Working Paper 2
October 2008

Building ClimateSmart in Queensland

Building and Regulatory Reform

A Premier's Council on Climate Change report

An initiative of the
Queensland Government

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Letter of commendation

Dear Premier,

Please find attached the Premier's Council on Climate Change second Working Paper on *Building ClimateSmart in Queensland – Building and Regulatory Reform*.

The report identifies opportunities that exist to achieve significant, cost effective greenhouse gas reductions from Queensland's built environment and for your administration to demonstrate national leadership in its response to climate change.

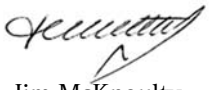
There is mounting evidence that the long term costs of inaction will far outweigh the costs of a prudent short term response to the challenge. Action to improve energy efficiency in the building sector now will deliver savings on energy bills for consumers. It will also ameliorate impacts of higher energy prices from the introduction of the proposed Carbon Pollution Reduction Scheme.

The report is comprehensive in its scope and considers both existing and new buildings in the commercial and residential sectors. Barriers to achieving greenhouse gas reductions are identified and a mix of regulatory and incentive based policy options is outlined for consideration.

I commend the report to you and if it is adopted by your government, suggest we engage with the Local Government Association of Queensland, energy providers and relevant industry bodies to ensure we achieve balance in our policy framework and effective partnerships in the implementation of these initiatives.

Finally, I must acknowledge the efforts and commitment of staff in the Office of Climate Change and Department of Infrastructure and Planning in research for and preparation of this report.

Yours faithfully



Jim McKnoulty
Premier's Council on Climate Change
and National President of Greening Australia

Premier's Council on Climate Change

The Premier's Council on Climate Change provides the Queensland Government with high-level strategic advice on climate change issues and actions.

The council first met in March 2008 and was commissioned by the Premier to advise the government on a long term climate change strategy for Queensland that:

- is informed by the best available knowledge about measures that Queenslanders can take, collectively and individually, to address climate change
- provides practical solutions to the problems that climate change poses for Queensland communities, industries and the environment
- maintains and enhances, where possible, Queensland's economic competitiveness
- generates new growth opportunities through innovation.

Specifically, the council was asked to provide high-level advice about:

- priorities for Queensland Government action to reduce Queensland's greenhouse gas emissions, including sectoral responses such as sustainable energy options, transport strategies and energy efficiency in the built environment
- mitigation and adaptation measures to assist Queensland communities and industries address the inevitable effects of climate change
- opportunities for innovation arising from climate change
- priority areas for investment though the Queensland Climate Change Fund
- major implementation issues with regard to any related measures
- Queensland's position in contributing to national policy setting and international negotiations.

The work program of the Premier's Council on Climate Change is facilitated by a number of working groups comprised of Council members. This paper was prepared by the Planning and Regulatory Reform Working Group with the assistance of staff from the Office of Climate Change and the Department of Infrastructure and Planning.

This document is Cabinet related and does not represent Queensland Government policy.

Executive summary

Queensland's built environment contributes significantly to the state's greenhouse gas emissions. In 2005 approximately 15 per cent, or 25Mt CO_2-e, of Queensland's emissions total of 159Mt CO_2-e came from the commercial and residential sectors. This figure largely comprises energy end use by building occupants, such as cooling and heating, water heating, lighting and appliance use.

Energy use and greenhouse gas emissions from the building sector are predicted to almost double by 2050 if current standards, practices and policies continue. The strong economic and population growth in Queensland has contributed to significant growth in demand in the building sector. Continuing to build and maintain inefficient buildings will compound the increasing energy requirements and greenhouse gas emissions from this sector.

Although the building sector will not be directly included in the Carbon Pollution Reduction Scheme, it will be affected by higher energy costs. Demand for electricity is relatively inelastic in the building sector[1] and increased electricity prices are unlikely to stimulate behaviour change. Accordingly, complementary measures are needed to drive energy efficiency and greenhouse gas abatement in the building sector.

Reducing energy consumption and improving building performance can lead to significant reductions in greenhouse gas emissions. McKinsey & Company's report on Australia's marginal abatement cost curve found that it is possible to reduce the building sector's greenhouse gas emissions by 60Mt at low or negative cost by 2030.[2]

This is supported by preliminary data from a Queensland marginal abatement cost curve, which indicates that all the energy efficiency measures modelled across the commercial and residential sectors in Queensland can be delivered at a net financial gain to the Queensland economy.

Measures such as improved insulation, commercial ventilation and water heating are all cost effective in the medium to long term, and deliver immediate benefits such as reduced energy bills.[3]

Despite the opportunities which exist to make significant savings, uptake and investment in these initiatives is often limited by barriers such as:

- the need for upfront capital expenditure
- split incentives between owners and occupiers
- a lack of consistent, reliable and clear information about the options available and their comparative features and potential benefits.

This paper considers a range of initiatives and policy options that the Queensland Government could implement to take advantage of cost effective opportunities to reduce greenhouse gas emissions in Queensland's built environment.

Why focus on buildings?

First things first—low hanging fruit

The relative importance of energy efficiency in delivering significant greenhouse gas reductions across the Australian economy has recently received great attention. Prime Minister Kevin Rudd stated that energy efficiency is the 'second plank' to drive Australia's emissions reduction, alongside the Carbon Pollution Reduction Scheme.[4] The United Nations Environment Programme has identified that the building sector is the 'lowest hanging fruit' in terms of abating emissions. It predicted that introducing relatively conservative efficiency regulations globally might deliver more than two billion tonnes CO_2-e, or close to three times the amount required under the Kyoto Protocol.[5]

The building sector can potentially make large cuts in emissions at low cost or net economic benefit. This paper will detail the specific potential for Queensland. As a growing state, the emissions from Queensland's building sector are predicted to continue to increase. The Queensland Government has an opportunity to take immediate action to reduce greenhouse gases in the building sector and ensure the greenhouse footprint of future growth is minimised.

Impact of the Carbon Pollution Reduction Scheme

The Australian Government recently released a Green Paper for consultation on the Carbon Pollution Reduction Scheme. While the building sector is not identified as a liable party or participant in the scheme, the flow-on effects will impact the sector through increased prices of electricity, gas, fuel, concrete and cement, and other building materials.

Assuming a carbon price of $20 per tonne, electricity prices are expected to rise by approximately 16 per cent in 2010–11 (approximately two cents per kilowatt hour).[6] The building sector's electricity demand is relatively inelastic, and analysis suggests that increased energy prices will not significantly reduce energy demand[7], or influence building design and construction. In the commercial sector, increased energy prices will have only a small impact because energy costs only represent approximately six per cent of total business costs. The Carbon Pollution Reduction Scheme is an inappropriate tool for stimulating additional investments to improve the commercial sector's greenhouse performance. Additional complementary measures will be required to unlock the abatement potential in this sector.

However, the effect of increased energy prices on the residential sector will be more substantial. Additional policy measures will be needed to support the uptake of energy-efficient measures and to protect the residential sector from the effects of increased electricity prices.

Queensland's growth—the population, the economy and the building sector

The expected scale and speed of Queensland's population growth and household formation to 2030 is unique among Australia's states and territories. Queensland's population grew by 1.6–2.4 per cent each year between 1996 and 2006[8], and is expected to increase to more than seven million by 2031.[9] This has put considerable pressure on the housing market, and increased growth in both the residential and commercial building stock.

The Queensland residential building sector has several notable characteristics.

