
Greenhouse Indicator

Annual Report: 2010

THE °CLIMATE GROUP

This is part of

THE CLEAN REVOLUTION

TABLE OF CONTENTS

Introduction	page 2
Overview of 2010 results	page 2
Electricity export/import analysis	page 5
Temperatures, GSP and population growth	page 6
Victoria analysis	page 8
New South Wales analysis	page 12
Queensland analysis	page 16
South Australia analysis	page 20
Additional section: Tasmania	page 24
Contact	page 27
Annex: Results Summary Table	page 28

INTRODUCTION

The Climate Group is now in its fifth year of tracking greenhouse gas emissions from energy use in Victoria, New South Wales (NSW), Queensland and South Australia on a weekly basis through the Greenhouse Indicator.

The Greenhouse Indicator provides accurate and real time information on greenhouse gases produced each week from energy use. It is a unique tool designed to bring greater understanding to the issue of climate change and to help track greenhouse gas emissions in selected Australian states.

Each and every week we release greenhouse gas emissions into the atmosphere. Because they can't be seen, it is difficult to understand how much is being produced.

All countries provide a detailed annual report of their greenhouse gas emissions but such reports are normally released long after the emissions have occurred. Thus this information, while comprehensive and critical for policy planning and scientific assessment, arrives much later than the emissions are produced. The Greenhouse Indicator puts a figure on what is happening now, and enables everyone to follow how much they are collectively emitting in their state, each and every week.

This Annual Report covers greenhouse emissions from energy during 2010 and compares them with emissions from 2009, as well as previous years.

The Greenhouse Indicator was recently expanded to Tasmania and there is a separate section on Tasmania included at the back of this report. The state is not included in the body of this report as we do not have a complete set of data for 2009 with which to make accurate comparisons with 2010.

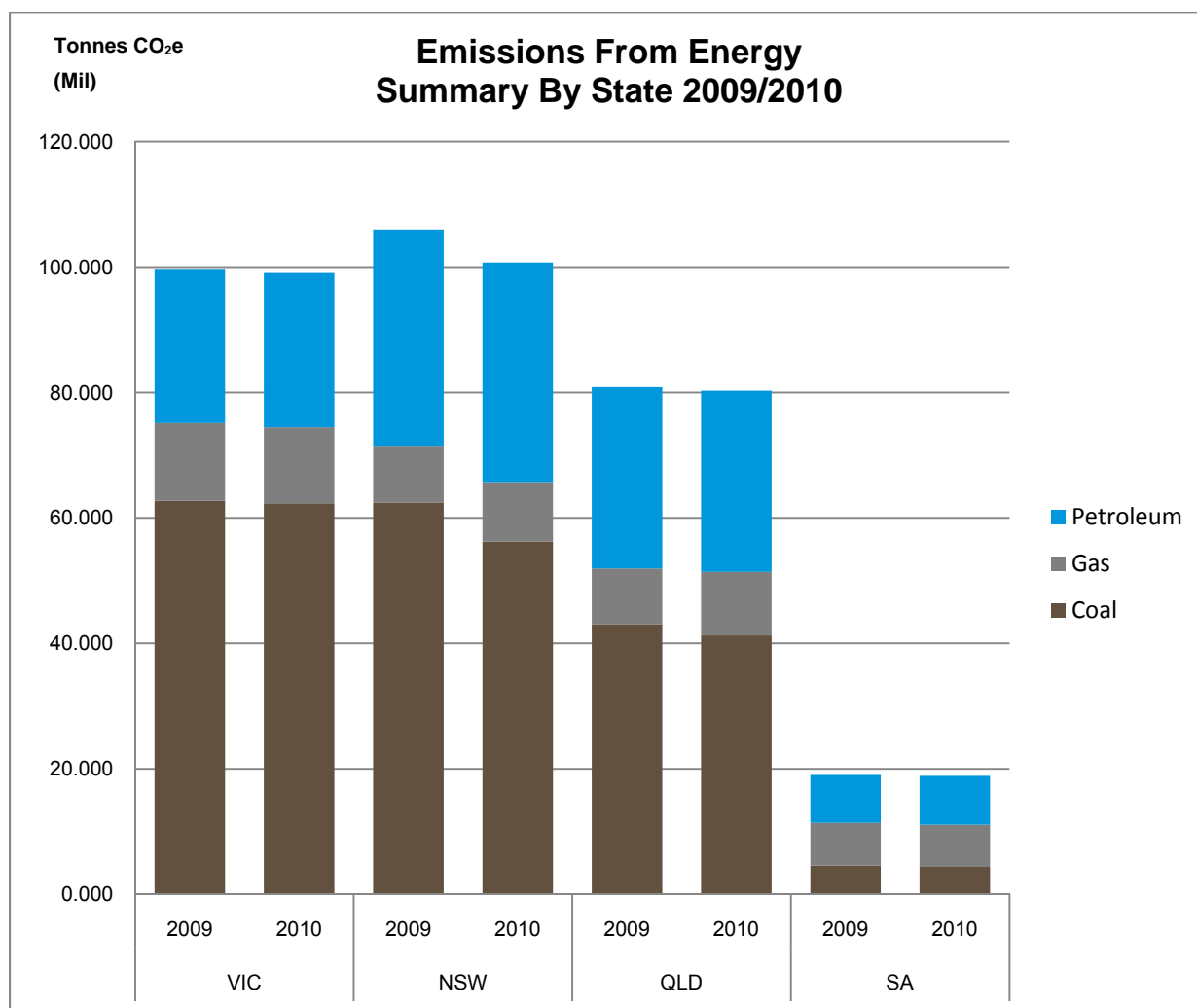
2010 RESULTS

Across Victoria, NSW, Queensland and South Australia annual emissions from energy in 2010 were 298.97 million tonnes - 6.64 million tonnes less than in 2009. This is a fall of 2.2 per cent for the year. Individually, all four states saw a decrease in emissions although the size of the decrease varied from state to state. This was on top of a fall of 1.8 per cent the previous year.

Annual emissions in NSW registered the largest decrease with a 4.98 per cent fall, or 5.3 million tonnes compared with 2009. Victoria and Queensland both registered reductions of 0.7 per cent: 671,000 tonnes and 566,000 tonnes respectively. Emissions in South Australia fell by 0.68 per cent or 129,000 tonnes.

In NSW, all of the decrease was due to a reduction in emissions from coal-fired electricity. Emissions from coal fell by 10.02 per cent or around 6.26 million tonnes. This was the single biggest relative and total decrease in emissions from any fuel category across all states. This decrease was slightly offset by a smaller rise in emissions from gas and petroleum of 5.3 per cent (481,000 tonnes) and 1.5 per cent (503,000 tonnes) respectively. This year's decrease in emissions was on top of a 3.1 per cent decline in NSW emissions in 2009 – largely due to a 4.2 per cent decline in emissions from coal that year. This means emissions from coal have decreased by 15.7 per cent in NSW over the last two years.

Emissions from coal also fell substantially in Queensland in 2010 – by 4.2 per cent or 1.8 million tonnes of emissions. Again this was partially offset by a substantial relative rise in emissions from gas of 14.1 per cent or 1.25 million tonnes. This was the largest single rise in emissions from any fuel category across the states – and represents a major increase in gas-fired generation in Queensland. Queensland's



petrol emissions fell marginally by 13,000 tonnes. In 2009 Queensland emissions also fell, by 1.1 per cent overall.

Coal emissions also fell in both South Australia and Victoria, by 4.5 per cent and 0.7 per cent. However, unlike NSW and Queensland, emissions from gas also fell in both states. They were 1.9 per cent lower in Victoria (232,000 tonnes) and a 1.5 per cent lower in South Australia (104,000 tonnes). South Australia saw a 2.4 per cent increase in emissions from petroleum products while Victoria's emissions from petroleum products were virtually unchanged since 2009.

As with the other two states, this is the second year in a row that emissions have fallen in Victoria and South Australia. In 2009 emissions fell by 4.2 per cent and 0.5 per cent in South Australia and Victoria respectively. The fall in gas emissions in 2010 also continues the trend seen in these states in 2009, when emissions from gas fell by 5.7 per cent in Victoria and 13.7 per cent in South Australia.

Compared with 2000 levels, all states' emissions from energy were higher, although only marginally in Victoria's case – by 0.2 per cent. Collectively all states were up 12.7 per cent on 2000 levels.

However, this hides some marked differences between the states. Queensland's emissions were 40.4 per cent above 2000 levels, while NSW and South Australia were 9.3 per cent and 10.3 per cent above respectively.

The gap in emissions above 1990 was more substantial in all states - collectively 42.3 per cent above 1990 levels. Queensland was 116 per cent above 1990 levels, while Victoria, NSW and South Australia were 29.2 per cent, 26.3 per cent and 15.2 per cent higher than 1990 respectively.

PETROLEUM

Total emissions from petroleum-based fuels across all four states were 96.299 million tonnes, up from 95.630 million tonnes in 2009 (a rise of 0.7 per cent).

This is in contrast with the previous year which saw a similar sized decrease in petroleum emissions compared with 2008, of 0.73 per cent.

Among the different fuel types, results were mixed. The use of and resulting emissions from diesel and aviation fuel grew across the four states by 1.7 per cent and 8.2 per cent respectively, while the emissions from petrol and LPG both fell by 1.4 per cent and 1.9 per cent respectively.

This trend was not uniform in all states. Emissions from petroleum grew in both South Australia and New South Wales by 2.4 per cent (184,000 tonnes) and 1.5 per cent, or (503,000 tonnes) respectively.

Victoria and Queensland's emissions from petroleum products were virtually the same as 2009, with both recording very small falls in emissions of 5000 tonnes and 13,000 tonnes respectively. For Victoria this is a contrast with last year, when petroleum emissions fell by 2.2 per cent, or around 502,000 tonnes compared with 2008.

ELECTRICITY

Across the four states the total amount of scheduled electricity generated during 2010 was 1.1 per cent or 2.07 million MWh lower – continuing the trend from 2009 when scheduled electricity generation was 1.9 per cent or 3.84 million MWh less than in 2008.

Coal was responsible for 84.3 per cent of total scheduled electricity generation, down from 87.8 per cent in 2009. This represents a five per cent fall in electricity generation from coal on 2009, continuing the trend seen the previous year, when coal-fired generation fell by 3.1 per cent on 2008.

The share of gas-fired generation across the states rose from 9.3 per cent to 11.4 per cent of total generation, representing an additional 3.87 million MWh of electricity. This was a 21 per cent relative increase in gas-fired generation – building on the 9.2 per cent rise in gas-fired generation seen the previous year. The greenhouse intensity of gas generation also improved by 4.4 per cent – reflecting the impact of newer, more greenhouse efficient stations.

Scheduled renewable generation increased by 50 per cent compared with 2009, generating an additional 2.78 million MWh of emissions-free electricity than in 2009. This was a substantially larger increase than during 2009, when scheduled renewable generation only increased by 1.7 per cent compared with 2008. During 2010 renewables accounted for around 4.3 per cent of the scheduled electricity generation mix across the four states.

It should be noted that this report only looks at scheduled electricity generation due to the lack of accurate information on non-scheduled generation this early in the year. A good proportion of renewable generation in each state is non-scheduled: in 2009, non-scheduled renewables accounted for 85 per cent of total renewable generation in Victoria, 33 per cent

in New South Wales, 60 per cent in Queensland and 46 per cent in South Australia. As a result, total renewable generation in each state is higher than stated in this report and the greenhouse intensity of overall electricity generation will be lower than stated here.

The Climate Group produces a more detailed Electricity Generation Report for Australia that includes scheduled and non-scheduled electricity generation. You can download this at www.theclimategroup.org/indicator.

GREENHOUSE INTENSITY

As a result of the movement in the coal, gas and petroleum generation categories, the overall greenhouse intensity of scheduled electricity generated across the four states declined by 2.8 per cent from last year to 0.906 tonnes CO₂e/MWh. In 2009, greenhouse intensity of scheduled electricity generation was 0.9322 tonnes CO₂e/MWh.

ELECTRICITY DEMAND AND GENERATION

Across all four states, electricity demand fell by 0.5 per cent (or 0.97 million MWh) – a continuation of the 0.6 per cent decline seen across the four states the previous year. This was despite strong growth in population and GSP across the four states in 2010 [see population and GSP table below].

