

Low Carbon Growth Plan for the Macquarie Park Precinct

Report Summary
November 2011



KEY FINDINGS

Building owners and tenants in the Macquarie Park precinct can significantly reduce their energy use - and hence the amount of money spent on energy bills - between now and 2020 using a range of widely available technology solutions that can be implemented at relatively low cost.

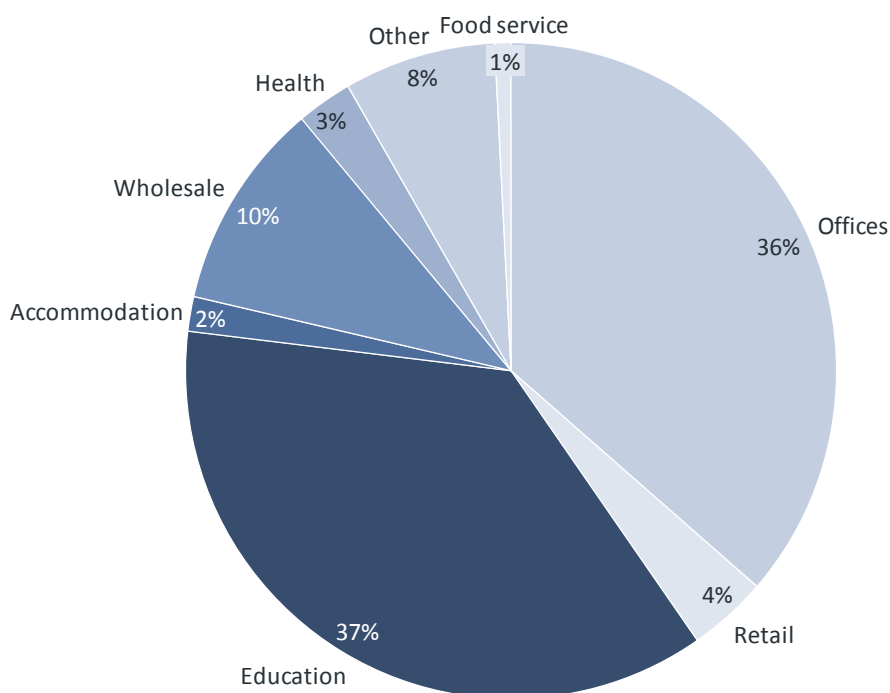
For Macquarie Park's commercial buildings:

- ▶ \$24.4 million could be saved per year by fully implementing the opportunities identified by ClimateWorks Australia. This would also reduce the precinct's greenhouse gas emissions from commercial buildings by 42% each year.
- ▶ Three quarters of all opportunities can save money, even after taking into account upfront costs.
- ▶ While the largest overall energy savings can be found by retrofitting buildings in the Offices and Education sectors, all of Macquarie Park's existing buildings can benefit from substantial energy savings of between 21% and 42%.
- ▶ Macquarie Park can also reduce its dependence on grid supplied electricity by 27,900 MWh each year through the installation of cogeneration and mid-scale solar PV.
- ▶ A carbon price associated with Australia's 5% emissions reduction target would increase the volume of profitable opportunities available to Macquarie Park's businesses by 28%.

Business-as-usual energy use in Macquarie Park

The Macquarie Park business precinct is home to a range of businesses of various sizes, Exhibit 1 illustrates the broad cross section of activities that these businesses undertake, by comparing floor space by sector.

Exhibit 1 - Comparison of commercial building floor space by sector



Source: ClimateWorks team analysis, based on data inputs from Macquarie Park

Highlights

- ▶ Education and corporate activity (Offices) represent the largest share of activity in Macquarie Park in terms of floor space occupancy, followed by warehousing (Wholesale).
- ▶ By 2020, it is expected that an additional 455,000 m² of new build commercial floor space will be constructed across the range of building sectors.
- ▶ Under business-as-usual, Macquarie Park's commercial buildings are expected to consume 290,500 MWh and generate 615,000 tonnes of greenhouse gas emissions each year by 2020.
- ▶ Of the total energy expected to be consumed by Macquarie Park's buildings in 2020, Offices are estimated to use the largest share (39%), followed by Education (28%) then the Health sector (12%).