- There are approximately 1.6 million private dwellings—76 per cent separate houses, 13 per cent units or apartments, and 7.5 per cent semi-detached or townhouses.[10]

> By using more energy efficient building design, lighting, air conditioning and hot water systems, all new and existing Queensland homes could potentially save 3.607 million tonnes of greenhouse gas emissions by 2020.
>
> *Queensland Marginal Abatement Cost Curve,* Supporting Data Table, The Nous Group and SKM, 2008.

- Approximately 40,000 new dwellings were approved in each year of the last five years, including 43,000 approved in 2007–08.[11]
- Approximately 33,000 new private dwellings are expected to be built every year until 2026.

In recent years, Queensland's strong economic performance has significantly increased the number of commercial buildings. The commercial building sector includes a range of buildings, such as retail, accommodation, offices, government administration and services. The commercial building sector has a number of key characteristics.

- In 2006–07, 5930 new commercial buildings were approved in Queensland, including offices, shops and industrial buildings, with a total value of more than $6 billion.
- Much of Australia's central business district stock was constructed in the 1970s and is now ready for retrofitting. Most of this stock performs poorly against sustainability benchmarks and greenhouse performance.

Continued growth in the Queensland economy will see the number of commercial buildings increase.

In both residential and commercial buildings retrofitting usually costs more than including design features and sustainable technology at the design and construction phases. Additionally, some design features, such as the building's orientation, cannot be retrofitted. Given the expected growth of Queensland's building sector, standard building practices must include cost-effective measures to improve the energy efficiency of buildings and reduce greenhouse gas emissions.

What is the business-as-usual case?

The building sector's growth is causing greenhouse gas emissions to rise. The building sector generates most of its greenhouse gas emissions through energy use. Buildings that are poorly designed result in occupants having increased energy use including cooling and heating systems, water heating, lighting and appliances. Continuing to build and maintain inefficient buildings that rely on air-conditioning and artificial lighting will compound the sector's increased energy requirements.

The built environment and its occupants contribute approximately 23 per cent of Australia's emissions total, or 130Mt CO_2-e per year.[12] In Queensland the percentage figure is lower but still significant. In 2005 the built environment and its occupants contributed approximately 15 per cent, or 25Mt CO_2-e, of Queensland's 159Mt CO_2-e emissions total.[13]

In 2005 the commercial and services sector contributed approximately 10 per cent, or 56Mt CO_2-e, of Australia's greenhouse gas emissions.[14] Increased economic activity and air-conditioning use has rapidly increased energy end-use in this sector.

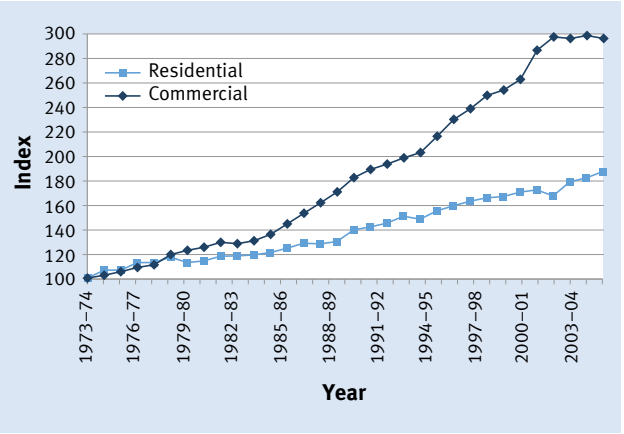
Each kilowatt of air-conditioning installed in Queensland costs up to $3000 in new energy infrastructure to meet peak demand. All electricity users share these costs. Continued use of traditional supply mechanisms to meet projected peak demand is expected to cost approximately $15 billion by 2020.

Ergon Energy, ENERGEX, Powerlink Queensland, Queensland Department of Mines and Energy, *Energy Conservation and Demand Management,* ENERGEX Limited, Brisbane, 2008.

The residential sector's emissions have also increased, though less rapidly, due to occupants' increasing use of energy-intensive appliances and air-conditioning. In 2005 the residential sector contributed 13 per cent, or 74Mt CO_2-e, of Australia's greenhouse gas emissions.

The figure below illustrates the increase in the building sector's energy end-use between 1973–74 and 2003–04.

Figure 1: Increases in the building sector's energy end-use: Index (1973–74 = 100)



Source: Centre for International Economics, *Capitalising on the building sector's potential to lessen the costs of a broad based greenhouse gas emissions cut,* Australian Sustainable Built Environment Council, Canberra, 2007.

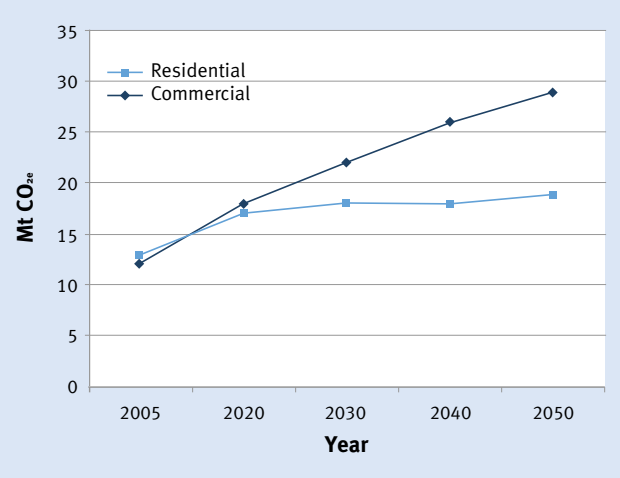
Following the historical trend, emissions from Australia's built environment are expected to grow to 278Mt by 2050. This prediction reflects the expected population growth, expansion in economic activity and trends in energy use, while accounting for improved building design and appliance efficiency.

Emissions in Australia's commercial sector are predicted to double by 2050, while the residential sector's emissions will increase by approximately 18 per cent.[15]

Similarly, emissions from Queensland's building sector will also increase. A report by Australia 21[16] predicts that emissions from Queensland's residential and commercial sectors will grow from 25Mt CO_2-e in 2005 to 48Mt CO_2-e in 2050 if current standards, practices and policies continue.

The following figure shows the predicted emissions growth of the building sector under Queensland's existing policy baseline.

Figure 2: Queensland's existing baseline projections for commercial and residential energy end-use



Source: Australia 21, "Australia 21 Queensland Government Climate Change Review, Stage 1 Report: Final', September 2007.

Maintaining a business-as-usual approach to building design will 'lock in' a significant greenhouse footprint from Queensland's building sector. This will then require costly retrofit as the need to reduce emissions becomes more urgent. By adopting improved standards for new buildings and accelerating the retrofit of existing stock, Queensland can significantly reduce this sector's emissions.

The building sector's effect on energy peak demand

Increased air-conditioner use in Queensland buildings has placed considerable pressure on energy networks. Air-conditioner use in the commercial and residential sectors is driving significant investments in energy infrastructure to meet peak demand. In recent years, peak demand period is associated with air-conditioner use on a hot summer day. Although this peak typically occurs only two to three days a year, distribution infrastructure is maintained to meet demand during this peak period.

The energy infrastructure investment required to maintain peak demand is expected to be approximately $15 billion by 2020. Because the price that customers pay for electricity comprises the cost of electricity generation, transmission, distribution and retailing, all electricity users share the costs of distribution network upgrades.