In Victoria, electricity demand fell by 0.2 per cent in 2010. This compared with a 2 per cent fall the previous year. Generation from brown coal fell by 0.6 per cent while gas-fired generation fell by almost 60 per cent on the previous year. Increased scheduled renewable generation of 63 per cent made up for some of this decrease, although renewables held a small overall share of just 1 per cent of Victoria's scheduled electricity generation.

The fall in generation combined with a smaller fall in demand for electricity meant that Victoria's net exports of electricity to other states fell from 4.6 per cent of electricity produced in 2009 to 2.8 per cent in 2010.

In NSW, electricity demand fell by 0.7 per cent, continuing the 1.2 per cent fall seen during 2009. Generation from black coal fell by 9.6 per cent while gas-fired generation grew by 20.6 per cent. This change in the generation mix continued from 2009, when black coal-fired generation fell by 6.1 per cent, and gas-fired generation grew substantially by 191 per cent, albeit from a very low base. Much stronger generation from the state's hydro-electric stations meant that scheduled generation from renewables rose in NSW by 74.7 per cent producing 5.55 million MWh of scheduled generation in 2010.

The overall fall in generation coupled with a much smaller fall in electricity demand meant that NSW increased its imports of electricity from other states by 63.8 per cent. NSW now imports just over 9 per cent of its total electricity demand.

In Queensland, electricity demand fell by 0.8 per cent in 2010, compared with a rise in demand of 1.5 per cent the previous year. Generation from black coal fell by 3.8 per cent, continuing a 3.0 per cent fall in the previous year. Gas-fired generation increased by 68.1 per cent – by far the largest absolute increase in generation in any sector across the four states – representing some 4.4 million additional MWh. This was because of the commissioning of new gas plants at Condamine and Yarwun. Gas now makes up 18 per cent of Queensland's generation mix.

The increase in electricity generation in Queensland of 4.2 per cent coupled with the decrease in demand meant that overall the state's exports of electricity increased by 60.5 per cent compared with the

previous year, with the state now exporting 12.5 per cent of its electricity – up from 8.1 per cent and 10.5 per cent in 2009 and 2008 respectively.

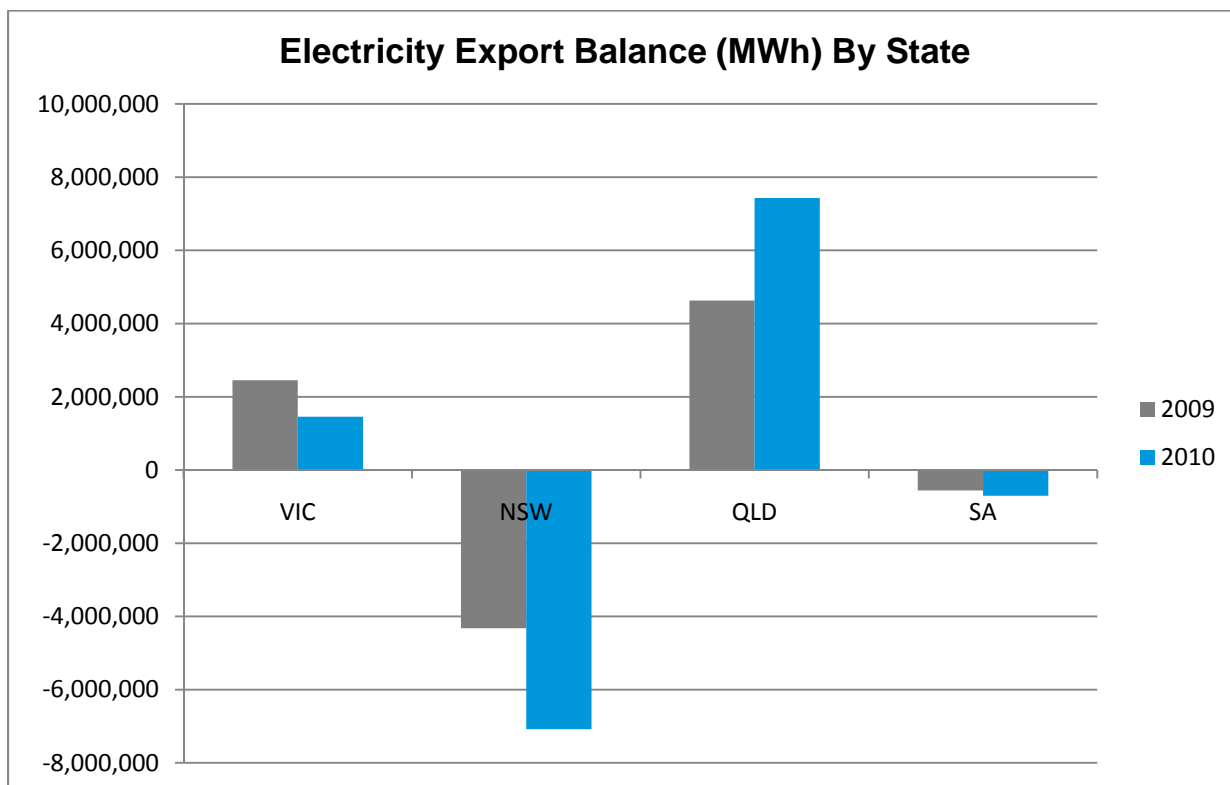
In South Australia, electricity demand increased by 0.7 per cent, the only state to see a rise in demand in 2010. Generation from coal-fired generators fell by 2.6 per cent, a similar fall to that seen in 2009 (2.8 per cent). The amount of electricity produced from gas also fell by 2.9 per cent with scheduled renewable generation growing strongly by 21.2 per cent, making up 12 per cent of South Australia’s scheduled generation.

The overall increase in demand coupled with lower generation meant that South Australia imported 26 per cent more electricity than in 2009 (or 146,545 more MWh). The state now imports just over 5.2 per cent of its electricity demand.

GAS (DOMESTIC AND INDUSTRIAL USE)

In contrast with the rise in gas use for electricity generation, the emissions from gas used for domestic purposes (heating and cooking) and for industrial purposes fell by around 1 per cent overall across the four states, or just under 270,000 tonnes of emissions.

The trend was not uniform across all states. Domestic and industrial gas use grew by 3.5 per cent (398,000 tonnes) and by 2.4 per cent (172,000 tonnes) in Victoria and NSW respectively. In contrast, it fell by 14 per cent (768,000 tonnes) and 2.9 per cent (72,000 tonnes) in Queensland and South Australia respectively.



TEMPERATURES

Australia recorded its 8th warmest year on record for minimum temperatures. The national anomaly was +0.59 °C above average with each of the four states covered in this report also posting above average minimum temperatures of between +0.31 and +0.78 °C. Despite being above average, minimum temperatures were cooler than in 2009 when the national average was +0.76 above the long term average.

Maximum temperatures for 2010 were below the long term average, with an average anomaly of -0.21 °C. All of the four states posted below average maximums with the exception of Victoria, which was

0.31°C above average. This contrasts with last year when maximum temperatures were 1.04 °C above average nationally, with three of the four states in this report posting maximums of over 1.3 °C above average.

When compared with last year, the likely effect of these temperatures is reduced demand for air conditioning in summer when temperatures are at their highest. It is likely that this has contributed to the reduced electricity demand in Victoria, NSW and Queensland compared with 2009. However, given the overall cooler minimum temperatures than in 2009, it is likely that this effect will have been tempered by slightly increased demand for heating during the winter.

Temperature Summary 2010 and 2009					
Maximum Temperatures			Minimum Temperatures		
Area	2010 Anomaly (°C)	2009 Anomaly (°C)	Area	2010 Anomaly (°C)	2009 Anomaly (°C)
National	↓0.21	↑1.04	National	↑0.59	↑0.76
VIC	↑0.3	↑1.36	VIC	↑0.67	↑0.71
NSW	↓0.47	↑1.53	NSW	↑0.6	↑1.13
QLD	↓0.85	↑0.85	QLD	↑0.78	↑0.57
SA	↓0.3	↑1.33	SA	↑0.31	↑1.19

Source: Bureau of Meteorology. Anomalies are calculated with respect to the period 1961 – 1990.

Extremes of temperature in both summer and winter have a strong correlation to higher electricity use. In summer, high temperatures result in an increased need for cooling, with emissions from energy often increasing as a result. The same result occurs during winter due to increased demand for heating.

POPULATION

Emissions have decreased across all states, despite growth in the population of each state during June 2009 – June 2010. This means per capita emissions from energy have continued to fall in 2010 – carrying on the trend from the previous year. 2010 emissions from energy were 15.779 tonnes per capita across the four states, a fall of 4.2 per cent on the previous year.

GROSS STATE PRODUCT

Data from the last financial year of June 2009 to June 2010 indicates that all states recorded growth in GSP of between 1.5 and 2.0 per cent. While these are higher growth rates than last year, they are reasonably low compared with previous years, which will reduce upward pressure on emissions levels.

Growth Summary from June 09 to June 10 ¹		
State	Gross State Product (%)	Population (%)
VIC	▲2.0	▲1.8
NSW	▲1.7	▲1.5
QLD	▲1.6	▲2.0
SA	▲1.5	▲1.2

¹ GSP figures: Source ABS 5220.0 Australian National Accounts: State Accounts. Population figures: Source ABS 3101.0 Australian Demographic Statistics, June 2010. Please note that population figures are as of June 2010.

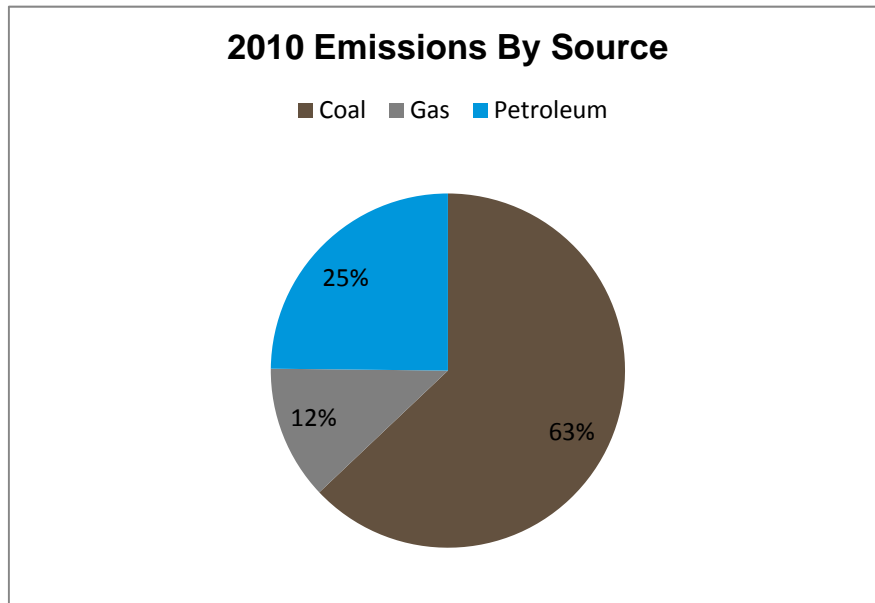
Victoria

2010 emissions: 99.052 million tonnes CO₂e, down 671,000 tonnes, or 0.67 per cent on 2009.

