COMMERCIAL PROPERTY AND CLIMATE CHANGE – Exposures and Opportunities

EXISTING BUILDINGS PROJECT

Industry Partnership Program

Revised Edition

Total Environment Centre Inc

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Climate change is emerging as a key challenge for commercial property. As climate change gathers momentum, the responses of government, the market, and the elements will all converge to reshape the operating environment of building owners. As a result of climate change, building owners are simultaneously exposed to demand risk, compliance risk, regulatory risk, inflated cost structures, extreme weather events, reputational risk, and broader market risks.

Fortunately, the means by which commercial property trusts can manage these risks not only offer above market rates of return but are also eligible for third party subsidisation. The neutralisation of carbon liabilities currently embedded within the commercial property sector boasts the rare quality of simultaneously allowing trusts to realise the value that has long lied dormant within property assets.

Recent years have witnessed the rise of both public and private sector concern around the emissions profile of office buildings. Emissions from the non-residential building sector, of which office buildings are the largest contributor, are predicted to double from 1990 levels by 2010. This growth is not only inconsistent with the deep cuts required for Australia to play its part in avoiding dangerous climate change but is also inconsistent with the modest targets established by the first stage of the Kyoto Protocol.

Concern around the emissions profile of office buildings has manifested in demand, compliance, and regulatory risk for the sector. In Australia, both Commonwealth and State governments have put in place minimum greenhouse performance ratings for government tenancies and elements of the private sector seeking to limit their own emissions are increasingly following suit. The provision of energy efficient office buildings currently offers building owners a competitive advantage. Over the short to medium term it will simply become a defensive strategy.

Commercial property owners also face significant regulatory risk. On February 9, 2007, Australia's State Premiers collectively expressed the possibility of mandating energy efficiency upgrades with payback periods of up to 3 years. Some state governments have already given effect to such threats. Through the Energy and Resource Efficiency Plan (EREP) Program the Victorian government now requires organisations that are captured by program thresholds to identify and act upon available energy efficiency opportunities.

On December 10, 2007 the NSW Government announced that the States top 200 energy users would be required to implement cost effective energy savings measures. This comes on top of the Commonwealth Government's Energy Efficiency Opportunities (EEO) program which requires captured organisations to publicly report on energy efficiency opportunities. As governments come under increasing pressure to reduce greenhouse gas emissions it is likely that energy efficiency requirements will be further tightened.

Broader policy responses to climate change and its environmental implications also stand to inflate the operating cost structure of building owners. Of most immediate concern is the exposure of trusts to increases in electricity prices. The Commonwealth Government has committed to the implementation of an Emissions Trading Scheme (ETS) by 2010 and as power generators are forced to pay for the greenhouse gases that they produce, electricity prices will rise.

EXECUTIVE SUMMARY

Emissions trading will not be the only climate related driver of electricity prices. As climate change gathers momentum, and the frequency of heat waves grow, greater investment in peak generation capacity will be required. This will inevitably inflate the capital intensity of Australia's energy system and thereby increase the ultimate cost borne by end users. This cost will be in addition to the cost increases already being driven by climate related water shortages.

The cost implications of climate change are not only limited to energy prices. As predictions of decreased rainfall over Australia's population centres and increases in the frequency and severity of extreme weather events continue to manifest, both water and insurance costs will rise. More broadly, upward pressure on such basic inputs to production as energy, water, and insurance threatens to increase the price of all other goods and services demanded by building owners. As government, the market, and the elements all respond to climate change, costs will rise, and the profit margins of building owners will be imposed upon.

In addition to the significant reputational risk that inaction on greenhouse gas emissions presents for commercial property owners, it is important to also recognise the exposure of the sector to the broader market impacts of unabated climate change. The climatic sensitivity of the Australian economy is not only derived from the prominence of agriculture and tourism but also from the fact that the fortunes of the Australian economy are increasingly tied to that of the global economy. In this regard it is worth noting the warnings of the Stern Review that unabated climate change could yield downturns in the order of the Great Depression and the Great Wars. Industrial disruptions of any magnitude will undoubtedly have direct implications for the demand for office space, vacancy rates, and the subsequent profitability of building owners.

The financial materiality of climate change has laid the groundwork for the growth of investor pressure witnessed in recent years. Internationally the Investors Group on Climate Change (IGCC) administers the Carbon Disclosure Project (CDP) on behalf of 385 institutional investors that collectively account for over US$ 57 trillion in assets under management. This pressure has been built upon by the Institutional Investors Group on Climate Change (IIGCC), the US based Investor Network on Climate Risk (INCR) and, more locally, by the recent review into the ASX Corporate Governance Principles. Following ASX guidance that listed companies are required to disclose whether they have policies in place to manage material business risk, it is clear that there will be greater investor scrutiny of the measures that Australian companies are taking to manage their climate change-related exposures.

Fortunately, whilst the commercial property sector is one of the sectors most clearly exposed to climate change it is also one of the sectors that is best placed to manage these risks. The upgrading of existing building stock boasts the rare quality of offering above market rates of return whilst also qualifying for third party subsidisation; thus ensuring that the management of an embedded liability simultaneously allows trusts to realise the embedded value that has long lied dormant within commercial property assets.

Whilst recent years have witnessed the rise of 'green' building the focus of industry has so far been upon the development of new buildings. Where needed, new 'green buildings' will help to mitigate the predicted growth in emissions from the sector but the fact that up to 98% of existing floor space is accounted for by inefficient property stock means that any real attempt to reduce emissions from commercial property will require the upgrading of existing buildings.

Furthermore, the embodied emissions of new 'green' buildings means that replacing Australia's inefficient building stock with new 'green' buildings would be, in emissions terms, a backward step. By one estimate, the emissions benefit of replacing an existing building capable of upgrade with a new 'green' building designed to achieve a 5 Star NABERS Energy Rating (previously known as the Australian Building Greenhouse Rating) would not be realised for almost 300 years.

Total Environment Centre (TEC) recognises that the most climate friendly buildings are not new buildings designed for maximum energy efficiency but existing buildings that have been upgraded to achieve substantial cuts in greenhouse gas emissions. The embodied emissions of existing buildings are a sunk cost that needs to be capitalised upon in order to optimise the contribution that commercial property can make to emissions reduction efforts.

