

# THE °CLIMATE GROUP

## WEEKLY GREENHOUSE INDICATOR VICTORIA, NEW SOUTH WALES AND QUEENSLAND ANNUAL REPORT 2008

### OVERVIEW

The Climate Group has now tracked greenhouse emissions from energy use in Victoria, New South Wales and Queensland on a weekly basis for two years through its unique Greenhouse Indicator.

The Greenhouse Indicator provides accurate and real time information on greenhouse gases produced each week from energy use.<sup>1</sup> 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 too late for us to respond to it in the manner necessary to tackling this growing problem.

The Greenhouse Indicator puts a figure on what is happening now, and enables everyone to follow how much we are collectively emitting in our state each and every week.

### 2008 RESULTS

Across Victoria, NSW and Queensland annual emissions were 3.6 million tonnes higher in 2008 than in 2007. This is a rise of 1.3 per cent for the year. The increase was not uniform across all states. Emissions in Victoria and Queensland rose in 2008, up 2.2 and 2.0 million tonnes respectively, while in NSW emissions fell by 0.5 million tonnes.

Most of the increase in emissions was from coal-fired generators in Queensland and Victoria, which both produced an extra 1.5 million tonnes each in 2008. This was 3.6 per cent more emissions from coal than in 2007 in Queensland and a 2.4 per cent increase in Victoria. In NSW, emissions from coal-fired electricity rose by 0.7 per cent or nearly half a million tonnes.

Compared with 2000 levels, emissions from energy were significantly higher across all states, collectively up 19 per cent. In 2008 the NSW Indicator was 25 per cent higher than equivalent 2000 emission, the Victorian Indicator was 6 per cent higher and the Queensland Indicator was 34 per cent higher.

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<sup>1</sup> See each state for what the Weekly Indicator covers

The increase above equivalent 1990 levels is even more substantial. In Queensland it has risen 116 per cent, NSW it is up 30 per cent and in Victoria the rise has been 32 per cent.

## **PETROLEUM**

Fuel prices seem to have had a mixed impact on sales and therefore greenhouse gas emissions in 2008. Across the eastern seaboard emissions from petroleum products actually dropped in 2008, down 0.6 per cent or more than half a million tonnes less than 2007. The lower figure was because of an almost 1 million tonne reduction in emissions from petroleum products in NSW in 2008 despite emissions from petroleum products rising by 1.4 per cent in Victoria and a slight increase of 0.2 per cent in Queensland in 2008.

High petrol prices in 2008 are likely to have reduced sales. However, population growth in each of the states would have had the alternative effect. The higher population growth in Queensland and Victoria relative to NSW is generally consistent with the petroleum emissions growth seen in those two states.

In 2008 there was a noticeable move towards diesel across all states. Petrol sales decreased by 9 per cent in NSW, 7 per cent in Queensland and 2 per cent in Victoria while sales of diesel for automotive use increased 7 per cent in Victoria, 2 per cent in NSW and 5 per cent in Queensland.

## **ELECTRICITY**

Across the three states the total electricity generated in 2008 was 1.3 per cent higher than 2007. However, emissions from electricity increased by 2 per cent as more electricity was produced from coal-fired generators and less from gas and renewable sources.

In Victoria, electricity demand increased by 1 per cent in 2008. Generation from coal-fired generators increased by 0.7 per cent, while electricity produced from gas-fired generation was 35 per cent lower. Victoria's net export of electricity to other States was 50 per cent less than 2007 levels.

In NSW, electricity demand increased by only 0.4 per cent in 2008. Generation from coal-fired generators in NSW increased by 0.7 per cent with net imports from other states falling 8 per cent compared with 2007 levels.

In Queensland, electricity demand increased by 0.8 per cent. Generation from coal-fired generators increased by 4 per cent, output from hydro was 19 per cent lower and gas-fired generation grew by 19 per cent. The net export of electricity to other states from Queensland was 59 per cent higher than the amount exported in 2007.

## GREENHOUSE GAS INDICATOR, VICTORIA

**Total 2008: 105.748 million tonnes CO<sub>2e</sub> up 2.167 million tonnes on 2007**

Coal-fired electricity: 62.738 million; 59.3 per cent up 2.4 per cent on 2007  
Natural gas: 14.903 million; 14.1 per cent up 2.2 per cent on 2007  
Petroleum: 28.107 million; 26.6 per cent up 1.4 per cent on 2007

The 2008 Victoria Indicator was  
2.1 per cent higher than 2007 levels  
6.2 per cent higher than 2000 levels  
32 per cent higher than 1990 levels

2000 equivalent: 100 million tonnes  
1990 equivalent: 80 million tonnes

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 on average 350,000 tonnes per week.