Coal-fired electricity: 62.334 million tonnes; down 0.69 per cent or 434,000 tonnes on 2009

Natural gas: 12.125 million tonnes; down 1.88 per cent or 232,000 tonnes on 2009

Petroleum: 24.594 million tonnes; down 0.02 per cent or 5000 tonnes on 2009



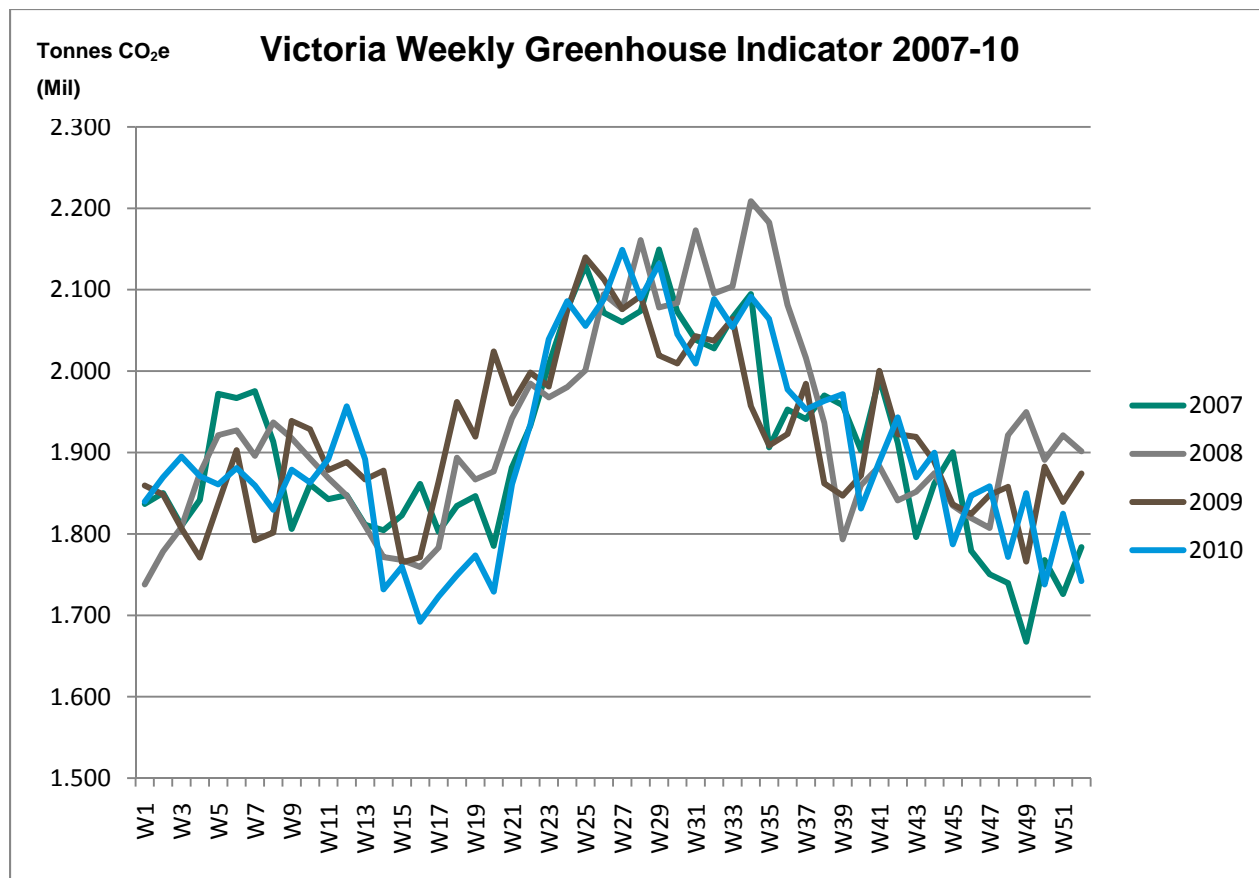
The Greenhouse Indicator accounts for just about all of Victoria's emissions from energy and about 85 per cent of the state's total greenhouse gas emissions. Remaining emissions come from agriculture, waste and industrial processes. Forestry also acts as a sink for about 2 per cent of the total emissions. Greenhouse gas emissions in Victoria not included by the Indicator are estimated to be approximately 20 million tonnes for the year as a whole. As a result, total annual emissions in 2010 were around 117 million tonnes.

Total weekly emissions fluctuated over the year between 1.69 and 2.15 million tonnes – a marginally larger range than in 2009. The Indicator peaked during the first week of July, which was the second highest week of the year for emissions from coal as well as for gas. The week was particularly cold causing increased demand for electricity for heating across the National Electricity Market. July is traditionally a peak month for the Indicator in Victoria

and other states for this reason – as highlighted by the graph below.

The lowest weekly emissions occurred during the third week of April which was also one of the lowest levels of emissions from coal for the year.

The average weekly emissions in Victoria were 1.905 million tonnes – less than last two years but very similar to 2007 weekly emissions levels.



Electricity from coal accounted for 63 per cent of all emissions in Victoria and 97.7 per cent of scheduled electricity generation compared with 96.3 per cent last year.

The total annual emissions from coal-fired power stations were 62.334 million tonnes, 434,000 tonnes less than the previous year. Emissions from coal peaked at 1.308 million tonnes during the third week of March with a particularly emissions intense generation unit coming online. The lowest weekly level recorded occurred in the third week of May and was 0.976 million tonnes with a number of generation units offline at the time.

The use of natural gas caused the lowest level of emissions of the three energy sources in Victoria – making up 12 per cent of total emissions from energy.

Natural gas is used in industrial and commercial applications as well as for domestic use (largely heating) and to fuel electricity generation. In 2010, the average weekly emissions from gas use were 233,000 tonnes, down 1.88 per cent or 232,000 tonnes less than in 2009. This was due to a fall in the amount electricity generated from gas of 60 per cent (or 630,000 tonnes emissions), more than compensating for a 3.5 per cent increase in emissions from gas being used for domestic and industrial purposes.

Petroleum emissions in 2010 were on average 473,000 tonnes per week, virtually identical to 2009. Petrol emissions include sales of LPG, automotive transport fuels, aviation fuel, industrial diesel and fuel oil. Emissions from the use of petrol and LPG both fell, by 1.1 per cent and 4.9 per cent respectively. In

contrast, emissions from aviation fuel and diesel rose by 4.5 per cent and 4.1 per cent respectively.

Electricity demand fell by 0.2 per cent in 2010. This compared with a 2 per cent fall the previous year. Average maximum temperatures were lower in 2010 than in 2009 (which was 1.3 °C above the 1961 - 1990 average). This is likely to have reduced upward pressure on electricity demand due to less demand for air conditioning during the hottest days. In contrast, despite being 0.69°C higher than the long term average, minimum temperatures were lower than last year (0.71°C above average) which may have increased demand for heating in the colder months.

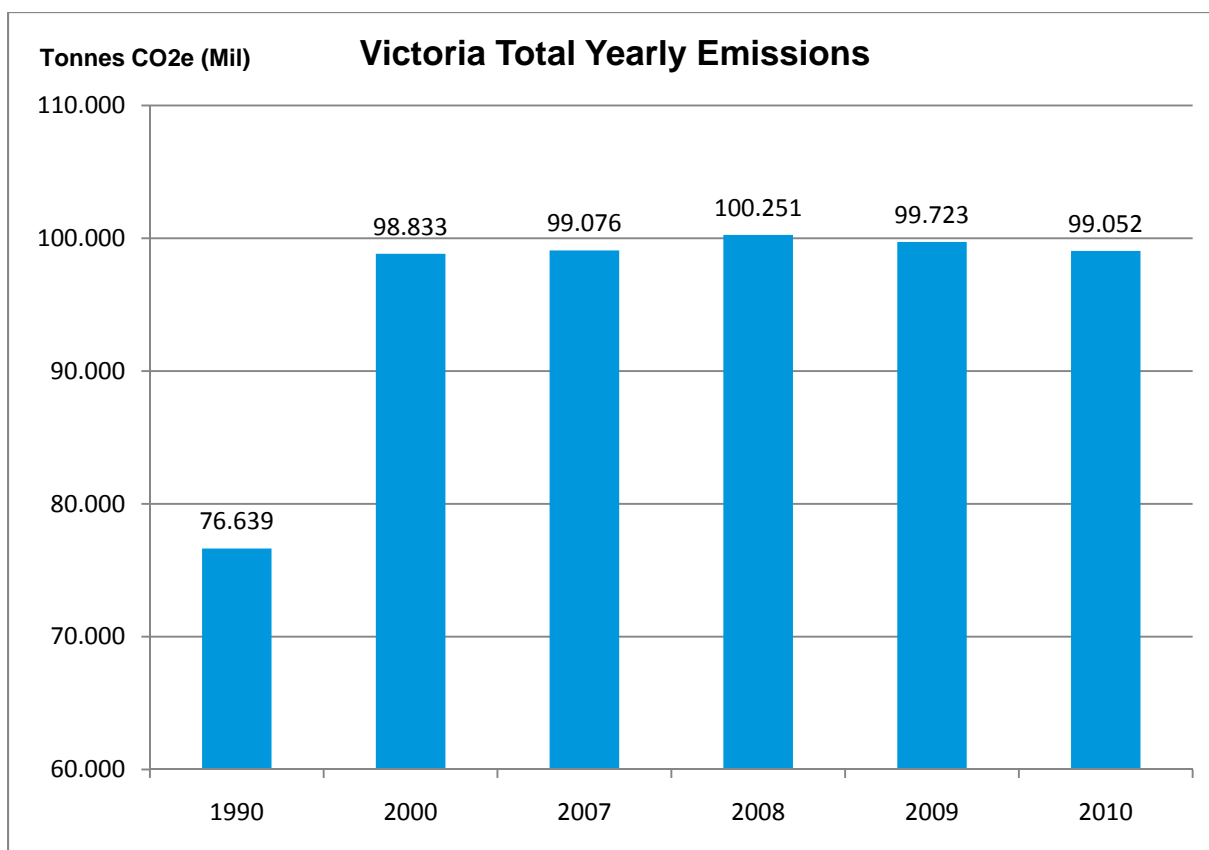
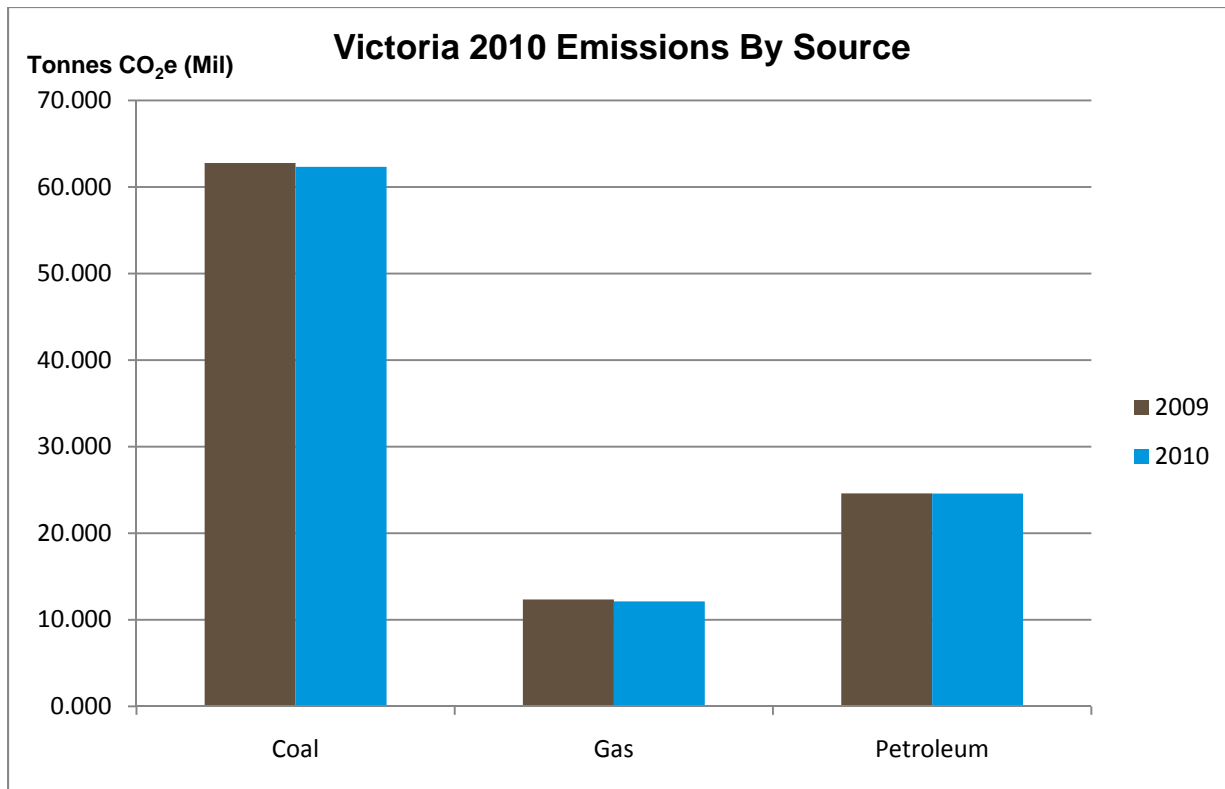
Electricity generation from brown coal-fired generators fell by 0.6 per cent while gas-fired generation fell by almost 60 per cent on the previous year. Increased scheduled renewables generation of 63 per cent made up for some of this decrease, although the impact was limited as renewables held a

small overall share of just 1 per cent of Victoria's scheduled electricity generation.

