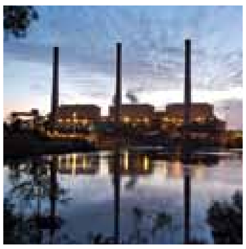
Information Paper
August 2011

Queensland's emissions profile

National Greenhouse Gas Inventory



A Premier's Council on Climate Change information paper

An initiative of the
Toward Q2 Tomorrow's Queensland
Queensland Government

The information contained in this paper is current as at August 2011. Readers should be aware that some information may be superseded as a result of further policy developments and/or scientific studies.

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Premier's Council on Climate Change

The Premier's Council on Climate Change was formed in late 2007 to provide the Queensland Government with high-level strategic advice on climate change issues and actions.

The Council is chaired by the Premier of Queensland and Minister for Reconstruction, the Hon Anna Bligh MP. The Deputy Chair is the Minister for Environment, the Hon Vicky Darling MP.

The Council's membership comprises eminent persons drawn from a range of sectors relevant to climate change.

The Council provides advice to the Queensland 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.

Information Papers on topics of interest are released by the Council periodically for the purpose of informing debate on key climate change issues.

This paper was endorsed by the Council members and prepared with the assistance of staff from the Office of Climate Change in the Department of Environment and Resource Management.

The views expressed in this paper are those of the Council and do not represent Queensland Government policy.

Executive summary

The National Greenhouse Accounts released on 18 April 2011 show Queensland's emissions are decreasing despite carbon pollution continuing to rise on a national basis.

Queensland has achieved the highest annual decrease in emissions of any state. Total emissions have declined by about 9 million tonnes (Mt) from 2008 to 2009 and remain below the 1990 level. This is despite the extraordinary population and business growth that Queensland has experienced.

Between 1990 and 2009, Australia's absolute emissions increased by 2.7 per cent. The *State and Territory Greenhouse Gas Inventories 2009* report shows that, over the same period, Queensland achieved the highest decrease in emissions of any state or territory both in absolute and per capita terms.

The greatest contributor to this reduction in absolute emissions is the Queensland Government's strong action to ban broadscale tree clearing, reflected in the fall in Land Use, Land Use Change and Forestry (LULUCF) emissions. Queensland's vegetation management legislation (the *Land Act 1994* and the *Vegetation Management Act 1999*) and the policy to end broadscale land clearing have reduced Queensland's emissions by at least 15Mt since 2007. These reforms were the biggest contributor to Australia meeting its Kyoto Protocol targets.

Although Queensland has seen the highest decrease in its per capita emissions between 1990 and 2009, it remains Australia's highest emitter on a per capita basis and has the second highest absolute emissions of any state. This is primarily due to growth in Queensland's energy-intensive industries such as aluminium and minerals processing.

Between 1990 and 2007, Queensland's energy emissions have roughly doubled and population has increased by 50 per cent. Given that LULUCF emissions relate to only one sector of the economy, this indicates increasing emission intensity in other areas of the economy.

This highlights the importance of programs that lower the emissions intensity of our electricity supply, such as the Queensland Gas Scheme, and increase energy efficiency in the workplace and households, such as business sustainability programs (ecoBiz and ClimateSmart Business Clusters) and the ClimateSmart Home Service.

Introduction

The National Greenhouse Gas Inventory (NGGI) provides estimates of Australia's greenhouse gas emissions based on the latest available data and the accounting rules that apply for the Kyoto Protocol under the United Nations Framework Convention on Climate Change.

Under the Kyoto Protocol, Australia has set a target of limiting emissions to an average of 108 per cent of 1990 levels over the period 2008-2012. Therefore 1990 represents a base year for many emissions reporting processes.

Under the Copenhagen Accord, Australia has committed to a target range: an unconditional 5 per cent reduction by 2020 on 2000 levels, up to 15 per cent or 25 per cent conditional on the extent of action by other countries[1].

The Queensland Government supports a national target, rather than individual state targets, supported by a market-based mechanism, as the best way to promote low cost abatement opportunities on a national scale.

Queensland Government climate change policies are designed to complement a national emissions trading scheme.

On 18 April 2011, the Commonwealth Government publicly released the latest (2009) NGGI, including data on state and territory emissions. This paper is based upon that data set.

Queensland emissions — overview

Key points:

- Australia's emissions have increased by 2.7 per cent from 1990 levels.
- Queensland's absolute emissions were 5.7 per cent lower in 2009 than in 1990.
- Queensland remains a high emitter in absolute and per capita terms, but has demonstrated the greatest reductions in absolute and per capita emissions.

The national emissions context

The National Greenhouse Gas Inventory (NGGI) reported Australia's absolute emissions in 2009 were 564.5Mt CO_2-e. On the whole, Australia's 2009 emissions have increased by 2.7 per cent from 1990 levels (with the inclusion of LULUCF). However, some individual sectors have experienced reductions in emissions.

The agriculture and waste sectors have both experienced a decline over the 1990-2009 period with agriculture reducing 2.4 per cent (2.1Mt CO_2-e) and waste exhibiting a strong decline of 21.9 per cent (3.9Mt CO_2-e), driven mainly by increasing patterns of recycling and enhanced methane recovery.

Historically, the stationary energy sector is the largest sectoral contributor to increasing emissions, experiencing an increase over the 1990-2009 period of 51.1 per cent (99.4Mt CO_2-e). The second highest contributor in Australia is the transport sector with emissions increases of 34.6 per cent (21.5Mt CO_2-e).

A change to the sectoral accounting of emissions, notably the inclusion of LULUCF in emissions accounting since 2008, has changed average emissions trends in Australia often resulting in emissions decreases due to reforestation or cessation of deforestation.