The economic and environmental costs of the business-as-usual case for the building sector's energy end-use and greenhouse gas emissions indicate that any opportunities available to address this challenge should be investigated. Improving the performance of new and existing buildings will reduce energy use through decreased use of air conditioning. Reducing our reliance on air conditioning will influence growth in peak demand and the subsequent costs to consumers.

What are the opportunities?

Growing evidence indicates that opportunities exist to significantly reduce greenhouse gas emissions by improving building design and adopting energy efficiency technologies. Many recent reports have identified that these measures not only offer significant potential to reduce emissions, but offer that potential at low cost or net benefit to the economy.

McKinsey & Company's report on Australia's marginal abatement cost curve identified that the building sector can potentially abate large volumes of greenhouse gas for low or negative costs. The building sector offers the third-greatest volume of abatement potential by 2030, behind the power and forestry sectors. However, the building sector has opportunities to achieve abatement at the lowest average cost, as upfront costs are offset by savings in energy costs and avoided costs associated with new infrastructure. Accordingly, each tonne of CO_2-e abated in the building sector provides a net economic benefit of $130.[17] This can be compared favourably with abatement in the power sector which costs $55 per tonne.

> The new Green Square North Tower in Fortitude Valley has a 6 star Green Star rating, focussing on energy efficiency and including cogeneration. It has reduced its carbon footprint from approximately 111kg CO_2 per square metre per year (under a 4 star Australian Building Greenhouse Rating) to 26kg CO_2 per square metre per year.
>
> Mark Sanders, Leighton Contractors Pty Limited, 2008, personal communication, 19 September.

McKinsey & Company found that by 2030 the building sector could reduce its greenhouse gas emissions by 60Mt, all at low or negative cost. Approximately 50Mt of these abatement opportunities will be available by 2020, and many can be implemented now. McKinsey & Company further noted substantial opportunities to reduce energy use and increase energy efficiency by improving commercial ventilation and air-conditioning, as well as residential water-heating systems. It also highlighted Australia's relatively low level of insulation as a specific opportunity for increased energy efficiency in residential and commercial buildings.[18]

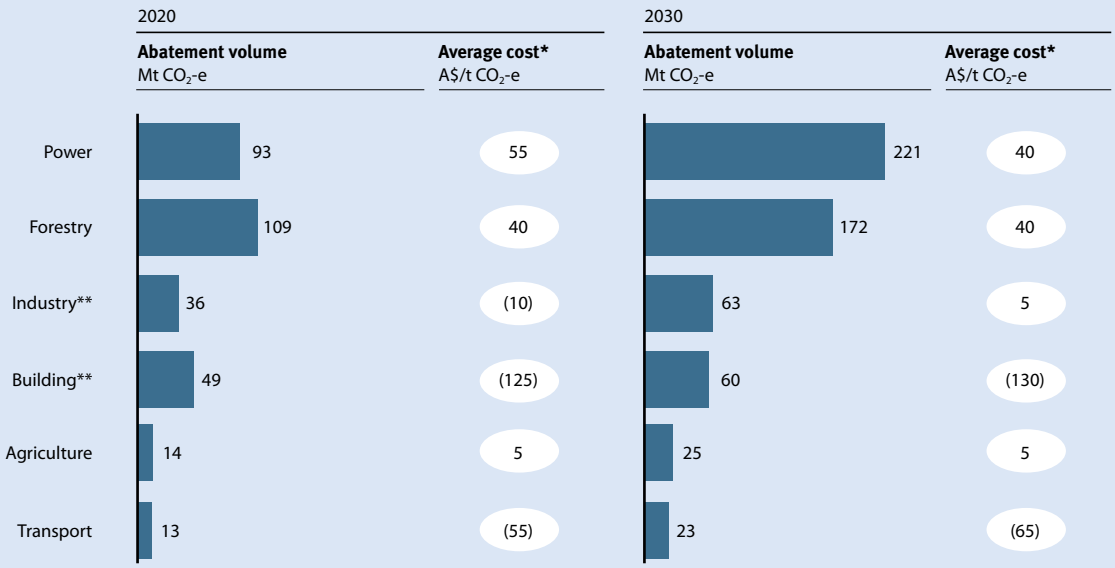
Figure 3 illustrates emissions abatement opportunities and costs by sector. While the building sector has lower abatement potential than the power and forestry sectors, the abatement comes at a net economic benefit rather than a cost.

The McKinsey & Company report stated that two key levers to achieve abatement outcomes in this sector are:

- better aligning incentives for occupiers and developers to improve energy efficiency
- implementing direct regulation to establish appropriate building codes and standards.[19]

McKinsey & Company's work shows that Queensland has the opportunity to achieve significant greenhouse gas savings for low cost by implementing an appropriate combination of regulatory and incentive-based measures.

Figure 3: Emissions reduction opportunities and cost by sector



* Volume weighted costs to the economy—does not necessarily represent loss of profit to individual businesses

** Opportunities in the building sector, and a proportion of those in industry, are measures to reduce energy demand and thereby indirectly reduce emissions in the power sector

Source: McKinsey & Company, *An Australian Cost Curve for Greenhouse Gas Reduction*, McKinsey & Company, 2008.

On a broader scale, The Allen Consulting Group analysed the cost benefit of a mandatory energy-efficiency program and calculated that implementing a program across Australia would result in a net economic benefit of $710 million.[20] Queensland's share of the benefit would be $200.6 million—the second highest of all the states—and would save 21PJ of energy and 2.794Mt CO_2-e.[21] Queensland's commercial and services sector would receive a net economic benefit of approximately $35 million.[22]

These figures are based on a three-year payback period and do not account for residential energy savings. The energy savings and economic benefit of a broader based energy-efficiency program that includes the residential sector are likely to be substantially hgher.

Most recently the Australian Sustainable Built Environment Council's report, *The second plank—building a low carbon economy with energy efficient buildings* found that fully realising the energy-efficiency potential of Australia's building sector would save the economy approximately $38 billion by 2050, and reduce greenhouse gas emissions by 30–35 per cent.[23]

As part of the review of the *ClimateSmart 2050* strategy the Queensland Government has commissioned the development of a Queensland specific marginal abatement cost curve. While this work is still in development, indicative data shows that all the energy efficiency measures modelled across the commercial and residential sectors in Queensland can be delivered at negative cost (Table 1)[24].

Table 1: Abatement opportunities and costs – Queensland residential and commercial sectors

Initiative	Total abatement potential to 2050 (Kilotonnes)	Cost per tonne of abatement (NPV to 2050)	Total potential NPV to 2050
Elevators – (Comm) Reduction in the energy demand of elevators through high efficiency drive systems.	181	-$823.49	$149,051,690
Office Equipment -(Comm) Reduction in the energy demand of office equipment through increased efficiencies.	2,197	-$132.91	$292,003,270
Lighting - (Res) Decrease in the energy demand from residential lighting through phasing out of halogen light bulbs.	2,653	-$110.84	$294,058,520
Cooking - (Comm) Reduction in the energy demand of commercial cooking through higher efficiency equipment and increased microwave use.	1,079	-$84.64	$91,326,560
Refrigeration - (Comm) Reduction in the energy demand of commercial refrigeration through high efficiency motors, reduced energy loss and regular maintenance.	3,749	-$47.45	$177,890,050
Water Heating - (Comm) Reduction in the energy demand of commercial water heating through increased efficiency.	6,054	-$42.64	$258,142,560
Lighting - (Comm) Reduction in the energy demand through high efficiency light source technology and installation.	4,437	-$41.47	$184,002,390
Air Handling – (Comm) Reduction in the energy demand of commercial air handling through efficiency improvements.	4,437	-$37.51	$166,431,870
Other Appliance Efficiency - (Res) Reduction in energy demand from more efficient appliances	7,739	-$26.56	$205,547,840
Heating (Res) – reduction in energy demand from residential heating.	6,511	-$16.96	$110,426,560
Space Heating - (Comm) Reduction in the energy demand of commercial space heating through efficiency improvements.	4,618	-$14.29	$65,991,220
Cooling - (Res) reduction in energy demand from residential cooling (insulation).	15,782	-$10.36	$163,501,520
Cooling/Pumping - (Comm) Reduction in the energy demand of commercial air cooling/pumping through increased efficiency.	19,407	-$8.41	$163,212,870
Water Heating - (Res) reduction in energy demand from residential water heating devices through increased efficiency.	25,351	-$0.98	$24,843,980
			$2,346,430,900