**Total weekly emissions** fluctuated over the year at around 2 million tonnes. The Indicator reached its highest levels during the winter months when coal-fired emissions peaked - due to a large number of generation units being online - as well as higher gas use for heating. The highest Weekly Indicator (2.336 million tonnes) was in August. This was 3.3 per cent more than the highest Weekly Indicator in 2007. Four weeks in 2008 recorded higher emissions than the peak in 2007. Other peaks in emissions occurred in February and early December when coal-fired emissions were above average. The lowest Weekly Indicator (1.831 million tonnes) was in early January due to the holiday period. It was also low in April mainly due to lower coal-fired emissions as a number of generation units were offline, as well as less gas used for heating. There was no time in 2008 when the cumulative emissions for the year were lower than at the equivalent time in 2007. The highest Weekly Indicator was 28 per cent higher than the lowest Indicator during 2008.

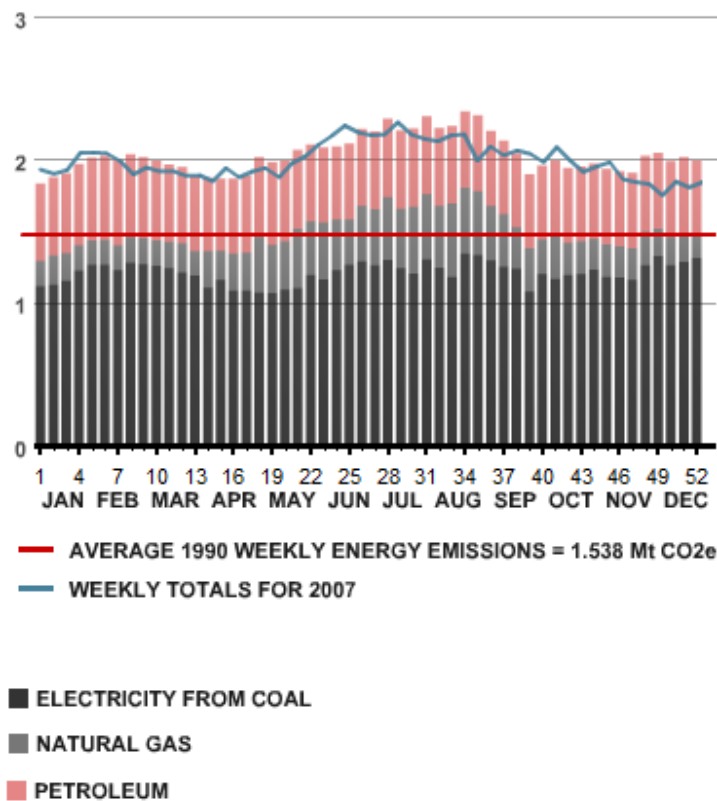
**Electricity from coal** is the largest contributor to emissions in Victoria and accounted for 95 per cent of electricity generated in the state in 2008. During 2008 the average weekly emissions from coal-fired power stations was 1.207 million tonnes, up 2.4 per cent on 2007. Emissions from coal peaked in winter and summer periods. The highest peak in coal emissions occurred during August and was 11 per cent above the average due to higher electricity demand for heating across the eastern states. The lowest trough was during May and was 12 per cent below the year's average. Traditionally, planned maintenance of generation units occurs during the lower electricity demand periods of autumn and spring.

**Natural gas** causes the lowest level of emissions of the three energy sources. Natural gas is used in industrial and commercial applications as well as for domestic use (largely heating) and to fuel electricity generation. During 2008 the average weekly emissions from gas use was 287,000 tonnes, up 2.2 per cent on 2007. Emissions from natural gas increased significantly during the cooler months from a summer average of

188,000 tonnes to a winter average of 422,000 tonnes as demand increased for domestic heating. The highest was in August and was 5.4 per cent higher than the highest level in 2007. The lowest was in December and was 6.1 per cent higher than the lowest in 2007.

**Petroleum** emissions during 2008 were on average 541,000 tonnes per week - 1.4 per cent higher than in 2007. These emissions include sales of LPG, automotive transport fuels, aviation fuel, industrial diesel and fuel oil. The trend towards diesel use was notable in Victoria, with diesel sales up by 7 per cent and petrol sales down by 2 per cent. The trend over the course of the year was generally in line with 2007.