PROJECT BACKGROUND

Macquarie Park is set to experience unprecedented growth over the next 20 years from 77,000 to 210,000 residents and workers. The demand on resources and space will be significant. In 2010 the Office of Environment and Heritage, Sydney Water, the City of Ryde and Macquarie University agreed to collaborate to streamline access to support programs and encourage uptake of programs that reduce resource consumption, with the aim of assisting Macquarie Park to become an exemplar Green Precinct.

The Low Carbon Growth Plan for the Macquarie Park precinct report aims to assist the Macquarie Park community to identify a range of cost-effective actions that will reduce energy consumption and greenhouse gas emissions.

METHODOLOGY. All of the findings detailed in this report are based on the low carbon growth plan methodology used by ClimateWorks Australia. This approach identifies commercially available technology solutions to reduce greenhouse gas emissions and excludes:

- ▶ actions expected to occur under current policies (as these are captured in the business-as-usual case);
- ▶ changes to lifestyles or behaviours (e.g. driving less, or switching off lights or appliances when not in use);
- ▶ the transaction costs associated with implementing these opportunities (e.g. the cost of management time, energy audits or building contractors engaged to undertake the work), as these vary with the precise approach chosen for each opportunity.

Many findings are averaged across a range of businesses within a building type, or across a range of building types that could implement a particular technology solution, and therefore the actual savings that could be achieved by any individual business could vary from these findings.

