge by getting in touch in the first instance with those “key-holders” to knowledge networks – experts who navigate the maze of information, individuals and organisations and can open the right door to trusted sources of the right knowledge for the individual SME's needs.

A striking feature revealed by the case studies was the dynamic nature of knowledge networks, and the importance of the ongoing involvement of SME owner/managers in two-way knowledge transfer to others. Some SMEs have been invited through government programs to share their learning with other businesses in their sector or in their local area and they appreciate the importance of this to knowledge generation, irrespective of whether they see themselves as sector leaders.

The case-study SMEs had mixed experiences working with universities and the potential of universities as providers of knowledge and resources for innovation in response to the low-carbon economy is not particularly tangible for SMEs. In some cases, the SMEs felt that researchers gained more from the interaction than they did as companies. In the more successful interactions, universities provided opportunities that enabled contact and two-way transfer of knowledge between communities of research and practice. Examples included advisory committees, ‘town and gown’ forums, interns, guest lecturers – what the literature calls the “public space” role of universities; that is, opportunities to meet and talk rather than formal commercialisation initiatives.

A resounding theme from SME case studies is the value of governmental programmes which provided in-person points of contact for advice and information, such as those provided by certain local governments and the federally funded Enterprise Connect initiative. Often an

initial phone call or meeting opened the doors for SMEs to wider knowledge networks. The features most valuable to SMEs were that the services were free; that they enabled ongoing contact with individuals; and, importantly, that they felt comfortable approaching them even with limited knowledge about where to start.

Value creation

How did the business changes made to deal with the low-carbon economy prove valuable to our SMEs? While the motivations of the owners or managers may differ, business benefits were nonetheless achieved. The business benefits reported by the case companies in the discussion forum were:

- increased sales due to customer preference and loyalty
- new product and service offerings building a new customer-base
- process improvements – for example, by streamlining processes to save time
- cost savings, for example through reduced material costs or energy costs
- staff attraction, retention and loyalty
- differentiation of products or services from competitors
- access to new markets, for example, through environmentally preferable purchasing policies or via green business networks.

Profitability and success allows successful low-carbon economy innovators to invest further in developing their strategic capabilities, building a virtuous cycle. For example, Corban and Blair were able to invest further in their creative processes, and RMB Lawyers were able to invest in the community that they serve.

The challenges

The cases studies and SME workshop revealed several challenges that SMEs face. Many of these challenges are common to any innovation or change process, especially in the context of SMEs who typically have scarce resources (management, financial, time and staffing). Some of these challenges are compounded due to the policy uncertainty, knowledge-intensiveness, and the difficulties involved in accurately measuring the impact of the low-carbon economy. The case studies and workshop research revealed the following challenges, grouped here as those largely within businesses (internal) and those in the businesses' external environments:

Internal and management challenges

- lack of financial resources
- the perceived costs of making changes
- gaps in knowledge, and problems accessing external knowledge
- lack of time and management resources to investigate and then undertake innovations
- a lack of qualified personnel
- difficulties in motivating staff to make changes given uncertain outcomes
- difficulties in making innovations over the longer term (as opposed to one-off projects) including difficulties in achieving continuous improvement
- difficulty in measuring business benefits and payoffs.

External Challenges

- uncertain federal government policy and regulation on carbon
- lack of coordination between government agencies and policies

- uncertainty about customer demand and appeal
- lack of policing of green claims and subsequent greenwashing decreasing trust
- difficulty in accessing technology and the perception that new technologies and processes are expensive and risky
- disparate and confusing sources of information on activities and innovations in the low-carbon economy.

These challenges show that there is a need to identify what is needed in the market, in information, policy and regulation – and how different stakeholders might better contribute to creating an SME-driven low-carbon economy.

Chapter 7. Recommendations

This study revealed a wide range of activities, opportunities and challenges for SMEs in a low-carbon economy. In some cases, SMEs in this study were simply reacting to external pressures being placed upon them, while in others the SMEs were actively working to contribute to the creation of a low-carbon economy due to their own personal motivation. As the case studies, the workshop and the analysis of our findings highlighted, there are several areas where improvements can be made.

Whilst there is incredible diversity amongst SMEs, we offer here some thoughts and recommendations for SMEs, and for the institutions that both guide and serve them in regards to the low-carbon economy – government/policy makers, industry associations, service providers, and universities. This section summarises, by stakeholder group, what is needed to support and enable SMEs to boost their capability for innovation and capitalise on the opportunities of a low-carbon economy.