Imports/Exports: The fall in generation combined with a smaller fall in demand for electricity meant that while Victoria remains a net exporter of electricity, exports to other states fell from 4.6 per cent of electricity produced in 2009 to 2.8 per cent in 2010.

1990/2000 comparisons: Victoria's emissions are 29 per cent above 1990 levels – with an additional 22.4 million tonnes emitted. However the state's emissions are only marginally above 2000 levels by 219,000 tonnes over the course of the year.

GSP and Population: Victoria registered solid growth in Gross State Product during the last financial year of 2.0 per cent, the highest of any of the four states. Victoria's population also grew by 1.8 per cent. Despite this, overall electricity demand fell marginally in the state, by 0.2 per cent.



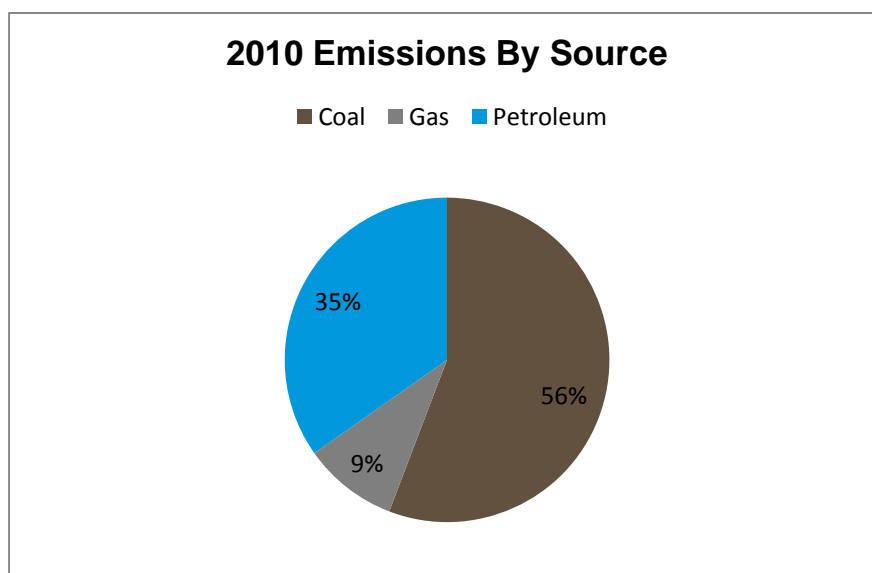
New South Wales

2010: 100.726 million tonnes CO₂e, down 5.277 million tonnes, or 4.98 per cent on 2009.

Coal-fired electricity: 56.210 million; down 10.02 per cent or 6.261 million tonnes on 2009

Natural Gas: 9.513 million; up 5.33 per cent or 481,000 tonnes on 2009

Petroleum: 35.003 million; up 1.46 per cent or 503,000 tonnes on 2009



The Greenhouse Indicator accounts for more than 90 per cent of NSW's emissions from energy and 65 per cent of the State's total greenhouse gas emissions. Remaining emissions come from agriculture, land use, waste, industrial processes and fugitive emissions from coal mining. Greenhouse gas emissions in NSW not included by the Indicator are estimated to be approximately 57 million tonnes for the year as a whole. As a result, total annual emissions in 2010 were around 156 million tonnes.

The Weekly Greenhouse Indicator in NSW ranged between 1.57 and 2.22 million tonnes during the year. Total emissions for NSW in 2010 fell by 4.98 per cent due entirely to a substantial decline in emissions from coal-fired generation.

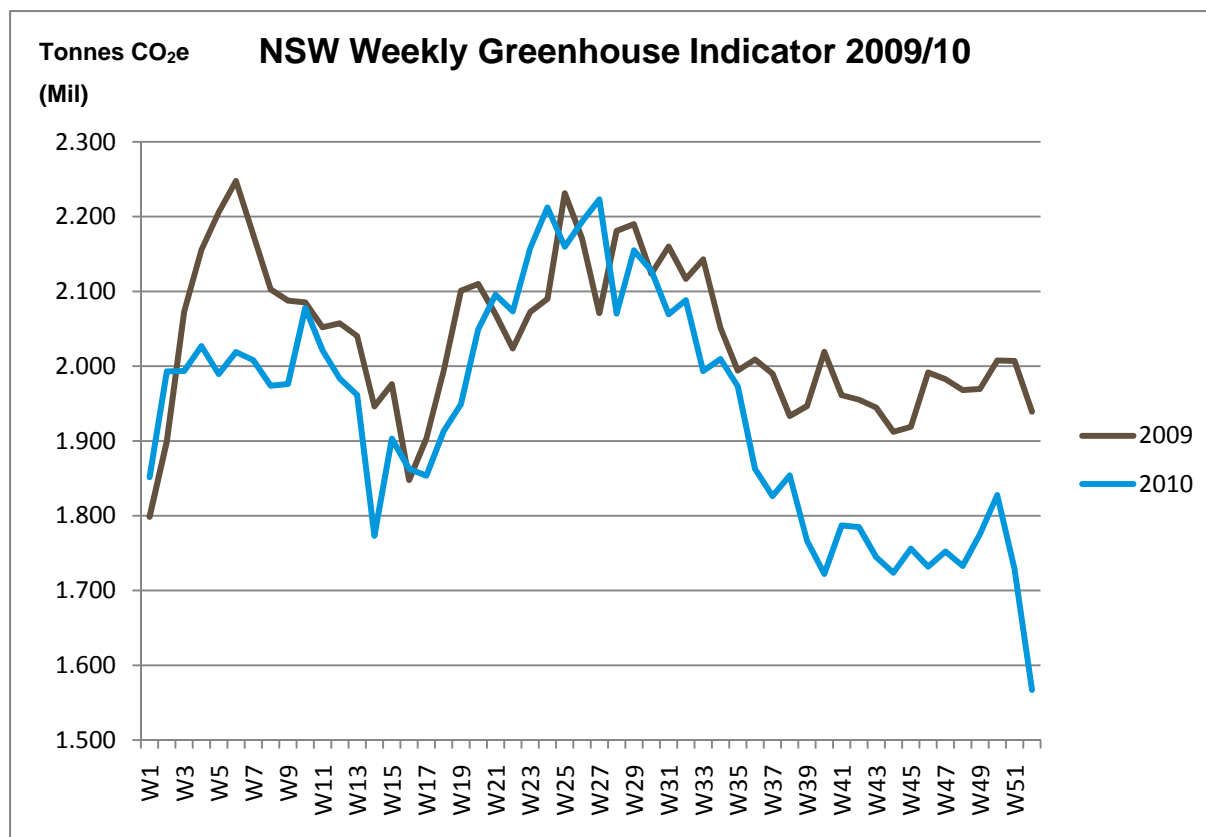
The Weekly Indicator peaked at 2.22 million tonnes during the first week of July. This coincided with the highest week of the year for emissions from coal and gas in NSW, as well as the highest level of demand for electricity across the National Electricity Market as

a whole, due to low winter temperatures, particularly in NSW and Victoria. Emissions in January and February were noticeably lower in 2010 than in 2009, when there is a traditional peak associated with high energy demand for cooling. This was due to lower emissions from coal compared with the previous year, as well as lower consumption of petroleum.

The lowest Weekly Indicator recorded was 1.57 million tonnes during the final week of December and

was due to the reduced industry and business taking

place over the holiday season.



Electricity from coal causes the most emissions from energy in NSW and accounted for 86.3 per cent of electricity generated in 2010. The average weekly emissions from coal-fired power stations were 1.081 million tonnes, down 10.02 per cent or 6.26 million tonnes as a whole on the previous year. This was the result of a 9.6 per cent fall in coal-fired electricity generation over the entire year with all coal-fired power stations operating at significantly reduced capacity, with the exception of Mount Piper. This continued a 6.1 per cent fall in coal-fired generation during 2009.

Emissions from coal peaked in the first week of July. The lowest emissions from coal came during the final week of December with 753,000 tonnes emitted that week.

The use of natural gas causes the lowest level of emissions of the three energy sources, contributing 9.4 per cent of the state's total annual emissions, up from 8.5 per cent the previous year. During 2010 the average weekly emissions from gas use were 183,000 tonnes. The amount of electricity generated from gas rose by 20.6 per cent in 2010, continuing the trend from 2009 when gas-fired generation grew by 191 per cent.

Petroleum emissions during 2010 were on average 673,000 tonnes per week and accounted for 34.8 per cent of total emissions from energy. Petroleum emissions include sales of LPG, automotive fuels, aviation fuel, industrial diesel and fuel oil. Emissions from diesel and LPG rose marginally, while emissions from aviation fuel rose by more than 10 per cent

compared to 2009. Emissions from petrol fell by 0.7 per cent on 2009.

Electricity demand fell by 0.7 per cent, continuing the 1.2 per cent fall seen during 2009. 2010 maximum temperatures were 0.47°C below the long term average; 2°C lower than 2009 when maximum temperatures were 1.53 higher than average. This is likely to have reduced upward pressure on electricity demand due to less demand for air conditioning during the hottest days. In contrast, despite being 0.6°C higher than the long term average, minimum temperatures were lower than last year (1.13°C above average), which may have increased demand for heating in the colder months.