EXECUTIVE SUMMARY

Total Environment Centre's Existing Buildings Project seeks to:

- Communicate the exposure of commercial property to climate change
- Communicate energy efficiency options available to building owners
- Suggest profitable and innovative ways to finance such upgrades
- Communicate low emissions energy options, and
- Celebrate industry leaders seeking to achieve cross-portfolio emissions reductions

The project will provide an independent framework that will allow third parties to differentiate between genuine attempts by property trusts seeking to promote the sustainability of their portfolios from those trusts seeking to 'greenwash' their operations by making only superficial improvements.

TEC welcomes the opportunity to collaborate with industry on this project and invites building owners to choose one of three project tiers. The first two tiers entail public commitments to portfolio NABERS Energy Rating targets. The third tier will allow participating trusts to defer making a public commitment to either target for a period of 1 year whilst participating in a series of workshops made available to project participants.

TEC Existing Buildings Project Tiers

	Base Building		**Tenancy**
Time Period	**Short Term**	**Long term**	
		January 2012	January 2008
First Tier	Discretionary	4.5 Portfolio NABERS Energy Rating or better	Begin actively engaging tenants
Second Tier	Discretionary	4.0 Portfolio NABERS Energy Rating or better	Begin actively engaging tenants
Third Tier	Active consideration over 12 months. Participation in workshop series	Active consideration over 12 months. Participation in workshop series	Active consideration over 12 months. Participation in workshop series

01 THE CONTRIBUTION OF COMMERCIAL PROPERTY TO AUSTRALIAN GREENHOUSE GAS EMISSIONS

01

Emissions from the non-residential building sector[1], of which office buildings are the largest contributor[2], are predicted to double from 1990 levels by 2010[3]. This predicted growth in emissions needs to be set aside the fact that in order to play its part in averting dangerous climate change, Australia must reduce its emissions by at least 40% by 2020 on 1990 levels and effectively decarbonise by 2050[4]. In promoting movement on such reductions the Rudd Labour Government has ratified the Kyoto Protocol. However, the predicted growth in emissions from the commercial property sector[5] is not only inconsistent with the deep cuts required in future years but is also inconsistent with Australia's modest targets under the first stage of the Kyoto Protocol. This fact alone presents a myriad of risks for building owners.

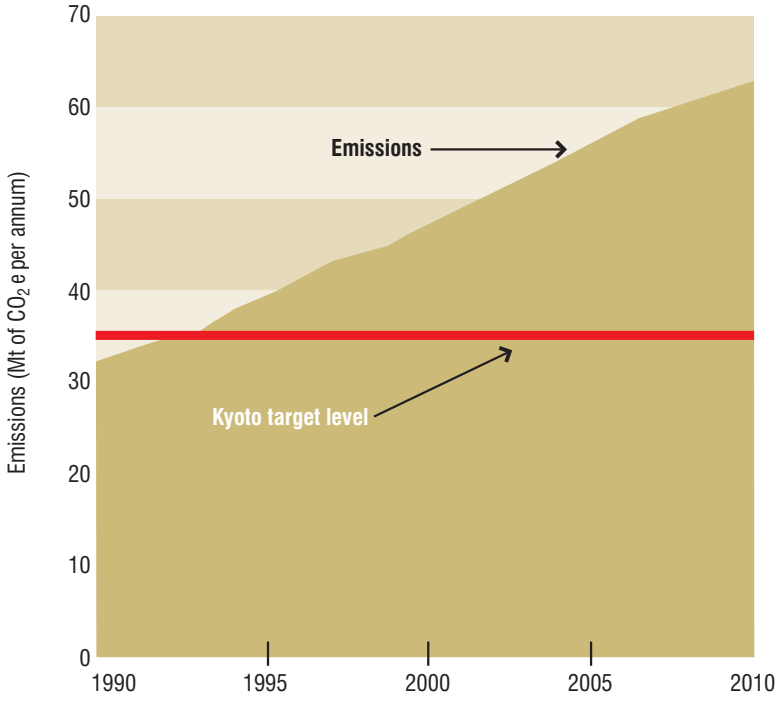

Figure1: Emissions attributable to non-residential buildings 1990-2010
SOURCE: (Australian Greenhouse Office, 1999, p.4)

[1] Building Classes 5-9 in the Building Code of Australia
[2] AGO, 1999, p.6
[3] Ibid, p.4
[4] IPCC 2007

02 COMMERCIAL PROPERTY EXPOSURES TO CLIMATE CHANGE

02

The inconsistency between the predicted growth in emissions, current and future emissions reductions targets, and climate policy more generally, presents a myriad of risks for the commercial property sector.

2.1 Demand risk

The growth in demand for energy efficient office buildings has been fuelled by both public sector procurement policies and voluntary actions of companies seeking to reduce their own carbon footprint. The growth of green office procurement by the public sector in particular presents significant demand risk for building owners that fail to upgrade the greenhouse performance of their buildings. The following table shows the base building and tenancy NABERS Energy Rating requirements for government tenants in Australian jurisdictions.

The demand for energy efficient office buildings is also being fuelled by elements of the private sector seeking to reduce their own carbon footprint. The number of companies seeking to achieve emissions reductions will only grow as organisations are required to disclose their greenhouse gas emissions under the National Greenhouse and Energy Reporting (NGER) Act. Under the legislation organisations emitting more than 50,000 tonnes of CO_2e a year or 25,000 tonnes of CO_2e from a single site will be required to publicly disclose their greenhouse gas emissions profile.

2.2 Compliance Risk

Commercial property groups face several forms of compliance risk as a result of the ongoing rollout of climate policy throughout Australian jurisdictions. Climate policy that is likely to create compliance risk for building owners include:

a) Commonwealth- National Greenhouse and Energy Reporting (NGER) Act

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) establishes a national framework for Australian corporations to report greenhouse gas emissions, reductions, removals and offsets, and energy consumption and production.

