

# **Low Carbon Green Growth: Tracking Progress in Australia's Built Environment Industry Towards a Green Economy**

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## Executive Summary

The 21st century's economy will be urban and green. The urban transition is well advanced globally, albeit unsustainably (Newton, 2008; Newman and Matan, 2013). The green economy is in its infancy. Yet like other revolutionary socio-technical transitions before it, there are irrepressible sets of push and pull factors massing that can trigger transformative change. The push factors are those capable of delivering innovation. New technologies are among these (see Figure 1) as well as business strategies and practices and government policies and programs that all need to shift towards facilitating this new economy. The pull factors are also clear and relate, among others, to the challenge of creating sustainable and resilient built environments capable of functioning within the ecosystem limits of a single planet subject to climate change and forecast to be home to 9 billion people by 2050 (Newman et al., 2009; Pearson et al., 2013).

This study represents a first attempt within Australia to explore the extent to which a green economy is emerging within different sectors of industry. Its emergence is underway within the energy sector (Newton and Newman, 2013); less so elsewhere. For the built environment sector, given its critical role in sustainable urban development, it is important to understand where the industries that constitute this sector are headed. The survey on which this report is based probes senior managers in both private and public sector organisations in relation to:

- Perceptions of their current operating environment
- Corporate strategies
- Green business opportunities
- Areas where government can assist business in creating an environment conducive to low carbon green growth.

Based on responses to an on-line survey by 173 senior managers representing organisations with membership in either GBCA, IPA, ISCA or EA undertaken between April and July 2013, we can highlight the following results:

- Private sector firms are at varying stages of developing green lines of business. The study found that *only 13% of companies derive all their revenue from green products or services*, with a further 13% receiving at least half from this area of business. Green services have a larger share, but not by a large margin. The challenge is for the 46% of built environment businesses that currently have less than 10% of their sales in green products and services to be actively looking for such opportunities.
- The significant scope for increasing green revenue is tempered by the high level of uncertainty *surrounding a firm's understanding of what customers are willing to pay for green products and services* (55% of respondents 'uncertain'). The challenges of competition, growing revenue and being innovative – among several other traditional business metrics – clearly outranked sustainability issues around the management table when put in the full context of contemporary business operations.
- Notwithstanding, *sustainability is a permanent agenda item with senior management in 85% of both private sector and public sector organisations* responding to the survey (43% of private sector firms have sustainability as a permanent *and core* agenda item compared to 38% in public sector). The private sector appears more alert to sustainability/low carbon agenda issues than the public sector, possibly because they are more exposed externally to the 'front line' of the

economy. They are embedding sustainability within *all* aspects of their organisation's operations to a greater extent than the public sector (51.6% to 38.1%).

- *For in-house sustainability and measurement practices, public sector organisations are currently in the lead* in terms of having a formal sustainability policy, sustainability manager, sustainability board/committee, reportable sustainability indicators and a sustainability-oriented procurement strategy. Public sector organisations also had higher levels of routine measurement of energy, water and CO2 emissions; the exceptions were with noxious emissions, where there has been mandated reporting for such waste discharges for some time by state environmental protection authorities.
- *Approximately half of the organisations are yet to change their business model in response to sustainability/low carbon development issues. A primary reason for this is the level of difficulty reported to be associated with evaluating 'green' business cases.* A comparable percentage indicate that sustainability is yet to be embodied within *all* facets of operations.
- *The opportunities identified for green business development within the built environment sector were weak* and not representative of the range that currently exist in the marketplace, let alone those that are emerging opportunities. *Most of the opportunities identified could be classed as 'mature', reflecting the lack of leading edge 'green' innovation currently represented in most urban development projects in Australia.*
- *Two-thirds of organisations surveyed had a strategy in place for reducing their carbon footprint* (similar to results from the EIU survey a year earlier). 90% of respondents indicated that government has a lead role to play in encouraging carbon reduction; although there was significant variability in response as to where government intervention should occur. Most favoured were subsidies, incentives, information and education. Least favoured were taxes, either on business or consumers.

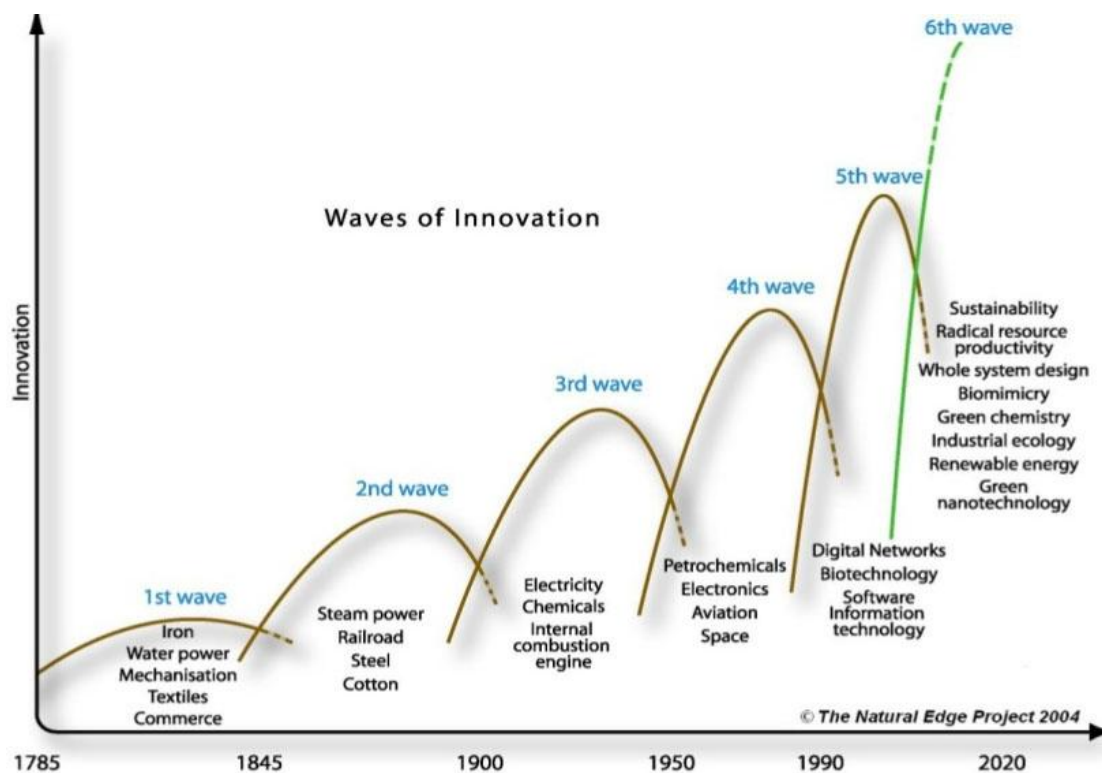
This survey has demonstrated that in the built environment area Australian business and government are gearing up for the green economy challenge. There are signs that Australian business is highly aware of the issues and has structured itself to prepare, perhaps even more so than businesses in other countries, based on the results of global surveys. But the transition is not yet as market-oriented as it could be so many businesses are still waiting to see if consumers will go green and whether governments can offer more consistent policy direction in this area. Meanwhile they are conducting business as usual. Publicly funded organisations appear to be less market-aware than business but are demonstrating green economy approaches and outcomes at a high level of commitment. If Australia is to be a strong global competitor in the green economy, then awareness and commitment will need to increase across the board in private and public sector built environment activity.

## Introduction

The green economy has been defined by UNEP (2011; see Bibliography in Appendix 2 for similar sets of definitions from other national and international organisations) as a “*system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks and ecological scarcities*”. Transition to a green economy is seen as essential for delivering sustainable urban development – and there are clearly close linkages with the classic Brundtland definition. The green economy has been identified as a vehicle for overcoming the shortcomings of previous economic development paradigms, enabling economic growth to be decoupled from unsustainable resource consumption and environmental degradation as well as leading to a narrowing of socio-economic inequalities. The economic and cultural shifts required are significant and challenging (Victor, 2008; Jackson, 2009).

The study of which this survey is part focuses on a number of critical innovation pathways that can underpin the transition to a green economy – a new engine for sustainable development in the 21st century: technology; business innovation; and innovation in the manner in which cities are designed and operated.

- *Technological innovation*; specifically one that ushers in a new, green economy based on renewable, distributed energy, resources from waste, closed loop manufacturing, industrial ecology, integrated water etc. The ‘6th wave’ of technological innovation since the beginning of the industrial revolution is seen as a technology platform capable of initiating a green economy (Figure 1).



**Figure 1: Green economy technology innovation platform**

Source: Hargroves and Smith (2006)

- *Business innovation* that operates on clear sustainability principles whereby product and service lines reduce the environmental footprint of the firm while improving productivity and worker health and welfare, both locally and globally. It is clear that there are significant and challenging opportunities in each sector of industry as they track towards goals of higher eco-efficiency performance (high productivity and profitability and small ecological footprint). Examples of innovations that enable the achievement of green goals relevant to major sectors of the economy and the industries within those sectors are listed in Table 1.