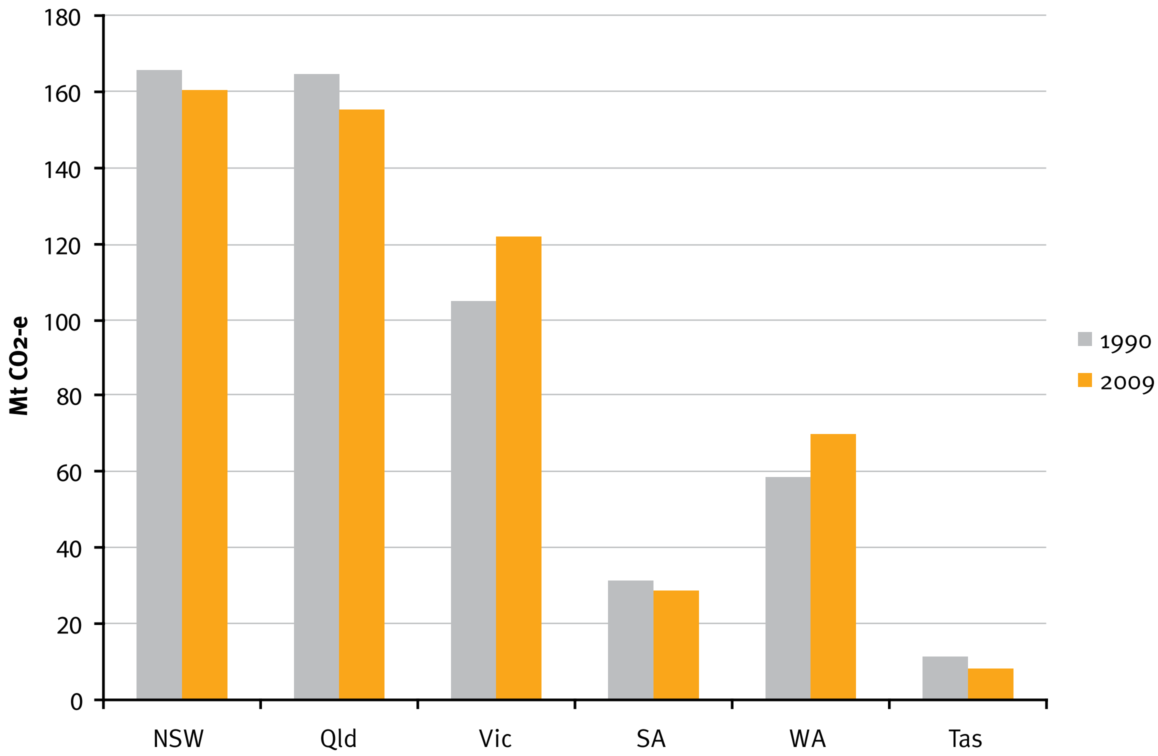
Queensland's absolute emissions

Queensland's absolute emissions in 2009 were 155Mt CO_2-e. This is down from 164Mt CO_2-e in 1990 (a 5.7 per cent reduction).

Historically, Queensland has had high emissions compared with other states, largely due to its energy and emissions intensive industries and reliance on fossil fuel-based energy sources, in particular coal. In addition, Queensland has traditionally generated high emissions from the LULUCF sector, which in 1990 accounted for half of Queensland's emissions and 65 per cent of all Australian emissions from deforestation.

In 2007, Queensland's absolute emissions had grown to be Australia's highest. By 2008, New South Wales had overtaken Queensland as the highest emitting state in absolute terms, due to the decline in Queensland's overall emissions. This remains the case in 2009 at which time New South Wales had absolute emissions of 160Mt CO_2-e compared to Queensland's 155Mt CO_2-e.

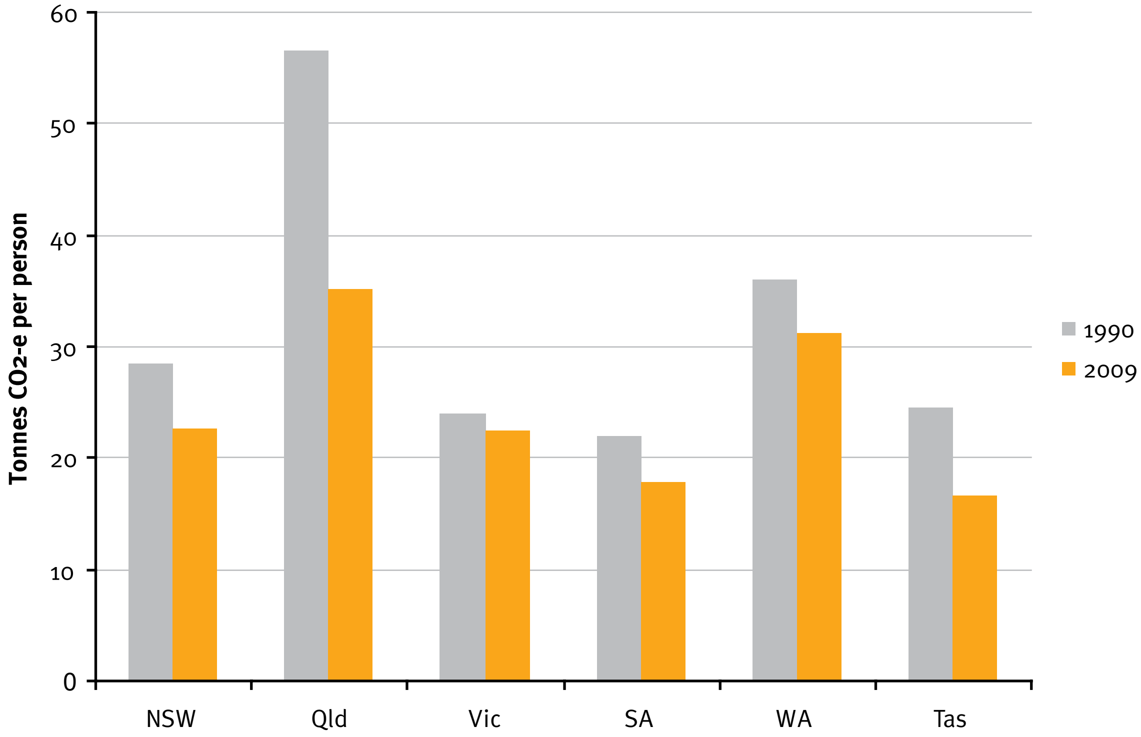
Figure 1: States' absolute emissions in 1990 and 2009