For SMEs

SMEs' options for changing their practices will vary widely depending on their sector, their size, their suppliers, their customers and their proximity to regulatory-driven markets. Nonetheless the cases revealed the following 'best practices' that might be useful for SMEs who are beginning to consider their contribution to the low-carbon economy:

- Reach out to “knowledge key-holders” as a starting point.
- Look at what other SMEs have achieved, how they did it and what value it brought them.
- Stand back and assess your products and services through the lens of a low-carbon economy. What could be provided differently?
- Create a brief strategic plan for priority activities, costs and benefits in order to guide development and innovation. Set targets and goals.
- Investigate options for gaining external funding and advice from local, state and federal governmental programmes. Look outside your business to where you can develop and access networks of knowledge providers, including universities.
- Appoint an internal champion and communicate with your staff about your activities.
- Talk to your value chain (your suppliers and your customers) about why you are making the effort, what you hope to achieve, and your results.
- Where possible, verify your results using independent certifications and recognition programs.
- Seek recognition for your work, for example, by seeking awards, promoting your work online, speaking at events and sharing your experiences with your peers.

- Celebrate successes, both small and large.
- Provide mentorship to others on the journey.

For policy makers

Because a low-carbon economy is fundamentally tied to government policy and regulation on greenhouse gas emissions, the actions of governments at all levels have a profound effect on the shape and speed of an emerging low-carbon economy. Several actions can be taken by government agencies to more directly engage SMEs in the creation of the Australian low-carbon economy.

At all levels of government, policy-makers can:

- make grants easier to find and access, and improve accessibility by investing in better information design and targeted outreach efforts.
- ensure that federal, state and local programmes and grants are consistent and connected; and provide a more consistent inter-agency approach between different agencies such as environmental departments, economic development agencies and planning departments
- develop and apply relevant energy efficiency and low-carbon standards
- reduce the “green tape” SMEs have to deal with
- provide more funding for R&D into low-carbon innovations, both high and low-tech.
- develop sustainable government purchasing policies that give preference to low-carbon providers and diversify suppliers to include more Australian SMEs
- invest more in grants and other programmes for specific types of SMEs, making small grants and loans available with low overheads for both agencies and recipients.

Local Governments can:

- seek to avoid duplication (i.e. each local council having to reinvent the wheel in terms of setting up an SME one-stop shop). Regional groupings of local councils and local government associations need to build strong networks so that they can share consistent resources, information and expertise, and also increase their influence through economies of scale.
- act as a channel for information from federal and state government programmes to SMEs, and tailor this information to suit their local audience and provide a one-stop shop e.g. for resources on grants
- provide networking opportunities for SMEs to learn about low-carbon economy innovation from each other, and partner with local universities and service providers to provide expertise and knowledge relevant to SMES in their region.

State governments can:

- provide local governments with information for their SME constituents.
- provide technical assistance.
- provide greater policy certainty on regulations.
- fund capacity building programmes for SMEs in their state.
- work with local and federal agencies and other state governments to provide a consistent approach.

The federal government can:

- provide greater certainty around policy and regulation. This is the single largest action that government can take to create a sound enabling environment.

- coordinate between federal agencies with a focus on providing services and infrastructure to Australian SMEs
- prevent “green-washing” by ensuring that “green” claims are subject to regulation
- provide funding for R&D.
- promote Australian SMEs’ low-carbon innovations internationally.

For universities

Universities have great potential as to promote and be actively involved in sharing knowledge to inspire innovation. SMEs strongly value face-to-face interaction, and being able to engage with the person rather than a faceless research report. The case studies reveal successful knowledge-transfer relationships and research incubators being developed between SMEs and universities through the direct and active involvement of researchers in communities of practice which extend beyond academia – to local government, and to industry associations. This involves researchers being both the public and personal face of universities, and having the space to speak at public forums.

Independence and knowledge is invaluable, and universities are well placed to fulfill the role of “knowledge key-holders” by engaging with SMEs, governmental agencies and industry associations. In general, there is a need for better integration of SMEs into the innovation system; and for universities to better connect to SMEs. As knowledge creators, educators and as institutions with their own carbon footprint, the following activities are recommended for universities:

Knowledge creation and dissemination

- Investigate the “business case” for making changes with real case examples, detailed measurements and independent and credible assessments of the potential costs and benefits, and risks and rewards of low-carbon innovations for SMEs. Go beyond platitudes.
- Measure the results achieved, in aggregate, of SMEs’ shifts to the low-carbon economy. Promote and disseminate these findings in the media to show what SMEs can achieve.
- Document and showcase best practices and achievements by SMEs in the low-carbon economy.
- Provide guidance tailored to SMEs on how to avoid greenwashing and how to make compelling eco-marketing claims.
- Lend expertise to both formal and informal standard-setting practices in the low-carbon field, such as in energy efficiency standards, labels, award programs, directories, and other voluntary programs.
- Enhance the accessibility of research by encouraging non-academic publications, forums and communications.

Foster innovation for a low-carbon future through training and education

- Facilitate learning outside of the classroom, with students participating in “problem-based learning”, and “learning by doing” programmes.
- Provide training programs for managers of SMEs, with professional development courses, e-learning, guidebooks and seminars.
- Increase participation in such programs by partnering with service providers, government agencies and industry associations, and by developing accreditation and recognition for training steps being achieved.
- Provide space for networking events and actively seek to create “communities of practice” that enable SMEs to participate and learn from each other and from members of the university community.