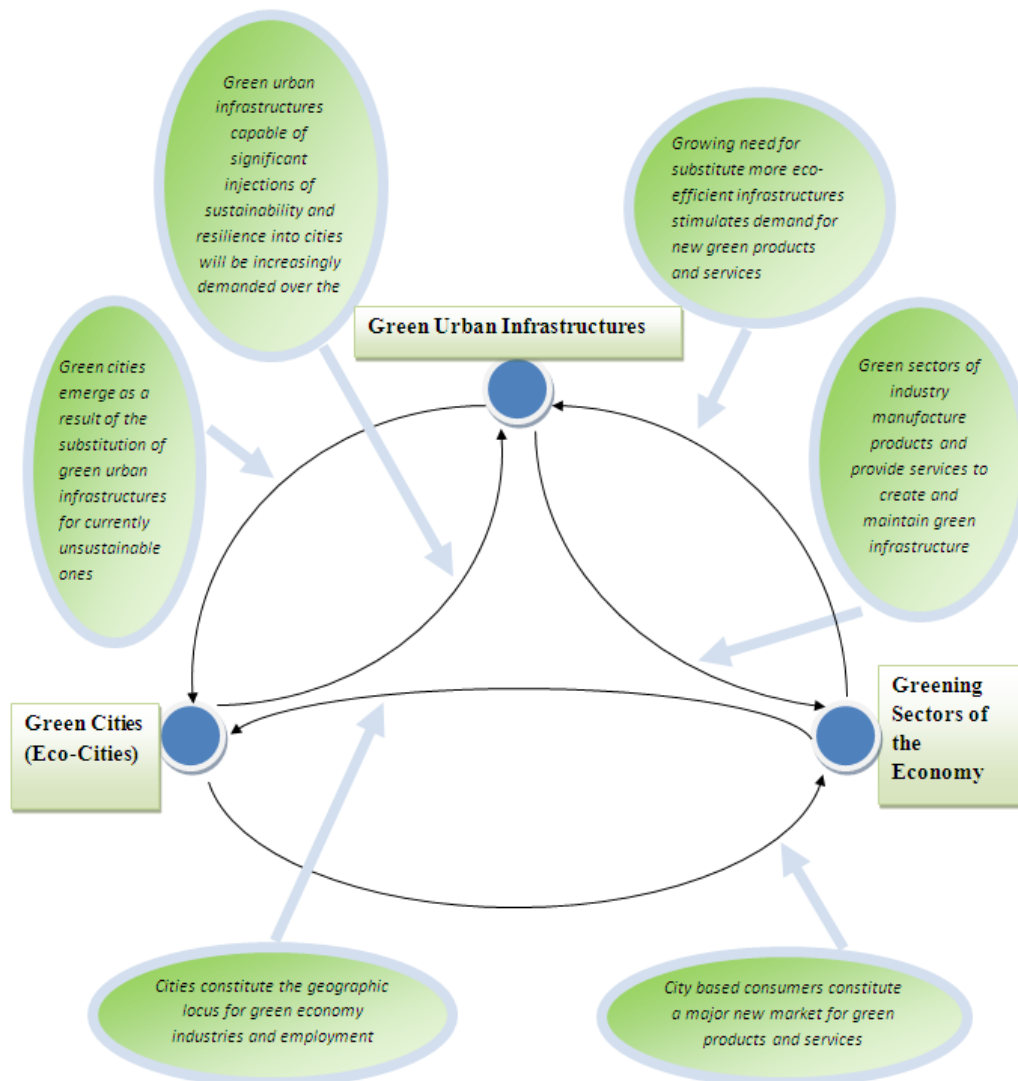
**Table 1: Greening the economy: key sectors and green goals**

Industry Sectors	Green Goals Associated with Sector
Manufacturing	Cradle-to-cradle; closed loop production; industrial ecology
Energy Utilities	Renewables; distributed (local) generation; green design; smart grids
Water Utilities	Integrated (stormwater, wastewater) systems; water sensitive urban design
Waste	Recycling, reuse; eco-industrial development
Construction	Smart, green building; virtual design and construction; life cycle analysis
Trade (Retail/Wholesale)	Zero waste (packaging, food etc.); carbon management; green supply chain
Transport	Hybrid, electric, hydrogen vehicles; land use integration; active transport
Finance and Property	Green accounting; urban retrofitting; building accreditation
Services	Zero waste; reduced consumption, carbon management; e-services
Government	Green procurement; de-coupling policies; sectoral decarbonising schemes; regulation; incentives

- Innovation in the manner in which cities are designed and operated. No 21st century solution to sustainable development is possible without working through the urban dimension and, in particular, cities. This message has been articulated by both authors (Newman and Kenworthy, 1999; Newman and Jennings, 2008; Newton, 2008) and more recently within a green economy framework by GIZ and ICLEI (2012) and UNEP (2011). This requires a *new logic for sustainable urban design and development* – a major opportunity for the built environment sector.

There is an increasing interdependence emerging in these areas. Cities will be critical to sustainable urban development in the 21st century. With the world's 9 billion population forecast to be 75% urban by 2050 (UN DESA, 2012), the sustainability challenge will focus more closely on the performance of cities, and the ecological footprints of their built environments and their populations (Newton, 2012). A range of physical infrastructures are required to support urban living: transport, energy, water, waste, communications and buildings. The consensus is that the sustainability performance of each is currently poor, given that they all emerged in an era where there were few resource constraints and climate constraints. Next generation infrastructures and urban designs will need to demonstrate significantly greater eco-efficiency and resilience in their operation than those that they need to replace (Engineers Australia, 2010). The demand for new urban infrastructures and green services represents the trigger for a raft of innovative infrastructure technologies to move more widely into the urban marketplace. Figure 2 also indicates that cities constitute a geographic locus for green industry location, given the agglomeration economies they deliver to firms generally as well as the customer base for green products and services.





**Figure 2: Critical connections: green economy, green urban infrastructure and green (eco) cities**  
Source: Newton (2013)

The barriers to change are considerable, but evidence of progress in each arena is emerging. A common feature for all transition arenas is the set of critical normative goals that they address: using resources more efficiently and reducing non-renewable resource consumption, reducing emissions and utilising wastes as resources, restoring environmental quality, enhancing human wellbeing, and developing human settlements that are liveable, productive, environmentally sustainable, socially inclusive and resilient.

This survey explores the directions that Australia's built environment industries are taking as reflected in senior management's thinking about their company's sustainability practices and green growth strategies.

### Green economy transition

A number of books have been published with the term 'green economy' in their titles. The most recent include those by international agencies such as the United Nations and OECD that are seeking to establish a new global platform for sustainable development. These global policy agendas/roadmaps (e.g. UN R10+21 Sustainable Development, UNEP Green Economy; OECD Green Growth; UN ESCAP Low Carbon Green Growth) are presented

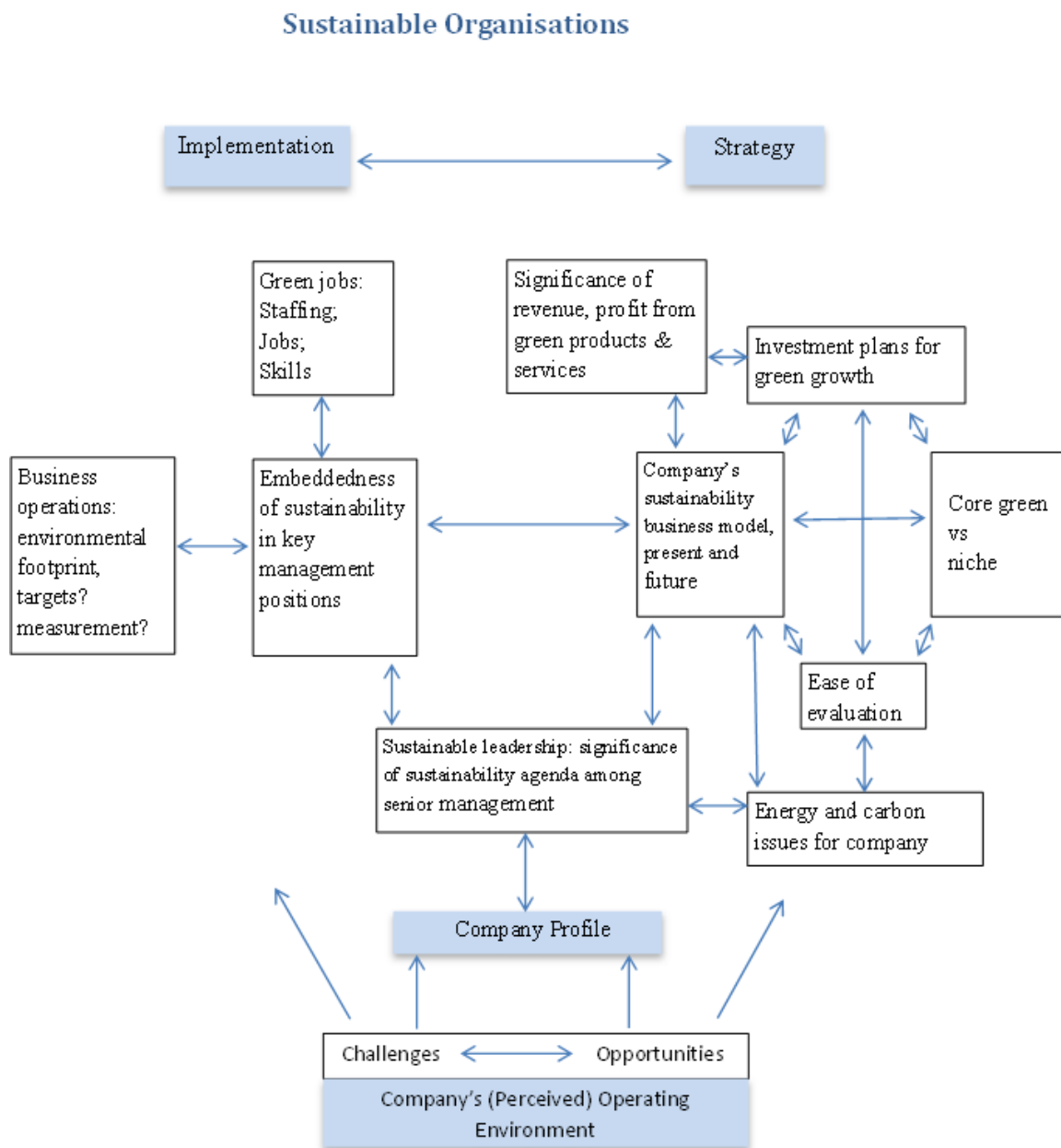
as a backdrop against which more specific national policy agendas are emerging, although to date not in Australia. A number of initiatives, such as those out of Asia (e.g. UN ESCAP and the Korean government), are focusing on projects capable of delivering blueprints for low carbon green growth at a national scale. In many Western countries (e.g. USA), the focus has centred more on green energy and green jobs, driven by national interests related to energy security and creating new industries capable of generating new green jobs in an era of slow growth. The academic literature has attracted a range of authors from a variety of disciplines, each of whom view the green economy through different sets of lenses. The early literature on the emerging information economy published in the 1980s and 1990s was similar in its breadth of titles, as scholars grappled with its various dimensions: the economic, the organisational, the geographic etc. (see Broatch et al., 1987). Titles on the green economy are being written from a similarly diverse range of perspectives, e.g. economic (Barbier and Markandya 2012: environmental valuation and accounting), from an industry location and employment perspective (Moretti 2012), from an education and training perspective (Elder, 2009) and from a broad societal governance perspective. Here Milani (2000) suggests that the green economy will emerge from the bottom up, through public opinion and new social movements. Brown (2001) puts the responsibility for bringing about the transition to an eco-economy almost exclusively into the hands of the state (via the three principle levers available to governments: regulation, subsidies/incentives and pricing/taxing instruments). Hatfield-Dodds et al. (2008, p. 3) argue that both government and industry have a role, especially considering that the business sector is beginning to emerge as a central player in strategic thinking and planning about sustainability (MIT Sloan Management Review, 2012).