Per capita emissions

Figure 2 shows that Queensland remains the highest emitter in Australia on a *per capita* basis. Queensland's *per capita* emissions of 35.2 tonnes of CO_2-e per person in 2009 were significantly higher than the 2009 national average of 25.1 tonnes of CO_2-e per person. However, this is down from 56.6 tonnes CO_2-e per person in 1990 (a 38 per cent reduction).

Figure 2: States' per capita emissions in 1990 and 2009



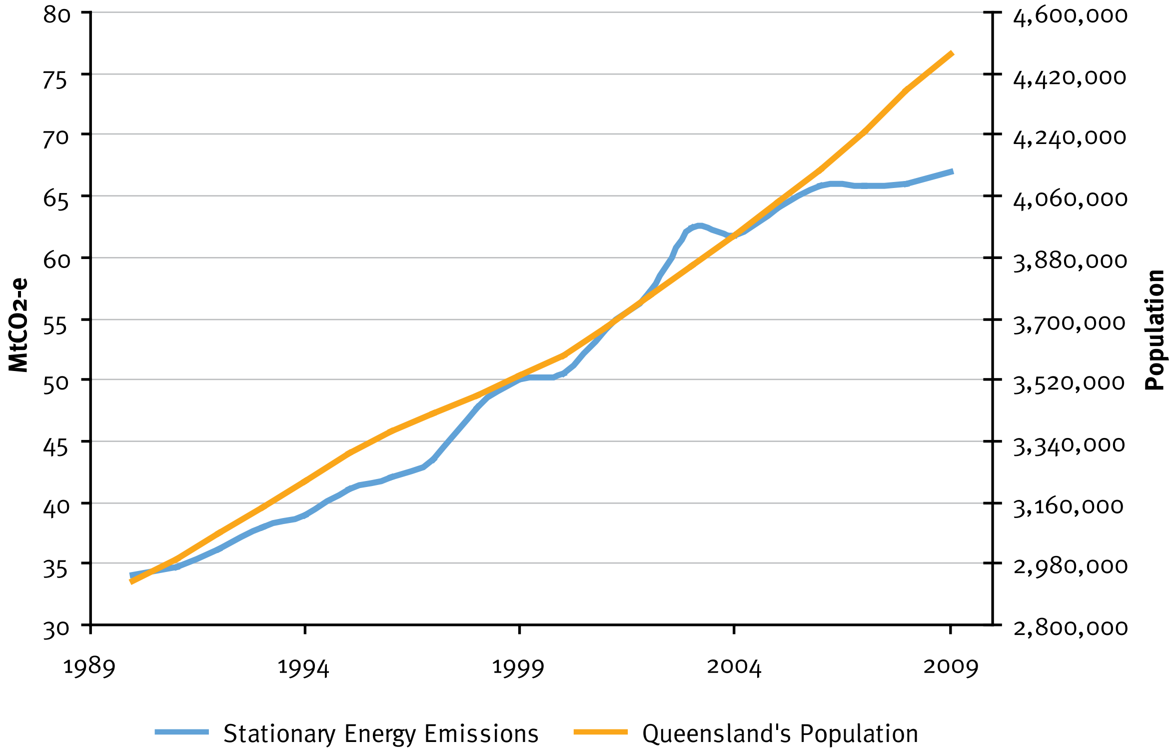
While Queensland's emissions remain high, as at 2009 the state had achieved the greatest reduction since 1990 of any state in both absolute and *per capita* terms. The reduction in *per capita* emissions is correlated with the high population growth in Queensland between 1990 and 2009. During that time absolute emissions fell by 5.7 per cent while population grew from 2.93 to 4.48 million, driving the 38 per cent decrease in recorded *per capita* emissions.

However, *per capita* consumption of energy increased over the period. While emissions from energy use roughly doubled between 1990 and 2009, population increased by roughly one-half. This was mainly due to the increasing energy demands of industry energy, representing 75 per cent of energy use[2].

The reduction in LULUCF emissions therefore offsets trends in other parts of the economy. When emissions from LULUCF are excluded from an assessment of *per capita* emissions, a very sharp increase is observable between the mid-1990s and 2003. Since that time *per capita* emissions (not including LULUCF) have plateaued. This is primarily due to the reduction in the rate of increase of emissions from the energy sector, coupled with an ongoing population increase.

Figure 3 demonstrates the correlation between population growth and energy use. The observable slowing in the rate of *growth* in energy emissions in the context of continuing population growth illustrates a slowing in the rate of *growth* in energy demand and the reduction in the emissions intensity of Queensland's energy over the period 2004–2009.