**FIGURE 1: VICTORIAN GREENHOUSE INDICATOR OVER 2008**



## **GREENHOUSE GAS INDICATOR, NEW SOUTH WALES**

**Total 2008: 98.442 million tonnes CO<sub>2e</sub> down 0.531 million tonnes on 2007**

Coal-fired electricity: 61.175 million; 62.1% up 0.7% on 2007  
Gas-fired electricity: 0.501 million; 0.5% up 10.7% on 2007  
Petroleum: 36.766 million; 37.3% down 2.6% on 2007

The 2008 Indicator was  
0.5% lower than 2007 levels  
25% higher than 2000 levels  
30% higher than 1990 levels

2000 equivalent: 80 million tonnes  
1990 equivalent: 76 million tonnes

The Greenhouse Indicator accounts for more than 80% of NSW's emissions from energy and 60% of the State's total greenhouse gas emissions. Remaining emissions come from agriculture, land use, waste, industrial processes and fugitive emissions from coal mining. Unlike Victoria, no regular accurate data is currently available for gas consumption other than gas used for electricity generation in NSW. Greenhouse gas emissions in NSW not included by the Indicator are estimated to be on average 1.2 million tonnes per week.

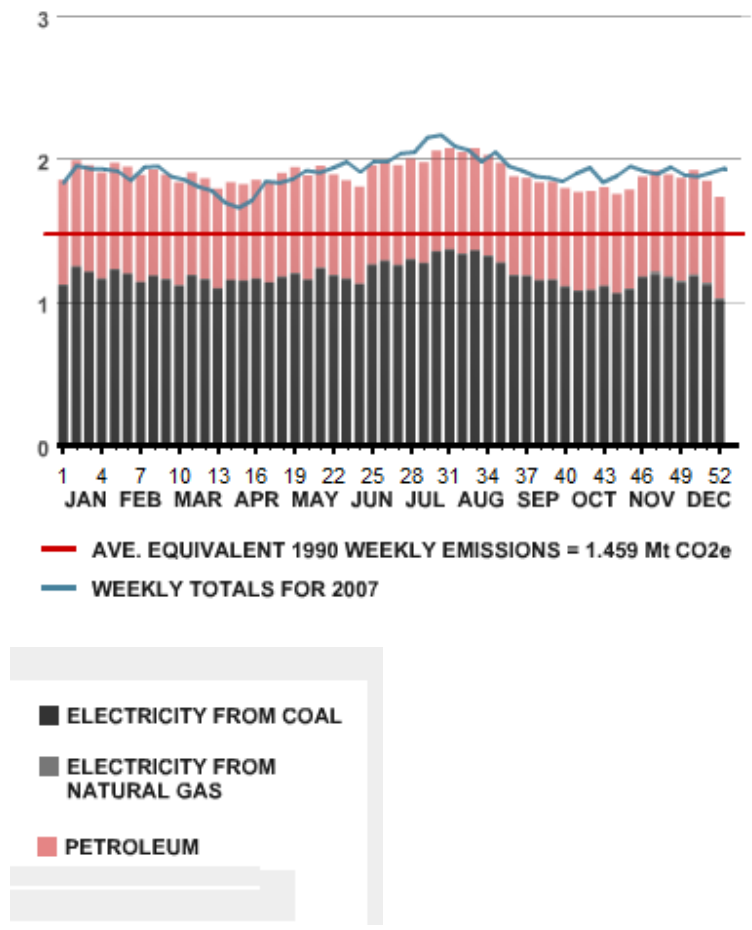
**Total weekly emissions** fluctuated over the year at around 1.9 million tonnes. Total emissions for NSW in 2008 fell, unlike Victoria and Queensland, which both saw rises. The NSW Weekly Indicator was highest during the winter months where there was eleven consecutive weeks where it was more than 1.9 million tonnes. This was when coal-fired emissions were at their highest – due to greater electricity demand in NSW which could not be matched by imported electricity from other states. The highest Weekly Indicator (2.072 million tonnes) was in August. This was 4.3 per cent lower than the highest Weekly Indicator in 2007. Other peaks occurred in January, due to high petroleum emissions, combined with above average coal-fired emissions driven by higher than average electricity demand and lower electricity imports. The Indicator was at its lowest level for the year (1.730 million tonnes) during December, due to year-low coal-fired emissions over the Christmas holiday week. It was also low in October due to below average coal-fired and petroleum emissions. It was not until October that cumulative emissions for the year were lower than at the same period in 2007. They remained below 2007 for the rest of the year. The highest Weekly Indicator for the year was 20 per cent greater than the lowest Weekly Indicator.