From 1 July 2008, corporations will be required to register and report if:

- they control facilities that emit 25 kilotonnes or more of greenhouse gas (CO_2 equivalent), or produce/consume 100 terajoules or more of energy;

Jurisdiction	Base Building	Tenancy
Commonwealth	4.5	4.5
NSW	≥ 3.5	4
Victoria	4.5	5
South Australia	Disclosure + preference given to 5	Disclosure + preference given to 5
Western Australia	4.5	4

Figure 2: Australian Government Tenant NABERS Energy rating requirements

or

- their corporate group emits 125 kilotonnes or more greenhouse gas (CO_2 equivalent), or produces/consumes 0.5 Petajoules or more of energy.

Lower reporting thresholds will be progressively phased in by 2010-11 with the final threshold settling at 50,000 tonnes of CO_2 equivalent. It is likely that many property groups will be ultimately captured by NGER thresholds and will be required to report under the legislation.

b) Commonwealth- Energy Efficiency Opportunities (EEO)

The Energy Efficiency Opportunities (EEO) program is an initiative of the Commonwealth government that requires large energy users (organisations that use more than 0.5 petajoules per annum) to identify, evaluate, and publicly report on energy efficiency opportunities that carry payback periods of 4 years or less. Large property groups may be captured by EEO thresholds.

c) Federal- Building Code of Australia (BCA)

In November 2005, the Australian Building Codes Board (ABCB) decided to include energy efficiency provisions for office buildings in the Building Code of Australia (BCA) 2006. The amendments apply to both the construction of new buildings and the refurbishment of existing buildings and embody a targeted 20% increase in building energy efficiency.

d) NSW Energy Efficiency Strategy (EES)

On December 10, 2007 the NSW Premier Morris Iemma announced a new energy efficiency strategy for the State. Amongst the range of announced measures was a new requirement for the States top 200 energy users to implement the 'cost effective' energy efficiency measures identified under the Energy Savings Action Plans (ESAP) Program. It is likely that a number of large buildings will be captured by these new requirements.

e) Victoria- Energy and Resource Efficiency Plan (EREP)

From January 1 2008, all commercial and industrial sites in Victoria that use more than 100TJ of energy per annum are required to prepare an energy saving plan, and implement energy efficiency options that carry payback periods of 3 years or less.

2.3 Regulatory risk

The desire to improve the greenhouse performance of building stock has so far resulted in a range of policy responses. However, as governments come under increasing pressure to deliver greenhouse gas abatement at least cost, it is likely that new policies will emerge, targets in existing programs ratcheted up, and existing program thresholds lowered to capture a larger number of energy users.

This potential was foreshadowed by the Regulation Impact Statement for Proposal to Amend the Building Code of Australia to include Energy Efficiency Requirements for Class 5 to 9 Buildings which noted:

> The ABCB's approach to the optimisation of the regulation is to first eliminate the worst of current practices, targeting a 20% reduction in energy use in this case. Given experience with the proposed regulation, including resolution of some of the many existing uncertainties, and the time required for industry to adjust current practices plus reduce existing stock, it is possible that increased stringency in a second round of energy efficiency measures may be appropriate. The high benefit/cost ratios suggest there may be scope for further improvements.[6]

On February 9, 2007 a joint communiqué from Australia's State Premiers expressed the likelihood of mandating energy efficiency upgrades that carry payback periods of up to 3 years.[7] Thus far, Victoria, and NSW have been the only states to act upon this threat. However, a June 13, 2008 Communiqué from COAG energy ministers expressed a desire to revisit the idea once greater clarity emerged around the design of the Australian emissions trading scheme.[8]

It is foreseeable that mandated energy efficiency projects would result in a scramble for the services required to achieve such gains. The surge in demand for such services would only add to the costs of the inevitable upgrades required in the sector. It is much better for building owners to be ahead of these inevitable regulatory changes by moving 'early' to implement energy efficiency upgrades.

[6] ABCB, 2006, p.iv
[7] CAF, 2007, p.4
[8] MCE, 2008, p.5

2.4 Operating cost structure exposures

The broader policy responses to climate change and its environmental implications stand to substantially inflate the operating cost structure of building owners. 'Early' movement on operational efficiencies will not only safeguard existing profit margins, but will also ensure a competitive advantage over those groups that fail to pursue operational efficiencies in preparation for Australia's entry into a carbon constrained world.

a) Electricity

Of most immediate concern is the exposure of building owners to increases in energy costs as emissions trading becomes a reality and water shortages become increasingly prevalent. As power generators are forced to pay for the greenhouse gases that they emit, energy prices will rise. These emissions trading related price increases will be in addition to other climate policy related drivers of electricity prices such as renewable energy targets, white certificate trading schemes, and Feed-in-Tariffs (FiTs). These policies place a liability on electricity retailers to purchase renewable energy and to invest in energy efficiency projects.

Figure 3 shows the electricity price increases that are likely to occur as a result of emissions trading. These estimates are made on the assumption that all emissions associated with the extraction, processing, transport, refinery, and final combustion of generation fuels are priced under a future emissions trading scheme (known as 'full fuel cycle' carbon pricing), and that all carbon costs are passed through to the end user (known as '100% pass through'). It follows that these predictions are the upper bounds of likely outcomes. The price elasticity of demand for electricity and availability of substitutes will ultimately determine the magnitude of 'pass through.'

These increases will come on top of those price rises attributable to climate change induced water shortages. The past year has witnessed significant increases in both the spot and forward price of electricity as both hydro and coal fired generation has fallen below capacity. Whilst the connection between water shortages and hydro generation is obvious to most, the implications of water shortages for coal fired generation are often overlooked. Coal fired generators rely upon the creation of steam to drive turbines and use water for thermal cooling; if water shortages exist, turbines cannot be driven at full speed, and generation will be below capacity.

In response, the National Electricity Market Management Company (NEMMCO) commissioned a Drought Scenarios Steering Committee (DSSC) to investigate the impacts of water shortages on Australia's electricity supply. A subsequent report released on April 30 2007, found that the continuation of rainfall patterns experienced over the previous 12 months, an outcome that the report itself acknowledges as 'optimistic', could reduce Australia's electricity supply by up to 10% of total capacity.[9]

State	Market price per tonne of CO_2e ($AUD)		
	$20 per tonne	$40 per tonne	$60 per tonne
NSW	2.12 cents	4.24 cents	6.36 cents
ACT	2.12 cents	4.24 cents	6.36 cents
Victoria	2.62 cents	5.24 cents	7.86 cents
Queensland	2.08 cents	4.16 cents	6.24 cents
South Australia	1.96 cents	3.84 cents	5.88 cents
Western Australia	1.96 cents	3.84 cents	5.88 cents
Northern Territory	1.58 cents	3.16 cents	4.74 cents
Tasmania	0.26 cents	0.52 cents	0.78 cents

Figure 3: Increase in electricity prices (cents per kWh) after carbon pricing*
*These emissions trading related price increases will be in addition to other climate policy related drivers of electricity prices such as renewable energy targets, white certificate trading schemes, and Feed-in-Tariffs (FiTs).