The emergence of Newsweek's (2010) Green Rankings (which quantify the ecological footprints, policies and reputations of the US top 500 and Global top 100 businesses) and the ASX Clean Tech Sector listing among others are following in the wake of the earlier and broader-based corporate sustainability (TBL-based) rankings of companies (e.g. Dow Jones Sustainability Index; Australian SAM Sustainability Index; see Grey, 2008, Nugent and Hughes, 2008). The former group (green rankings) are indicative of the changes beginning to sweep across all industry sectors that are shining a spotlight on corporate environmental performance.

## Survey

The objective of the survey was to discover how Australian organisations (private and public) in the built environment sector are positioning themselves for a low carbon green growth future and to what extent this is reflected in their current business strategies and management practices.

The questionnaire (see Appendix 1) was designed to probe senior management thinking in relation to the adoption of sustainability management practices and green growth business models. It covers the twin areas of strategy and implementation, and addresses key elements characteristic of sustainable organisations, as suggested by literature in this area (MIT Sloan Management Review; EIU, 2011) (see Figure 3). A key objective of the survey is to assess the extent to which organisations are embedded in green economy activities, with prospects ranging from 'core green' (all revenues or actions aligned to environmental sustainability activities) to 'niche' (only part of organisation involved) to possibly none.



**Figure 3: Facets of a sustainable organisation**

The research involved an online survey of members of the GBCA, IPA, ISCA and EA occupying senior management positions within their organisations. The survey was undertaken between April and August 2013. 173 surveys were returned for analysis. It is important to note that not all questions secured a 100% response. Consequently, the sample size is indicated for each table in the report.

The respondents were drawn from a spectrum of the built environment sector (see Table 2), with 85% from private industry and 15% from the public sector. Among the private sector, the largest representations were from design, building and construction, consulting and manufacturing firms. The analyses provided in this report on responses to the survey questions are in terms of public versus private and total.

**Table 2: Survey respondents by business category**

Private	85.0
Design	18.5
Building & Construction	16.8
Facility Management	1.7
Utility	1.2
Green Consulting	11.0
Project Management	2.9
Clean Technology	2.9
Property Development	4.6
Finance	1.2
Industry Association	2.3
Building Services	3.5
Estate Agents	1.2
Distribution - Building & Construction	3.5
Properties	
Manufacturing	8.1
Transport Services	0.6
Engineering Services	3.5
Legal Services	0.6
Waste Management	1.2
Public	15.0
Government	10.4
Tertiary Education	4.6
<i>Total</i>	<i>100.0</i>

n=173

Two thirds of the organisations were involved in Australian-based operations; 30% were restricted to a single state (Table 3), but one in five had international business.

**Table 3: Geography of organisation's operations**

Single State	30.1
Multiple States	26.0
All States	12.1
Australia + Asia Pacific	11.0
Australia + Global	20.8
<i>Total</i>	<i>100.0</i>

n=173

New South Wales and Victoria are the two largest states in Australia (32% and 27% of population respectively in 2013) and they also had the highest representation among respondents (see Table 4); Queensland and South Australia were under-represented relative to their size.

**Table 4: Location of organisation's headquarters**

Melbourne Metro	21.4
Rest of VIC	2.9
<b>TOTAL VIC</b>	<b>24.3</b>
Sydney Metro	37.6
Rest of NSW	4.6
<b>TOTAL NSW</b>	<b>42.2</b>
Brisbane Metro	11.0
Rest QLD	1.7
<b>TOTAL QLD</b>	<b>12.7</b>
Adelaide Metro	3.5
Rest of SA	0.0
<b>TOTAL SA</b>	<b>3.5</b>
Perth Metro	13.9
Rest of WA	0.0
<b>TOTAL WA</b>	<b>13.9</b>
Hobart Metro	0.6
Rest of TAS	1.2
<b>TOTAL TAS</b>	<b>1.7</b>
City of Darwin	0.0
Rest of NT	0.0
<b>TOTAL NT</b>	<b>0.0</b>
Canberra	0.6
Rest of ACT	1.2
<b>TOTAL ACT</b>	<b>1.7</b>
<i>Total</i>	<i>100.0</i>

n=173

Responses were received from organisations across the size spectrum: approximately 40% were SMEs (fewer than 50 employees ;Table 5).

**Table 5: Size of organisation's workforce**

< 20 employees	30.1
20-49 employees	11.0
50-199 employees	17.3
200- 999 employees	18.5
1,000-10 000 employees	16.8
>10,000 employees	6.4
<i>Total</i>	<i>100.0</i>

n=173

## Findings

### Business Perceptions of Operating Environment and Key Challenges

A formidable set of built environment challenges to sustainability and resilience are now confronting all societies and their economies as identified recently by Newton and Doherty (2013). These include financial uncertainty, global competition, resource constraints, climate change, extreme events exhibiting shorter return periods, population growth, urbanisation and built environment intensification, biosecurity, failing infrastructures, widening socio-demographic disparities and fragmenting social and human capital. Against this backdrop of challenges, private sector firms as well as public sector organisations have been confronted with the task of establishing management strategies and making investments that can advance their operations. The manner in which the organisations responding to this survey have rated the challenges are instructive (see Table 6).

In line with previously published MIT studies in this area (Kruschwitz and Haanaes, 2011), we found that while 88% of companies indicated that sustainability is *permanently* on their agenda (see following section; Table 7), when this issue is placed in the context of the large number of challenges that business needs to manage, it is rated down the scale of importance. Responding effectively to threats and opportunities of sustainability to their business are seen by 40% as a *significant challenge* (category 4 and 5 responses), but green competition is only identified by 23% as such. Green technology is seen as something that can be acquired relatively easily. Resource constraints and carbon constraints are rated as significant by less than 20% of companies. The big challenge is understanding “whether customers are willing to pay a premium for green products and services”. Sixty per cent of respondents indicate that *uncertainty* in this area is the key issue. Uncertainty rates high as a key challenge in other areas as well: global financial markets (45%) and consistency of government (over 50%). Uncertainty in these three areas ranks with issues of increased competition in the Australian market (54%), the challenges of growing revenue (51%) and being innovative (54%) as the key targets on the radar screens of senior management in the built environment industry.

**Table 6: Rating of challenge to the company in the next five years (private firms only)**

Area of challenge	Level of Challenge (%)					
	1 (Low)	2	3 (Moderate)	4	5 (Major)	Not applicable
<b>Technological</b> (n=156)						
Acquiring and/or adapting new low carbon technology	18.6	12.2	40.4	13.5	5.8	9.6
Limited Australian R&D capacity	18.6	16.0	21.8	16.0	13.5	14.1
Identifying emerging new technology and assessing relevance to business	10.3	14.7	41.0	22.4	10.3	1.3
<b>Market Related</b> (n=156)						
Responding to changing market conditions	7.7	11.5	28.8	28.8	19.9	3.2
Increasing competition in Australian markets	8.3	12.2	16.7	30.8	23.7	8.3
Increasing competition in global market	14.1	9.0	22.4	24.4	12.8	17.3
International trade barriers to export of products and services	28.8	11.5	17.9	4.5	3.2	34.0
Whether customers are willing to pay a premium for green products, services	6.4	10.3	26.9	23.7	31.4	1.3
Competitors increasing commitment to sustainability, green products/services faster than expected	18.6	17.3	31.4	17.9	5.1	9.6
<b>Government Related</b> (n=156)						
Addressing impact of government regulations, standards etc / maintaining 'licence to operate' on our business	9.6	16.7	30.8	20.5	15.4	7.1
Lack of certainty regarding government policies/legislation	5.8	10.3	28.8	20.5	30.8	3.8
<b>Financial</b> (n=156)						
Taxation policy (eg carbon tax, corporate tax etc)	14.7	21.2	33.3	18.6	7.7	4.5
Global financial uncertainties	5.8	12.8	32.1	28.8	16.0	4.5
Cost of capital, borrowing	14.7	23.7	30.8	15.4	7.7	7.7
Access to capital	14.7	22.4	29.5	11.5	13.5	8.3
Growing revenue	5.1	10.9	28.2	35.9	15.4	4.5
<b>Staff Related</b> (n=153)						
Acquiring necessary skills/competing for new talent	6.5	13.7	37.3	24.2	16.3	2.0
Shortage of skilled labour	15.7	19.0	35.3	17.6	10.5	2.0
Attracting talented people	9.8	21.6	27.5	26.8	13.1	1.3
Retaining and motivating existing employees	7.2	23.5	35.3	24.2	7.8	2.0
<b>Business Operations</b> (n=153)						
Reducing costs and increasing efficiencies	3.3	11.1	31.4	33.3	20.9	.0
Innovating to achieve competitive differentiation	5.9	8.5	26.8	38.6	15.7	4.6
Responding effectively to threats and opportunities of sustainability	5.9	15.0	36.6	29.4	11.1	2.0
Increasing operating speed and adaptability	2.6	17.6	32.0	30.7	13.1	3.9
Responding effectively to disruption of our business model	5.9	24.2	33.3	24.2	7.2	5.2
Stricter requirements from partners along the value chain	11.8	25.0	29.6	16.4	3.9	13.2
<b>Externalities</b> (n=153)						
Climate change adaptation (increasing temperature, sea level, rainfall, variability etc) challenges for your company	26.8	22.9	21.6	13.7	5.2	9.8
Shortage (high cost) of material inputs to company operations	21.6	22.2	22.2	13.1	3.9	17.0