**Electricity from coal** causes the most emissions for NSW and accounted for 94 per cent of electricity generated in 2008. During 2008 the average weekly emissions from coal-fired power stations was 1.176 million tonnes, up 0.7 per cent on 2007. Emissions from coal fluctuated, peaking in winter and with the predominant trough during spring. The highest peak in emissions from coal-fired electricity occurred during August and was 15 per cent above the average. This was due to record high NSW electricity demand for the year occurring that week, with only a slight increase above average of electricity imports from other states. The lowest trough in coal-fired emissions occurred during the final week of the year and was due to the low electricity demand over the Christmas holiday week.

**Electricity from natural gas** causes the lowest level of emissions of the three energy sources. Natural gas is also used in industrial and commercial applications as well as for domestic use (largely heating) however no regular accurate data is currently available on this. During 2008 the average weekly emissions from gas-fired generation was 10,000 tonnes. This was up slightly from the 2007 average due to the commissioning of two new gas-fired generators towards the end of the year.

**Petroleum** emissions during 2008 were on average 707,000 tonnes per week – this was 2.6 per cent lower than in 2007. This is particularly notable as it has occurred despite a state population growth of more than 1 per cent over the 2007/08 year. Weekly emissions were less than those in the same week in 2007 from March through to November, with emissions just picking up again during December to reach those of 2007. Petrol use in particular fell 9 per cent, a much greater fall in consumption than the other states, with diesel use rising but only by 2 per cent. Petroleum emissions include sales of LPG, automotive fuels, aviation fuel, industrial diesel and fuel oil.

**FIGURE 2: NEW SOUTH WALES GREENHOUSE INDICATOR OVER 2008**



## **GREENHOUSE GAS INDICATOR, QUEENSLAND**

**Total 2008: 75.054 million tonnes CO<sub>2e</sub> up 2.006 million tonnes on 2007**

Coal-fired electricity: 42.803 million; 57.0 per cent up 3.6 per cent on 2007

Natural gas: 2.146 million; 2.9 per cent up 27.9 per cent on 2007

Petroleum: 30.105 million; 40.1 per cent up 0.2 per cent on 2007

The 2008 Queensland Indicator was:

2.7 per cent higher than 2007 levels

34 per cent higher than 2000 levels

116 per cent higher than 1990 levels

2000 equivalent: 55 million tonnes

1990 equivalent: 35 million tonnes

The Weekly Indicator accounts for about 75 per cent of Queensland's total energy emissions and 50 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. Unlike Victoria, no regular accurate data is currently available for gas consumption other than gas used for electricity generation in Queensland. Greenhouse gas emissions in Queensland not included by the Indicator are estimated to be on average 1.6 million tonnes per week.

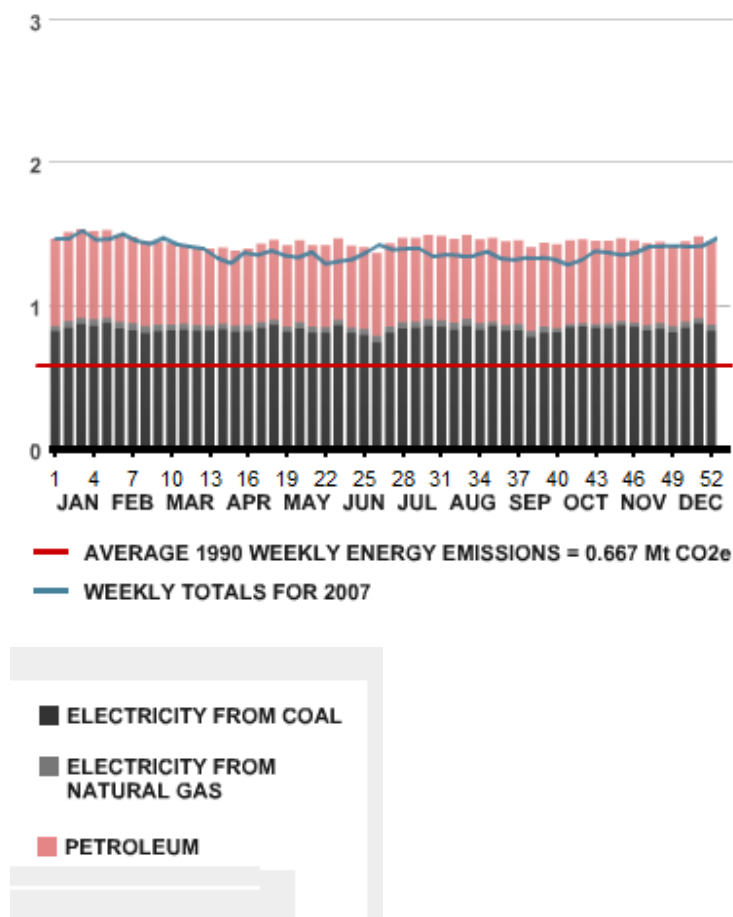
**Total weekly emissions** in Queensland fluctuated less than those in NSW and Victoria and were fairly stable over the year at more than 1.4 million tonnes, only dipping below this level during March and April and then briefly in June. The March/April trough was largely due to emissions from petroleum reaching its year low combined with below average coal-fired emissions. The lowest Weekly Indicator (1.359 million tonnes) was in June and was predominantly due to the lowest coal-fired emissions for the year, with a number of generation units not operating. The highest Weekly Indicator (1.527 million tonnes) was in January when petroleum emissions were near their peak and coal-fired emissions were also at a high. This was 1 per cent lower than the highest Weekly Indicator in 2007. The cumulative emissions for 2008 remained below those for the same period in 2007 only for the first eight weeks of the year, after which they remained above 2007. By the end of the year they were more than 2 million tonnes more than 2007. The highest Weekly Indicator for the year was 12 per cent greater than the lowest Weekly Indicator.