Increase accessibility and transform practices

- Improve transfer of intellectual property and knowledge from universities to SMEs by improving transparency, providing appropriate information, and actively looking for commercial partners.
- Publish in non-academic journals and venues.
- Present at industry events and roundtables.
- Lead the way by reducing universities' own carbon footprints, thereby contributing to the low-carbon economy.
- Consider reformulating university purchasing policies to include more diverse providers (including SMEs and local companies); implement "green" purchasing policies that favour local, sustainable providers and measure the results.

For service providers

Companies in regular contact with SMEs can play an important role in disseminating information and providing the knowledge and networks needed to enable the growth of the low-carbon economy. Trusted providers like banks, law firms, accountants and energy and water utilities are already in direct and regular contact with SMEs. As trusted business partners, they could provide information, training and networking experiences for their clients. A benefit of doing so may be increased loyalty and customer retention. Specifically, such service providers could offer:

1. training events and seminars tailored for SMEs on opportunities and challenges within the low-carbon economy
2. networking events to facilitate peer learning for SMEs
3. awards and recognition programs for low-carbon innovations from SMEs
4. information and resources targeted to SMEs, for example, on what government programmes are available to support low-carbon innovations
5. referrals to experts and universities with particular knowledge and skills appropriate for their sector and their strategic plans.

For industry associations

Industry associations, whose members include many SMEs across the country, are in a unique position to encourage and assist SMEs to overcome barriers and finding opportunities in the low-carbon economy. Beyond advocating for their members' interest in policy-making, industry associations could:

1. Systematically assess who SMEs have regular contact with, who they will listen to and who they trust and channel information and resources accordingly.
2. Actively create communities of practice and learning:
 - a. by promoting best practice amongst their members, and to facilitate networking
 - b. by providing guidance on how to make defensible and profitable green marketing claims
 - c. by creating seminars and events which will act as information hubs on the low-carbon economy for SMEs
 - d. by providing incentives, awards, and speaker opportunities;
 - e. by publicising results achieved by members, individually and collectively.
3. Partner with other knowledge providers such as universities, consultants, service providers.

Chapter 8. References

ABS see Australian Bureau of Statistics

Adriaens, P. (2008). Leading innovations: CleanTech. Berkshire Encyclopedia of Sustainability. Great Barrington, Berkshire. 2.

AFS and Netbalance (2010). What SMEs say and do about sustainability and climate change. Netbalance.

Allen Consulting Group and St James Ethics Centre (2008). Small and medium sized enterprises and responsible business practice, St James Ethics Centre.

Andersen, E., B-A. Lundvall and H. Sorrn-Friese (2002). "Editorial." Research Policy 31(2): 185-190.

Arundel, A. and R. Kemp (2009). Measuring eco-innovation. Maastricht, Netherlands.

AusIndustry (2010). "AusIndustry Programs." Retrieved 14/07/2010, 2010, from <http://www.ausindustry.gov.au/InnovationandRandD/Pages/home.aspx> .

Australian Bureau of Statistics (ABS) (2008). Australian and New Zealand Standard Industrial Classification (ANZSIC), 2006 (Revision 1.0). S. N. Z. Australian Bureau of Statistics. Canberra.

Australian Bureau of Statistics (ABS) (2010 a). 4660.0 Energy, water and environment management, 2008-09.

Australian Bureau of Statistics (ABS) (2010 b). 8158.0 Innovation in Australian business, 2008-09.

Australian Bureau of Statistics (ABS) (2010 c). Characteristics and performance of small and medium-sized businesses in Australia. Australian Economic Indicators.

Australian Government DIISR see Department of Innovation, Industry, Science and Research.

Aylward, D. and J. Glynn (2006). "SME innovation within the Australian wine industry: a cluster analysis." Small Enterprise Research 14(1): 42-55.

Balzat, M. and A. Pyka (2006). "Mapping national innovation systems in the OECD area." Int. J. Technology and Globalisation 2(1/2): 158-176.

Bessant, J. R. Lamming, H. Noke and W. Phillips (2005). "Managing innovation beyond the steady state." Technovation 25: 1366-1376

Carillo-Hermosilla, J., P. del Rio Gonzalez and T. Konnola (2009). Eco-innovation: when sustainability and competitiveness shake hands. Hampshire, Palgrave Macmillan.

Carlsson, B, S. Jacobsson, M. Holmen and A. Rickne (2002). "Innovation systems: analytical and methodological issues." Research Policy 31(2): 233-245.

CEEDR see Centre for Enterprise and Economic Development Research

Centre for Enterprise and Economic Development Research (CEEDR), M. U. B. S. (2009). SMEs in a low carbon economy.