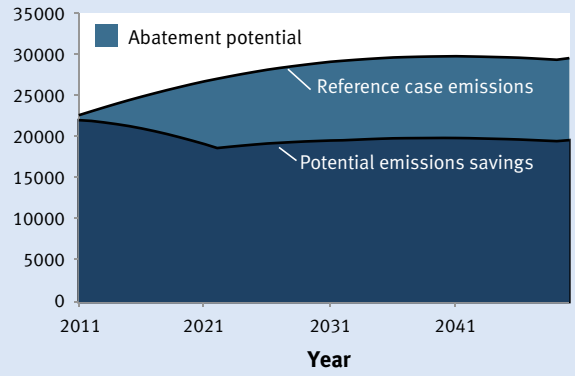
Source: The Nous Group, 'Draft Report – Queensland Marginal Abatement Cost Curve', October 2008.

The costs or benefits of the measures examined in the above table are economy wide costs or benefits per tonne of greenhouse gas emissions abated. These costs or benefits represent cumulative economy wide savings to Queensland with a net present value (NPV) of $2.3 billion out to 2050. The analysis of the specific energy efficiency opportunities indicates that all measures can be delivered at a net financial gain to the Queensland economy over this period. These cost savings are largely derived through ongoing energy savings to building owners and tenants. There are various options for Government to unlock these abatement opportunities ranging from low cost regulation and information programs to higher cost rebate or other incentive models.

While these measures represent significant economic benefit, they also have the potential to reduce emissions from this sector by up to 104Mt by 2050 (Figure 4), with 58Mt from residential buildings and 46Mt from commercial buildings.

An additional driver for improving the greenhouse performance of buildings is the growing market demand from commercial tenants for sustainable buildings. The Colliers International *Office Tenant Survey 2008* found that a building's environmental performance is an important consideration for new tenants. It rose in significance from the 14th most important consideration in office choice in 2005 to eighth most important in 2008.[25] Colliers' state director noted that larger tenants now expect a new building to have a minimum of 5-star Green Star rating.[26]

Figure 4: Princeton wedge (greenhouse gas abatement) from residential and commercial sector total electricity demand



Source: The Nous Group, 'Draft Report – Queensland Marginal Abatement Cost Curve', October 2008.

This evidence suggests that Queensland has the opportunity to introduce initiatives that will reduce the building sector's energy use and improve energy efficiency, as well as provide a net financial gain to the Queensland economy. These initiatives could be expected to deliver multiple benefits, including reduced greenhouse gas emissions, reduced energy costs for consumers (ameliorating the effects of higher energy prices from an emissions trading system) and savings from avoided energy networks upgrades.

What are the barriers?

Sufficient evidence exists that reducing the building sector's greenhouse gas emissions, by reducing energy use and improving energy efficiency, results in a positive financial benefit over time. Despite the evidence, barriers or market failures prevent these measures being implemented without suitable policy measures.[27]

The Carbon Pollution Reduction Scheme will be a primary driver of Australia's response to greenhouse emission reduction. However, many cost-effective improvements in energy efficiency may not be realised due to barriers and market failures which prevent the full uptake of the commercial energy-efficiency opportunities despite the price on emissions. These failures and barriers include information barriers, transaction cost inefficiencies, high upfront investment costs (despite the savings made over time), and split incentives between building owners and tenants.

The following table describes some key barriers relevant to the sector. It is drawn from a number of sources that have provided commentary about the barriers to reducing greenhouse gas emissions from the building sector.[28]

Table 2: Barriers to reducing emissions in the building sector

Barrier	Description	Examples
Information gaps	Market failures are created when there are problems or a lack of access to information on the type, availability, and appropriateness of sustainable technology and energy-efficiency measures. The lack of information can be an obstacle to investment.	The lack of information about the lifecycle costs, particularly the annual energy savings, of solar hot water systems may lead a purchaser to buy a cheaper electric system.
Split incentives	This is a situation where there is an incentive for a tenant to undertake certain actions (such as install technologies to reduce energy use) but are unable to act on the incentive because the landlord is responsible for making these decisions. This manifests as developers/landlords choose to install less efficient technologies that have a cheaper upfront cost rather than install a more efficient systems that deliver benefits to tenants/ occupiers.	Installing insulation while building adds to project costs but can provide savings on cooling and heating costs over time. Developers do not benefit from these savings. It is much cheaper for a landlord to install an electric hot water system than a solar hot water system. Over the life of the system, the cost of the solar technologies are lower, but the tenant would receive the savings, not the landlord.
Bounded rationality	Individuals and firms are limited in their ability to use, store and analyse the vast quantities of data and are not always able to make optimum decisions.	A building manager may be assessing priorities for a major retrofit of a building. Due to the large number of decisions needed and their individual capacity to access and interpret information about technologies, the manager may not incorporate the best or most cost effective measures.
Regulatory barriers	Regulatory barriers may be unintentional, i.e. regulation is developed for an unrelated purpose but has unintentional impacts on energy-efficiency measures. Some regulations can favour energy inefficiency and provide a perverse incentive to adopt inefficient technology.	Community covenants that regulate black roofs and restrict the use of solar technologies. Body corporate provisions that are designed to improve governance can impede entry into energy performance contracts. Electricity market rules and pricing policies can favour centralised generation over on-site generation.

The government is able to address many of these barriers for little or no cost. The Queensland Government has already taken action to remove some of the barriers and encourage a more sustainable building sector which has been generally well received by both industry and the community. This paper will explore in more detail some specific complementary options for addressing barriers and unlocking additional opportunities to reduce the greenhouse gas emissions from the Queensland building sector.

What has Queensland already done?

The focus of the government's actions to improve the greenhouse performance in the building sector has largely been through mandatory requirements for new buildings in the residential sector. Currently, few eco-efficiency requirements apply to the existing housing stock, with the exception of some mandatory water-efficiency features required during major renovations, such as 3-star showerheads and toilets. Regulatory requirements for commercial buildings are very limited. There are also a number of voluntary, incentive-style initiatives aimed at the residential sector.

The following table outlines the main initiatives that the Queensland Government has implemented or announced.