## Management and Sustainability

The survey findings suggest that issues relating to sustainability and carbon reduction are now a *permanent and core* fixture on the agenda of built environment's top management for over 40% of organisations, with a higher representation among private sector companies (see Table 7). Although the sample size of public organisations represented in this survey is small, there are several topics where important differences appear to be emerging that the authors considered should be reported (albeit with the above qualification). Most tables, however, are restricted to reporting private sector responses.

**Table 7: Sustainability as an agenda item with senior management**

	Private n=128	Public n=21	Total n=149
Already a permanent fixture and core strategic consideration	43.0	38.1	42.3
On the agenda permanently, but not core	42.2	47.6	43.0
Temporarily on the agenda, but not core	12.5	14.3	12.8
Excluded from the agenda, because viewed as a passing fad	0.0	0.0	0.0
Never considered for the agenda	2.3	0.0	2.0
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

International comparisons suggest that Australian companies have elevated sustainability to a higher level of corporate concern than their overseas counterparts (see Table 8; the international survey was not restricted to built environment industries).

**Table 8: International comparison of role of sustainability in corporate strategy**

Status	MIT		ARC (2013)
	(2010)	(2011)	
Already a permanent fixture and core strategic consideration	24	28	42
On the agenda permanently, but not core	38	42	43
Temporarily on the agenda, but not core	22	19	13
Excluded from the agenda, because viewed as a passing fad	4	2	0
Never considered for the agenda	8	8	2
<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>

For 52% of private sector firms and 38% of public organisations, sustainability is being embedded within *all* facets of their operations, and there remains only a very small percentage where sustainability has not been addressed at all (Table 9); not unexpected, perhaps, given that all organisations responding are members of industry associations with strong sustainability objectives.



**Table 9: Extent of sustainability penetration throughout organisations**

	Private n=124	Public n=21	Total n=145
Sustainability is being embedded within all aspects of my organisation's operations	51.6	38.1	49.7
My organisation addresses sustainability as a separate, delineated activity	41.9	57.1	44.1
Sustainability has not been addressed in my organisation	6.5	4.8	6.2
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

It is evident that a significant proportion of built environment organisation's *business models have changed* as a result of issues surrounding sustainability and low carbon development (Table 10). A higher percentage of private sector organisations have effected some change, compared to public sector organisations.

**Table 10: Whether organisation's business model has changed as a result of issues surrounding sustainability and future low carbon development**

	Private n=129	Public n=21	Total n=150
Yes	45.7	42.9	45.3
No	50.4	42.9	49.3
I do not know	3.9	14.3	5.3
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Taken overall, the percentages associated changed business models are closely aligned to published studies of international organisations (Table 11).

**Table 11: Whether organisation's business model has changed: international comparison**

Change	MIT (2011)	ARC (2013)
Yes	46	45.3
No	40	49.3
I do not know	14	5.3
<i>Total</i>	<i>100</i>	<i>100</i>

Source: Kruschwitz and Haanaes (2011)

Part of the reason for lack of a higher level of progress in embedding sustainability more deeply and effectively within private sector organisations is the level of difficulty expressed in evaluating the business case (see Table 12). All issues listed have a level of difficulty associated with their execution. Those heading the list involve the challenge of resolving uncertainties surrounding customer response and incentives.

**Table 12: Level of difficulty expressed in evaluating the business case for sustainability related strategies**

Issue	Level of difficulty (%)					Average Score
	Not	2	Moderately	4	Very	
Establishing financial incentives for considering sustainability	7.3	15.3	23.4	34.7	19.4	3.44
Predicting customer response to sustainability strategies	2.4	19.4	29.8	37.1	11.3	3.35
Quantifying intangible effects of sustainability strategies (e.g. brand reputation, employee hiring, retention and productivity)	7.3	21.8	21.8	31.5	17.7	3.31
Capturing comprehensive metrics about sustainability impact of operations	6.5	18.5	35.5	26.6	12.9	3.21
Lack of model/framework for incorporating sustainability in business cases	10.5	18.5	27.4	31.5	12.1	3.16
Uncertainty about future carbon pricing	13.7	14.5	35.5	18.5	17.7	3.12
Opposition from executives or influential individuals	12.1	22.6	25.8	23.4	16.1	3.09
Evaluating competing priorities	4.8	27.4	37.1	26.6	4.0	2.98
Quantifying sustainability-related risks	8.1	24.2	39.5	19.4	8.9	2.97

n=124

### In-House Sustainability

Results of the survey suggest that the private sector is more alert to green business strategies and opportunities external to the firm than the green credentials of its own operations. It is in relation to in-house sustainability management and measurement that the public sector currently has the lead (see Table 13).

**Table 13: In-house sustainability indicators (per cent of responses indicating 'Present')**

Indicator	Private n=124	Public n=21	Total n=145
A formal sustainability policy/strategy	75.0	85.7	76.6
A senior sustainability manager role	47.6	52.4	48.3
Sustainability Board or committee	33.1	52.4	35.9
Key sustainability performance indicators (such as feature in the Annual Report or its equivalent)	38.7	71.4	43.4
A sustainability-oriented procurement strategy	46.8	57.1	48.3
Routine measurement of the following:			
Energy used	74.2	95.2	77.2
CO2 generated	49.2	81.0	53.8
Water used	54.0	95.2	60.0
Other emissions to air (SO <sub>2</sub> , NO <sub>2</sub> etc.)	16.9	9.5	15.9
Liquid waste	29.8	19.0	28.3
Solid waste	45.2	76.2	49.7

## Measuring the Green Economy

As with prior socio-technical transitions, the green economy will be based on the maturation and diffusion of several core enabling technologies and their associated market products and services capable of being supplied into the market. Phillimore (2001) and others view the green economy as revolving primarily around energy and the transition from fossil fuels to renewables. However, in its broader conceptualisation, the green economy extends beyond 'core' industries associated with low and zero carbon energy generation (Elder, 2009). It can be seen to embrace innovations that enable achievement of green goals relevant to other major sectors of the economy and the industries within those sectors (again, see examples in Table 1). A recent UNEP (2011, p. 454) report has suggested that green industries are dominated by service industries and tend to be concentrated in the largest consumer markets. There is, however, an absence of research that attempts to measure how organisations in different sectors are attempting to green their strategies, business plans and operations. In this study we attempt to measure the significance of green business to an industry sector by the proportion of an organisation's incomes that are derived from providing green products or services to meet current needs in the marketplace (Table 14). For built environment organisations in the public sector, over 90% derive either less than 10% or no income from this source. In contrast, 22% of private sector firms are currently securing more than half of their income from green products and services; but there appears to be considerable scope for growth with over half with little or no involvement. Of those organisations deriving some income from green business, the distribution between products and services is in line with the UNEP (2011) finding (see Table 15): 52% of private sector firms receive more than 90% of their income from services (vs 61.5% in the public sector).

**Table 14: Proportion of organisations' income derived from providing green products or services to meet sustainability needs in the market place (%)**

Proportion	Private n=145	Public n=26	Total n=171
100%	11.0	0.0	9.4
50-99%	11.0	3.8	9.9
10-49%	24.1	3.8	21.1
Less than 10%	40.7	42.3	40.9
None	13.1	50.0	18.7
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

**Table 15: Approximate proportion of 'green income' due to green services as opposed to green products (%)**

Proportion	Private n=123	Public n=13	Total n=136
More than 90% services / 10% products	52.0	61.5	52.9
70% services / 30% products	2.4	0.0	2.2
50% services / 50% products	6.5	7.7	6.6
30% services / 70% products	10.6	7.7	10.3
Less than 10% services / 90% products	28.5	23.1	27.9
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

When we cross-classify these two measures of green business activity for private sector firms (Table 16) we find that they are at varying stages of developing lines of business in these areas. The study found that 13% of companies derive *all* their revenue from either green products or services, with a further 13% receiving at least half from this area of business. Green services have a larger share of firm income, but not by a large margin. The challenge is for the 46% of built environment businesses that currently have less than 10% of their sales in green products and services to be actively looking for such opportunities.