Commonwealth of Australia (2009). Powering ideas: an innovation agenda for the 21st century (full report).

Commonwealth of Australia (2010). Australian Innovation System Report 2010.

- Cutler & Company (2008). *Venturous Australia: Building Strength in Innovation*.
- Department of Innovation, Industry and Regional Development (2010). *Jobs for the future economy: Victoria's action plan for green jobs*. Victorian Government, Melbourne.
- Department of Innovation, Industry, Science and Research (2010). *Small to medium enterprises and productivity*. Australian Government, Australia.
- Dodgson, M., A. Hughes, J. Foster and J.S. Metcalfe (2010). *Systems thinking, market failure, and the development of innovation policy: the case of Australia*. University of Queensland and University of Cambridge.
- Edquist, C. (2005). *Systems of innovation: perspectives and challenges*. The Oxford Handbook of Innovation. Edited by J. Fagerberg, D. C. Mowery and R. R. Nelson. New York, Oxford University Press.
- Elkington, J. (2001). The Chrysalis Economy: how Citizen CEOs and Corporations can Fuse Values and Value Creation, Capstone Publishing/John Wiley, Oxford.
- European Commission (2005). *The new SME definition: User guide and model declaration*, European Commission.
- Eurostat (2009). 'High-tech industry and knowledge-intensive services'. http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/htec_esms.htm, European Commission.
- Fagerberg, J. (2004). *Innovation: a guide to the literature*. The Oxford Handbook of Innovation. Edited by J. Fagerberg, D. C. Mowery and R. R. Nelson. New York.
- Feinson, S. (2006). *National Innovation Systems Overview and Country Cases*, in *Knowledge Flows and Knowledge Collectives: Understanding the Role of Science and Technology Policies in Development*. Centre for Science, Policy and Outcomes, Arizona State University.
- Gans, J. and S. Stern (2003). *Assessing Australia's innovative capacity in the 21st century*. Intellectual Property Research Institute of Australia, The University of Melbourne.
- Grayson, D. and T. Dodd (2007). *Small is sustainable (and Beautiful!): Encouraging European smaller enterprises to be sustainable*. A Doughty Centre for Corporate Responsibility Occasional Paper, Cranfield University School of Management.
- Green, R. (2009). *Management Matters in Australia: Just How Productive Are We? Findings from the Australian Management Practices and Productivity global benchmarking project*. Report commissioned by Australian Government Department of Innovation, Industry, Science and Research.
- Hall, B. (2005). *Innovation and diffusion*. The Oxford handbook of innovation. J. e. a. Fagerberg, Oxford University Press.
- Hauser (2005). *A qualitative definition of SME*. Towards better structural business and SME statistics. O. S. Directorate. Bonn, OECD.
- Hoffman, K., M. Parejo, J. Bessant and L. Perren (1997). *Innovation amongst small and medium-sized enterprises*. Technovation **18**, 39–55.
- Hughes, A. (2006). *Optimal innovation systems: lessons from the UK and the USA*. Innovation Leadership Summit.
- Kauffmann, C. and C. T. Less (2010). *Transition to a Low-carbon economy: public goals and corporate practices*. 10th OECD Roundtable on Corporate Responsibility, Organisation for Economic Co-operation and Development.
- Laursen, K. and A. Salter (2004). "Searching high and low: What types of firms use universities as a source of innovation?" Research Policy **33**(8): 1201-1215.
- Lester, R. K. (2005). *Universities, innovation, and the competitiveness of local economies: a summary report from the Local Innovation Systems Project - Phase 1*, MIT Industrial Performance Center Working Paper. Boston MIT.
- Lundvall, B. Å., B. Johnson, E. Anderson and B. Dalum (2002). *National systems of production, innovation and competence building*. Research Policy **31**(2): 213-231.
- Lundvall, B-Å. (1992). 'Introduction.', in Lundvall, B-Å. (Ed.): *National systems of innovation: towards a theory of innovation and interactive learning*, Pinter, London, pp.1.-19.