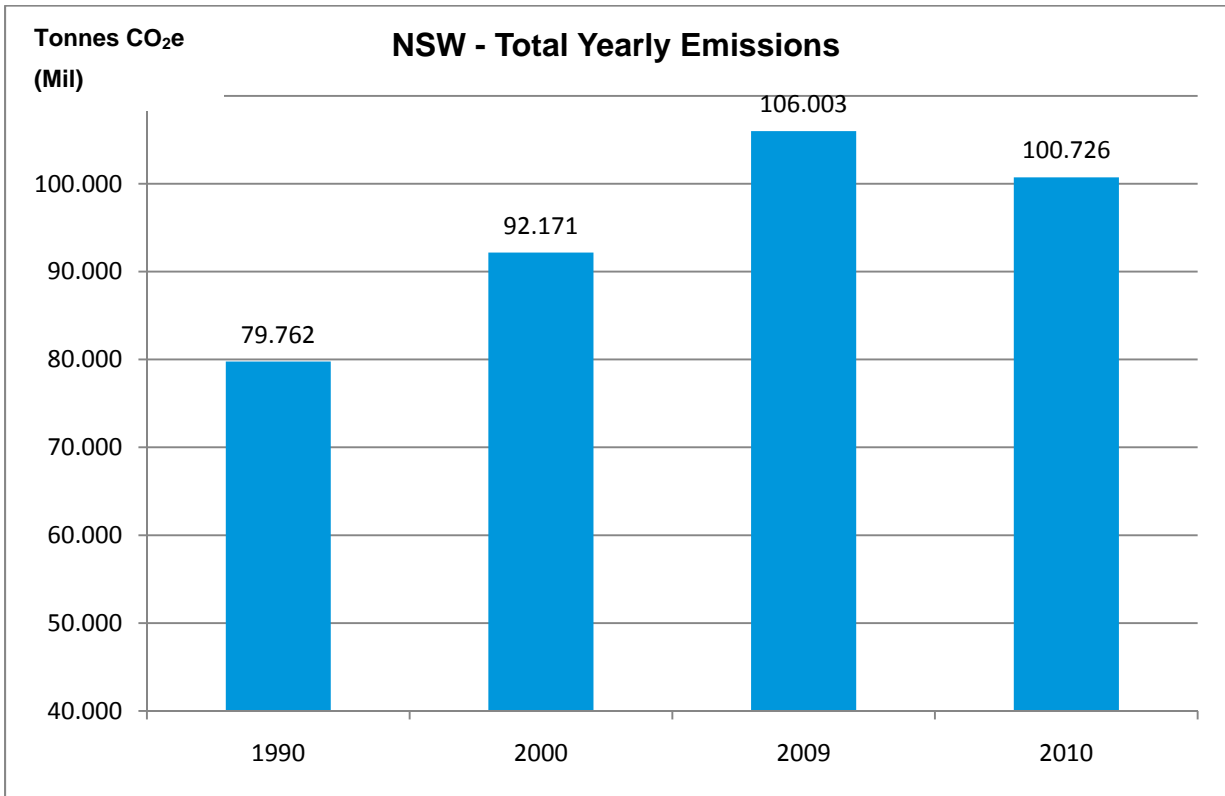
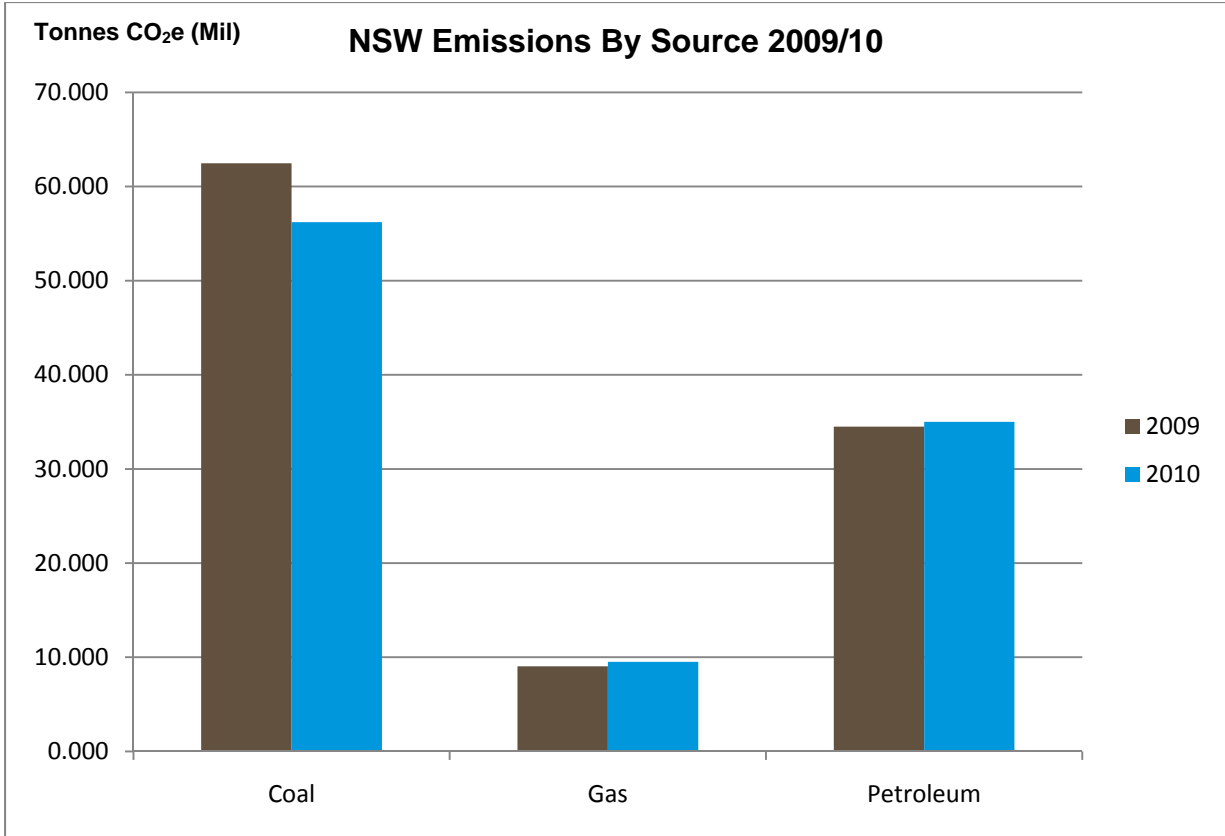
Total **electricity generation** fell by 4.6 per cent. The change in the generation mix continued from 2009, with black coal-fired generation falling and gas-fired generation increasing, albeit from a low base. Scheduled generation from renewables rose in NSW by 74.7 per cent – with renewables producing 5.55

million MWh of scheduled generation in 2010 with much more hydro-electric generation compared with 2009.

Import/export: The overall fall in generation, coupled with a much smaller fall in electricity demand, meant that NSW increased its imports of electricity from other states by 63.8 per cent. NSW now imports just over 9 per cent of its total electricity demand from other states, offsetting the reduced electricity production from black coal generators in the state.

1990/2000 comparisons: NSW's emissions are 26.3 per cent above 1990 levels and 9.3 per cent above 2000 levels. This is the equivalent of an additional 21.0 million tonnes and 8.55 million tonnes emitted last year compared with 1990 and 2000 respectively.

GSP and Population: The overall decline in emissions occurred despite positive growth in both population (1.7 per cent) and Gross State Product (1.5 per cent).



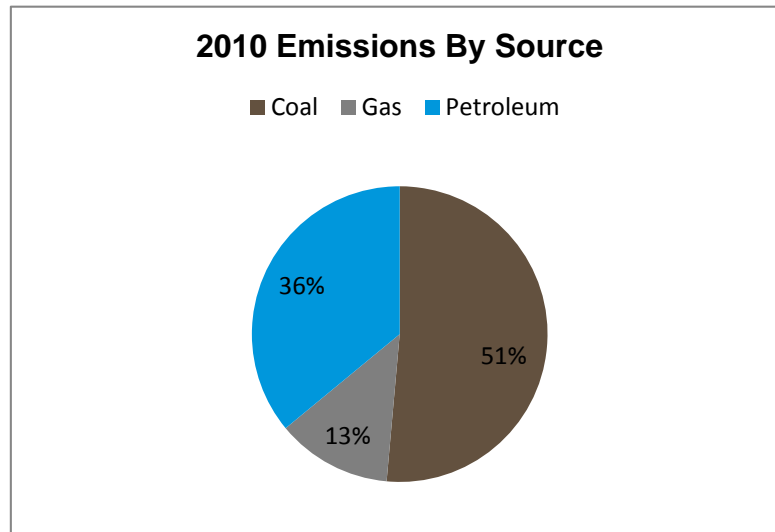
Queensland

2010: 80.287 million tonnes CO₂e, down 0.566 million tonnes or 0.70 per cent on 2009.

Coal-fired electricity: 41.277 million; down 4.19 per cent or 1.805 million tonnes on 2009

Natural gas: 10.120 million; up 14.12 per cent or 1.252 million tonnes on 2009

Petroleum: 28.890 million; down 0.04 per cent or 13,000 on 2009



The Weekly Indicator accounts for about 80 per cent of Queensland's total energy emissions and 45 per cent of the state's total greenhouse gas emissions. Remaining emissions come from agriculture, land use, waste, industrial processes, electricity generated on-site by industry and fugitive emissions from coal mining. Greenhouse gas emissions in Queensland not included by the Indicator are estimated to be approximately 99 million tonnes for the period as a whole. As a result, total annual emissions in 2010 were around 179 million tonnes.

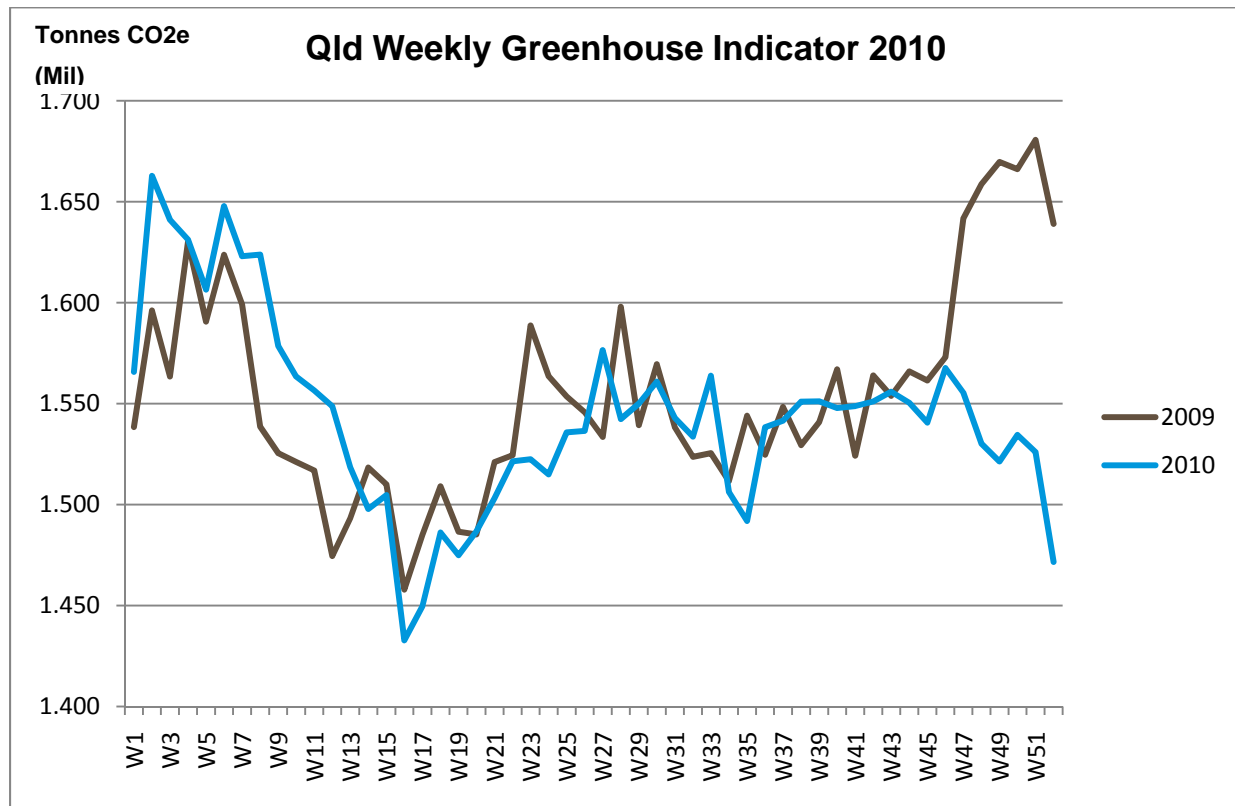
The Weekly Greenhouse Indicator in Queensland ranged between 1.43 and 1.66 million tonnes in 2010, a greater range than in 2009. Queensland's total emissions fell compared with last year by 0.7 per cent. As with the previous year, this was primarily due to a fall in coal emissions of 4.19 per cent

The highest Weekly Indicator recorded was 1.663 million tonnes in the second week of January. This coincided with the peak in coal-fired emissions in the

state at 906,000 tonnes for that week, as well as being one of the highest weeks for emissions from petroleum. December and January are traditionally the peak months for emissions in Queensland when the hot weather across the eastern states increases electricity demand for cooling across the National Electricity Market. As the graph below shows, this was the case in both 2009 and 2010.

The lowest Weekly Indicator was during the third week of April at 1.433 million tonnes, which was also the lowest week for emissions in 2009. April and May are traditionally low emissions months with generally more comfortable temperatures across the eastern states reducing demand for electricity. As the graph

shows, Queensland did have an unexpected dip in emissions during the final four weeks of the year, which contrasts with emissions levels at the same time the previous year. This was because of lower coal-fired emissions corresponding with significantly lower demand across the NEM.



Electricity from coal accounted for 51 per cent of emissions in Queensland and 80.6 per cent of scheduled electricity generated in 2010 – a 3.8 per cent fall in generation on the previous year, continuing a 3.0 per cent decline in 2009. The average weekly emissions from coal were 794,000 tonnes, down 4.19 per cent or 1.805 million tonnes over the year as a whole. Peak emissions from coal occurred during the second week in January with a number of stations operating at high capacity. The lowest level of emissions for coal was in the last week of December – at 688,000 tonnes for the week. That week was one of the lowest weeks for overall emissions in Queensland during the year.

The use of natural gas caused the lowest level of emissions at 195,000 tonnes on average per week. Total gas-fired generation was up by 68.1 per cent on 2009, producing 4.4 million additional MWh and 2.02 million tonnes of additional emissions, due to the commissioning of new gas power plants at Condamine and Yarwun. This was the largest absolute increase in generation in any sector across the four states. Gas makes up 18 per cent of Queensland’s scheduled electricity generation mix.