[9] NEMMCO, 2007, p.4

02 COMMERCIAL PROPERTY EXPOSURES TO CLIMATE CHANGE

Within the context of ever increasing demand it is clear that water shortages, increasingly prevalent as a result of climate change, will continue to drive increases in the price of energy. Whilst there will be those who will point to the role of air cooling, desalination, and increased dam capacity as potential solutions, it's important to recognise that these responses will only add to the capital intensity of electricity generation and its subsequent cost to end users.

Perhaps of more relevance over the longer term is the impact of a warming Australia on the capital intensity of electricity generation and the frequency with which bushfires will initiate short-term price fluctuations. With the capital intensity of electricity generation being more a function of peak demand than average demand, a warming Australia that brings many more days with high temperatures[10] will substantially increase the peak demand for electricity, and subsequently increase the capital intensity of electricity generation. This will increase the unit cost of electricity production, and the ultimate cost to end users.[11]

In terms of short-term price fluctuations it is worth considering the potential impact of predicted increases in bushfires. A joint CSIRO/Australian Bureau of Meteorology report released in December 2005 predicted that the combined frequency of days with very high or extreme fire danger in south-east Australia could increase by 4-25% by 2020 and 15-70% by 2050 as a result of climate change.[12]

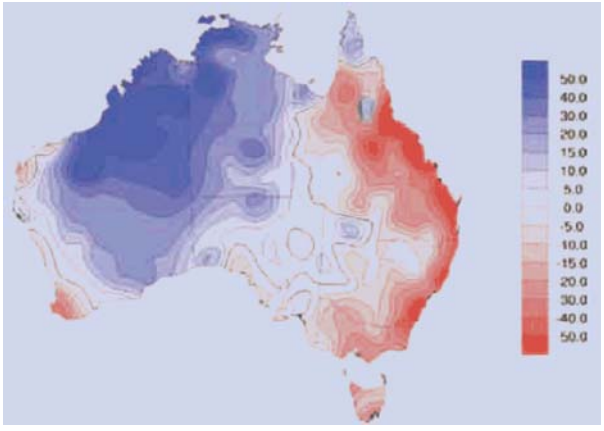

Figure 4: Australian trend in rainfall 1950-2003
SOURCE: Commonwealth of Australia

The implications of bushfire for electricity prices were made apparent on January 16, 2007 when bushfires caused the largest electricity transmission link into Victoria to fail. As a result, 20% of supply was cut off and the spot price of electricity surged by more than 21,000 % to over $9585 per Megawatt hour (MWh).[13]

The implications are clear. As climate change gathers momentum, the responses of government, the market, and the elements will all converge to ensure that energy prices will rise significantly over the short, medium, and long term.

b) Water

Implications for the operating cost structure of trusts are not only limited to energy prices. As predictions of decreased rainfall over Australia's population centres increasingly manifest, water prices will rise. Figure 4 demonstrates the drying trends experienced around Australia's population centres over the period 1950-2003. As shown in figure 5, this drying trend is predicted to continue as the pace of climate change increases over the coming decades.

[10] CSIRO, 2001, p.4
[11] AGO & DEH, 2006, p.12
[12] CSIRO & BoM, 2005, p.5
[13] NEMMCO Market Data

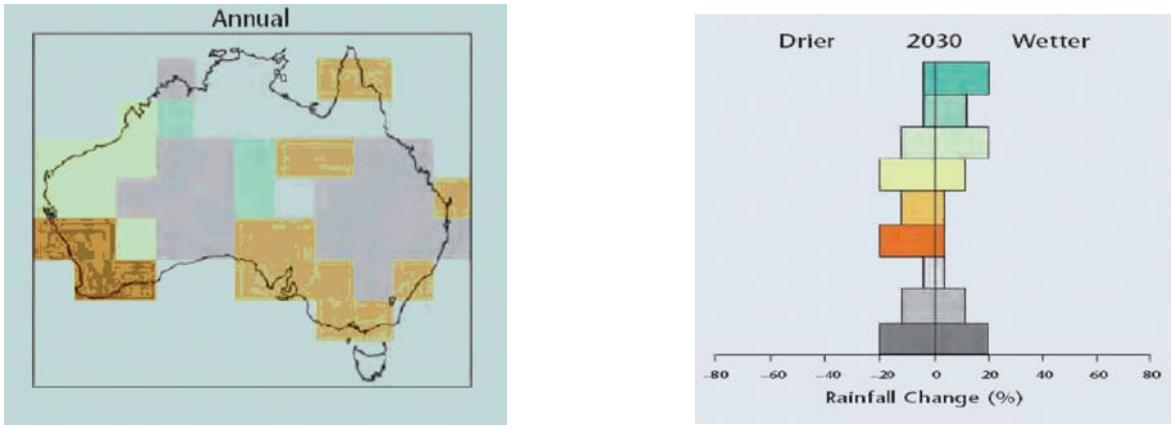

Figure 5: Predicted change in rainfall by 2030
SOURCE: CSIRO, 2001, Climate Change Projections for Australia, available at http://www.cmar.csiro.au/e-print/open/projections2001.pdf

Even areas of Australia that are predicted to experience increased rainfall are also predicted to be drier than current levels. This simply reflects the predicted impact of increased evaporation throughout a warmer Australia.[14]

In considering the operational impacts of such drying it is worth noting a recent report from the Water Services Association of Australia which predicted that $30 Billion in urban water infrastructure investment would be required to diversify water infrastructure away from rain-dependent systems. Movement away from rain fed systems requires capital intensive options such as desalination and water recycling and would have 'to be paid for in some way' with the report noting that these costs would ultimately be passed on to end users.[15]

In this regard, the warning that Melbourne water prices will double within the next 5 years as a result of such investments should be taken as a sign of things to come.[16] This reality was confirmed on October 23, 2007 by the ACT Chief Minister who announced that water prices in the ACT would rise by more than 60% as $308 million in capital expenditure was undertaken in response to the water supply challenges presented by climate change.[17]

This was followed on June 16, 2008 by the announcement that Sydney Water would increase retail water prices by over a third by 2012 to cover the cost of Sydney's desalination plant and water recycling grid.