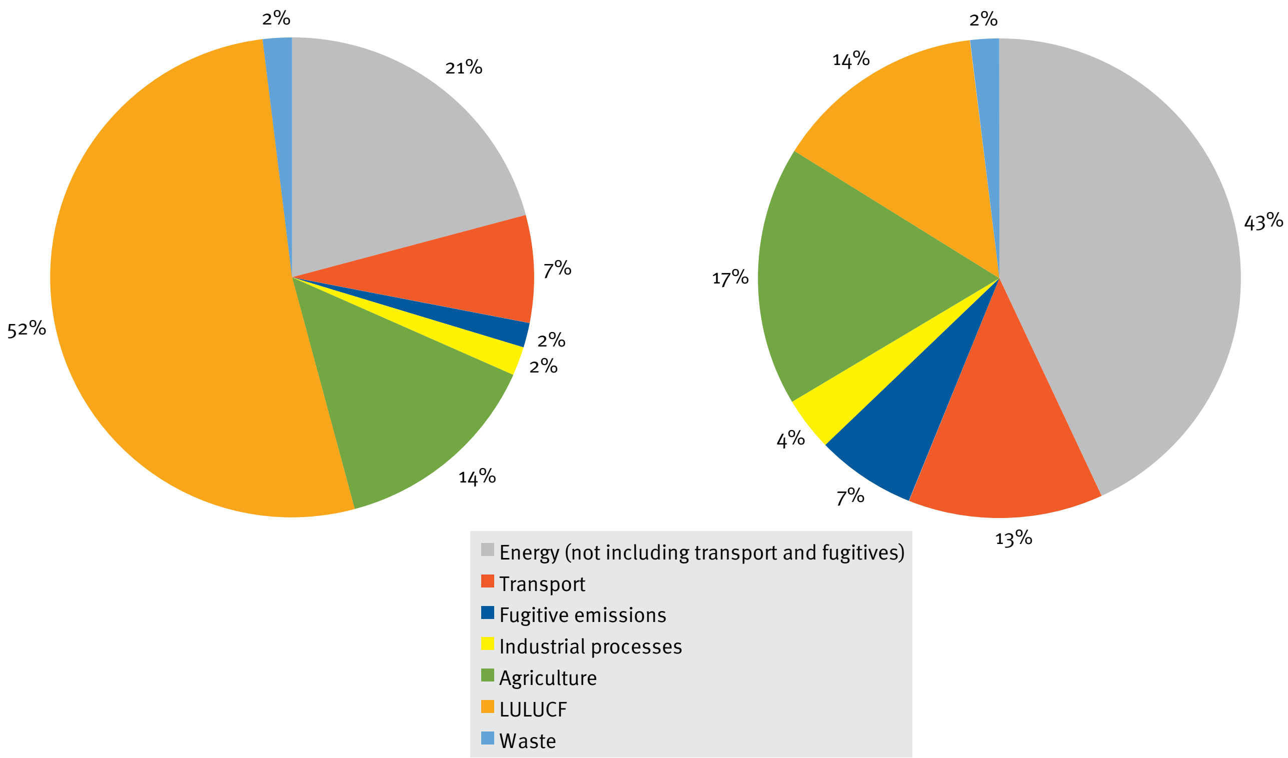
Figure 3: Queensland stationary energy emissions and population, 1990 to 2009



Emissions by sector

Figure 4 shows the change in Queensland's emissions profile by sector between 1990 and 2009. It illustrates the changing composition of Queensland's emissions profile, especially the decline in significance of LULUCF and the growth in relative significance of other sectors, especially energy.

Figure 4: Queensland emissions by sector in 1990 and 2009



Key changes between 1990 and 2009 include:

- the decline in significance of the LULUCF sector from 52 per cent to 14 per cent
- the increase of energy sector emissions from 21 per cent to 43 per cent
- the near doubling of relative emissions from transport (7 per cent to 13 per cent) and industrial processes (2 per cent to 4 per cent)
- the increase in significance of fugitive emissions from 2 per cent to 7 per cent
- the relative stability of emissions from agriculture and waste.

These trends are covered in more detail in following sections.

Sectoral analysis

Key points:

- Emissions from LULUCF have declined by approximately 74 per cent from 1990 levels due to Queensland Government action to end broadscale land clearing and improve vegetation management.
- Emissions from stationary energy, transport and industrial processes have grown reflecting a growing economy and population.
- Growth in emissions in the energy sector have recently slowed reflecting factors including the impact of the Queensland Gas Scheme (the Scheme) which enables electricity to be generated with lower emissions.

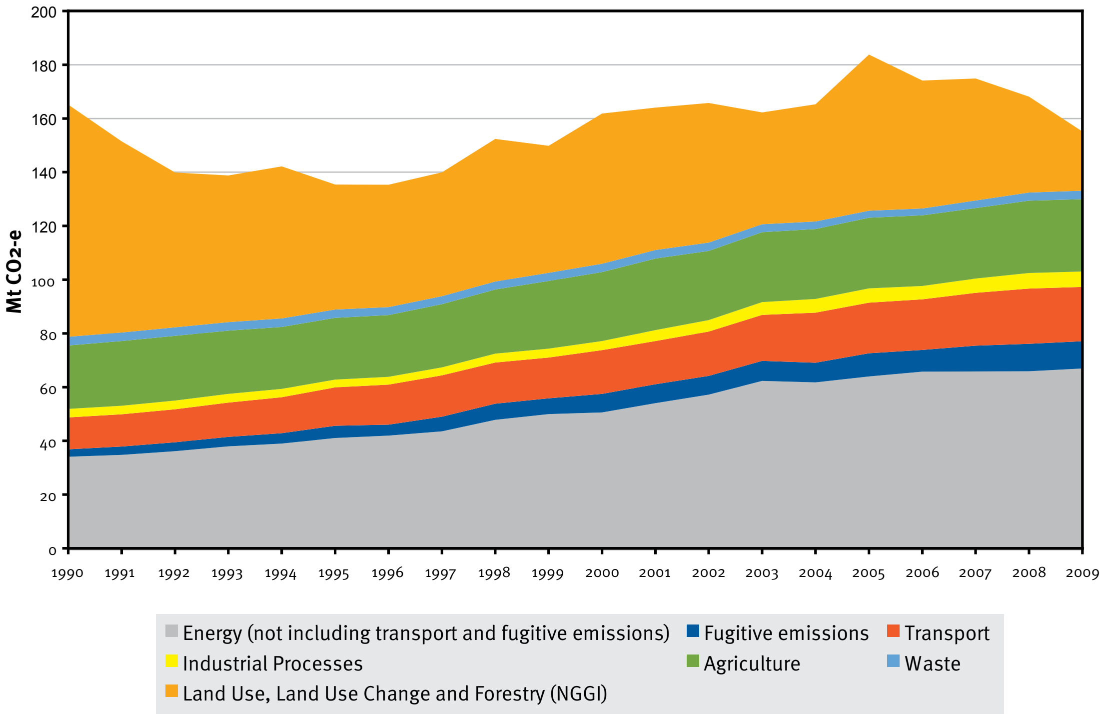
Historical emissions by sector

The ‘story’ of Queensland’s historical emissions is dominated by the energy and LULUCF sectors. Figure 5 shows the predominance of the long-term growth in energy emissions on Queensland’s emissions profile and the reduction (in absolute and relative terms) from the LULUCF sector.