- OECD see Organisation for Economic Co-operation and Development
- Organisation for Economic Co-operation and Development (OECD) (2009). Sustainable manufacturing and eco-innovation: framework, practices and measurement, Synthesis Report.
- Organisation for Economic Co-operation and Development (OECD) (2005). OECD SME and entrepreneurship outlook - 2005 edition.
- Organisation for Economic Co-operation and Development (OECD) (n.d.) The measurement of scientific and technological activities: the Oslo manual.
- Organisation for Economic Co-operation and Development (OECD) (2011) Fostering innovation for green growth. September 2011.
- O'Rourke, A. and H. de Zwart (2007). Turning Green into Gold. Cleantech Network.
- Parry, M. L., O. F. Canziani, J.P. Paultikof, P.J. van der Linden and C.E. Hanson (eds) (2007). Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC Fourth Assessment Report (AR4) International Panel on Climate Change.
- Phelps, R., R. Adams and J. Bessant (2007). "Life cycles of growing organizations: A review with implications for knowledge and learning." *International Journal of Management Reviews* 9(1): 1-30.
- Potts, T. (2010). The natural advantage of regions: linking sustainability, innovation, and regional development in Australia." *Journal of Cleaner Production* 18: 713-725.
- Rennings, K. (2000). Redefining innovation – eco-innovation research and the contribution from ecological economics. *Ecological Economics* 32: 319-332.
- Roberts, B. and M. Enright (2004). "Industry clusters in Australia: recent trends and prospects." *European Planning Studies* 12(1): 99-121.
- Roos, G., Fernström, L. and Gupta, O. (2005). National innovation systems: Finland, Sweden and Australia compared. Sydney: Australian Business Foundation www.abfoundation.com.au/pdf/NISRoosShortPaper22Nov05.pdf
- Scott-Kemmis, D., A. Jones, E. Arnold, C. Chittravas and D. Sardana (2008). Absorbing innovation by Australian enterprises: the role of absorptive capacity. Report for the Department of Industry, Tourism and Resources.
- Tagar, E. and C. Cocklin (2010). Offsetting the disadvantages of smallness: promoting green entrepreneurs through industry clusters, in Schaper, M (ed). *Making Ecopreneurs: Developing Sustainable Entrepreneurship*. Gower Publishing Limited.
- The Climate Group, Queensland Government and ARUP (2009). Business guide to a low carbon economy.
- Thorpe, D. and N. Ryan (2007). Responding to global Issues: sustainability and innovation in the Australian SME residential building construction sector. *ICCPM/ICCEM 2007 Proceedings*. Singapore, Nanyang Technological University, Building and Construction Authority and Korea Institute of Construction Engineering and Management.
- Thorpe, R., R. Holt, A. Macpherson and L. Pittaway (2005). Using knowledge within small and medium-sized firms: a systematic review of the evidence. *International Journal of Management Reviews* 7(4): 257-281.
- Van Passel, S. (2008). Can Cleantech contribute to a sustainable future?
- Vickers, I., P. Vaze, L. Corr, E. Kasparova, F. Lyon (2009). SMEs in a low carbon economy. Final Report for BERR Enterprise Directorate. Centre for Enterprise and Economic Development Research, Middlesex University.
- Victorian Government (2009). Victorian Climate Change Green paper.
- Victorian Government DIIRD see Department of Innovation, Industry and Regional Development.
- Walker, B., J. Redmond, L. Sheridan, C. Wang and U. Goefl (2008). Small and medium enterprises and the environment: barriers, drivers, innovation and best practice. Small and Medium Enterprise Research Centre (SMERC) and Swan Catchment Council.
- World Resources Institute (2007). EarthTrends: climate and atmosphere country profiles. from http://earthtrends.wri.org/country_profiles/index.php?theme=3.

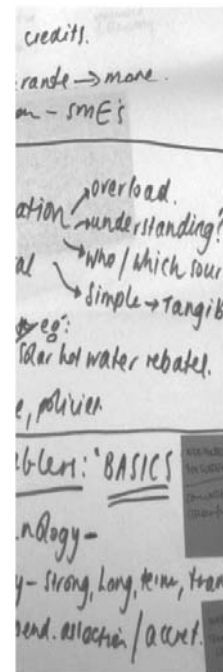
Appendix A – Discussion forum summary

WHAT IS DRIVING SME INNOVATION AND TRANSFORMATION IN A “LOW-CARBON ECONOMY”?

On 22 July 2010 ten invited participants from small and medium sized businesses joined the Institute for Sustainable Futures (ISF), University of Technology, Sydney, and the Australian Business Foundation (ABF) to share their perspectives and experiences about the ‘low-carbon economy’ in a breakfast conversation.

The conversation was a key component in a wider research project, undertaken by ISF, into the drivers and enablers of SME innovation and transformation in the low-carbon economy. The need for the research project arose from ISF and ABF recognising that most of the policy debate and research in this area is focused on large businesses, despite the importance of SMEs to the Australian economy. As part of the research, the team obtained SME input from a range of sectors, including businesses whose core products or services do not focus on low-carbon technologies and services.

We would like to extend our thanks to the SME owner/managers who shared their time and insights to inform this stage of the research. Below we have summarised the conversations which unfolded during breakfast.



What is the role of knowledge networks in driving SME transformation in a low-carbon economy?

Table 1 participants shared their perspectives on the importance of various networks to their businesses, as well as the challenges resulting from “greenwash” messages and practices affecting customer markets. They identified the following networks as being important to their businesses:

Industry networks – Participation in industry networks was identified as key for attracting and building a new customer base for emerging products and services.