City	Retail Price Increases
Sydney	Over 1/3 increase by 2012
Melbourne	Over 100% increase by 2012
ACT	Over 60% increase

Figure 6: Increase in metropolitan water prices

c) Insurance

Building owners are also likely to face increasing insurance costs as a result of two climate change related phenomena; the increasing frequency and severity of extreme weather events, and rising sea levels. Whilst the Intergovernmental Panel on Climate Change (IPCC) predicts that sea levels stand to rise by between 18 and 59 cm by 2100,[18] there are those such as James Hansen of NASA that predict that sea levels could rise by several metres by the end of the century.[19] This will have clear implications for Australia's predominantly coastal real estate.

[14] CSIRO, 2001, p.6
[15] WSAA, 2007, p.15
[16] Media Release: August 14, 2007.Reform of Melbourne's Water Industry. The Premier of Victoria
[17] Media Release. Chief Minister ACT. October 23, 2007.
[18] IPCC, 2007, p.13
[19] Hansen, 2007, p.1949

Perhaps of more immediate concern to trusts are increases in the frequency and severity of extreme weather events. Of 8,820 natural catastrophes analysed worldwide between 1960 and 1999 85% were weather-related, as were 75% of economic losses and 87% of insured losses.[20] These figures closely accord with the Australian experience in which 87% of economic losses in the period 1967–1999 were attributable to weather related events.[21]

Of particular concern for building owners are the 'non-linear' impacts of severe weather events. Whilst some have pointed to the fact that a doubling of wind speeds results in a four-fold increase in related damages[22], the experience of Insurance Australia Group (IAG) suggests that a 25% increase in peak wind gust strength can generate a 550% increase in building claims.[23] As the frequency and severity of extreme weather events increase, and insurers are forced to contend with greater uncertainty, insurance premiums will rise. In the case that global warming results in sea level rises of such magnitude as to threaten coastal real estate, building owners may not be able to secure insurance coverage; an outcome that would have obvious implications for asset valuations.

d) Transport fuel

As transport fuels enter into an emissions trading scheme fuel costs will rise. This will impact upon groups through the cost of staff travel, use of transport services, and company car fleets. The ultimate increase in price will be determined by the carbon intensity of the respective fuels. Assuming that all emissions associated with the extraction, processing, transport, refining, and final combustion of transport fuels are priced under a future emissions trading scheme ('full fuel cycle' carbon pricing), and that all carbon costs are passed to the end user (100% pass through) then the likely magnitude of fuel price increases as a result of carbon pricing are as set out in figure 7. These assumptions make this pricing a 'worse case' scenario as the price sensitivity of users will ultimately determine the level of pass through.

e) Supply chain costs

As the cost of basic inputs to production (i.e energy, water, and insurance) rise, so may the costs of all carbon intensive goods and services. The extent to which building owners are exposed to such price increases will depend on the extent to which suppliers manage their own exposures, maximise operational efficiencies, and thereby negate the price impact of such cost increases. It is for this reason that some elements of the private sector are beginning to link procurement contracts to the efforts that suppliers are taking to prepare for their entry into a carbon constrained world.

Fuel	Market price per tonne of CO_2e ($AUD)		
	$20 per tonne	$40 per tonne	$60 per tonne
Petrol	5 cents	10 cents	15 cents
Diesel	5.8 cents	11.6 cents	17.4 cents
LPG	3.4 cents	6.8 cents	10.2 cents
Natural Gas	5.2 cents/ m^3	10.4 cents/ m^3	15.6 cents/ m^3
Ethanol	2.6 cents	5.2 cents	7.8 cents
Biodiesel (Tallow)	2.6 cents	5.2 cents	7.5 cents
Biodiesel (Canola)	3 cents	6 cents	9 cents
Aviation turbine	5.6 cents	11.2 cents	16.8 cents

Figure 7: Increase in fuel prices (cents per litre/m3) after carbon pricing*

* assuming 100% pass through over full fuel cycle in accordance with NGA Factors

[20] Munich Re, 2000 cited in Coleman, 2002, p.2

[21] BTE, 2001 cited in Coleman, 2002, p.2

[22] Mills et al, 2001, p.72 cited in Coleman, 2002, p. 5

[23] Coleman, 2002, p.4

2.5 Reputational risk

While the commercial implications of climate change are significant, climate change is not solely a commercial issue. Climate change is ultimately a human rights issue. Global warming will drive changes that amount to a redistribution of the world's resources. When considered within the context of fixed national boundaries, climate change threatens to reduce the resource base upon which the living standards of individual nations are built.

Organisations not pursuing practical emissions abatement opportunities will be increasingly open to the criticism of environmental and social disregard. The capacity for third parties to make such claims will only increase as individual entities are forced to publicly report their emissions profile as well as the energy efficiency opportunities that are available to them.

Reputational risk clearly has the potential to have a financially material impact upon commercial entities. As recently noted by Finsia an 'increasing component of company value (book and market) is held in intangibles (eg. brand, image, reputation). If reputation factors are not properly managed (and disclosed), returns are exposed to greater volatility and risk.'[24]

The pursuit of emissions reductions may act to safeguard or promote the reputation and brand value of the firm - thereby safeguarding or promoting company value.

2.6 Broader market risks

In addition to these direct impacts it is important to recognise the exposure of buildings owners to the broader market risks of climate change. The Stern Review on the economics of climate change estimated that the onset of unabated climate change could present social and economic disruptions in the order of the Great Depression and the World Wars[25]. Furthermore, models that seek to predict the impact of emissions reductions on the economy have found that the later that emissions reductions are implemented, the greater the risk of severe industrial disruption- as nations are forced to accept increasingly onerous annual emissions reductions to achieve required cuts.[26]

The Draft Report of the Garnaut Review confirmed the macroeconomic vulnerability of Australia to climate change.[27] This vulnerability is not only derived from the fact that Australia's fortunes are increasingly tied to that of the global economy but also because of the prominence of highly climate dependent sectors such as agriculture, and tourism.