While the amount of electricity generated from gas increased, other uses of gas (mainly industrial and

domestic) fell, with 768,000 tonnes less emissions for the year (or 14 per cent less).

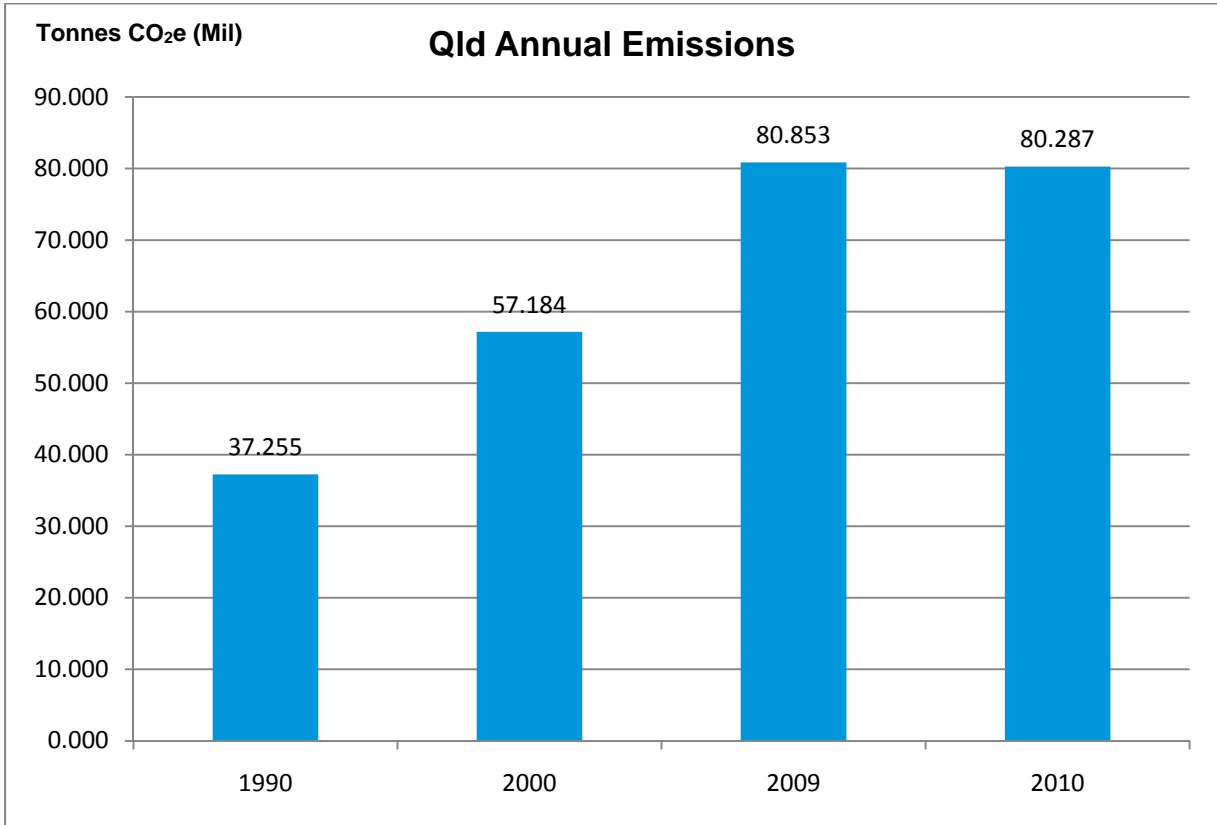
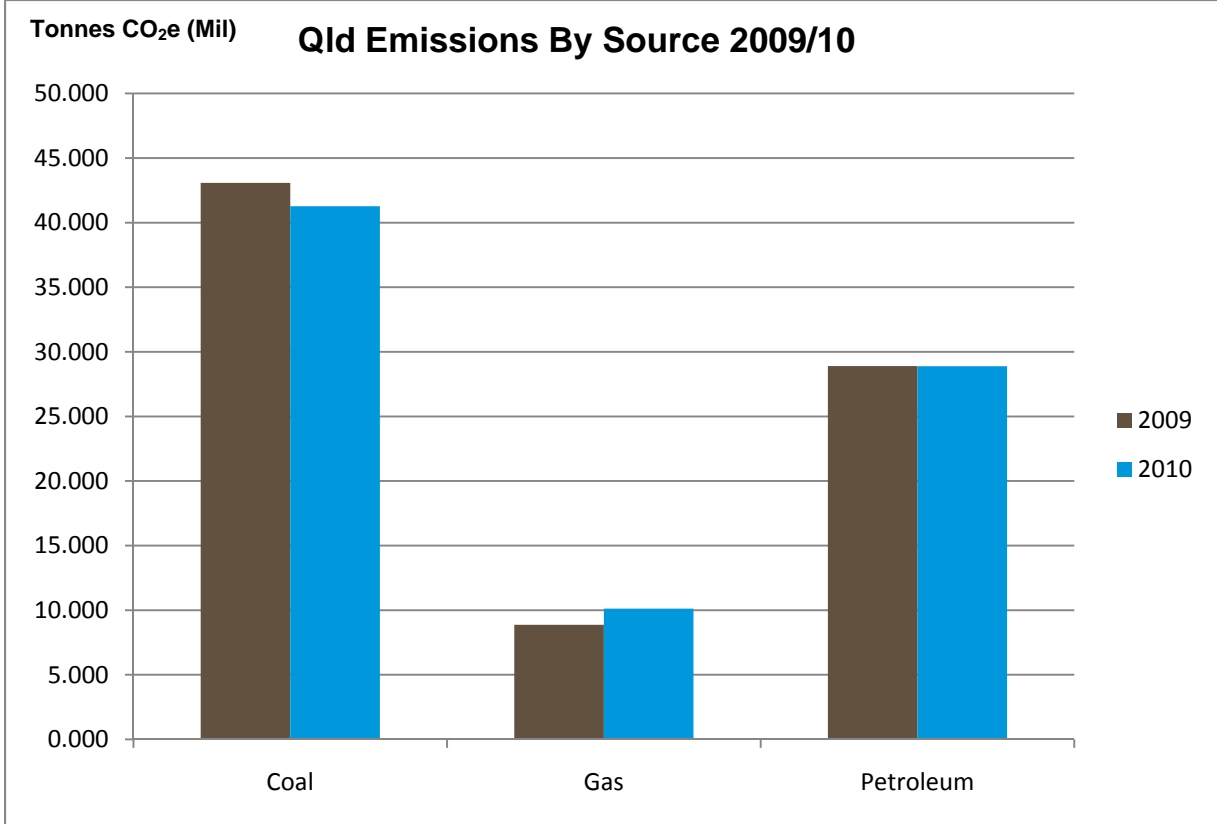
Petroleum emissions averaged 556,000 tonnes per week. The highest weekly emissions were 588,000 tonnes for the week and the lowest 488,000 tonnes. Emissions from petrol and LPG both fell in 2010 by 2.9 per cent and 1.1 per cent respectively, while emissions from aviation fuel rose by 5.9 per cent. Emissions from diesel were similar to 2009.

Electricity demand fell by 0.8 per cent in 2010, compared with a rise in demand of 1.5 per cent the previous year. An overall increase in electricity generation in Queensland of 4.2 per cent coupled with the decrease in demand meant that the state's exports of electricity increased by 60.5 per cent compared with the previous year, with the state now exporting 12.5 per cent of its electricity (7.43 million MWh) – up from 8.1 per cent and 10.5 per cent in 2009 and 2008 respectively.

2010 maximum temperatures were 0.85°C below the long term average, and 1.7°C lower than 2009, when maximum temperatures were 0.85°C higher than average. This is likely to have reduced upward pressure on electricity demand due to less demand for air conditioning during the hottest days. Warmer minimum temperatures (0.78°C above average) than in 2009 (0.57°C above average) are also likely to have reduced demand for heating in the colder months.

1990/2000 comparisons: Queensland's emissions are 116 per cent above 1990 levels – with an additional 43.032 million tonnes emitted in 2010 than in 1990. The state's emissions are 40.4 per cent above 2000 levels, resulting in 23.103 million tonnes extra emissions in 2010 than in 2000.

GSP and population: The overall decline in emissions occurred despite positive growth in both population (2 per cent) and Gross State Product (1.6 per cent).



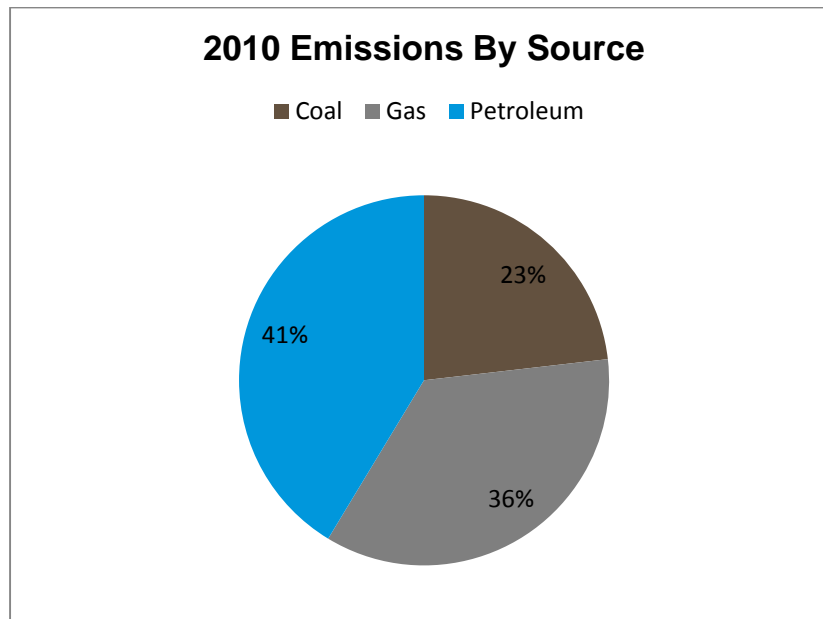
South Australia

2010: 18.899 million tonnes CO₂e, down 129,000 tonnes or 0.68 per cent on 2009.

Coal-fired electricity: 4.380 million; down 4.54 per cent or 208,000 tonnes on 2009

Natural gas: 6.707 million; down 1.53 per cent or 104,000 tonnes on 2009

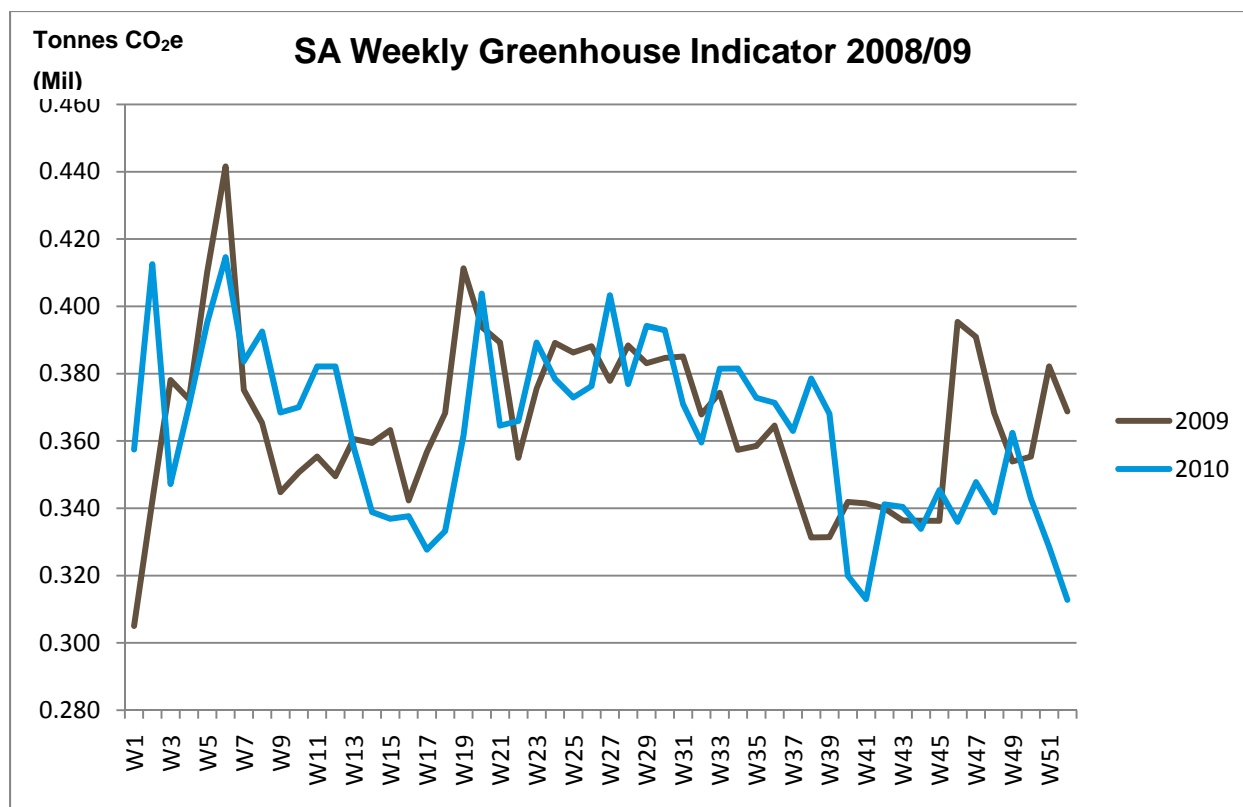
Petroleum: 7.812 million; up 2.41 per cent or 184,000 tonnes on 2009



The Weekly Indicator accounts for around 90 per cent of South Australia's emissions from energy and about 65 per cent of the State's total greenhouse gas emissions. Remaining emissions come from agriculture, waste and industrial processes. Greenhouse gas emissions in South Australia not included by the Indicator are estimated to be approximately 10 million tonnes for the year as a whole. As a result, total annual emissions in 2010 were around 29 million tonnes.