**Electricity from coal** causes the most emissions in Queensland and accounted for 89 per cent of electricity generated in 2008. The average weekly emissions from coal-fired electricity was 823,000 tonnes, up 3.6 per cent on the 2007 average. Emissions from coal fluctuated very little over the course of the year, with emissions just higher than average over summer as generation units met the traditional period of higher than average electricity demand due to air-conditioner use during the Queensland summer. The highest peak in coal emissions occurred during February and was just 5.7 per cent above the average. The lowest trough was a sharp, one week drop during June when a number of generation units were not operating and emissions were 11 per cent below the average.

**Electricity from natural gas** causes the lowest level of emissions at only 41,000 tonnes on average per week. However, this is up substantially (28 per cent) from 2007, due to increased generation to meet higher demand and increased exports to other states. Natural gas is also used in industrial and commercial applications as well as for domestic use (largely heating) however no regular accurate data is currently available on this.

**Petroleum emissions** during 2008 were on average 579,000 tonnes per week – just 0.2 per cent greater than in 2007. This was despite more than 2 per cent population growth in the 2007/08 year and strong economic activity. Petroleum emissions over the course of the year generally followed the trend of 2007. The trend towards diesel use was also notable in Queensland with a 5 per cent growth in sales, compared with a 7 per cent fall in petrol sales. Petroleum include sales of LPG, automotive fuels, aviation fuel, industrial diesel and fuel oil.

**FIGURE 3: QUEENSLAND GREENHOUSE INDICATOR OVER 2008**



## APPENDIX 1

### GREENHOUSE INDICATOR (MILLION TONNES CO2 EQUIV)

	VIC		NSW		QLD		Combined	
<b>2007</b>								
Coal	61.263		60.769		41.322		163.353	
Gas	14.586		0.452		1.679		16.717	
Petroleum	27.732		37.752		30.048		95.532	
<b>Total 2007</b>	<b>103.581</b>		<b>98.973</b>		<b>73.048</b>		<b>275.602</b>	
<b>2008</b>								
Coal	62.738	2.4%	61.175	0.7%	42.803	3.6%	166.716	2.1%
Gas	14.903	2.2%	0.501	10.7%	2.146	27.9%	17.550	5.0%
Petroleum	28.107	1.4%	36.766	-2.6%	30.105	0.2%	94.979	-0.6%
<b>Total 2008</b>	<b>105.748</b>	<b>2.1%</b>	<b>98.442</b>	<b>-0.5%</b>	<b>75.054</b>	<b>2.7%</b>	<b>279.245</b>	<b>1.3%</b>
<i>Change from 2007 (mt)</i>	<i>2.167</i>		<i>-0.531</i>		<i>2.006</i>		<i>3.642</i>	

Note: Gas emissions in NSW and Queensland are from electricity generation only

### YEAR 2000 EMISSIONS

The Australian Government has committed to reduce greenhouse emissions by 5% by 2020 from year 2000 levels. The levels of greenhouse emissions in 2000 equivalent to those covered by the Indicator are approximately:

Victoria	100 million tonnes
NSW	80 million tonnes
Queensland	55 million tonnes
Total	235 million tonnes

Increase in emissions covered by the Indicator on 2000 levels:

Victoria	6 per cent
NSW	25 per cent
Queensland	34 per cent



The Purves Environmental Fund is proud to support **The °Climate Group's** Greenhouse Indicator. The fund works to advance environmental sustainability in Australia and to preserve our unique biodiversity, primarily through education. Climate change is perhaps the most serious threat to environmental sustainability and biodiversity that we have ever faced.

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