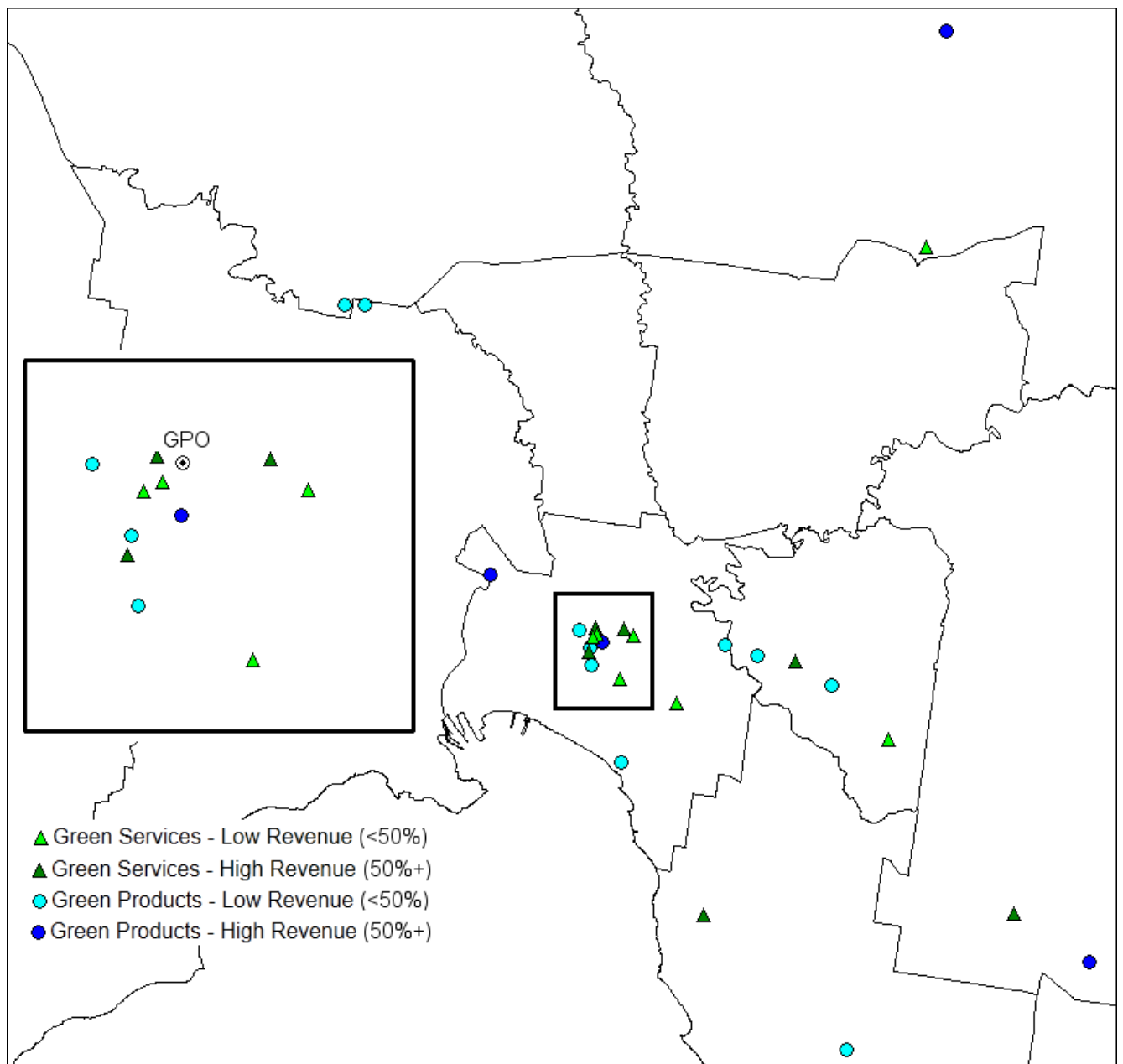
**Table 16: Measuring green business activity in the built environment sector (private sector only)**

Proportion of total income derived from green lines of business	Proportion of firm income from services versus products			
	Mostly products (> 50%)	Roughly 50:50% products and services	Mostly services (> 50%)	Total
100 %	3.3	0.0	9.8	13.0
50-99 %	4.9	3.3	4.9	13.0
10-49%	10.6	0.8	16.3	27.6
< 10%	20.3	2.4	23.6	46.3
None	0.0	0.0	0.0	0.0
Total	39.0	6.5	54.5	100.0

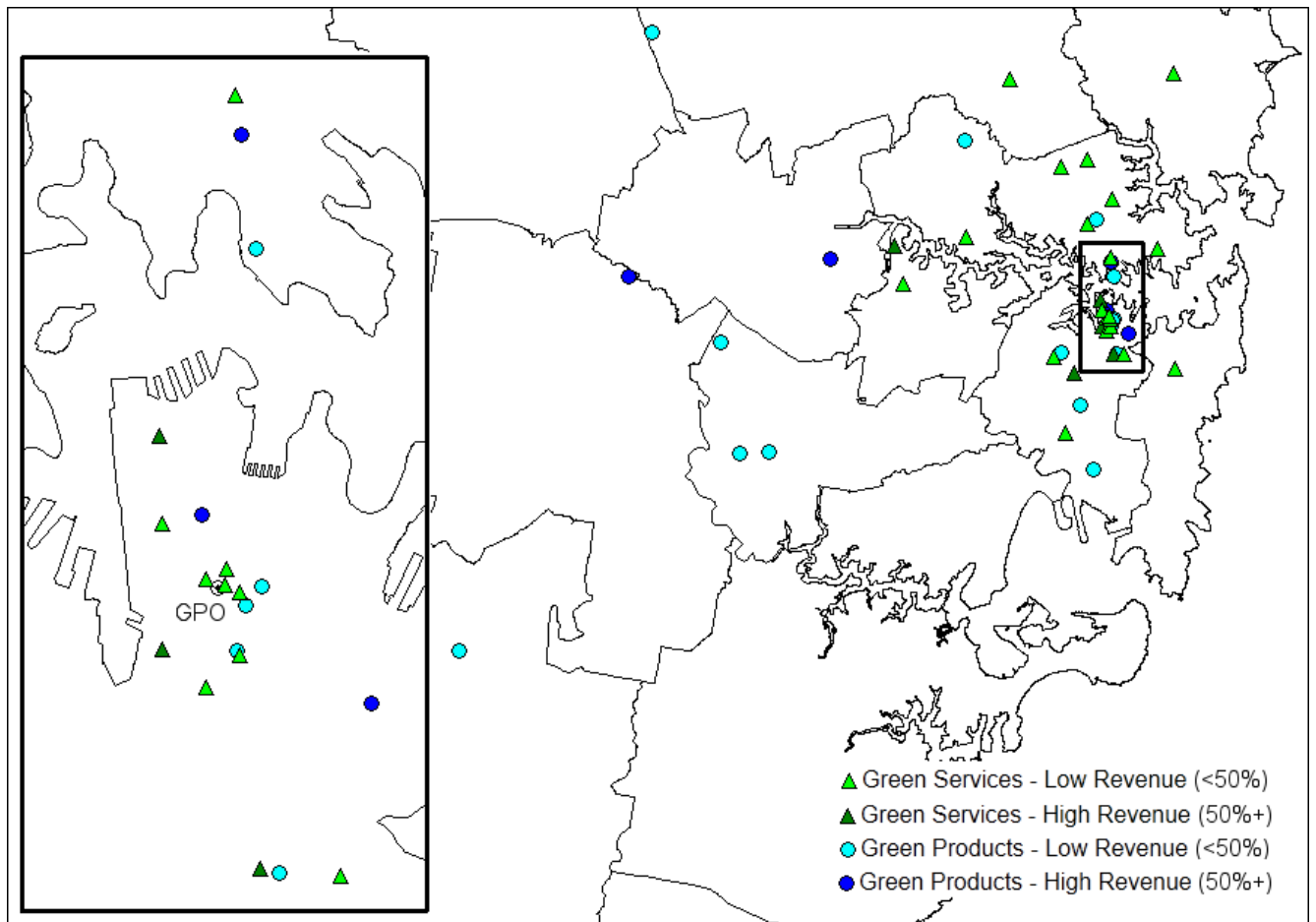
n=123

## The Geography of the Green Economy

Notwithstanding the relatively small sample in a segmentation of Sydney and Melbourne headquartered firms, a mapping of their locations represents an initial search for any pattern in their choice of location. Figures 4 and 5 depict the geography of headquarters of service-oriented versus product-oriented firms, as well as a differentiation of the relative significance of green revenue to their bottom line.



**Figure 4: Headquarters of built environment companies located in Melbourne differentiated by product and service dominance and level of green revenue**



**Figure 5: Headquarters of built environment companies located in Sydney differentiated by product and service dominance and level of green revenue**

Service-oriented firms in the built environment sector are more centrally located than product-oriented. Across all firms, there is a trend towards central city-CBD concentrations as well as locations in the higher income suburbs extending to the southeast in Melbourne and the north-south corridor on either side of the harbour in Sydney. Green products firm's headquarters are also more evident in the western suburbs of Sydney. More data is required to explore this issue more deeply.

### **Locating Green Opportunities by the Private Sector**

When built environment organisations were probed as to where they saw major opportunities (Table 17) for delivering green products or services in the built environment sector, most of the responses did not identify new or cutting edge areas. They were mostly in areas where the level of risk/uncertainty had diminished as a result of a sufficient number of frontrunner applications over the past 10 to 15 years having established the viability and attractiveness of the particular green product or service. There are a clearly defined set of persistent and significant barriers that are a challenge to innovation in this sector (see Table 18) and to the emergence of a green economy and eco-efficient cities.