Local community networks – When aiming to offer new products and services in a specific geographic region, engaging collaboratively with other local businesses, organisations and the community was identified as critical to building the overall market. This can be achieved by supporting other businesses that provide complementary associated goods and services.

Working collaboratively in the local area was also seen as a way of aligning business activities with “social responsibility” goals and helping to ensure an SME’s credibility and longer-term acceptance in a region.

“In our approach, we really did not want to be this kind of Sydney company stomping on the local businesses ...”

Social, informal and word-of-mouth networks – Establishing and participating in social networking activities such as on-line conversations and “green” networking events was identified as being integral to operating successfully as a business in the low-carbon economy.

Networking was identified by one SME manager as core to their business strategy, rather than the conventional “creating sales” approach. This aligned with another SME manager’s observation that building and maintaining customer bases through reputation and is far more effective than any self-promotion through advertising.

“A lot of our work is from referrals ... these have more credibility than any advertising you could do.”

Whilst on-line blogs and conversations were seen as a key way to engage and motivate the community and the market in low-carbon transformations, it was also noted that social networking can “go both ways” and also be a forum for the expression of public disenchantment, for example about greenwash or the ineffectiveness of responses to climate change.

Customer knowledge – Participants noted that it was difficult for customers to access credible information to enable them to distinguish between high-quality and reliable sustainability (e.g. renewable energy) products/services and the many poor-quality and inappropriate offers available on the market supplied by green “cowboys”.

How and where does your business source knowledge for harnessing a low-carbon economy? What knowledge gaps exist?

Table 2 participants discussed various sources of information as well as the challenges involved in identifying and using relevant knowledge.

Sources of information

- *Government programs*, such as the support of the Department of Environment, Climate Change and Water for industry-government partnership under the Sustainability Advantage Program.
- *Industry-specific sources*, such as the UN World Tourism Organisation and the CRC for Sustainable Tourism for the tourism sector.
- *Industry-specific accreditation schemes*, such as Green Star for the property sector.
- *Networking activities*, including the Total Environment Centre breakfast events
- *Apprentice schemes and networks*.

Participants noted that the *internet* is a key information source, enabling international best practice to be sourced by Australian businesses. All participants identified potential opportunities and importance of being linked to *universities*, to enable them to access cutting edge developments and new research.

Participants also identified a number of drivers for obtaining knowledge, including supply chain drivers and awards with green criteria.

“Soft” knowledge networks – Amongst the wide range of information available, participants observed that it is difficult to know what information to trust.

“There’s a saturation of knowledge out there however it’s hard to navigate.”

In this regard, soft knowledge networks, informal systems coupled with trust and word of mouth are extremely important in obtaining credible knowledge to change business activities for a low-carbon economy. They also appreciated that businesses need to be on the front foot to actively source appropriate knowledge.

Knowledge gaps – Participants felt that there is more knowledge and learning support available for some sectors than others. Overall, we perceived that the knowledge gaps were large and unknown.

“It’s not a knowledge gap, but a [knowledge] chasm”.

“It’s difficult to see the gaps as we don’t know what knowledge we don’t have”.

What is your organisation’s experience in accessing or generating funding to make changes for a low-carbon economy?

Table 3 participants shared their reflections on accessing funding opportunities. Participants were generally very interested in finding out more about funding opportunities available to support change and transformation.

Transaction costs of funding – An overall theme emerged that there is a high transaction cost involved with finding out about and applying for funding. Participants reported that they had difficulty knowing where to look and difficulty understanding the information such as the eligibility criteria.

Participants suggested a user-friendly “one stop shop” website for SMEs on funding opportunities would help improve access. Ideally this website would allow users to search by sector and other parameters e.g. grant type, amount and eligibility.

Sources and styles of funding – Participants on Table 3 were more familiar with government funding than private funding sources or venture capital.

Many participants noted that they would like to know about funding for their own businesses, but also funding that their clients could access.

There was some discussion around the potential of R&D tax credits. There was a sense that the task of claiming the credits would be onerous, but that they would like to explore the idea of clusters of similar businesses defining their research questions and collaborating on R&D and sharing tax credits.

“We would love to be funded to do general research that would help us innovate in sustainability, rather than having to absorb R&D costs into projects.”

Challenges, opportunities and enablers

Participants on all tables discussed their views on the challenges, opportunities and enablers for SME innovation and transformation in the low-carbon economy.

Challenges

Costs were identified as a key barrier for customers in their decisions not to purchase low-carbon products or services. The time and it took SMEs to plan, fund and implement new technologies or processes was also identified as a key challenge. SMEs do not have the financial base to influence decision makers. For example, as many SMEs rent their premises, their limited finances limits the extent of their influence on building sustainability.

“Capital costs of large scale changes are prohibitive for SMEs.”

‘Cowboys’ who take advantage of the sustainability agenda to sell poor-quality or inappropriate products and services have a negative impact on wider consumer attitudes towards sustainability.