The Weekly Greenhouse Indicator in South Australia ranged between 313,000 and 415,000 tonnes in 2010, a smaller range than in 2009. Total emissions fell by 0.68 per cent (or 129,000 tonnes) compared with 2009 due to a decrease in emissions from both gas and coal. This continues the trend in 2009, which saw a 4.2 per cent decrease in emissions on 2008, with a big fall in gas-fired generation particularly.

The highest Weekly Indicator recorded was 415,000 tonnes in the first week of February. This peak was due to high emissions from coal, combined with peak petroleum emissions for the season. The lowest Weekly Indicator, 313,000 was in the final week of December with less business and industrial activity at the start of the holiday period meaning less demand for cooling. This was the lowest week of electricity demand across the National Electricity Market.



Electricity from coal accounted for the lowest contribution to emissions in South Australia, in contrast with the other three states. Coal accounted for 23 per cent of emissions (or 4.38 million tonnes) during the year and 35.4 per cent of scheduled electricity generated this year, down from 52.5 per cent the year before. This was a similar fall in coal-fired generation to that seen in 2009. The decrease was due to the Playford B power station operating at decreased capacity. Northern power station's output remained virtually the same as last year.

The average weekly emissions from coal were 84,000 tonnes. Peak emissions from coal occurred during the second week of summer, when 109,000 tonnes were emitted, with both the state's coal plants, Northern Power Station and Playford B, operating at a higher than average capacity. The lowest weekly emissions for coal occurred in the second week of October – with coal-fired stations producing less than a third of the energy produced during their peak.

The use of natural gas contributed 129,000 tonnes on average per week to South Australia's emissions – down by 1.5 per cent on last year (104,000 tonnes less emissions in total). Gas-fired generation in South Australia accounted for 52.4 per cent of scheduled electricity generation, a fall of 2.9 per cent on 2009. Gas used for domestic and industrial purposes fell compared with 2009 by just under 3 per cent.

Peak emissions from gas occurred during the first full week of July, with 166,000 tonnes emitted that week. The lowest weekly emissions from gas were in the final week of the year, with 93,000 tonnes emitted.

Petroleum emissions accounted for the highest proportion of South Australia's emissions, with a 41 per cent share. This year, petroleum emissions averaged 150,000 tonnes per week, a rise of 2.41 per cent compared with last year. This was because of a 6 per cent rise in emissions from diesel and a 4.2 per

cent rise in emissions from aviation fuel. These rises were slightly offset by a 3.6 per cent fall in emissions from LPG in the state.

Electricity demand increased by 0.7 per cent, with South Australia the only state to see a rise in demand in 2010. The fall in generation from coal and gas was somewhat offset by a rise in scheduled renewable generation of 21.2 per cent. Scheduled renewable generation now makes up 12 per cent of South Australia's scheduled generation.

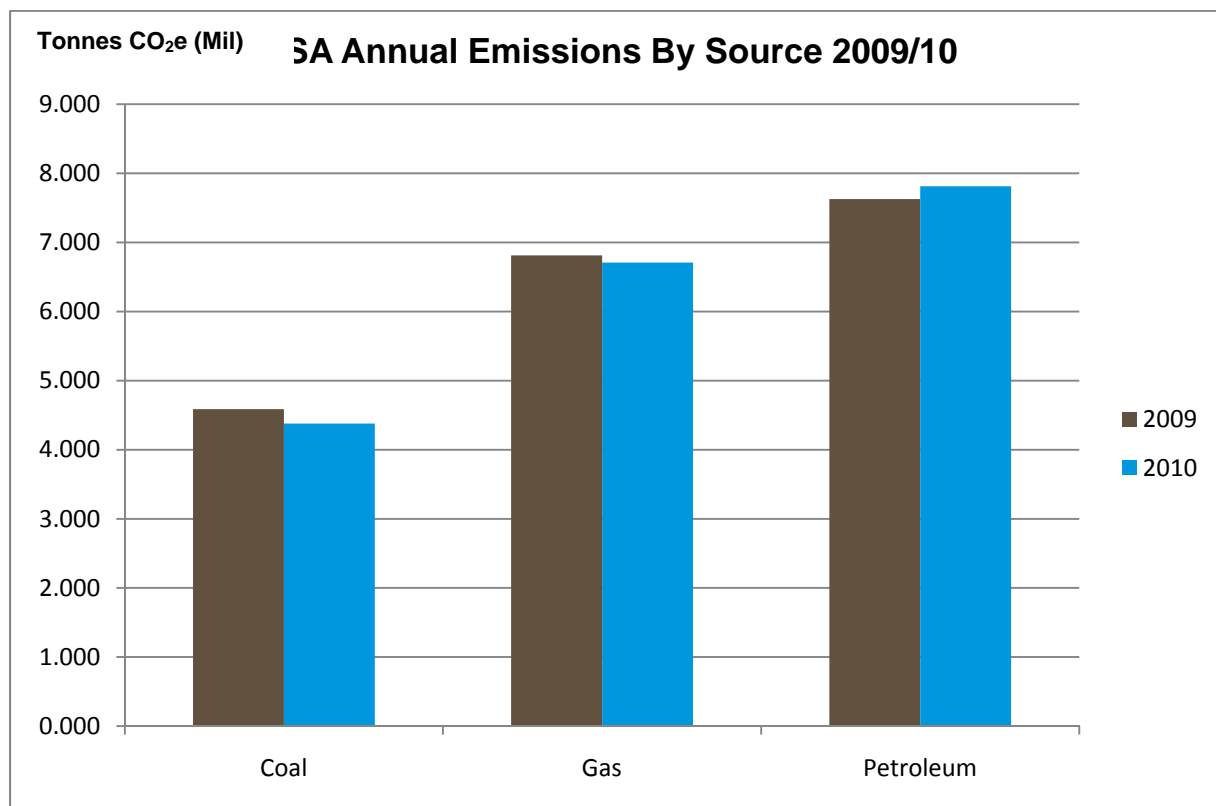
The overall increase in demand coupled with the lower overall generation meant that South Australia imported 26 per cent more electricity than in 2009 (or 146,545 more MWh). The state now imports just over 5.2 per cent of its electricity demand.

2010 maximum temperatures were 0.3°C below the long term average, and 1.63°C lower than 2009 when

maximum temperatures were 1.33 higher than average. This is likely to have reduced upward pressure on electricity demand due to less demand for air conditioning during the hottest days. Despite being 0.31°C warmer than average, cooler minimum temperatures than in 2009 (which were 1.19°C above average) are likely to have increased demand for heating in the colder months.

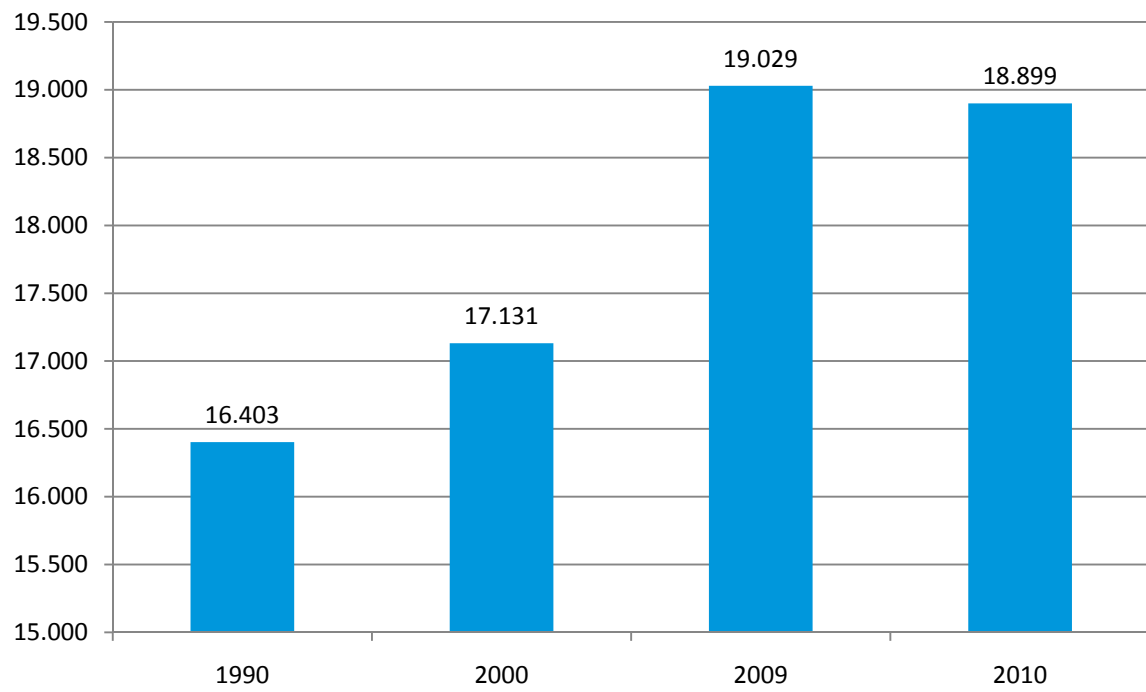
1990/2000 comparisons: South Australia's emissions are 15.2 per cent above 1990 levels – with an additional 2.496 million tonnes emitted in 2010 than in 1990. The state's emissions were 10.3 per cent or 1.768 million tonnes above 2000 levels.

GSP and Population: The overall decline in emissions occurred despite positive growth in both population (1.2 per cent) and Gross State Product (1.5 per cent).



Tonnes CO₂-e
(Mil)

SA - Total Annual Emissions



ADDITIONAL SECTION: TASMANIA

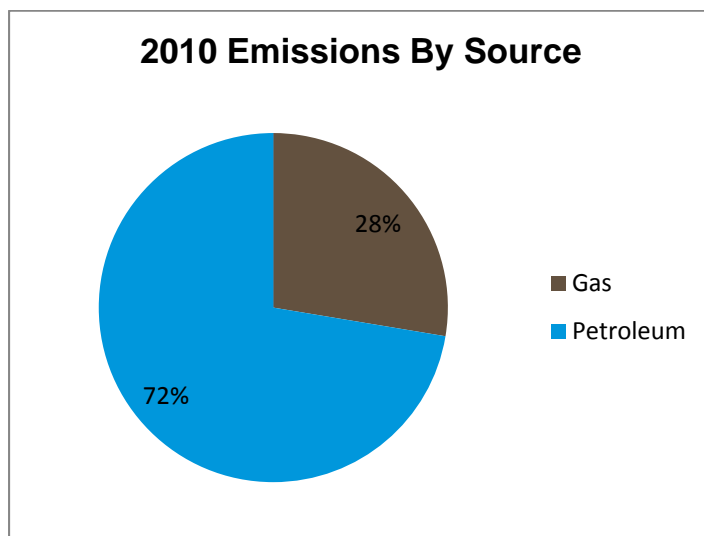
The Greenhouse Indicator recently expanded to include Tasmania and weekly reports are now available from The Climate Group's website (www.theclimategroup.org/indicator) and our weekly email service. They are also published in the Hobart Mercury each Tuesday. Tasmania is not included in

the body of the report above as we do not have a complete set of emissions data for 2009 with which to make accurate comparisons. However, a complete set of data for 2010 along with brief analysis is set out below.