Table 3: Initiatives implemented or announced by the Queensland Government

Existing residential

- Electric hot-water system phase-out– involving Class 1 buildings in gas reticulated areas, to be replaced by a greenhouse-efficient system (gas, solar or heat pump) from 2010
- ClimateSmart Homes Service—an energy audit involving the installation of 15 compact fluorescent light bulbs, 3-star shower rose and an energy use monitor for $50 (voluntary)
- Solar Homes Program—the Queensland Government's tender for a bulk supply of 1000 1-kW photovoltaic panels reduced the installed costs for householders to $185 when combined with federal rebates (voluntary)
- Solar Bonus Scheme—a feed-in tariff that pays residential consumers for energy they contribute to the electricity grid from solar panel systems (voluntary)

New residential

- Queensland Development Code—requirement for all new houses, townhouses and terrace houses to comply with the following:
  - certain water-efficiency features
  - energy-efficient lighting in 40 per cent of the floor area
  - greenhouse gas–efficient hot water systems
- A mandatory, minimum, 3.5–4-star energy equivalence efficiency rating—for new detached houses (Class 1 buildings)

Existing commercial

- Mandatory alternative water sources—required for certain commercial buildings

New commercial

- Mandatory 4-star energy efficiency—required for new commercial buildings from 2010

As the above table demonstrates, few regulatory or voluntary measures currently target commercial building and multi-residential sectors, and few regulatory measures are aimed at Queensland's existing housing stock.

Feedback from the *Sustainable Housing discussion paper*

The current discussion paper on sustainable housing outlines the range of additional requirements for new dwellings that are currently being considered.[29] These include:

- investigating a mandatory, minimum 5-star (out of 10) energy equivalence–efficiency rating for new multi-residential buildings
- increasing energy-efficient lighting requirements from 40 per cent to 80 per cent
- introducing additional water-efficiency measures.

If implemented, these measures will bring Queensland in line with national standards and those adopted by other states. However these measures do not take full advantage of the significant opportunities to deliver cost effective emissions reductions from the building sector or provide a buffer to energy price increases for building owners and tenants.

The Department of Infrastructure and Planning has provided a summary of the feedback on the *Improving Sustainable Housing in Queensland: Discussion Paper.* Submissions were received from 284 individuals and organisations, including detailed written submissions from 51 industry and key stakeholder groups, such as building, planning, design, manufacturing and conservation groups.

Almost all the proposed measures received a high level of community support of 59–95 per cent, except a voluntary sustainability declaration.

Most measures also received broad industry and stakeholder support. However, several respondents suggested that some proposals, such as the minimum star rating for pool pumps and the ban on selling or installing inefficient air-conditioners, might be more effective as a national approach.

Some stakeholders also commented on potential financial implications, implementation barriers or technical difficulties, and increased technical training requirements that related to some measures, including the ban on selling and installing inefficient air-conditioners and the phase-out of electric hot water systems. Several stakeholders commented on the financial implications and legal liability issues surrounding the mandatory disclosure option, and they made numerous suggestions about altering its content.

The investigation of requiring photovoltaic cells to be installed on large houses was a more controversial measure that polarised many stakeholders. Some industry groups were opposed to this proposal, while others indicated in-principle support subject to further details. Several organisations advised that cost could be a barrier and called for further government rebates and financial incentives.

The consultation results indicate the high level of community support for mandatory sustainability measures. This support suggests that the time is right to adopt measures with greater potential to reduce energy use, improve energy efficiency and reduce greenhouse gas emissions in the building sector. The following investigation of measures adopted by other jurisdictions illustrates the types of options used elsewhere that could assist Queensland to take advantage of the opportunities to deliver greenhouse gas reductions from the building sector.

What have other states and countries already done?

Nationally and internationally, other jurisdictions are recognising the benefits and opportunities associated with improving energy efficiency and reducing energy use in their building sectors. They are implementing a large number of regulatory, voluntary and market based complementary policy measures to reduce emissions from the building sector.

The following table lists initiatives adopted elsewhere that represent possible opportunities for the Queensland Government to position itself as a world leader in reducing greenhouse gas emissions from the building sector.

Table 4: Initiatives adopted by national and international jurisdictions

Existing residential

- Energy efficiency trading scheme—NSW, SA, Vic, UK, Italy, France, Belgium, California
- Stamp duty rebates for purchasers who implement sustainable technology on properties—US states and UK
- Mandatory solar hot-water system replacement—Spain
- Mandatory disclosure of energy-efficiency ratings—ACT and UK
- Phase-out of importing incandescent light bulbs—national
- Energy-efficient air-conditioning—California (US)

New residential

- Energy efficiency trading scheme—NSW, SA, Vic, UK, Italy, France, Belgium, California
- 5-star standards applying to new houses and major renovations—ACT, SA, Vic, WA
- 5-star standards applying to multi-residential buildings—Vic
- Incentive schemes for installed self-generation—California (US)
- Network charge for installing energy-intensive technology—California (US)
- Carbon-neutral housing through standards and incentives—UK
- Low carbon buildings program—UK
- Equivalent 7-star ratings for houses and units—UK, California (US), Canada
- Mandatory solar hot-water and solar panels for houses over 100 square metres—Spain
- Mandatory energy-efficient air-conditioning—California (US)

Existing commercial

- Energy efficiency trading scheme—NSW, UK, Italy, France, Belgium, California
- Retrofit incentives for small to medium-sized commercial buildings—Canada
- Mandatory solar hot-water system replacement—Spain
- Energy performance certificates—UK
- Retro-commissioning guidelines to improve energy performance—California (US)
- Mandatory disclosure schemes requiring vendors and lessors to disclose the energy efficiency of certain commercial buildings, including office buildings—national

New commercial

- Energy efficiency trading scheme—NSW,UK, Italy, France, Belgium, California
- Facilitated approval process for high-performance buildings—US cities and states including California, North Carolina, New York
- Mandatory 4-star rating for large commercial buildings—Vic
- Headworks charge for installing energy intensive technology—California (US)
- Mandatory solar panels on large commercial buildings—Spain
- Mandatory solar hot-water systems—Spain
- Low carbon buildings program—UK
- 7-star green building standards–California (US)

Options to consider

Analysis of the issues, barriers and opportunities, as well as other jurisdictions' experiences highlights the range of policy options available to help improve the Queensland building sector's energy efficiency and reduce its greenhouse gas emissions. The following table summarises the options.

Table 5: Options for reducing greenhouse gas emissions in the building sector

Existing residential

- Energy efficiency trading scheme
- Stamp duty rebates for purchasers who improve housing energy efficiency within 12 months of purchase
- Mandatory energy-efficiency features for houses that install energy-intensive technology, e.g. air-conditioning or a swimming pool
- Amended body corporate legislation to enable energy-efficient building management
- A mandatory sustainability declaration by property owners with dwellings offered for sale, with training for real estate agents
- An expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues

New residential

- Energy efficiency trading scheme
- Mandatory 5-star standards to apply to new houses and major renovations, increasing to 7-star by 2015
- Mandatory 5-star standards for multi-residential buildings by 2010, increasing to 6-star by 2015
- Mandatory offsetting for houses that install energy-intensive technology, e.g. more than 2.5kW of air-conditioning or a swimming pool
- Energy infrastructure charges with flexible developer incentives for energy-efficient building
- Amended body corporate legislation to enable energy-efficient building management A mandatory sustainability declaration with training for real estate agents. An expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues

Existing commercial

- Energy efficiency trading scheme
- Amended body corporate legislation to enable energy-efficient building management
- An expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues

New commercial

- Energy efficiency trading scheme
- Removal of the approval barriers for high-performance buildings
- Standards for commercial buildings, i.e. moving to mandatory 5-star ratings
- Energy infrastructure charges with flexible developer incentives for energy-efficient building
- Removal of barriers to on-site energy generation on large commercial buildings
- Amended body corporate legislation to enable energy-efficient building management
- An expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues
- Submetering in all new commercial buildings

Options in detail

Energy efficiency trading scheme

Existing residential	New residential
Existing commercial	New commercial

Greenhouse gas savings potential: high

Three Australian states (Victoria, New South Wales and South Australia) have announced mandatory energy efficiency trading schemes[34] to commence in 2009 as complementary measures to the Carbon Pollution Reduction Scheme. Energy efficiency trading schemes are used to harness the innovation capacity of the private sector to find cost effective methods of delivering energy efficiency results. In the absence of a national scheme, the Queensland Government could similarly consider an energy efficiency trading scheme to achieve energy savings in the residential and commercial building sectors.