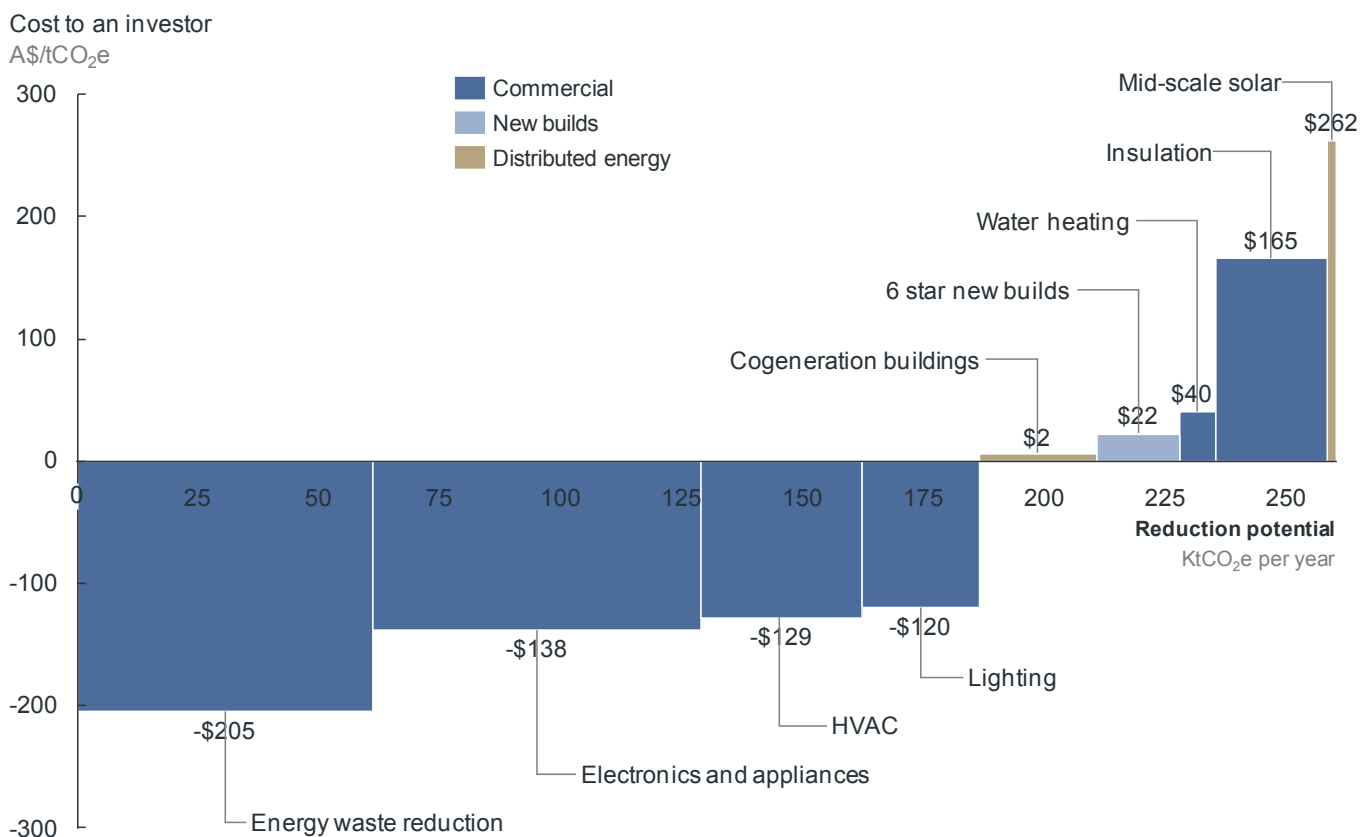
The Opportunity

Macquarie Park's commercial buildings have the opportunity to significantly reduce their demand for energy between now and 2020. In doing so, businesses could generate combined financial savings of \$24.4 million each year. This would also reduce the precinct's greenhouse gas emissions from commercial buildings by 42% per year (259,300 tonnes). These savings can be achieved through a combination of energy efficiency measures and new distributed energy generation from lower emission sources.

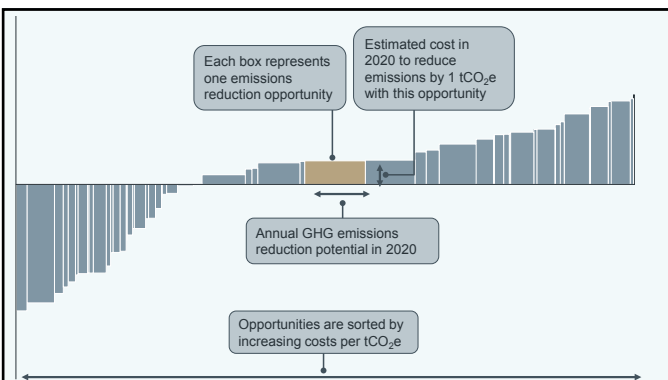
Exhibit 2 illustrates the range of low cost abatement opportunities available to Macquarie Park's businesses and compares the annual net cost (in dollars per tonne of emissions reduced) of capturing these opportunities. These opportunities are realistically achievable by 2020 using technologies that are already commercially available to reduce energy use or provide cleaner, less emissions intensive energy to Macquarie Park's buildings.

Macquarie Park's businesses could save \$24.4 million and reduce greenhouse gas emissions from energy used in buildings by 42% each year through energy efficiency and distributed energy.

Exhibit 2 - Macquarie Park commercial buildings 2020 greenhouse gas emissions reduction cost curve



Source: ClimateWorks team analysis, derived from the Low Carbon Growth Plan for Australia 2020 greenhouse gas emissions reduction cost curve with data inputs from Macquarie Park. For a detailed explanation of the above identified opportunities and assumptions, visit www.climateworksaustralia.org.