“Some of the operators in providing renewable energy products are ... not exactly scrupulous.”

Policy uncertainty, a lack of regulations and a lack of a carbon price are major barriers to transformation. Frequent changes to policies make it difficult for SMEs to plan and make long-term sustained changes. Participants identified that governments are not driving change in this area, but that SMEs must do this independently.

A lack of *regulation* was also identified as a barrier to wider development of the market.

“We [forum participants] are the trail-blazers in this area ... but we are not doing anything really extraordinary”.

“The market is still in early-adopter stage ... the challenge is how to get the much larger middle ground to change.”

Knowledge, and keeping knowledge relevant and current, is another challenge facing SMEs. This is related to building the capacity and skills to transform, including to identify new market opportunities, and to identify financing opportunities.

Motivating and engaging staff is also seen as a possible challenge, particularly when innovation requires changing established paradigms.

The lack of urgency among the general public about climate change, perhaps reflecting Australia’s isolation from other countries, is a challenge in developing new markets.

Opportunities

All tables identified that there is *emerging demand* for new products and services related to the low-carbon economy, e.g. an increasing number of developers and home owners are seeking to build or own “green buildings”, and the interest in specialised renewable energy products is increasing.

Participants also identified opportunities to *capitalise on the competitive edge* presented by changing markets and circumstances – by taking the first-mover advantage, providing product or service points of difference, creating value propositions for clients and customers, and greening the supply chain. Marketing and communicating these points of difference was seen as critical to achieving competitive outcomes.

Through *cultural change* internally within a company, SME participants also saw the potential for improved productivity from their workplaces.

Cost reductions through improved efficiencies were also identified as a potential opportunity.

Enablers (current and needed)

A key theme emerging from the morning's conversation was the importance of recognising and communicating that low-carbon issues extend beyond sustainability and the environment to business values, ethics and *social responsibility*. This is related to the need to understand customer motivation, and what messages and modes of communication might resonate with potential customers.

“The focus should be on acting responsibly, rather than on [telling people about] sustainability.”

Participants also identified the need to *grow the visibility of technologies*, including through formal and informal networking and information provision. More credible and recognised information sources about sustainable products, services and financial incentives (e.g. rebates) were identified as crucial to help drive change.

The internet, and *communications technology* in general, is an enabler of change and transformation. There is a need to develop this further, for example by developing one-stop information tools for SMEs, or by making better use of teleconferencing.

Networking and relationship-building was highlighted as a key enabler of change, including the building of relationships with government and universities; sharing and finding out about positive outcomes and good results; and potentially partnering with bigger firms.

Participants also identified “external” or indirect enablers, such as drought, which could have a wide impact on public, policy and customer attitudes.

Appendix B – Green innovation concepts

CONCEPT 1: CLEANTECH

The term “cleantech”, which has only come into usage in the last decade¹⁰², denotes technologies which “optimise our use of natural resources and minimise environmental impacts”.¹⁰³ Cleantech products and services generally involve cutting energy or water use or waste and pollution output. Further, cleantech is not an industry sector itself but is supported by innovations from fields such as nanotech, biotech and IT, and thus delivers efficiency and sustainability benefits across diverse sectors of the economy.¹⁰⁴

“Cleantech” is directly relevant to SMEs and the low-carbon economy in two ways. First, many businesses developing new cleantech technologies are small high-tech start-ups. Second, cleantech technologies can be incorporated into the business processes of existing SMEs, allowing them to increase their efficiency and lower their environmental impacts. The rate of adoption of cleantech by SMEs has implications for Australia’s ability to transition successfully to a low-carbon economy. Appropriately, cleantech has been heralded as a major contributor to making progress towards a low-carbon economy. While cleantech is vital (both in practice and as a catalyst for new ideas in this area), it is not only the cleantech sector that can drive the low-carbon economy.

The sources of investment in cleantech companies include venture capital funds, which are able to take the risks of investing in emerging technologies. They also include multinational corporations looking to improve the efficiency of their operations. These corporations often invest in small cleantech companies as a means of outsourcing the development of the technologies that can drive these operational efficiencies.¹⁰⁵ Cleantech companies are also funded at different stages in their growth by universities, government grants, incubators, angel investors (individuals) and by the entrepreneurs themselves (in what is known as “bootstrapping”).

Australia appears to be lagging behind other industrialised countries in its development of a viable cleantech industry, as evidenced by the following:

- Investment in cleantech venture capital as a percentage of GDP is five times higher in the United States than it is in Australia¹⁰⁶

¹⁰² Adriaens (2008)

¹⁰³ Van Passel (2008)

¹⁰⁴ O’Rourke and de Zwart (2007)

¹⁰⁵ Adriaens (2008)

¹⁰⁶ O’Rourke and de Zwart (2007)

- Adjusted for the relative size of their economies, Australian venture capital investments are just 47% of those in the United States and 36% of those in Canada¹⁰⁷
- Venture capital investment in cleantech has also been growing at a much faster rate in the United States, Europe and Canada than it has been in Australia.¹⁰⁸

While venture capital is only one of several funding sources, these statistics illustrate a gap in the Australian market relative to its European and North American peers.