An energy efficiency trading scheme[30] is a market based instrument that sets a target for energy efficiency or energy savings. The scheme can be structured to deliver the energy efficiency gains in various sectors e.g. residential, commercial and industry by creating tradeable certificates.

An energy efficiency trading scheme places requirements on electricity retailers to meet targets by sourcing certificates. A retailer can create a certificate by engaging in activities that reduce energy use or improve energy efficiency in residential and commercial buildings. This might involve providing ceiling insulation in housing, replacing old appliances or installing energy efficient hot water systems.

Energy efficiency trading schemes can operate in conjunction with emission trading schemes to deliver many cost-effective improvements in energy efficiency, that due to market failures and barriers, are not delivered through a price on carbon. These failures and barriers include information gaps, transaction cost inefficiencies, high upfront capital costs caused by retail supply chain inefficiencies (despite savings made over time) and split incentives between building owners and tenants. An energy efficiency trading scheme can effectively deal with the market failures and barriers that prevent the full uptake of the commercial energy efficiency opportunities created by the price on emissions.

An energy efficiency trading scheme can be designed in a number of ways. The schemes in other states have varying characteristics.

- New South Wales' scheme covers residential, commercial and industrial energy use, except trade-exposed, emissions-intensive industries.
- Victoria's scheme covers electricity and gas used by residential customers with a target of 2.7Mt of greenhouse gas reductions per year for 2009–11.
- South Australia's scheme covers residential electricity and gas with a specific requirement to achieve a portion of the target in low income households.
- The key driver for all three schemes is to deliver energy efficiency improvements and minimise the impact of energy price rises expected as a result of the Carbon Pollution Reduction Scheme.

New approval process for high-performance buildings

New commercial

Greenhouse gas savings potential: medium

Proponents planning to build high-performance buildings experience significant difficulties in obtaining development approvals, which causes delays in approval times and increases holding costs. The holding costs for undeveloped land due to project delays are a substantial disincentive for developers to build high-performance buildings. The barriers include:

- planning scheme provisions that are not designed to allow sustainable development, for example, building height restrictions that prevent the installation of sustainable technology such as embedded generation or rainwater tanks on the roof
- local government assessment officers who lack the skills and experience to assess new technology and non-standard design
- the rigid application of acceptable solutions as standards rather than guidelines.

To overcome these barriers and encourage the development of high-performance buildings, developments that meet defined criteria, such as the Green Building Council of Australia (GBCA) 6-star Green Star rating system, could follow an alternative approval track. At the start of the application process, the proponent would identify either that the development was a standard development, which would proceed under the usual process, or that it was a high-performance project, which would be assessed under the alternative track. The GBCA system can conduct an assessment of a building design to determine a star rating on the building performance.

To overcome the barrier of lack of skills and experience, an expert panel would be utilised as required to conduct the assessment of the development application. As it would not be possible to convene an expert panel for every local government, the state government should initially undertake the task. Accordingly, the state would have the power to make binding recommendations for approval, including overriding any planning scheme or local government prohibitions that prevented the project achieving a 6-star rating, such as building height restrictions. The assessment manager would be required to implement the panel's recommendations in deciding the development application.

These powers would be carefully designed so that the state government could only override planning schemes where necessary to achieve the 6-star rating. For example, it may relax a building height restriction to allow the installation of rooftop ventilation, chilled beam technologies, a water collection system or solar panels. This process would preserve the integrity of the planning system by preventing, for example, applications for a 20-storey building in an area with a six-storey height limit on the grounds that it was high performance.

Some cities in the United States have implemented 'fast-track' approval systems for buildings that meet green building standards, usually under the LEED (Leadership in Energy and Environmental Design) Green Building Rating System. Coupled with stricter base requirements for environmental performance, this has led to a large increase in new sustainable buildings in many cities.

Queensland has a precedent for alternative approvals systems for state significant development under the *Urban Land Development Authority Act 2007*. The state-significant system exists to encourage and facilitate large development of economic importance to Queensland. One purpose of the Urban Land Development Authority is to provide a range of housing options to meet diverse community needs, including affordable housing. Similarly, the purpose of this alternative high-performance approval system would be to encourage more 6-star, world's best practice buildings in Queensland to deliver the associated benefits of improved energy and water efficiency.

5-star standards for new houses (Class 1) and major renovations, moving to 6-star by 2010 and 7-star by 2015

New residential

Greenhouse gas savings potential: high

Under Stage 2 of Sustainable Housing, all new houses and major renovations of housing would be built to a 5-star energy equivalent rating. Requiring new houses to have a 5-star rating is a positive step towards improving the energy efficiency of new Queensland houses.

As the Building Code of Australia already establishes a 5-star standard, this will bring Queensland in line with current national standards. Queensland then has the opportunity to take a leadership role and adopt a policy of continuous improvement by regulating higher performance standards over time, moving to 6-star in 2010 and 7-star in 2015. While the effect would need to be costed, this should include an examination of the operating costs that demonstrate how the improved standards offset the upfront capital costs. A 7-star demonstration house built in Camberwell, Victoria cost only five per cent more than a 5-star design.

Much of the feedback on the Sustainable Housing discussion paper supported the Queensland Government moving beyond the national 5-star standard in order to reduce greenhouse gas emissions and reduce household energy costs. Improving the performance of building can be achieved without significant increases in cost. In partnership with the Queensland Government, Tamawood homes have developed a 5-star housing product (three bedroom, low set project home) that can be delivered to market at $103,000. Under the Victorian Government's Sustainable and Affordable Home Initiative, four architectural firms designed homes to meet a minimum 6-star rating, for environmentally sustainable design for a building cost of less than $150,000. Therefore, the potential exists to achieve both affordability and energy efficiency in new dwellings.

5-star standards for multi-residential (Class 2) buildings by 2010, moving to 6-star by 2015

New residential

Greenhouse gas savings potential: high

Multi residential buildings typically deliver poor environmental performance. There is significant growth in this type of building with multi residential buildings expected to account for up to 80 per cent of new housing stock in Brisbane between now and 2026. Multi residential buildings are also more difficult to retrofit than houses.

A recent Property Council of Australia report presented evidence that high-density buildings consume more energy per person than some low-density dwellings. It stated that the current design of high-density buildings leads occupants to rely on air-conditioners and elevators, and require lighting in common areas.[31]

Given the need to increase urban densities, it will be important to ensure that multi-residential buildings are more energy efficient and deliver improved greenhouse performance. Incorporating good design principles, sustainability features, energy efficient communal infrastructure and equipment can deliver improved greenhouse performance over the life of the building.

Stage 2 of Sustainable Housing proposes that in the coming year, the Queensland Government will investigate raising the minimum energy equivalent rating requirements for new units in Queensland from 3.5–4-star (depending on climate zone) to 5-star.