Building owners are clear stakeholders in such outcomes and those that pursue emissions reductions are simultaneously contributing to broader efforts to manage the likelihood of climate-induced downturns.

2.7 Extreme weather events

As previously discussed, climate change is predicted to bring with it an increase in extreme weather events. Building owners will not only face increasing insurance costs as a result but will also face the increased likelihood of direct property damage from the elements. Property trusts acting to reduce their emissions are simultaneously contributing to broader efforts to manage the likelihood of such outcomes.

2.8 Growing investor demands

The financial materiality of climate change-related risk has laid the groundwork for the growth in investor pressure witnessed over recent years. Internationally the Investor Group on Climate Change (IGCC), whose members collectively account for US $57 trillion in funds under management, administers the Carbon Disclosure Project (CDP) which requests information from the world's leading companies on how they are addressing the climate change-related risks that they face. Such pressure has been built upon by the Institutional Investors Group on Climate Change (IIGCC), the US based Investor Network on Climate Risk (INCR) and, more locally, by the recent review into the ASX Corporate Governance Principles. Following ASX guidance that listed companies will be required to disclose whether they have policies in place to manage material business risk, it is clear that there will be greater investor scrutiny of the measures that Australian companies are taking to manage their climate change-related exposures. Failure to move on emissions reductions comes with the risk of facing a decreasing pool of investable funds from which to draw upon.

[24] Finsia. Submission to ASX Corporate Governance Council Review of Principles. 14/02/07 p. 3
[25] Stern Review on the economics of Climate Change. 2006. p.iv.
[26] ABRCC, 2006, p.5
[27] Garnaut, 2008, p.233

03 NEUTRALISING EMBEDDED LIABILITIES

03

The most effective means to manage, and in some cases neutralise, the climate change related liabilities that are currently embedded within commercial property is to reduce the emissions profile of office buildings. The most cost effective means to achieve such reductions is through the pursuit of energy efficiency upgrades. As repeatedly demonstrated, the pursuit of energy efficiency upgrades in commercial property boasts the lowest marginal cost of greenhouse gas abatement - both locally and globally.[28] Indeed, the marginal cost of abatement is in fact negative - energy efficiency upgrades are profitable for building owners.

3.1 Steps that building owners can take to increase portfolio energy efficiency

There exist a wide range of measures available to building owners seeking to increase the energy efficiency of their portfolios and, as shown in figure 8, the majority of these measures offer above market rates of return.

3.2 Alternative energy options – Green Power™ and microgeneration

An additional option available to trusts seeking to reduce the emissions profile of their buildings is to purchase Green Power™ from accredited Green Power™ providers. Green Power™ is sourced from renewable energy sources and produces zero greenhouse gas emissions.

An increasingly common alternative to the purchase of Green Power™ is the use of low emissions microgeneration plants which can deliver substantial greenhouse performance improvements for buildings.

[28] McKinsey, 2007, p.38; NEXTEnergy, 2004, p.1; Vatenfall, 2007, p.3

Description	Rates of Return
Building Envelope	
Apply external shading to minimise solar heat gain	2 - 6%
Apply window tinting to minimise solar heat gain	6 - 20%
Apply light colours to external walls	
Use light colour internal partition and carpets to maximise daylighting effect	5%
Add internal shading devices to minimise/regulate solar heat gain	5 - 20%
Plant trees around the building for shading purposes	~
Upgrade insulation of building envelop, e.g. roof, walls, floor etc. to minimise heat gain/loss	2 - 20%
Change space layout to enhance daylight, ventilation and zone controls.	2 - 40%
Mechanical Services	
Use Variable speed drives for efficient system regulation and variable flow control	15 - 30%
Employ high efficiency chillers	2 - 15%
Employ high efficiency boilers	2 - 20%
Review operation and calibration of economy air cycles.	0 -100%+
Employ combined heat and power generation.	2 -15%
Insulation of equipment, ductwork and pipes.	2 - 20%
Investigate feasibility of 'hybrid' conditioning and openable windows for cross ventilation.	2 - 40%
Fine tune the building management system. Pay particular attention to - night purge - enthalpy control of economy air cycles - floating heating and chilled water setpoints - optimised start and stopping - CO2 control of outside air	5 - 100%+
Replace low efficiency motors with high efficiency motors	3 - 6%
Lighting Services	
Installation of occupancy sensors	6 - 15%
Installation of master reset control to switch lighting off	15 - 30%
Replace dichroic globes with IRCs / compact fluorescents'	30%/50%+
Employ daylight control	2 – 15%
Upgrade from T12 & T8 to T5	2 – 6%
Install fixed range dimmers on fluorescent circuits	20 - 30%
Install fixed range dimmers on HID circuits	10 - 30%
Building Management Systems	
Review room temperature Set points	100%+
Review plant operating time against occupancy pattern	100%+
Maintenance	
Review present mechanical services maintenance procedures and revise, such that they better embrace energy efficiency initiatives	25 – 100%+

Figure 8: Energy efficiency measures available to building owners
SOURCE: Steensen Varming (Australia) Pty Ltd. 2007

04 REALISING THE EMBEDDED VALUE LYING DORMANT WITHIN PROPERTY ASSETS

04

The energy efficiency upgrading of commercial property portfolios is essentially a risk management exercise that boasts the rare quality of being ultimately profitable and eligible for third party subsidisation.

4.1 Energy efficiency projects offer trusts above market rates of return

As shown in Figure 8, the energy efficiency upgrading of commercial property assets offers commercial property trust positive returns that, in many cases, will be higher than market rates of return.

4.2 Third Party Subsidies

Despite the profitability of such energy efficiency projects there exist a variety of government and third party subsidisation mechanisms for such upgrades.

a) Commonwealth Green Building Fund

The $90 million Green Building Fund is designed to subsidise energy efficiency projects in existing buildings and to support the training of building operators. Under the program building owners can apply for up to 50% of the costs of building upgrades up to a maximum of $200,000 per building.

b) Commonwealth Greenhouse Friendly Abatement Projects

Under the Greenhouse Friendly scheme operated by the Commonwealth Department of Climate Change (DCC) actions that can be shown to reduce greenhouse gas emissions such as energy efficiency upgrades can be potentially subsidised by those groups seeking to offset their own emissions elsewhere in the economy.