**Table 17: Major opportunities to be captured in response to sustainability and low carbon challenges**

<b>GENERAL</b>
Providing green services, products, technologies in response to increased awareness and demand – to meet changing customer needs; wherever possible at a cost point that increases market interest (**)
<b>NEW PRODUCTS AND TECHNOLOGIES TO DRIVE BUSINESS OPPORTUNITIES</b>
Alternative (renewable, low carbon) energy sources, distributed generation (***)
Natural/hybrid ventilation systems; adiabatic cooling, solar shading (*)
Low energy lighting
Improved energy metering, monitoring, energy management systems, energy efficiency (EE)
Low VOC products, enhanced IEQ
Recycling of C&D waste/less waste (*)
Paperless operations – requires less storage/floorspace
<b>NEW SERVICES</b>
Sustainability consulting
Resource minimisation consulting
Carbon and/or sustainability rating and profiling of buildings, infrastructures, precincts
Financial packages/options for clean energy/EE
LCI/LCA assessment of products
Climate change planning and design
Centres of expertise aligned to needs of low carbon economy
<b>DESIGN</b>
Design leadership; companies should challenge themselves to find new eco-efficient solutions; have a belief that they <i>can</i> derive green designs at competitive cost; ‘find ways to produce cost effective sustainable dwellings that produce a competitive edge for the company’ (**)
Utilise GBCA products in design (***)
Sustainable precinct design (*)
Design to prescribed as well as increased levels of sustainability
<b>CONSTRUCTION</b>
Energy efficient retrofits (***)
<b>FACILITY MANAGEMENT</b>
Optimal building operating performance
Building with lower life cycle costs
<b>LEADERSHIP</b>
Be seen as a market leader in promoting sustainable built environment technologies (**)
Demonstrate credentials/points of difference with competitors
<b>EDUCATING CLIENTS</b>
Educating clients about longer term benefits of green design, green technology as a means of growing business (**)

Note: (\*) represents similar comment by more than one respondent; (\*\*) by at least three; (\*\*\*) by five or more

**Table 18: What needs to change to create opportunities for business in relation to low carbon living and low carbon green growth**

<b>GOVERNMENT</b>
Clarity, continuity, and commitment of governments (all levels) on direction for low carbon green growth in order for business to adopt sustainability business model
Increase government regulations and audits
Energy/carbon legislative change that is appropriate and effective
Green standards and certification for products and services; life cycle product performance declarations need to be mandatory
Application to life cycle assessment to all aspects of government – drive a whole of life approach
Green procurement
<b>INDUSTRY</b>
Locate and increase pools of investment capital to match company's sustainability goals
Once large corporations change their business models, they represent a major opportunity/driver for smaller consulting companies
Demonstration of connection between sustainable built environment and financial sustainability of organisation
Increasing global demand for new green products and services
Attitudes of company executives
<b>PUBLIC</b>
A cultural shift towards a greener way of life opens up a multitude of opportunities for new products and services
Increased education of consumers regarding carbon footprints of their behaviour/lifestyle

## The Carbon Challenge

The federal government introduced its Clean Energy Strategy in July 2011 (<http://www.cleanenergyfuture.gov.au/>) containing a number of measures to reduce the nation's greenhouse gas emissions, including a carbon tax. At the time of writing this report (September 2013) there has been a change of (federal) government to a conservative Liberal/National coalition that will attempt to repeal the carbon tax and introduce a 'direct action' program in an attempt to mitigate growth in CO2 emissions. The Economist Intelligence Unit (2011) undertook a survey of 130 Australia-based senior executives prior to the introduction of the carbon tax. The present survey was undertaken several months after its introduction, which should have provided organisations with an opportunity to begin to gauge its impact on their operations. The two surveys convey similar percentages in relation to whether organisations overall have a strategy in place for reducing their carbon footprint (see Table 19). More than 30% are still lacking such a strategy, with a higher proportion in the private sector.

**Table 19: Organisation has a strategy in place for reducing its carbon footprint (%)**

	Private n=90	Public n=17	Total n=107	EIU n=131
No	35.8	14.3	32.6	30.0
Yes	64.2	85.7	67.4	70
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Source: EIU (2011) and ARC Survey (20130

Governments currently have a lead role in establishing policies, regulations, pricing and incentives on this topic. Recent announcements by international scientific groups (IPCC) as well as financial institutions (World Bank, 2012) all point to a likely '4° world' by the end of this century unless significant greenhouse gas mitigation occurs (e.g. ~ 80% reductions on 1990 CO2 levels by 2050). There are multiple pathways that have been advanced to decarbonise the built environment (Dixon, 2011) as well as the economy and society more generally. A list of



these (based on EIU, 2011) was incorporated in this survey. The results from private sector respondents are listed in Table 20.

**Table 20: Preferred government action on carbon reduction (%)**

	Yes	No
Provide subsidies for clean technology investments by companies	87.4	12.6
Establish incentives for corporate behaviour that leads to low carbon business operations	87.4	12.6
Provision of information on sustainable practices for companies	87.4	12.6
Introduce a performance standard/label for all energy generation technologies	85.7	14.3
Provision of education on green practices for consumers	85.7	14.3
Establishment of national carbon emission reduction goals	84.0	16.0
Subsidies for clean technology usage by consumers	82.4	17.6
Establishment of environmental reporting standards for business	72.3	27.7
Link to an international carbon pricing scheme	67.2	32.8
Introduce carbon labelling for all manufactured products	62.2	37.8
Carbon cap and trade scheme	55.5	44.5
Current federal government carbon pricing scheme	52.1	47.9
Establishment of penalties for lack of carbon efficiency compliance by companies	50.4	49.6
Corporate tax on carbon footprint of business operations	43.7	56.3
Consumer/sales tax on carbon footprint of goods/services consumed	39.5	60.5
Establishment of penalties for lack of carbon efficiency compliance by consumers	34.5	65.5
None of the above government can help most by doing nothing and letting the market come up with solutions	9.2	90.8

n=119

Government was clearly endorsed as having a role to play (over 90% of industry respondents in favour), but from this point on the directions for intervention varied. The highest proportions of 'no' votes by companies were reserved for any imposition of carbon taxes on goods and services consumed as well as consumer-centred compliance, suggesting that more decisive action was required higher up the supply chain. Here, corporate taxes or company carbon compliance charges were among the least favoured actions for governments to take. Incentives and subsidies were clearly favoured over taxes for both consumers and producers. There was strong support for introduction of a performance label for all energy generation technologies as well as incentives for the introduction of clean technologies, both targeting the front end of the energy supply chain – and indicative of 'direct action'. National carbon emission reduction goals were endorsed by 84% of business, part of the search for certainty on the part of business and a clear signal to government that more consistency is required.

## Conclusions

The emergent new low carbon green economy is shaping as the next competitive advantage for industry. This survey has demonstrated that in the built environment area, Australian business and government are gearing up for this challenge. There are signs that Australian business is highly aware of the issues and has structured itself to prepare, perhaps even more so than their international counterparts, based on the results of global surveys (Haanaes et al., 2011; MIT Sloan Management Review Research Report, 2012). But the transition is not yet as market-oriented as it could be so many businesses are still waiting to see if consumers will pay a premium for going green; meanwhile, they are doing normal business. Government agencies appear to be less aware than business but are demonstrating green economy approaches and outcomes at a high level of commitment.