Given the opportunities presented by this building type it is proposed that the government commit to introducing 5-star standards by 2010 and further, to increase these standards to 6-star by 2015. Currently, Victoria leads multi-residential unit standards in Australia with mandatory 5-star standards. This would bring Queensland in line with world's best practice, demonstrated in the United Kingdom, Canada and California.

Improving standards for commercial buildings, moving to mandatory 5-star by 2010

New commercial

Greenhouse gas savings potential: high

In June 2007, the Queensland Government committed to making 4-star standards for commercial buildings mandatory by 2010. While this is an important step, 4-star now reflects what is essentially best practice in the commercial building sector. There is an opportunity to achieve continuous improvement by indicating an intention to introduce a step-wise approach to mandatory 5-star standards by 2010.

The design of commercial buildings is crucial in achieving energy efficiency, particularly in reducing air-conditioning and air-handling (ventilation) load. This can include design measures such as sunshades, thermal performance of the building shell, and building around atriums to improve ventilation.

This area also represents a significant opportunity for the government to demonstrate leadership as the owner of many commercial buildings. The current policy is for all new government buildings to meet 4.5-star standards. As the government is not captured by the 'split incentives' dilemma and will benefit from making the upfront capital investments through lower ongoing running costs, it is proposed that the government review the standards applied to new government buildings with a view to increasing them to 5–6-stars immediately.

Removing barriers to on-site energy generation

Existing commercial | New commercial

Greenhouse gas savings potential: medium

New and existing commercial buildings and large scale commercial developments provide significant opportunities for on-site energy generation. Many commercial buildings already have existing electricity generating capabilities associated with basement located uninterruptible power supply systems, usually in the form of diesel generators. An opportunity exists for such systems to be converted to gas and operate on a more regular basis to assist with meeting peak electricity demands. Opportunities also exist for using commercial building roof space to house large photovoltaic (solar) systems. The output of a photovoltaic system matches closely the electricity demand load profile of commercial buildings, largely associated with air-conditioning.

Generating electricity on site through either gas or renewable fuel sources improves the greenhouse performance of a building. On site generation also provides additional benefits from avoided distribution and transmission costs associated with the more traditional centralised model of providing energy. Other benefits include:

- improving supply reliability to building operators and occupants
- reducing the overall building energy consumption and carbon footprint , especially when coupled with building energy efficiency
- providing surplus electricity to the grid
- reducing the need for new investment in energy infrastructure[32]
- reducing peak electricity loads on the network[33].

The most recent example of on-site generation in Queensland is the new Green Square North tower in Fortitude Valley. This development incorporates on-site gas generation which in addition to energy efficiency measures has reduced the carbon footprint of the development from 111kg CO_2-e per square metre per year (average 4-star building) to 26kg CO_2-e per square metre per year.

While there are no real technical or regulatory barriers to installing on-site generation in commercial buildings, there are other barriers to uptake, including:

- awareness and guidance – there is limited understanding in local councils of the issues (eg. managing air quality and noise) and solutions for assessing on-site generation technologies
- experience and examples – there is an element of uncertainty around performance and appropriateness of low emission on-site energy generation technologies with few actual examples of commercial type systems connected to the grid
- connections and agreements - there is a lack of standardisation of grid connection agreements.

In order to increase uptake of on-site generation to deliver greenhouse gas reductions from commercial buildings, it is suggested that the government develop planning and assessment guidelines to be used by local government and the development industry on the

appropriate application and use of on-site generation technologies. In relation to connections to energy infrastructure it is suggested that Ergon and Energex be required to develop standard technical guidelines and connection agreements for on-site generation. Together these measures will provide the transparent information to local governments and the development industry.

Offsetting for houses installing energy-intensive technology

Existing residential (Class 1)	New residential (Class 1)

Greenhouse gas savings potential: medium

Houses that install energy-intensive technology, such as a swimming pool or more than 2.5kW of air-conditioning, could be required to offset their increased energy demand through energy-efficiency improvements or a reduced reliance on centralised generation. For example, the owner of the technology could:

- install on-site generation, such as solar panels, or a solar hot water system to offset the energy requirements of the energy intensive technologies; or
- improve the energy-efficiency performance of the house, through insulation, glazing or other actions to achieve for example a 6-star energy-efficiency rating.

The Sustainable Housing discussion paper suggests investigating requiring solar panels on large houses. While this was generally well received during the submission period, a more performance based approach targeted at reducing energy demand in a household through various technologies may be more effective and equitable.

A similar precedent has been set recently under the south-east Queensland water restrictions, where dwelling owners who wish to install a new pool or spa are required to install a number of water-efficiency features and to source water from non-drought affected areas.

Energy infrastructure charges—flexible developer incentives for energy-efficient buildings

New residential (multi-residential)	New commercial

Greenhouse gas savings potential: medium

Poorly designed buildings have higher energy usage and often require significant investments to provide additional energy network infrastructure. As discussed previously, every one kilowatt of air conditioning costs up to $3000 in new energy infrastructure to meet peak demand. Based on this a new 100 unit multi-residential complex with two 2kW air-conditioners in each unit, will cost in excess of $1 million for energy infrastructure to meet peak demand. The cost of this additional infrastructure would be shared by all electricity users.

A system of infrastructure charges for the provision of water and waste water has been established which ensures appropriate developer contributions to these costs. Similarly consideration should be given to establishing flexible arrangements for energy infrastructure charges to encourage higher performance buildings and reduce energy network costs.

This measure would act as a disincentive to the development of inefficient buildings. For example, some multi-residential buildings are designed in such a way that they need air-conditioning for comfortable living. Flexible energy infrastructure charges would encourage developers to explore alternatives to energy-intensive technology when designing new housing.

Energy infrastructure charges could be scalable depending on the amount of on-site generation and the energy efficiency performance of the development. This would ensure a positive incentive to improving building design.

Stamp duty rebates for installation of energy efficient technology

Existing residential

Greenhouse gas savings potential: medium

Another incentive to improve the greenhouse performance of Queensland's existing housing stock could be the provision of stamp duty rebates for the purchase and installation of energy efficient technologies.

On average, residential properties change owners every seven years. An energy-efficiency incentive linked to housing purchase will encourage purchasers to consider the operating costs of a dwelling. Also, limiting the rebates to measures installed within 12 months of purchase means the incentive does not affect housing prices.

The rebate could be based on a graduated scale, determined by the energy efficiency gains from installing a specified range of measures. For example, replacing all incandescent and halogen light fittings with compact fluorescent bulbs would not receive as high a rebate as installing a solar hot water system or retrofitting ceiling insulation. The scheme must be presented simply to be easily understood and accessed by home owners.

The scheme should apply fully to residential housing stock built prior to the 2006 Queensland Sustainable Housing Code, which mandated certain sustainability technologies in new housing. For houses built after this, the scheme should apply only to sustainable technologies not mandated under the code. The rebate would be once off and not available on subsequent purchases of the measure installed.

This measure could also help to overcome the barrier of the split incentive, by providing a financial incentive for property owners to invest in energy efficiency technologies even though they do not receive the direct benefits from the energy savings.