Tasmania

2010: 3.092 million tonnes CO₂e

Natural gas: 0.854 million tonnes
Petroleum: 2.237 million tonnes



The Indicator accounts for around 63 per cent of Tasmania's emissions from energy and about 34 per cent of the state's total greenhouse gas emissions. Remaining emissions come from agriculture, waste and industrial processes. Greenhouse gas emissions in Tasmania not included by the Indicator are estimated to be approximately 6 million tonnes for the year. As a result, total annual emissions in 2010 were around 9.1 million tonnes.

Greenhouse emissions from energy in Tasmania covered by the Indicator totaled 3.092 million tonnes in 2010. The majority of these emissions (72 per cent or 2.24 million tonnes) came from petroleum related products – mostly petrol or diesel. The remaining 28 per cent of emissions came from the use of gas, both

for electricity production as well as for domestic use and industrial purposes. Around two-thirds of gas emissions in 2010 (555,000) tonnes came from electricity generation with roughly a third coming from domestic and industrial use of gas.

Tasmania is notable in Australia for its lack of emissions from large scheduled coal-fired electricity generation.

The Weekly Greenhouse Indicator in Tasmania ranged between 51,000 and 72,000 tonnes in 2010. The highest weekly emissions were recorded during the second and third weeks in March.

The lowest weekly emissions came during the second full week in May with very low emissions from gas and lower than average emissions from petroleum.

Emissions from petroleum averaged 43,000 tonnes each week. Automotive petrol as well as diesel (used in cars as well as in industry and for marine uses) accounted for 92.5 per cent of all petroleum emissions. Emissions from automotive petrol rose by 12 per cent compared with 2009, while diesel use remained at the same level as 2009. LPG accounted for around 4.7 per cent of emissions from petroleum with aviation fuel making up the remaining 2.8 per cent.

Emissions from gas, used for electricity generation as well as industrial and domestic uses averaged 16,000 tonnes each week.

Electricity Production in Tasmania increased by 17.5 per cent or 1.45 million MWh in 2010 compared with 2009. This was due to a 12.7 per cent increase in renewable generation (949,000 MWh) all of which is from the state's hydro-electric generators, as well as a 60.5 per cent or 500,000 MWh increase in gas-fired generation.

Tasmania's two gas-fired stations at Tamar Valley produced 13.6 per cent of Tasmania's scheduled electricity, with the remainder coming from hydro electricity.

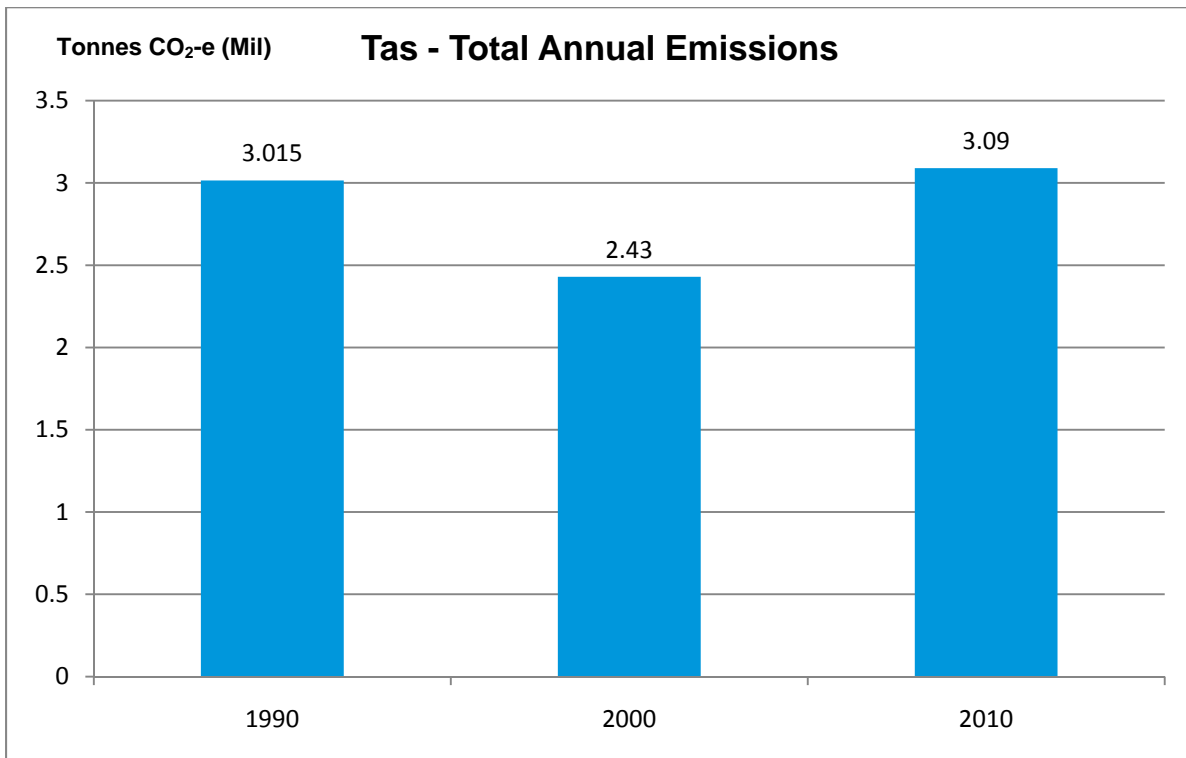
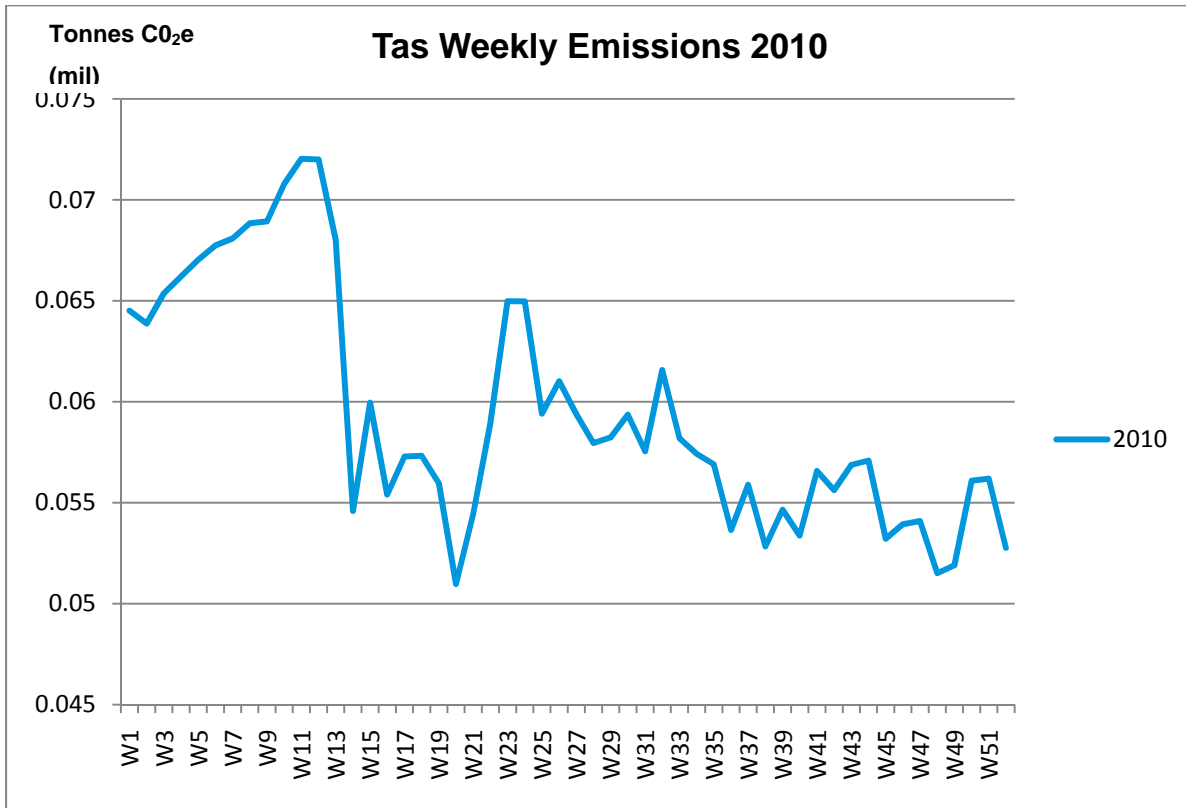
Electricity demand rose by 2.6 per cent or 258,000 MWh in 2010 compared with 2009. Despite the much larger rise in electricity generation, Tasmania remained a net importer of electricity in 2010, importing a total of 403,606 MWh - or just under 4 per cent of overall electricity demand. This was down substantially on 2009 when Tasmania imported 1.59 million MWh of electricity, or 16 per cent of total demand.

1990/2000 comparisons: Tasmania's emissions were 2.5 per cent above 1990 levels and 27.2 per cent above 2000 levels.

Both Tasmania's GSP and population grew from June 2009 – 2010. As of June 2010, Tasmania's population was 507,600 a rise of 0.9 per cent.² Tasmania's GSP also grew by 0.4 per cent over the same period.³

² Population figures: Source ABS 3101.0 Australian Demographic Statistics, June 2010

³ GSP figures: Source ABS 5220.0 Australian National Accounts: State Accounts.



NOTE ON METHODOLOGY

Information on The Greenhouse Indicator's methodology can be found at <http://www.theclimategroup.org/the-greenhouse-indicator/methodology/>

Please note that, as part of a regular review of the Indicator, the methodology was updated during 2010. As a result this report now covers additional emissions from gas used for domestic and industrial purposes in South Australia, Queensland and NSW.

The Climate Group would like to acknowledge Green Energy Markets for its assistance in preparing this report.

For more information visit www.theclimategroup.org/indicator

The Climate Group
Level 17, 1 Nicholson Street,
Melbourne, VIC 3000
Tel: +61 3 9668 5798
Australia@theclimategroup.org

ANNEX

Greenhouse Indicator 2010 Annual Summary Greenhouse Emissions (mill tonnes CO2 equiv)

	VIC	NSW	QLD	SA	Combined
2009					
Coal	62.77	62.47	43.08	4.59	172.91
Gas	12.36	9.03	8.87	6.81	37.07
Petroleum	24.60	34.50	28.90	7.63	95.63
TOTAL	99.72	106.00	80.85	19.03	305.61

2010		% change		% change		% change		% change		% change
Coal	62.33	-0.69%	56.21	-10.02%	41.28	-4.19%	4.38	-4.54%	164.20	-5.04%
Gas	12.12	-1.88%	9.51	5.33%	10.12	14.12%	6.71	-1.53%	38.47	3.77%
Petroleum	24.59	-0.02%	35.00	1.46%	28.89	-0.04%	7.81	2.41%	96.30	0.70%
TOTAL	99.05	-0.67%	100.73	-4.98%	80.29	-0.70%	18.90	-0.68%	298.96	-2.17%

Change from 2009 ('000s tonnes)	-670.97		-		-565.82		-129.45		-6642.84
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% Change from 1990	29.24%		26.28%		115.51%		15.22%		42.32%
% Change from 2000	0.22%		9.28%		40.40%		10.32%		12.68%

Breakdown by source

Coal	62.93%		55.81%		51.41%		23.17%		54.92%
Gas	12.24%		9.44%		12.60%		35.49%		12.87%
Petroleum	24.83%		34.75%		35.98%		41.34%		32.21%
TOTAL	100.00%		100.00%		100.00%		100.00%		100.00%

Average weekly	1.905		1.937		1.544		0.363		5.749
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