Figure 5 also shows the acceleration in emissions from transport and from industrial processes which, while a small component of overall emissions, remained steady during the 1990s and increased by more than half in the time since.

Emissions from waste have remained steady over the period while emissions from agriculture have exhibited a small but steady increase.

Figure 5: Queensland emissions by sector, 1990 to 2009



Energy (excluding transport and fugitive emissions)

Energy emissions (not including those from transport and fugitive emissions) were 67Mt CO_2-e in 2009 (43 per cent of Queensland's total emissions). This is a small increase of 1.2 per cent since 2008, but almost double 1990 levels. Energy includes emissions from electricity generation, fuel consumed in the manufacturing, construction and commercial sectors, and other sources like domestic heating. Emissions from energy are higher than for any other Queensland sector.

Recently the rate of growth in emissions has slowed due to, among other things, the operation of the Queensland Gas Scheme. This change is reflected in Figure 6. The Scheme required electricity retailers to source 13 per cent of their electricity supply from gas-fired generation. This requirement increased to 15 per cent in 2010 and will be maintained at this level in 2011.

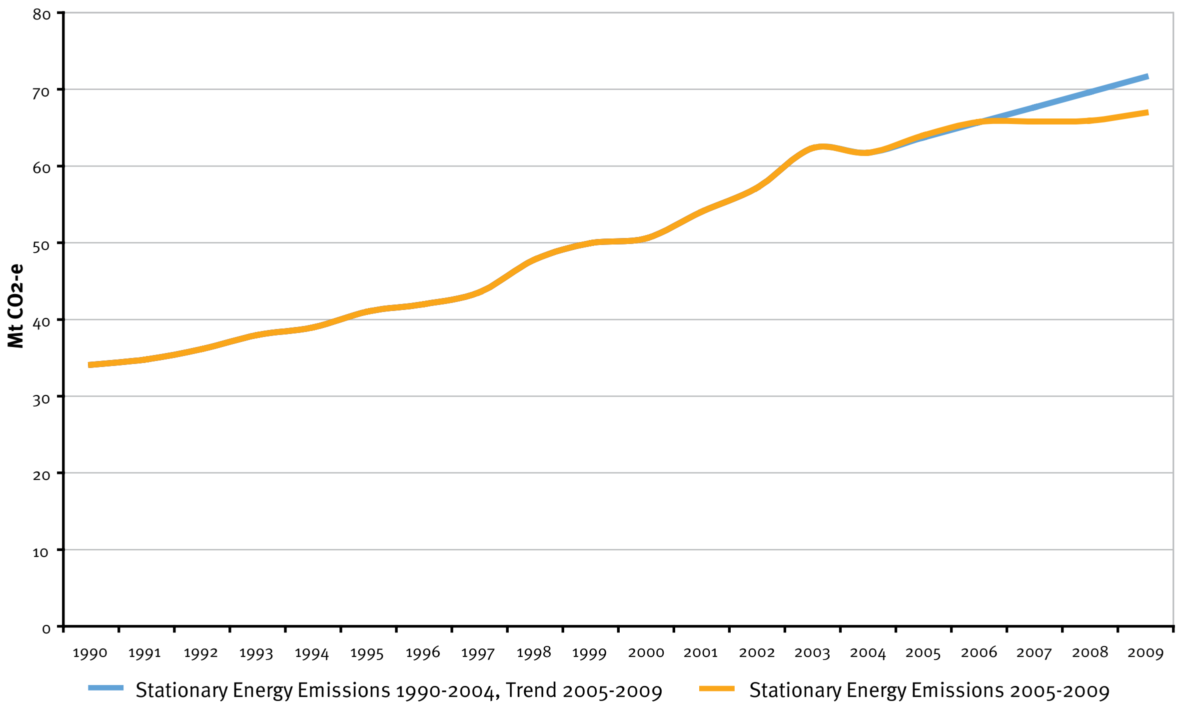
The Scheme has driven a very significant increase in the deployment of gas-fired generation in Queensland and, as gas-fired generators produce as little as half the emissions of coal-fired plant per unit of electricity generated, a reduction in emissions intensity of electricity.

From January 2005 to December 2009, 24 million megawatt hours (MWh) of gas-fired electricity were generated in Queensland. Assuming this generation offsets coal-fired generation, this represents a reduction of approximately 10Mt CO_2-e.

Since June 2009 around 1,400 megawatts of new gas-fired generation has been commissioned in Queensland. Policy restrictions on coal-fired generation and carbon pricing will ensure that gas-fired generation will be the dominant new entrant generation in Queensland for at least the next 10 years.

Figure 6 illustrates the trend in emissions from energy between 1990 and 2004, projected to 2009. The figure also shows the change in energy emissions from 2005 onwards, coinciding with the commencement of the Scheme. It is not possible to attribute this change solely to the operation of the Scheme but, as noted above, it is estimated that the Scheme has resulted in a reduction of around 10Mt CO_2-e.