Similar schemes targeting sustainable housing have been introduced or are being proposed in the United Kingdom and the United States. In the United Kingdom, stamp duty rebates are offered for new sustainable housing stock that meets specific standards under legislation. Based on the success of this scheme, and recognising that stamp duty reductions or rebates can encourage energy efficiency, the United Kingdom is now considering providing stamp duty rebates on existing housing stock. These rebates would be based on the recommendations of the Energy Performance Certificate within 12 months of moving in.[34]

This proposal operates differently to an energy efficiency trading scheme as it does not place an obligation on a third party. Instead, it is designed to provide an incentive to property owners to install energy efficiency technology. Additionally, the cost of this proposal would be borne by the government, rather than the energy retailers who gain a benefit from energy efficiency through avoided costs. This proposal is not likely to operate effectively with an energy efficiency trading scheme. Initial research suggests that an energy efficiency trading scheme is a more efficient mechanism to improve energy efficiency in building stock than a rebate system and the costs to government and consumers of the two alternatives will need to be considered.

Amended body corporate legislation to enable energy-efficient building management

Existing residential	New residential
Existing commercial	New commercial

Greenhouse gas savings potential: low

Some provisions of the *Body Corporate and Community Management Act 1997* (the Act) have unintentionally created barriers to implementing energy-efficiency measures. For example, a multi-residential building under body corporate management cannot:

- install solar panels as there is no means of ownership
- enter into energy performance contracts with energy providers to improve energy efficiency in a multi-residential building.

It is proposed that the Body Corporate Act be amended to ensure that there are no provisions that create unintentional barriers to more energy efficient building management. The Act could also be reviewed more broadly to consider ways to encourage energy-efficient practices in body corporate and community title schemes. Queensland currently has more than 35,000 body corporate schemes operating, comprising more than 324,000 lots. This number has increased significantly in the past decade and will continue to rise with new housing and higher density living arrangements. One option to encourage sustainable housing technology is to set requirements for design standards and appropriate ongoing maintenance in the Community Management Statement.

Additionally, the Sustainable Housing discussion paper outlines the possibility of regulating to prevent covenants in body corporate and community title schemes that discriminate against energy-efficient design and technologies. The discussion paper notes that some developers and councils use residential estate covenants and body corporate or community title rules that restrict energy-efficient household design principles, and water and energy-efficient fixtures. For example, priority may be given to visual amenity and aesthetics, which restricts homeowners using light colours on roofs and external walls, orientating the building (such as building garages on the western side of the house) and installing roof-mounted, solar hot-water systems. The government could consider regulatory provisions, potentially through the Act, which prevent covenants of this nature and the operation of existing covenants.

Supporting sustainability declaration implementation

Existing residential

Greenhouse gas savings potential: low

Stage 2 of Sustainable Housing proposes a mandatory sustainability declaration. The declaration will help people to identify a home's sustainability features when buying, renting or selling. It is proposed to be a simple process that homeowners can complete themselves. The sustainability declaration could be further augmented with a points system to provide more information about the comparative value of various measures. Initially this could be limited to water and energy efficiency, and then potentially include other sustainability measures.

It is also noted that the Federal Government has announced intentions to introduce mandatory sustainability declarations for residential buildings and some commercial buildings.

To facilitate the introduction of these measures it is proposed that the Queensland Government provide support to the real estate industry to train agents to assist homeowners and lessors with filling out the declaration. The agents' service would be free so that it does not add to the transaction costs of property purchase. However, liability for declaration accuracy must rest with the vendor or lessor to prevent potential professional indemnity claims against real estate agents.

The training should incorporate information on how design features can improve energy efficiency and reduce a building's greenhouse gas emissions. Additionally, the training should promote that sustainability features add value to a property over the life of a building, such as savings on energy and water bills. This builds capacity in the property market to place the appropriate value on sustainability technology in our existing housing stock. Property valuers could also undertake the training to help incorporate sustainability features into the value of a property.[35] Real estate agents and valuers would be encouraged to promote the ClimateSmart Homes Service as a cost-effective way for homeowners to improve the sustainability and attractiveness of their property to the market.

The training could build on a previous program about energy efficiency and sustainability of properties, which the Environmental Protection Agency undertook in partnership with the Real Estate Institute of Queensland. Real estate agents were given a checklist to use to assess properties on energy and water-efficiency technologies, and orientation.

An expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues

Existing residential	New residential
Existing commercial	New commercial

Greenhouse gas savings potential: low

Currently the Planning and Environment Court hears disputes over planning decisions that relate to sustainability issues. This expensive and lengthy process creates a disincentive to challenge an assessment manager's decision that prevents the implementation of sustainable design or sustainable technologies. As a part of the review of the *Integrated Planning Act 1997*, the Building and Development Tribunal's jurisdiction is proposed to be expanded to hear a wider range of disputes.

The review could empower the Building and Development Tribunal to hear disputes where a sustainable building cannot be approved due to a restriction within the planning scheme, such as building height restrictions. This would significantly reduce appeal costs in a dispute situation. However, this expanded jurisdiction is unlikely to be widely used if the government implements the previous option to facilitate approvals for high-performance buildings.

Mandatory submetering in all new commercial buildings

New commercial

Greenhouse gas savings potential: low

Currently most commercial buildings have a single meter and tenants share the costs of electricity on the basis of floor area. This creates a disincentive for individual tenants to reduce their energy consumption, as they do not directly benefit from the energy savings. Regulation is needed to ensure that all new commercial buildings contain submeters for each tenancy. Tenants can then receive information on their energy use, be responsible for their own energy costs and receive the direct benefit of energy savings. Water submetering has been required in all new commercial and multi-unit residential buildings since 1 January 2008.

Recommendations

The Council recommends that the Queensland Government consider a package of policy options that will maximise opportunities to deliver cost effective greenhouse gas reductions in the building sector and cost savings to property owners and tenants.

The options can be classified into three categories: low-risk options that remove barriers, options that represent policy change or involve some cost, and innovative options that represent world's best practice.

Low-risk or low-cost options to remove barriers

- Removing barriers to on-site energy generation (greenhouse gas savings: medium)
- Amended body corporate legislation to enable energy-efficient building management (greenhouse gas savings: low)
- Supporting sustainability declaration implementation (greenhouse gas savings: low)
- Expanded Building and Development Tribunal jurisdiction to hear disputes on sustainability issues (greenhouse gas savings: low)

Options that represent policy change or involve some cost

- New approval process for high-performance buildings (greenhouse gas savings: medium)
- Mandatory 5-star standards for new houses and major renovations, increasing to 7-star by 2015 (greenhouse gas savings: high)
- Mandatory 5-star standards for multi-residential buildings by 2010, increasing to 6-star by 2015 (greenhouse gas savings: high)
- Standards for commercial buildings, moving to mandatory 5-star (greenhouse gas savings: high)
- Submetering in all new commercial buildings (greenhouse gas savings: low)

Innovative options that represent world's best practice

- Energy efficiency trading scheme (greenhouse gas savings: high)
- Stamp duty rebates for installation of energy efficient technology (greenhouse gas savings: medium)
- Offsetting for houses that install energy-intensive technology, such as more than 2.5kW of air-conditioning or a swimming pool (greenhouse savings: medium)
- Energy infrastructure charge—flexible developer incentives for energy-efficient buildings (greenhouse savings: medium)

The council recommends that the Queensland Government consider adopting the full range of low-risk options as soon as possible. Further, the government should fully investigate the options that represent policy change or involve some cost, and cost them for implementation as soon as possible. This would give Queensland's building sector a strong leadership position in Australia. Additionally, the Queensland Government should consider the innovative options that represent world's best practice to take full advantage of the benefits of reducing energy use and improving energy efficiency in the building sector.

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