To address some of these challenges, the federal government has initiated a number of schemes that are aimed at increasing the investment in, and diffusion of, cleantech. Private and public sector funded venture capital investment funds specialising in cleantech have been founded. Other programs, such as *Re-tooling for Climate Change*, offer grants for small businesses to invest in cleantech technologies for their production processes.¹⁰⁹

CONCEPT 2: ECO-INNOVATION

As with “Cleantech”, eco-innovation is a relatively new concept that has emerged to describe innovations that support sustainable development, and result in environmental improvements.¹¹⁰ To date, the term eco-innovation has commonly been used to describe new technologies that improve both economic and environmental performance.¹¹¹ Eco-innovation has recently been introduced into Australian Government innovation policy documents to refer to the levels of funding for low-carbon and renewable energy innovation.¹¹² The OECD has recently emphasised eco-innovation as a key enabler of “green growth” economic strategies, given that “existing production technology and consumer behaviour can only be expected to produce positive outcomes up to a point”.¹¹³

Other concepts and frameworks for understanding eco-innovation recognise the broader organisational, institutional and social aspects of innovating for achieving positive environmental outcomes. For example:

- The European Commission’s Monitoring and Evaluation of Innovation Project defines eco-innovation to include a range of business activities, including “the production, assimilation or exploitation of a product, production process, service or management or business method”.¹¹⁴
- The Organisation for Economic Co-operation and Development (OECD) definition of eco-innovation articulates innovation in its broadest sense as occurring beyond the limits of an individual organisation and as being built on existing social structures. According to the OECD, the “scope of eco-innovation may go beyond the conventional organisational boundaries of the innovating organisation and involve broader social arrangements that trigger changes in existing socio-cultural norms and institutional structures”¹¹⁵.

A key characteristic of eco-innovation as described by the OECD is that it can be ‘accidental’ as it is “not limited to environmentally motivated innovations, but can include unintended environmental innovations”.¹¹⁶ Eco-innovation spans a diverse range of innovations, and includes innovations going beyond technology into managerial and organisational changes.

¹⁰⁷ O’Rourke and de Zwart (2007)

¹⁰⁸ O’Rourke and de Zwart (2007)

¹⁰⁹ AusIndustry (2010)

¹¹⁰ Arundel and Kemp (2009)

¹¹¹ Carillo-Hermosilla, del Rio Gonzalez and Konnola (2009)

¹¹² Commonwealth Australia (2010)

¹¹³ OECD (2011:9)

¹¹⁴ Arundel and Kemp (2009)

¹¹⁵ OECD (2009)

¹¹⁶ OECD (2009)

The breadth of the eco-innovation concept has led some critics of the term to believe that the practical value of the concept in guiding environmental management and policy may be limited.¹¹⁷ The research in this study is informed by the ‘eco-innovation’ concept and definition as provided by the OECD.

A survey by the ABS of the environmental management activities Australian businesses¹¹⁸ showed that the most common activity across all business sizes was to undertake energy efficiency or energy reduction strategies (as shown in Table 1). Smaller companies were far less likely to have environmental policies and plans, or to conduct energy audits, operate renewable energy systems, purchase green power, or prepare for a national carbon pollution reduction scheme.

TABLE 1: Energy, water and environmental management activities by size of business in Australia¹¹⁹

	Employment size (persons)				Total
	no.	0–19	20–199	200 or more	
Estimated number of businesses		1,042,556	50,828	3,111	1,096,495
Businesses with some form of environmental plan/policy or system	%	3.2	12.8	45.1	3.7
Businesses that undertook environmental management activities	%	27.2	54.8	74.7	28.6
Businesses that undertook water management practices	%	20.4	40.1	60.2	21.5
Businesses that have conducted energy usage audits	%	4.3	14.5	47.4	4.9
Businesses that have energy performance targets or indicators	%	3.4	8.9	29.4	3.7
Businesses that operated renewable energy systems or equipment	%	1.3	1.6	7.9	1.3
Businesses that undertook energy efficiency or energy reduction measures	%	54.2	77.8	87.6	55.4
Businesses that undertook measures to prepare for the proposed CPRS*	%	7.2	21.2	55.3	8.0
Businesses that purchased GreenPower	%	1.7	2.7	5.4	1.8
Businesses that generated electricity	%	0.6	1.0	6.2	0.6

*Carbon Pollution Reduction Scheme

¹¹⁷ Carillo-Hermosilla, del Rio Gonzalez, and Konnola (2009)

¹¹⁸ ABS (2010 a)

¹¹⁹ ABS (2010 a)