Figure 6: Queensland energy emissions, including 1990-2004 trend projected to 2009



Land Use, Land Use Change and Forestry (LULUCF)

The LULUCF sector includes net emissions from the practices of afforestation (planting of new forests on land which historically has not been covered by forest), reforestation (forests established since 1990 on land that was clear of forest on 31 December 1989) and deforsestation (land clearing). LULUCF emissions were 22Mt CO_2-e (14 per cent of Queensland's total) in 2009. This is a decline in emissions of about 74 per cent from 1990 levels. Although emissions from the land sector have declined significantly, LULUCF still represents a large source of emissions – this highlights the important role for the state's biosequestration policies in contributing to long-term reductions in absolute emissions. Queensland is taking an active role in understanding the potential of vegetation and rural processes to sequester carbon and is working with the Commonwealth Government to maximise opportunities for Queensland under the Carbon Farming Initiative.

Emissions from the legal clearing of vegetation fluctuate from year to year, depending on a range of factors such as the point in the re-clearing cycle, the price of agricultural commodities and rainfall. However there is a clear downward trend evident in Queensland's land clearing emissions since 1990, over a period which has seen the introduction of significant new Queensland Government controls over vegetation management.

Queensland's land clearing emissions were at a historical peak in the late 1980s and early 1990s. The global economic downturn in the early 1990s contributed to land clearing emissions starting to fall from this peak.

The introduction of the *Land Act 1994* saw the protection of endangered and threatened vegetation on leasehold land, and drove the decline in Queensland's land sector emissions between 1994 and 1995. Under the Land Act, leaseholders were required for the first time to obtain a permit to clear native vegetation. The introduction of the *Vegetation Management Act 1999* extended controls over the clearing of mature (or 'remnant') native vegetation onto both freehold and leasehold land, and provided the legislative mechanism for the full phase-out of broadscale land clearing in Queensland by the end of 2006. Clearing bans under the Vegetation Management Act were extended to include high-value regrowth as an election commitment of the Queensland Government in 1999. These controls have resulted in declines in Queensland's land sector emissions – since the phase-out of broadscale land clearing, emissions from Queensland's land sector have more than halved. The spikes in emissions evident in 1994, 1998 and 2005 suggest panic-clearing induced by the announcement of new controls.

Rural landholders have contributed to large reductions in Queensland's emissions over the past 20 years, and backed by growing investment in carbon have the potential to go even further. In 2009, the Premier's Council on Climate Change commissioned an expert scientific report from CSIRO which quantified the biosequestration and greenhouse gas abatement potential of Queensland's rural lands. The report found that with changed management practices, the carbon storage potential of the Queensland landscape over the next 50 years is highly significant.

Fully capitalising on these opportunities will be subject to policy development, such as an appropriate carbon price, and technical developments in measurement and verification methods. The Commonwealth's proposed Carbon Farming Initiative represents a starting point for the above by establishing a framework for the accreditation of land sector abatement from mid-2011. The Queensland Government is committed to helping rural landholders prepare for these opportunities. Ongoing policy work aims to optimise the market for carbon forestry by equipping stakeholders to make informed decisions about emerging opportunities in their region. The policy recognises the role for biodiverse carbon forests in supporting the health of existing regional ecosystems. This work will aim to ensure the right balance is struck between carbon and agriculture.

Agriculture

Agriculture emissions were 27Mt CO_2-e (17 per cent of Queensland's total) in 2009. This is the same as the case in 2008 and 14 per cent higher than 1990 levels. Agriculture emissions grew during the late 1990s, but have been steady since around 2000. Almost 78 per cent of Queensland's agricultural emissions come from enteric fermentation, that is emissions from cattle and sheep. Other sources of agricultural emissions include the use of nitrogenous fertiliser, soil management and cultivation practices.

Queensland's primary industries sector is a dynamic contributor to the Queensland economy, society, culture and environment, especially in regional areas. In 2006–07, primary industries contributed around 6 per cent of the Queensland economy. The sector is facing a number of key issues including changes to global commodity markets, rising food and fuel prices, skill shortages, increasing requirements for biosecurity and a changing climate.

Primary industries make up one of the most exposed sectors to the combined impacts of climate change and changes in global economic activity. The impacts of climate change will be different across the state and for different industries. Queensland is projected to have the greatest decline in Gross State Product (GSP) caused by potential reductions in agricultural productivity associated with climate change.

Policy measures to reduce emissions from agriculture include the expanded Rural Water Use Efficiency initiative which promotes energy efficient practices in agriculture and the $5.2 million Helping Primary Producers Adapt to Climate Change initiative which assists farmers to understand the potential impacts of climate change and adapt. Both of these initiatives come from Queensland's climate change strategy, *ClimateQ: toward a greener Queensland.*

Transport

Transport emissions were 20Mt CO_2-e (13 per cent) in 2009. This represents a slight decrease of 1.7 per cent since 2008 but is 70 per cent higher than 1990 levels. The vast majority of Queensland's transport emissions come from road transport (particularly passenger vehicles), which correlates strongly with changes in population. Although the total number of passenger vehicles in Queensland is steadily increasing, a slight decrease in new vehicle registrations is observable since 2007[3]. It is likely that the stabilisation of transport emissions in recent years results mainly from a combination of improved vehicle efficiency and driver behaviour.

Queensland's large geographical size, dispersed populations, and wide urban sprawl means locals and visitors often have long distances to travel in order to access goods and services, tourist destinations and employment. For example, Queensland road vehicles travelled approximately 15,200 kilometres per vehicle in 2007, compared with the national average of 14,600 kilometres per vehicle[4].

While passenger cars are the largest source of transport-related greenhouse gas emissions, their growth rate has not been as rapid as in other transport sub-sectors. Since 1990, emissions from the civil aviation sector have risen by 126 per cent and emissions form light commercial vehicles have increased by approximately 84 per cent. Passenger vehicle emissions have increased by approximately 43 per cent over the same period[5].