The broad eligibility requirements for participation in the program is financial and compliance 'additionality.' That is, building owners must be able to show that it is not privately cost effective for such upgrades to be made and that such action will not be simply in accordance with what they are required to do by law.

c) NSW Green Business Program

The $30 million NSW Green Business Program provides support for projects that achieve substantial energy efficiency gains in buildings. Funds are provided on a competitive tender basis.

d) NSW/ACT GGACs/NEECs

Under the Greenhouse Gas Reduction Scheme organisations investing in energy efficiency projects may apply for Greenhouse Gas Abatement Certificates (GGACS) under the Demand Side Abatement (DSA)/ energy efficiency category of the scheme.[29] Building owners that reduce emissions will be paid for each tonne of CO_2e that is not emitted into the atmosphere.

In June 2008, the NSW Government announced that a NSW Energy Efficiency Trading (NEET) Scheme will commence on January 1, 2009. Under the scheme, energy efficiency projects previously credited with GGACs under the Greenhouse Gas Reduction Scheme will begin to be credited with NSW Energy Efficiency Certificates (NEECs). Building owners that invest in energy efficiency projects will be able to generate NEECs which can be sold to electricity retailers and market intermediaries.

[29] http://www.greenhousegas.nsw.gov.au/acp/energy_efficiency.asp

e) Victorian ResourceSmart Commercial Buildings Program

Through the ResourceSmart Commercial Buildings Program the Victorian government provides support for building owners on the basis of gains in the NABERS Energy Rating of the building. As a performance based subsidy the greater the efficiency gain the higher the rebate. The ResourceSmart program also provides rebates for undertaking NABERS Energy building ratings.

f) Queensland EcoBiz Program

Under the EcoBiz program the Queensland government provides subsidies for businesses that undertake emissions reduction projects that are considered 'innovative' or 'best practice.'

g) Demand Management Funds

Under the NSW Electricity Supply Act 1995, power companies are required to pursue demand management options before increasing power capacity to areas experiencing capacity constraints. Building owners that hold assets in such areas can apply for funds from power companies to pursue energy efficiency upgrades so as to avoid the need to increase the power capacity of the area. A similar mechanism exists in South Australian through the ETSA Demand Management Program.

4.3 Alternative financing arrangements

If it is the case that conventional financing mechanisms for such energy efficiency upgrades are not palatable for particular building owners there exists alternative mechanisms by which owners can pursue energy efficiency upgrades so as to manage their various climate change-related exposures.

a) Energy Performance Contracts

Under an Energy Performance Contract (EPC) a third party will identify energy efficiency improvement possibilities, finance those upgrades, and take as their return the cost savings that will be achieved as a result. EPCs provide a mechanism by which building owners that do not have an appetite for particular forms of capital expenditure can manage their climate change-related exposures.

05 THE CRUCIAL ROLE OF EXISTING BUILDINGS IN AUSTRALIAN CLIMATE POLICY

05

While recent years have witnessed the commendable rise of the 'green building' movement the focus of activities has so far been upon the development of new 'green buildings.' Where needed, new 'green buildings' will help to mitigate the predicted growth in emissions but the fact that up to 98% of existing floor space is accounted for by inefficient building stock means that any real attempt to reduce emissions from the sector will require the upgrading of existing buildings.

Furthermore, the embodied emissions of new buildings means that replacing Australia's inefficient building stock with new 'green buildings' would be, in emissions terms, a backward step. Upon one estimate, the emissions benefit of replacing an existing building capable of being upgraded to a 4.5 NABERS Energy Rating with a new 'green' building designed to achieve and maintain a 5 Star NABERS Energy Rating, would not be realised for 290 years.[30]

TEC recognises that the most climate friendly buildings are not new 'green buildings' designed for maximum energy efficiency but existing buildings that have been upgraded to achieve substantial reductions in greenhouse gas emissions. The embodied emissions of existing buildings are a sunk cost that needs to be capitalised upon in order to optimise environmental outcomes.

Organisations looking to genuinely reduce their carbon footprint need to recognise that the most climate friendly buildings are not new 'green buildings' designed for maximum efficiency but existing buildings that have been upgraded to achieve substantial reductions in greenhouse gas emissions.

[30] Roussac, 2006, p.84

06 THE EXISTING BUILDINGS PROJECT

06

The Total Environment Centre's (TEC) Existing Buildings Project seeks to:

- Communicate the climate change-related risks facing the sector
- Provide information on the means by which energy efficiency improvements can be made to neutralise embedded liabilities whilst realising embedded value
- Suggest profitable and innovative ways to finance such upgrades
- Communicate zero and low emissions energy options, and
- Celebrate Industry leaders seeking to achieve cross portfolio emissions reductions

The project will also provide an independent framework that will allow third parties to differentiate between genuine attempts by building owners seeking to promote the sustainability of their portfolios from those trusts seeking to 'greenwash' their operations by making only superficial improvements.

TEC welcomes the opportunity to collaborate with industry on this project. The following components of the scheme have been developed after discussions with a range of building owners.

6.1 Project tiers

TEC invites building owners to join one of three project tiers. Two of the three project tiers will require a public commitment to the achievement and maintenance of a long-term portfolio NABERS Energy Rating target. The final tier allows building owners not yet willing to make a public commitment

TEC Existing Buildings Project Tiers

	Base Building		Tenancy
Time Period	**Short Term**	**Long term**	
		January 2012	January 2008
First Tier	Discretionary	4.5 Portfolio NABERS Energy rating or better	Begin actively engaging tenants
Second Tier	Discretionary	4.0 Portfolio NABERS Energy rating or better	Begin actively engaging tenants
Third Tier	Active consideration over 12 months. Participation in workshop series	Active consideration over 12 months. Participation in workshop series	Active consideration over 12 months. Participation in workshop series

Figure 9: TEC Existing Buildings Project Tiers

to either portfolio target to consider the information presented by the project and at the end of 1 year choose to either leave the project or make a public commitment to either target.