## References

- Barbier, E. B. and Markandy, A. (2012) *A New Blueprint for a Green Economy*, Earthscan, London
- Brotchie, J., Hall, P. and Newton, P. (1987) 'The transition to an information society' in Brotchie, J., Hall, P. and Newton, P. (eds) *The Spatial Impact of Technological Change*, Croom Helm, London
- Brown, L. R. (2001) *Eco-Economy: Building an Economy for the Earth*, Norton, New York
- Dixon, T. (2011) *Hotting Up? An Analysis of Low Carbon Plans and Strategies for UK Cities*, RICS, London
- Economist Intelligence Unit (2011) *Cleaning Up: Australia's Readiness for a Low Carbon Future*, London
- Elder, J. (2009) 'Preparing Americans for a green economy', *Sustainability*, 2 (4), pp. 240-2
- Engineers Australia (2010) *Infrastructure Report Card*, Engineers Australia, Canberra
- GIZ and ICLEI (2012) *Green Urban Economy: Conceptual Basis and Courses for Action*
- Grey, F. (2008) 'Sustainable corporations' in Newton, P. (ed.) *Transitions: Pathways Towards Sustainable Urban Development in Australia*, Springer, Dordrecht
- Haanaes, K. et al. (2011) 'New sustainability study', *MIT Sloan Management Review*, 52 (3), pp. 23-35
- Hargroves, K. and Smith, M. H. (2006) *The Natural Advantage of Nations*, Earthscan, London
- Hatfield-Dodds, S., Turner, G. and Schandl, H. (2008) *Growing the Green Collar Economy: Report to the Dusseldorp Skills Forum*, CSIRO, Canberra
- Jackson, T. (2009) *Prosperity Without Growth: Economics for a Finite Planet*, Earthscan, London
- Kruschwitz N. and Haanaes, K. (2011) 'First look: Highlights from the Third Annual Sustainability Global Executive Survey', *MIT Sloan Management Review*, 53 (1), pp. 86-9
- Milani, B. (2000) *Designing the Green Economy*, Rowman & Littlefield, Lanham, Mass.
- MIT Sloan Management Review Research Report (2012) *Sustainability Nears a Tipping Point: Findings from the 2011 MIT and Boston Consulting Group Sustainability and Innovation Global Executive Study*, Boston
- Moretti, E. (2012) *The New Geography of Jobs*, Houghton Mifflin Harcourt, New York
- Newman, P., Beatley, T. and Boyer, H. (2009) *Resilient Cities: Responding to Climate Change and Peak Oil*, Island Press, Washington, DC
- Newman, P. and Jennings, I. (2008) *Cities as Sustainable Ecosystems*, Island Press, Washington, DC
- Newman, P. and Kenworthy, J. (1999) *Sustainability and Cities*, Island Press, Washington, DC
- Newman, P. and Matan, A. (2013) *Green Urbanism in Asia*, World Scientific Publications, Singapore
- Newton, P. (ed.) (2008) *Transitions: Pathways Towards Sustainable Urban Development in Australia*, Springer, Dordrecht
- Newton, P. (2012) 'Liveable and sustainable? Socio-technical challenges for 21st century cities', *Journal of Urban Technology*, 19 (1), pp. 82-101
- Newton, P. (2013) 'City transitions: Infrastructure innovation, green economy and the eco-city' in Pearson, L., Newton, P. and Roberts, P. (eds) *Resilient Sustainable Cities: A Future*, Routledge, London
- Newton, P. and Doherty, P. (2013) 'The challenge to urban sustainability and resilience: What cities need to prepare for' in Pearson, L., Newton, P. and Roberts, P. (eds) *Resilient Sustainable Cities: A Future*, Routledge, London
- Newton, P. and Newman, P. (2013) 'The geography of solar photovoltaics (PV) and a new low carbon urban transition theory', *Sustainability*, 5 (6), pp. 2537-56
- Nugent, M and Hughes, P. (2008) 'Government and sustainability reporting' in Newton, P. (ed.) *Transitions: Pathways Towards Sustainable Urban Development in Australia*, Springer, Dordrecht
- Pearson, L., Newton, P. and Roberts, P. (eds) (2013) *Resilient Sustainable Cities: A Future*, Routledge, London
- Phillimore, J. (2001) 'Schumpeter, Schumacher and the greening of technology', *Technology Analysis & Strategic Management*, 13 (1), pp. 23-37
- UN DESA (2012) *World Urbanization Prospects: The 2011 Revision*, Department of Economic and Social Affairs, United Nations, New York
- UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, United Nations Environment Programme, Paris, <http://www.unep.org/greeneconomy/greeneconomyreport/tabid/29846/default.aspx>
- Victor, P. A. (2008) *Managing Without Growth: Slower by Design, Not Disaster*, Edward Elgar, Cheltenham, UK
- World Bank (2012) *Turn Down the Heat: Why a 4°C Warmer World Must Be Avoided*, Washington, DC

## Appendix 1

# Low Carbon Economy Survey

### Background and Ethics

In collaboration with the Green Building Council of Australia and funded by the Australian Research Council, Swinburne University of Technology and Curtin University are conducting a study into current Australian business strategies for future low carbon green growth. We have developed a questionnaire in collaboration with the OECD and MIT as part of this research. To begin the survey, please click the 'Start' button below.

If you would like more information about the study (including the ethics or confidentiality details) please read the plain language statement. You can access the statement by clicking on the link below. Your participation is greatly appreciated.

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### Plain language statement: background, privacy, and ethics

#### About the study

*What Direction is Industry Headed? Survey of Australian Built Environment Industries' Low Carbon Growth Strategies*

Funded by the Australian Research Council and as part of a research collaboration between Swinburne University of Technology (Professor Peter Newton), Curtin University (Professor Peter Newman) and the Green Building Council of Australia, this survey has been designed to assess executives' thinking about their company's sustainability and management practices in the context of strategies for future low carbon growth of their business.

To what extent are different business models emerging? How are different industry sectors in Australia responding? In what respects are the strategies and attitudes of Australian business similar to or different from their overseas counterparts? What role does government need to play?

In the past 12 months, a number of influential reports have emerged in relation to low carbon futures, green growth, and green economy (OECD, 2011 *Fostering Innovation for Green Growth*; UNEP, 2011 *Towards a Green Economy*; UNESCAP, 2012 *Low Carbon Green Growth Roadmap for Asia and the Pacific*; APEC, 2012 *The Green Initiative: Second Cycle of Daegu Initiative*) – as well as the Rio+20 United Nations Conference on Sustainable Development held in June 2012.

In the past 12 months, the Australian government has also launched its Clean Energy Future policy ([www.cleanenergyfuture.gov.au](http://www.cleanenergyfuture.gov.au)) linked to carbon mitigation. With a focus on the 500 largest polluters, it contains no roadmap encouraging sustainable growth across individual sectors of industry. This survey is part of a global cluster of surveys which seek to understand how private companies in different sectors are responding to a range of sustainability issues facing their businesses – financial, regulatory, material availability/price, climate change adaptation, skills availability, global competition etc. It is being replicated in several other sectors of Australian industry and is undertaken in parallel with similar surveys by MIT Sloan School of Management, Economist Intelligence Unit in the OECD. Results from the survey

will locate where Australian business is positioned in relation to its national and international counterparts in this era of transition/transformation.

**Key definitions:**

*Sustainability* examines whether or not a company's current economic activities – its operations, product and service lines – can be continued indefinitely into the future from the perspective of its resource use, environmental and social impact – both locally and globally.

A *Low Carbon environment* is one where the energy requirements for business operations can be met from sources that by 2050 generate at least 80% less CO<sub>2</sub> emissions than in 2000 (The Garnaut Climate Change Review 2008).

*Green Growth* is a strategy for achieving economic growth with new products, processes or services that deliver more environmentally sustainable developments and population well-being.

A *Green Economy* is one which is capable of delivering products and services that enables sustainable development that is equitable locally and globally and is within the planetary limits of earth's ecosystem (atmosphere, oceans and land-based material resources); and where green accounting (TBL) provides the measure of national progress.

**Privacy policy:**

We recognise that it's imperative that participants' data is secure, and that all responses are treated in the strictest confidence. We are committed to ensuring that neither the names of individuals nor their organisation will be revealed at any stage during the survey process or in the ensuing report, and that data submitted will be used for no other purpose than for the data analysis of the report at an aggregated level. Any contact details collected will be used solely for reporting the full results of the survey to participants. Nor will the data ever be passed on or sold to third parties.

Your participation is voluntary and you may refuse to participate, or may discontinue it at any time. If you have a question about your participation in this study, you can contact: Professor Peter Newton (E: [pnewton@swin.edu.au](mailto:pnewton@swin.edu.au); T: (03) 9214-4769).

**Research ethics:**

This project has been approved by Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any complaints about any aspect of the project, the way it is being conducted, or questions about your rights as a research participant, then you may contact:

Research Ethics Officer, Swinburne Research (H68),  
Swinburne University of Technology, PO Box 218,  
HAWTHORN VIC 3122  
Tel (03) 9214 5218 or email: [resethics@swin.edu.au](mailto:resethics@swin.edu.au)

## Section 1: About Your Organisation

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1. What is the name of your organisation (company)?

\_\_\_\_\_

2. List the principal business activities of your organisation:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

3. What is your current job title?

\_\_\_\_\_

4. Describe the geographical extent of your organisation's operations (please check response that best applies):

- ☐ Australia – Single State
- ☐ Australia – Multiple States
- ☐ Australia – All States
- ☐ Australia + Asia/Pacific
- ☐ Australia + Global

5. Where are the headquarters of your operations in Australia?

Suburb/Town: \_\_\_\_\_ Postcode: \_\_\_\_\_

State: \_\_\_\_\_

6. What is the size of your organisation's total workforce?

- |   |   |
|---|---|
| <input type="checkbox"/> < 20 employees     | <input type="checkbox"/> 200 – 999 employees      |
| <input type="checkbox"/> 20 – 49 employees  | <input type="checkbox"/> 1,000 – 10,000 employees |
| <input type="checkbox"/> 50 – 199 employees | <input type="checkbox"/> > 10,000 employees       |

## Section 1 (continued): About Your Organisation

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7. What proportion of your organisation's income is derived from providing "green" products or services to meet sustainability needs in the market place?

- ☐ None
- ☐ Less than 10%
- ☐ 10 – 49%
- ☐ 50 – 99%
- ☐ 100%

If you answered 'None' in Question 7, please go to Question 9.

8. Approximately, what proportion of that "green income" is due to green **services** as opposed to green products?

- ☐ ≤ 10% services / 90% products
- ☐ 30% services / 70% products
- ☐ 50% services / 50% products
- ☐ 70% services / 30% products
- ☐ ≥ 90% services / 10% products

## Section 2: Company's Operating Context/Environment: Challenges

9. On a scale of 1 to 5, rate the following **challenges** to your company in the **next five years**:

1 = Low level challenge

3 = Moderate challenge

5 = Major challenge

		Low level challenge		Moderate Challenge		Major Challenge		Not Applicable	
Technological									
1.	Acquiring and/or adapting new low carbon technology	1	2	3	4	5	N/A		
2.	Limited Australian R&D capacity	1	2	3	4	5	N/A		
3.	Identifying emerging new technology and assessing relevance to business	1	2	3	4	5	N/A		
Market related									
4.	Responding to changing market conditions	1	2	3	4	5	N/A		
5.	Increasing competition in Australian markets	1	2	3	4	5	N/A		
6.	Increasing competition in global market	1	2	3	4	5	N/A		

## Section 2: Company's Operating Context/Environment: Challenges (continued)

		Low level challenge	Moderate Challenge	Major Challenge	Not Applicable
Market related (continued)					