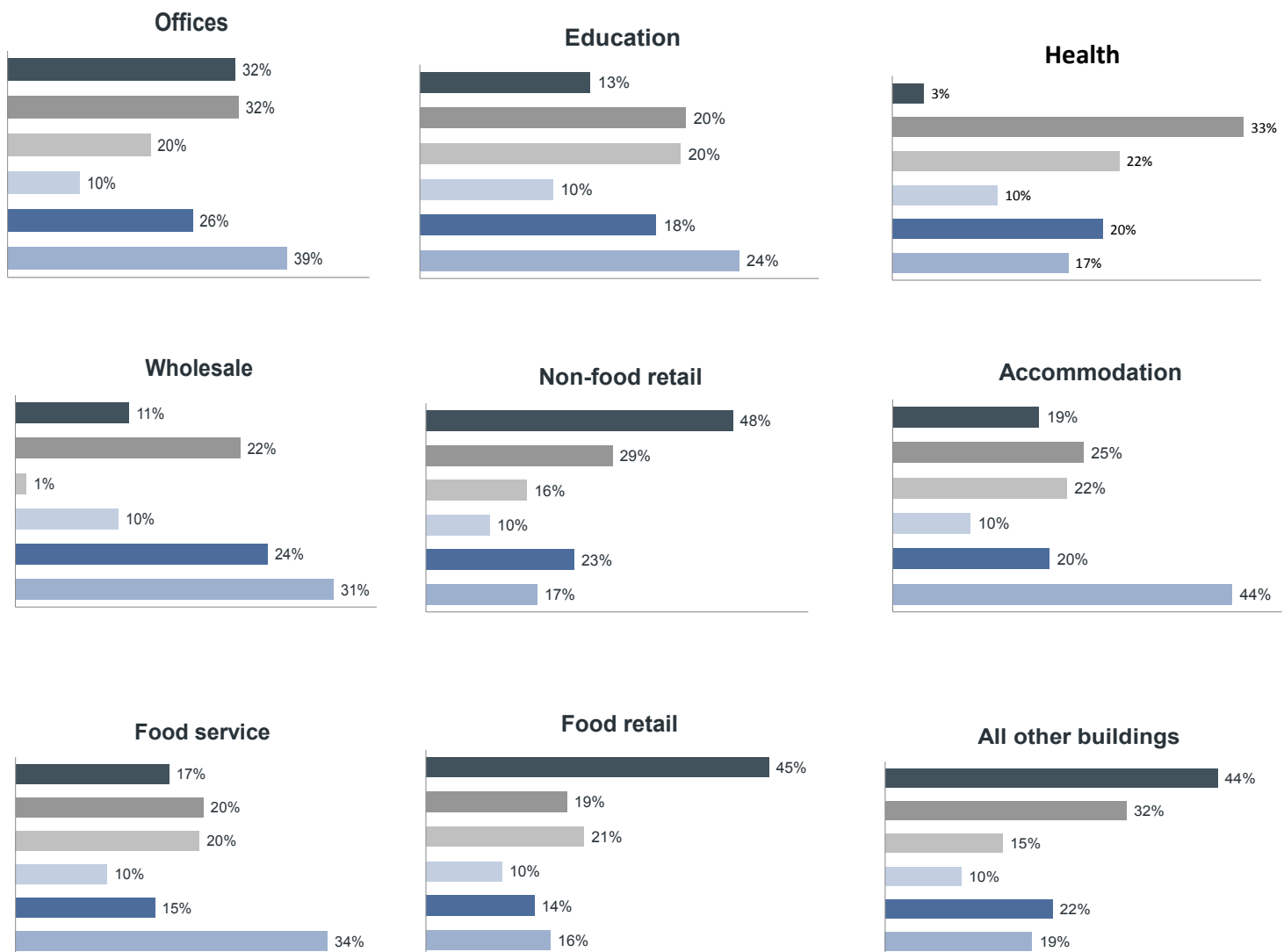
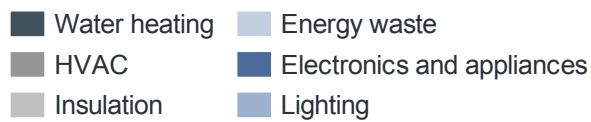
HOW TO READ AN EMISSIONS REDUCTION COST CURVE

All costs include the typical private cost of capital for each sector (8-14%), energy taxes and retail margins and subsidies, in order to illustrate the direct cost faced to implement an opportunity. However, project transaction costs (e.g. admin/ management time or consultancy fees) have not been included, as these can vary significantly depending on how the opportunity is captured.