6.2 Project Guidelines

a) Portfolio targets relate to office buildings only

At this stage, the NABERS Energy Rating targets relate only to office buildings. Diversified trusts that enjoy an exposure to commercial property, and that have made a public commitment to either of the targets, will be asked to only report on the office component of their portfolio.

b) Portfolio NABERS Energy rating calculation guidelines

i) The portfolio NABERS Energy Rating average will be calculated on a weighted by floor space basis.

ii) In the case that a participating trust jointly owned a particular building only their proportion of floor space would be included in the portfolio calculation.

iii) Buildings that reach completion after December 13, 2007 will be excluded from the portfolio calculation.

iv) 'Existing Buildings' purchased by the building owner after the launch date will be excluded from the portfolio calculation for a period of two years. This is designed to allow trusts to undertake operations to improve the NABERS Energy Rating of the building without suffering an unrepresentative decrease in the portfolio NABERS Energy Rating. Whether such a building will be included in the portfolio calculation within this two year period will be left to the discretion of the trust.

v) Buildings firmly earmarked for sale or demolition within 1 year of the project launch will be excluded from the portfolio calculation.

vi) Where a building is jointly held with an entity that is not a participant in the project, and where that building is not controlled by the participating group, and the joint owner fails to agree to upgrade the building in a manner consistent with project goals, the participating group will be able to nominate that building for exclusion from the portfolio calculation. In the case that the building is brought into the portfolio at a later date that building will be excluded from the portfolio calculation for a period of 2 more years. This is designed to allow the group to undertake upgrades to that building without suffering an unrepresentative decrease in the portfolio NABERS Energy Rating whilst work is being undertaken.

vii) Building owners are given the option to exclude those buildings where the base building is controlled by tenants and where those tenants do not agree to required upgrades. If a building falls out of such an arrangement that building will be excluded from the portfolio calculation for a period of two more years. This is designed to give building owners the time to undertake operations to improve the portfolio NABERS Energy Rating of the building without suffering an unrepresentative decrease in the portfolio rating. Whether such a building will be included in the portfolio calculation within this two year period will be left to the discretion of the building owner.

viii) An exclusion clause for buildings earmarked for refurbishment can't be granted without compromising the integrity of the project. Refurbishments scheduled to take place before 2012 will be reflected in the achievement of the 2012 target and buildings that are earmarked for post 2012 refurbishment could still undergo works with paybacks of over 5 years. This was one of the primary reasons that the interim NABERS Energy Rating target would remain discretionary- allowing sufficient flexibility to respect the different refurbishment schedules of participating groups.

c) Flexibility mechanisms within the Existing Buildings Project

There are 4 flexibility mechanisms in the TEC Existing Buildings Project. These are designed to give due regard to the diversity of building stock and the individual objectives of different trusts.

i) Portfolio NABERS Energy Rating average - By calculating the portfolio average on a 'weighted by floor space' basis there exists scope for efficiently designed buildings to compensate for less efficient buildings.

ii) NABERS Energy Rating – The NABERS rating system is non-prescriptive. In seeking to achieve their respective targets, building owners are free to decide the path that best suits the individual characteristics of their portfolio.

ii) GreenPower - Given that NABERS Energy Rating recognises the use of GreenPower,

building owners fearing that they would not be able to achieve their NABERS targets on the basis of operational efficiency alone would have the option of purchasing GreenPower. The costs savings made on more efficiently designed buildings could be used to purchase GreenPower chosen for other buildings. This would allow trusts to meet their NABERS Energy Rating target on a cost-neutral basis.

iv) Discretionary interim target - In recognition of the varied trajectories that different trusts would need to meet their relevant NABERS Energy Rating targets the interim target will be left to the discretion of individual trusts.

d) Progress monitoring

TEC seeks an undertaking with participating trusts that NABERS Energy Rating monitoring will occur on an annual basis. In addition, a half-yearly meeting is sought between TEC and participating trusts in which challenges, lessons, and project developments will be discussed.

e) What is required for the tenancy engagement program?

The ultimate form of the tenancy engagement process will be left to the creativity of participating trusts. Ultimately the tenancy engagement program would seek to secure the commitment of individual tenants to match the NABERS Energy Rating commitment of the building owner. As a minimum the tenancy engagement program would communicate:

- The nature of existing rating schemes
- The energy efficiency options available to tenants
- Financing options for such energy efficiency upgrades
- GreenPower and low emissions energy options

If a building owner sought to go beyond NABERS Energy Rating and promote broader sustainability issues such as water, waste, and indoor air quality it would be encouraged to do so. The engagement mechanism will be left to the trust's judgement but would need a form of effective interaction between the building owner and decision makers on the tenancy side. This may include commending a guidance document during meetings and following that up with subsequent engagement or may entail a workshop series for tenants.

If a tenant was in one of the regions captured by the CitySwitch Green Office program then the process would include a commendation of the program. Given that tenant actions will also influence base building demands, tenancy engagement would also aid in the achievement of base building targets. Upon refurbishment of tenancies the trusts will seek to maximise the energy efficiency of lighting services.

f) Disclosure

An undertaking is sought with participating trusts to publicly disclose their participation in the project, their respective portfolio NABERS Energy Rating target, their current portfolio NABERS Energy Rating, and the activities that they are undertaking with tenants. Further information such as the progress that a participating trust had made before their participation in the project would be left at the discretion of participating trusts. It is requested that this information be published on the websites of participating trusts and in their relevant publications.

g) Benefits to project participants

There exists a host of benefits for those that choose to participate in the Existing Buildings Project.

i) Workshop series for project participants

The Existing Buildings Project will provide project participants with a series of workshops that will supply relevant information by which building owners can decide whether greenhouse performance upgrades are a priority for building owners and the means by which such upgrades can be structured, financed, and achieved.

ii) Safeguard against criticism of greenwash

As 'green becomes the new black' it is only natural that many firms will attempt to capitalise upon such movements by 'green washing' their operations. It is equally natural that many will respond to such claims by cynically considering such movement as an insincere PR exercise. Participation in a project run by an established and credible environmental organisation will safeguard participating building owners from such criticism and highlight their leadership on the issue.

iii) Provides highly visible platform to showcase leadership on climate action

Participation in the Existing Buildings Project will send a powerful message of commitment to regulators, investors, prospective tenants and the community.

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