<b>7. International trade barriers to export of products and services</b>	1	2	3	4	5	N/A
<b>8. Whether customers are willing to pay a premium for green products, services</b>	1	2	3	4	5	N/A
<b>9. Competitors increasing commitment to sustainability, green products/services faster than expected</b>	1	2	3	4	5	N/A
<b>Government related</b>						
<b>10. Addressing impact of government regulations, standards etc/ maintaining “licence to operate” on our business</b>	1	2	3	4	5	N/A
<b>11. Lack of certainty regarding government policies/legislation</b>	1	2	3	4	5	N/A
<b>Financial</b>						
<b>12. Taxation policy (eg carbon tax, corporate tax etc)</b>	1	2	3	4	5	N/A
<b>13. Global financial uncertainties</b>	1	2	3	4	5	N/A
<b>14. Cost of capital, borrowing</b>	1	2	3	4	5	N/A
<b>15. Access to capital</b>	1	2	3	4	5	N/A
<b>16. Growing revenue</b>	1	2	3	4	5	N/A
<b>Staff related</b>						
<b>17. Acquiring necessary skills/competing for new talent</b>	1	2	3	4	5	N/A
<b>18. Shortage of skilled labour</b>	1	2	3	4	5	N/A
<b>19. Attracting talented people</b>	1	2	3	4	5	N/A
<b>20. Retaining and motivating existing employees</b>	1	2	3	4	5	N/A
<b>Business operations</b>						
<b>21. Reducing costs and increasing efficiencies</b>	1	2	3	4	5	N/A
<b>22. Innovating to achieve competitive differentiation</b>	1	2	3	4	5	N/A
<b>23. Responding effectively to threats and opportunities of sustainability</b>	1	2	3	4	5	N/A
<b>24. Increasing operating speed and adaptability</b>	1	2	3	4	5	N/A
<b>25. Responding effectively to disruption of our business model</b>	1	2	3	4	5	N/A
<b>26. Stricter requirements from partners along the value chain</b>	1	2	3	4	5	N/A
<b>Externalities</b>						

<b>27. Climate change adaptation (increasing temperature, sea level, rainfall, variability etc) challenges for your company</b>	1	2	3	4	5	N/A
<b>28. Shortage (high cost) of material inputs to company operations</b>	1	2	3	4	5	N/A

## Section 2: Company's Operating Context/Environment: Opportunities

**10.** What are the major opportunities you believe your company can capture in the next five years in response to sustainability and low carbon challenges?

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## Section 3: Creating Sustainable Organisations: Strategy and Progress

**11.** What is the status of **sustainability** and **low carbon** on the agenda of your organisation's top management?

- ☐ Already a permanent fixture and core strategic consideration
- ☐ On the agenda permanently, but not core
- ☐ Temporarily on the agenda, but not core
- ☐ Excluded from the agenda, because viewed as a passing fad
- ☐ Never considered for the agenda

**12.** Has your organisation's business model changed as a result of issues surrounding sustainability and low carbon?

- ☐ Yes
- ☐ No
- ☐ I do not know

**If you answered 'No' or 'I do not know' in Question 12, please go to Question 14.**

**13.** In what ways has your organisation's business model changed as a result of issues surrounding sustainability and low carbon?

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### Section 3: Creating Sustainable Organisations: Strategy and Progress (continued)

**14.** On a scale of 1 to 5, rate the degree of difficulty associated with each as an obstacle in evaluating the business case for sustainability related strategies.

*1= Not at all difficult*

*3= Moderately difficult*

*5= Very difficult*

	Not at all difficult		Moderately difficult		Very difficult
<b>1. Quantifying sustainability-related risks</b>	1	2	3	4	5
<b>2. Capturing comprehensive metrics about sustainability impact of operations</b>	1	2	3	4	5
<b>3. Evaluating competing priorities</b>	1	2	3	4	5
<b>4. Predicting customer response to sustainability strategies</b>	1	2	3	4	5
<b>5. Establishing financial incentives for considering sustainability</b>	1	2	3	4	5
<b>6. Opposition from executives or influential individuals</b>	1	2	3	4	5
<b>7. Quantifying intangible effects of sustainability strategies (e.g. brand reputation, employee hiring, retention and productivity)</b>	1	2	3	4	5
<b>8. Lack of model/framework for incorporating sustainability in business cases</b>	1	2	3	4	5
<b>9. Uncertainty about future carbon pricing</b>	1	2	3	4	5

**15.** Which of the following three statements are you most in agreement with?

- ☐ Sustainability is being embedded within all aspects of my organisation's operations
- ☐ My organisation addresses sustainability as a separate, delineated activity
- ☐ Sustainability has not been addressed in my organisation

Continued next page

### Section 3: Creating Sustainable Organisations: Strategy and Progress (continued)

16. Does your organisation have any of the following?

	Yes	No	Don't Know / Unsure
1. A formal sustainability policy/strategy	1	2	3
2. A senior sustainability manager role	1	2	3
3. Sustainability Board or committee	1	2	3
4. Key sustainability performance indicators (such as feature in the Annual Report or its equivalent)	1	2	3
5. A sustainability-oriented procurement strategy	1	2	3
6. Routine measurement of the following within the company:			
• Energy used	1	2	3
• CO <sub>2</sub> generated	1	2	3
• Water used	1	2	3
• Other emissions to air (eg SO <sub>x</sub> , NO <sub>x</sub> etc)	1	2	3
• Liquid waste	1	2	3
• Solid waste	1	2	3

### Section 4: Energy and Carbon Issues

17. What level of impact do you expect the federal government's carbon pricing will have on your business?

1= Significant negative impact

2= Somewhat negative impact

3= Neutral - No impact

4= Somewhat positive impact

5= Significant positive impact

	Significant negative impact	Somewhat negative impact	Neutral - No impact	Somewhat Positive impact	Significant positive impact
<b>1. Impact so far</b>	1	2	3	4	5
<b>2. Impact within the next 5 years</b>	1	2	3	4	5

#### Section 4: Energy and Carbon Issues (continued)

**18.** Which of the following options would your organisation like to see government pursue to encourage the reduction of carbon emissions:

	Yes	No
<b>1. Current federal government carbon pricing scheme</b>	1	2
<b>2. Link to an international carbon pricing scheme</b>	1	2
<b>3. Introduce carbon labelling for all manufactured products</b>	1	2
<b>4. Carbon cap and trade scheme</b>	1	2
<b>5. Corporate tax on carbon footprint of business operations</b>	1	2
<b>6. Consumer/sales tax on carbon footprint of goods/services consumed</b>	1	2
<b>7. Introduce a performance standard/label for all energy generation technologies</b>	1	2
<b>8. Provide subsidies for clean technology investments by companies</b>	1	2
<b>9. Establish incentives for corporate behaviour that leads to low carbon business operations</b>	1	2
<b>10. Establishment of national carbon emission reduction goals</b>	1	2
<b>11. Subsidies for clean technology usage by consumers</b>	1	2
<b>12. Establishment of environmental reporting standards for business</b>	1	2
<b>13. Provision of education on green practices for consumers</b>	1	2
<b>14. Establishment of penalties for lack of carbon efficiency compliance by companies</b>	1	2
<b>15. Provision of information on sustainable practices for companies</b>	1	2
<b>16. Establishment of penalties for lack of carbon efficiency compliance by consumers</b>	1	2

**17. None of the above: government can help most by doing nothing and letting the market come up with solutions**

1

2

**19.** Does your organisation have a strategy in place for reducing its carbon footprint?

☐ No

☐ Yes

#### **Section 4: Energy and Carbon Issues (continued)**

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**If you answered 'Yes' to Question 19, please go to Question 21.**

**20.** What are the main barriers to your organisation putting a strategy in place to reduce its carbon footprint?

☐ There are no barriers to making further progress

Barrier 1:

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Barrier 2:

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Barrier 3:

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Barrier 4:

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Barrier 5:

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Barrier 6:

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Barrier 7:

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Barrier 8:

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Please specify any further barriers:

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**21.** If you would like to receive a copy of the report when it is completed please provide your contact details below.

Name: \_\_\_\_\_

Email: \_\_\_\_\_

**Thank you for taking the time to complete this survey**

## Appendix 2: Green Economy Bibliography

- APEC SME Innovation Center (2012) *The Green Initiative: Second Cycle of Daegu Initiative*, Seoul
- Australian Bureau of Statistics (2012) 'Green growth', ch. 7, *Environmental Accounting in Practice*, Cat. no. 4628.0.55.001, Canberra
- Crifo, P., Flam, M. and Glachant, M. (2011) *French Industry in the Face of the Green Economy: The Example of Seven Pathways*, Report of the Industry Circle, Paris
- Department for Environment, Food & Rural Affairs (2011) *Green Economy, Green Business*, London
- GIZ and ICLEI (2012) *Green Urban Economy: Conceptual Basis and Courses for Action*
- Global Green Growth Initiative (2012) *Moving Towards a Common Approach on Green Growth Indicators*, Seoul
- Government of the Republic of Korea (2013) *National Strategy for Low Carbon Green Growth*, Seoul
- HM Government (2012) *Enabling the Transition to a Green Economy: Government and Business Working Together*, London
- House of Commons (2012) *A Green Economy*, London
- OECD (2011) *Fostering Innovation for Green Growth*, OECD Publishing, Paris
- OECD (2011) *Towards Green Growth*, OECD Publishing, Paris
- UN DESA (2012) *A Guidebook to the Green Economy*, NY
- UN DESA, UNEP and UNCTAD (2012) *The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective*, NY
- UNEP (2010) *Green Economy Initiative: Linkages to Sustainable Consumption and Production*, Paris
- UNEP (2011) *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication* ([www.unep.org/greeneconomy](http://www.unep.org/greeneconomy)), Geneva
- UN ESCAP (2012) *Developing a Framework for a Green Economy*, Bangkok
- UN ESCAP and KOICA (2012) *Low Carbon Green Growth Roadmap for Asia and the Pacific*, Seoul