Energy Savings in Commercial Buildings



Exhibit 3 - Energy savings potential against BAU by technology type and sector



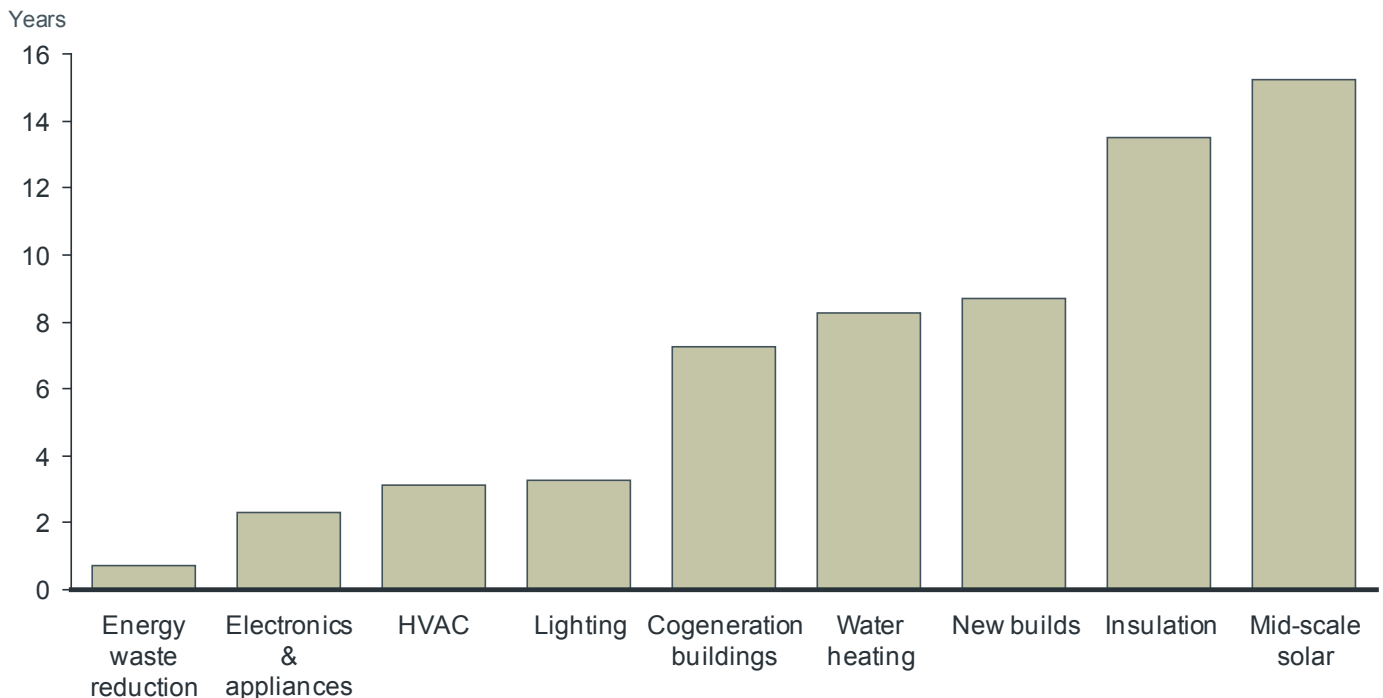
Macquarie Park's buildings can benefit from substantial energy savings of between 21% and 42%



The Cost

Capturing the energy savings and cleaner energy solutions identified in this report will require an upfront investment of capital. Yet even factoring in the upfront capital costs, and annualising them over the life of the relevant asset, the majority of opportunities identified will save businesses money over their lifetime. Four of the nine opportunities identified in the graph below have a payback of less than four years. Energy waste reduction has a payback of eight months - this is the relatively easy task of removing or downsizing unnecessary equipment (e.g. de-lamping, reducing the number of printers or photocopiers to service an office space, or downsizing a water heater to fit the requirements of the business it services).