The Queensland Government is active in national processes aimed at improving vehicle efficiency and in state programs aimed at driver behaviour (eg eco-driving and active transport initiatives). Other examples of Queensland programs to reduce emissions from the transport sector include ClimateQ initiatives such as, the $39.3 million Improving Traffic Flow for Reduced Emissions initiative to ease congestion and reduce emissions, the TravelSmart Schools program to encourage reduced car usage for school transport and the Greening the Taxi Fleet initiative which encourages the use of low-emission vehicles in the taxi fleet by offering discounted taxi licences to operators.

Fugitive emissions

Fugitive emissions were 10Mt CO_2-e (6.5 per cent of Queensland's total in 2009). This is a fall of 1 per cent since 2008 but a 270 per cent increase on 1990 levels. Fugitive emissions arise from coal mining activities and oil and natural gas production and distribution. Although the fugitive sector is by far Queensland's fastest growing emissions source of emissions, the annual increase is highly dependent on production rates.

For example, fugitive emissions from solid fuels (predominantly coal) fell by 6.2 per cent between 2008 and 2009 after steady increases over recent years, whereas fugitive emission from oil and natural gas production increased by 71 per cent between 2008 and 2009. This likely reflects the fall in production of coal from (typically more gassy) underground mines in Queensland between 2008 and 2009[6] and the increase in gas exploration and production.

Recent estimates from the Australian Government[7] also forecast strong emissions growth in Australia to 2020 in the absence of policy measures such as a carbon price. This is primarily as a result of strong demand for energy exports, particularly coal and liquefied natural gas (LNG) and is likely to continue the trend of increasing fugitive emissions.

One reason why fugitive emissions have grown at a slower rate than production is because proportionately more coal has come from open-cut coal mines, which are less gassy. There have also been improvements in measurement of fugitive emissions, with the recent availability of mine-specific emission data through the National Greenhouse and Energy Reporting System (NGERS).

Industrial processes

Emissions from industrial processes (such as cement production and minerals processing) were 5.7Mt CO_2-e (3.7 per cent) in 2009. This is the same as in 2008, but 81 per cent higher than 1990 levels. Growth in this category of emissions reflects the expansion of heavy industrial activity in Queensland over time, but still represents a relatively small proportion of the state's total emissions.

There are obstacles that can inhibit action to reduce emissions in the industrial sector. Some of these obstacles are physical, some are institutional and some are operational. The capacity of Queensland industry to reduce emissions will vary sector by sector and within sectors. Some industrial processes may already be near best practice or have intrinsic greenhouse gas generating activities that cannot be made more efficient using current or emerging technologies.

Early action will not only build the resilience of business to withstand the impacts of climate change, but new business opportunities may be identified and significant savings can be realised. Significant reductions in energy usage in most of Queensland's industries, including resource industries, can be achieved on a relatively low-cost basis.

Waste

Emissions from waste were 3.2Mt CO_2-e (2 per cent) in 2009. This is an increase of 6 per cent since 2008, but the same as 1990 levels. An increase in waste emissions in 2008 was predominantly due to improvements in the Commonwealth's accounting methodology. Notwithstanding this, the general trend for domestic waste generation in Queensland has seen growth over the last five years.

Queensland is developing a comprehensive Waste Strategy to 2020 which it is estimated will result in savings of 1.2Mt per annum by 2020, a significant reduction on current levels.