Simple payback



Source: ClimateWorks team analysis, based on Macquarie Park 2020 commercial buildings GHG emissions reduction cost curve

The Impact of the Carbon Price

The carbon price increases the financial savings that Macquarie Park's businesses can capture from implementing all opportunities on the cost curve by 41% - from \$24.4 million to \$34.5 million per year.

By increasing the cost of activities that produce greenhouse gas emissions, a carbon price amplifies the operational savings available from capturing opportunities to reduce those emissions.

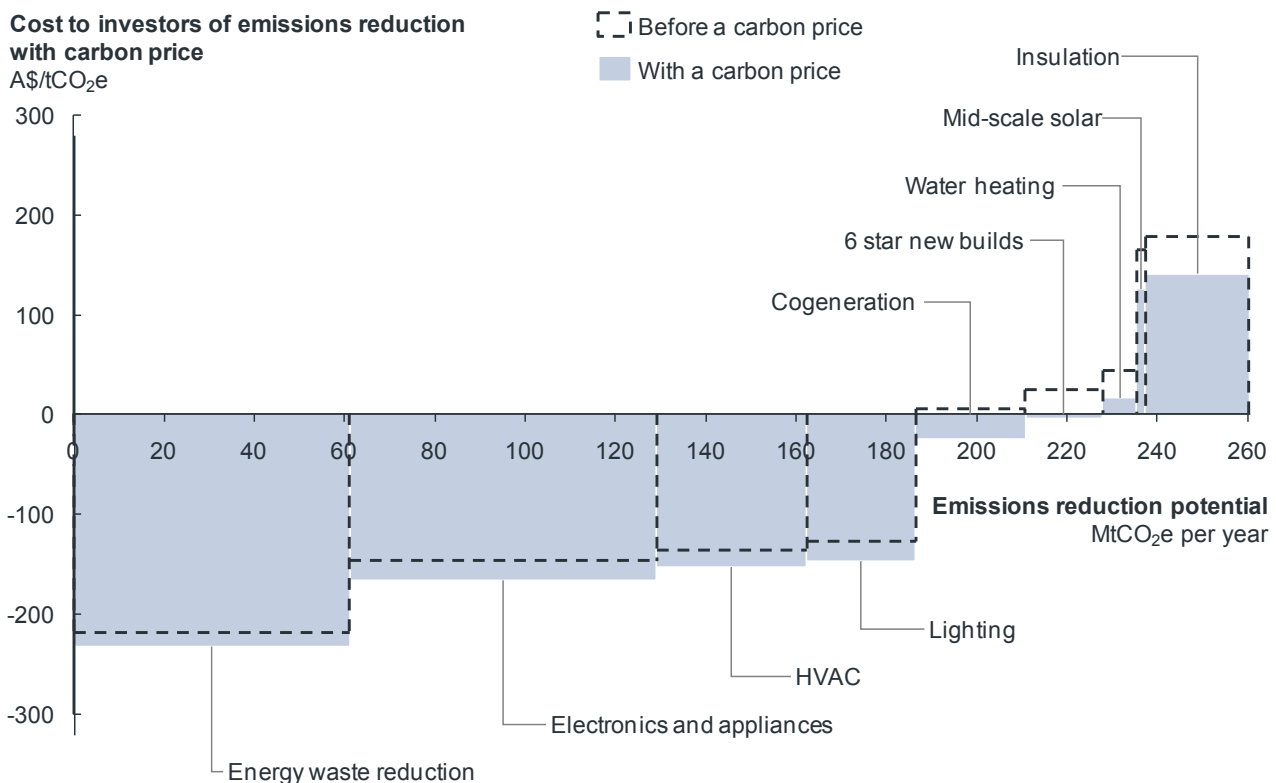
For most of Macquarie Park's businesses, the most significant impact of the carbon price will be felt through an increase in electricity prices, as power generators pass on the cost of carbon permits that they will be required to purchase.

This increase in electricity prices also increases the profitability of energy efficiency opportunities. Exhibit 4 illustrates the change in cost of capturing the opportunities identified for Macquarie Park's commercial buildings with a carbon price associated with a national 5% emissions reduction target below 2000 levels by 2020.

The Australian Treasury¹ has modelled that 85% of the carbon price will be passed through to the electricity price. Other expected electricity price increases, associated with infrastructure upgrades to the poles and wires that transmit and distribute our electricity have already been factored into the electricity price used in our modelling for 2020.

However, as illustrated in Exhibit 2 and Exhibit 4, many businesses are sitting on substantial financial savings that are not being captured, but which help to mitigate the impact of a carbon price.

Exhibit 4 – The impact of a carbon price in 2020 on the cost of emissions reductions²



1. Australian Treasury, *Strong growth, low pollution. Modelling a carbon price (2011)*

2. Using a carbon price of \$29 in 2010 real dollars, based on modelling by the Australian Treasury (5% target in 2020 scenario)

Challenges



Most of the opportunities that the report identifies are already profitable, yet are not being captured by Macquarie Park's businesses. This indicates that a range of barriers are preventing the capture of these energy savings and their associated emissions reductions and financial savings.

CAPITAL CONSTRAINTS & INVESTMENT PRIORITIES

- ▶ Access to capital
- ▶ Long pay-back periods
- ▶ Investment priorities

MARKET STRUCTURE & SUPPLY CONSTRAINTS

- ▶ Transaction costs
- ▶ Split incentives
- ▶ Contract structures
- ▶ Regulatory constraints

INFORMATION GAPS & DECISION PROCESSES

- ▶ Information gaps
- ▶ Decision process

Solutions

- ▶ Accessing funding for property to enable environmental upgrades (e.g. NSW Office of Environment and Heritage Energy Savings scheme, Low Carbon Australia's Energy Efficiency Program and the Green Building Fund).
- ▶ Factoring the impact of a future carbon price into project costings can improve the attractiveness of energy efficiency projects and reduce payback projections.

- ▶ Energy service companies can aggregate small scale projects on behalf of building owners, therefore lowering the cost of assessment, planning and implementation of energy efficiency projects.
- ▶ An amendment to the Local Government Act enables councils to enter into environmental upgrade agreements with building owners and finance providers. Tenants benefit from energy savings while the loan is repaid through Council rates.
- ▶ Tenants can negotiate 'green leases' that minimise energy use in buildings they lease.
- ▶ Support regulatory change to enable cogeneration plants that can service a number of buildings, to maximise efficiencies.

- ▶ Sharing information and success stories through industry networks or business groups can raise awareness and commitment, and build community cohesiveness (e.g. Energy Savings Scheme).
- ▶ Build awareness campaigns to stimulate demand for energy efficiency equipment.
- ▶ Work with local trade organisations to familiarise members with the benefits of energy efficient equipment (e.g. the Energy Efficiency Training Program).

The Next Steps

This section focuses on the next steps to capturing the identified opportunities, including consideration of the ease with which each opportunity can be implemented, and important factors to consider when planning for implementation. For all opportunities, there is work to be done now – not just those that are relatively easy to implement. For those that require additional effort, work should be done to address the barriers they face, to ensure they can be captured by 2020.

Relatively easy to implement	More difficult to implement	Most effort to implement
<ul style="list-style-type: none"> ▶ Commercial energy waste reductions ▶ Commercial lighting ▶ Commercial retrofit elevators, appliances and electronics ▶ Commercial new build elevators, appliances, electronics, refrigeration and cooking 	<ul style="list-style-type: none"> ▶ Commercial HVAC ▶ Commercial insulations ▶ Commercial water heating ▶ Commercial refrigeration and cooking ▶ Cogeneration 	<ul style="list-style-type: none"> ▶ Construction of new builds to a 6-star (NABERS) equivalent ▶ Solar PV

Supporting Government and National Programs



Detail of available funding opportunities and support can be accessed from the full report, available on www.climateworksaustralia.org

This Plan, as well as the *Low Carbon Growth Plan for Australia* and ClimateWorks' other reports, can be accessed at www.climateworksaustralia.org.

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