Future projections

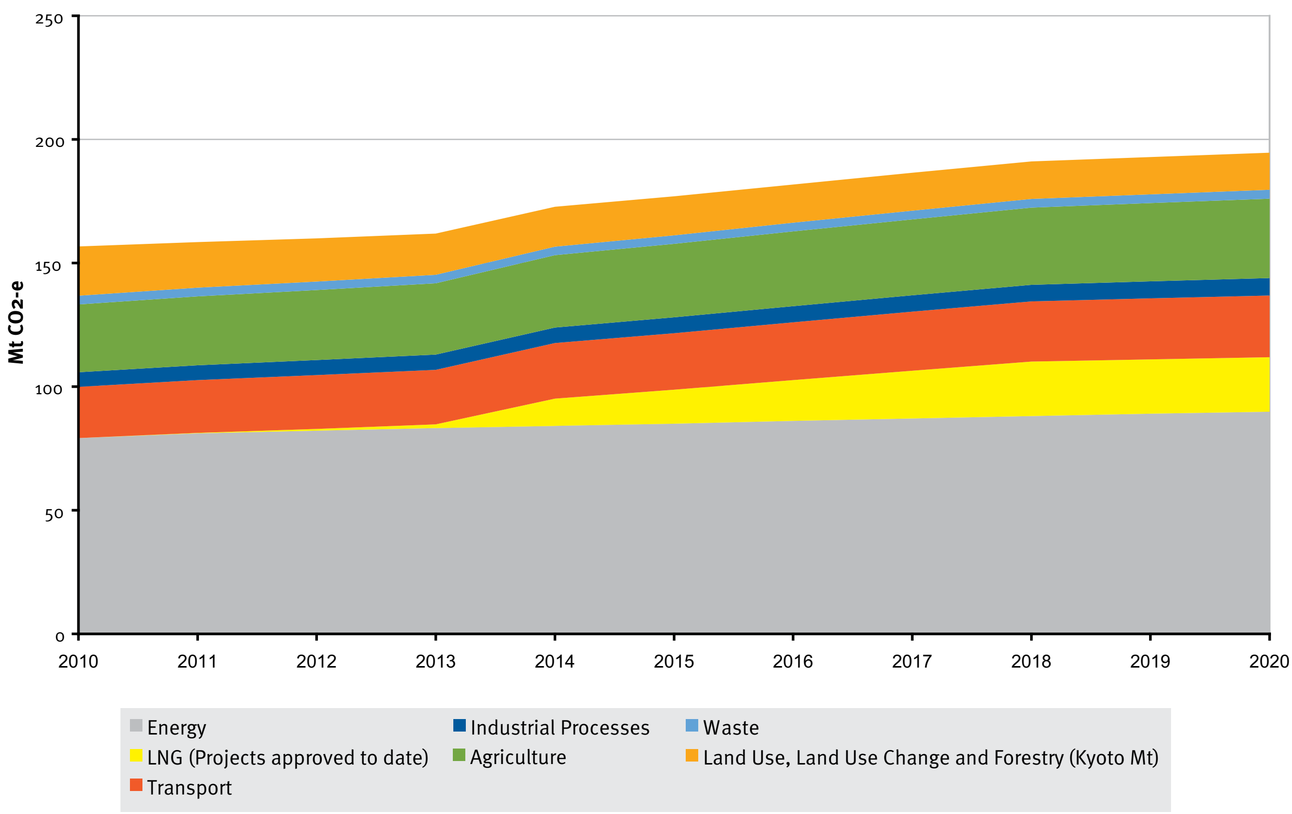
Key points

- Emissions from energy are projected to grow under a business-as-usual scenario highlighting the need for more gas-fired and renewable electricity generation, and energy efficiency measures to reduce demand for electricity.
- The development of the LNG industry will add to Queensland's emissions.
- Emissions from agriculture and waste are projected to stabilise.

Indicative emissions projections are shown in Figure 7, indicating the ongoing dominance of emissions from energy use as the key driver of emissions growth. In particular, expected emissions from the development of the LNG industry are highlighted.

It is important to note that the business-as-usual projections illustrated in Figure 7 were developed for *ClimateQ: toward a greener Queensland*, the Queensland Government climate change strategy released in 2009. These projections do not account for the larger than expected reductions in the LULUCF sector and the recent stabilisation of energy emissions described elsewhere in this paper.

Figure 7: Indicative projections of Queensland emissions by sector, to 2020



The projections indicate that, under a business-as-usual scenario, Queensland's emissions could increase from current levels to approximately 185Mt by 2020.

Additionally, based on information provided in the Environmental Impact Statements (EIS) of the three announced projects (Santos, Queensland Gas Company and Australia Pacific LNG), between 22 and 24.2Mt of CO_2-e per year could be emitted in Queensland when the coal-seam gas (CSG)-LNG industry is at full capacity in 2018.

The Queensland Government sees CSG as an important transitional fuel as part of the move away from coal powered energy. It is not a long-term solution but an important part of the energy mix as investment in renewable energy grows.

The vast majority of LNG produced in Queensland will be exported. While the emissions from producing LNG are significant, research suggests that the life-cycle emissions of LNG used for electricity generation may be approximately 40 per cent lower than for coal. If the LNG produced in Queensland and exported is used to substitute for coal in generating electricity in other countries, it will contribute to lowering global emissions.

The projections also highlight the importance of Queensland maintaining its policy commitments in the area of household emissions reductions (according to the Toward Q2 carbon target), waste management under the Queensland Waste Strategy and reducing the emissions intensity of electricity generation under the Queensland Gas Scheme and the Queensland Renewable Energy Plan.

Other priorities include the management of emissions from the LNG industry (and other emissions-intensive activities) through development approval processes and under the Environmental Protection Act. The government has had considerable success reducing land sector emissions. In the context of rising emissions in virtually all other sectors, it is important that the government continues to implement its biosequestration agenda.

Further information

Australia's National Greenhouse Accounts

The Federal Department of Climate Change and Energy Efficiency publishes a suite of reports that, together, constitute the Australian National Greenhouse Accounts. The Accounts include:

- the *National Greenhouse Gas Inventory*, reported on a Kyoto accounting basis and according to Intergovernmental Panel on Climate Change sectors
- a summary of *State and Territory Greenhouse Gas Inventories*, reported as per the National Greenhouse Gas Inventory
- the *National Inventory by Economic Sector*, comprising emission estimates by economic sector rather than by Intergovernmental Panel on Climate Change sectors
- the *National Inventory Report*, prepared under the reporting provisions applicable to the United Nations Framework Convention on Climate Change.

NGGI data is available at: www.climatechange.gov.au/en/climate-change/emissions.aspx

Footnotes

[1] Australian Government, 2010, Submission to the Copenhagen Accord, United Nations Framework Convention on Climate Change <http://www.climatechange.gov.au/en/government/initiatives/unfccc/~/media/publications/international/UNFCCC-letter-Jan-2010.ashx>.

[2] ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences), 2010, Table F4 Queensland energy consumption, by industry and fuel type energy units, viewed March 2011 <http://adl.brs.gov.au/data/warehouse/pe_abarebrs99001693/energyUpdateTableF2008-09.xls>.

[3] OESR (Office of Economic and Statistical Research), 2010, Motor vehicle registrations by vehicle type, Queensland, 2001 to 2010, viewed March 2011 <http://www.oesr.qld.gov.au/products/tables/motor-vehicle-registrations-qld/index.php>.

[4] ABS 2008, Survey of motor vehicle use, cat. no. 9208.0, Australian Bureau of Statistics, Canberra, <www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/40BA5EB0863D18F8CA2574B2000FD936/$File/92080_12%20months%20ended%2031%20october%202007.pdf>.

[5] DCCEE 2009, Australian Greenhouse Emissions Information System (AGEIS), Australian Government, <http://www.ageis.greenhouse.gov.au/Chart_KP.aspx?OD_ID=9455528147&TypeID=2>.

[6] DME (Department of Mines and Energy), 2009, Queensland Coal Statistics, 2009 calendar year <http://www.dme.qld.gov.au/zone_files/coal_stats_pdf/cyr_09.pdf>.

[7] DCCEE (Department of Climate Change and Energy Efficiency), 2010, Australia's Emissions Projections 2010.

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