THE CLIMATE GROUP

WEEKLY GREENHOUSE INDICATOR
VICTORIA, NEW SOUTH WALES AND QUEENSLAND
SUMMER REPORT 2008/09

OVERVIEW

The Climate Group is now in its third year of tracking greenhouse emissions from energy use in Victoria, NSW and Queensland on a weekly basis through its unique 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 select 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 we are collectively emitting in our state each and every week.

Greenhouse emissions traditionally peak in summer and winter months due to extra energy used to heat and cool our homes. This Summer Report covers greenhouse emissions from energy during the 2008/09 summer and also compares them to emissions over summer the previous year.

2008/09 SUMMER RESULTS

Across Victoria, New South Wales and Queensland emissions this summer totalled 68.69 million tonnes, 60,000 tonnes less than in summer 2007/08. The change was not uniform across all states.

Summer emissions in Victoria rose in 2008/09 by 480,000 tonnes to 25.379 million tonnes, while in NSW and Queensland emissions fell by 310,000 and 230,000 tonnes respectively to 24.382 million tonnes and 18.876 million tonnes.

The overall reduction in emissions was due to a substantial reduction in emissions from petroleum across the three states: NSW and Victoria produced nearly 350,000 tonnes less emissions each and Queensland 290,000 tonnes less. Petroleum emissions in Victoria were 6.9 million tonnes, 4.6 per cent less than summer last year. In NSW petroleum emissions dropped by 3.6 per cent to 9.2 million tonnes and in Queensland they dropped by 3.7 per cent to 7.5 million tonnes.

However, this drop in emissions from petroleum products was nearly entirely offset by a 1.9 per cent or 770,000 tonne growth in emissions from coal-fired power stations. This was primarily due to a 5.6 per cent increase in emissions from coal-fired power stations in Victoria. Emissions from Queensland's coal-fired power stations grew by 0.3 per cent while emissions from coal fell in NSW by 0.7 per cent.

PETROLEUM

While 2008 saw a mixed impact from increased fuel prices on petroleum sales over the year, this summer has seen a uniform decrease in sales across all three states compared with the previous summer. 2008 saw petroleum sales fall significantly in NSW compared with the previous year, but in Victoria and Queensland sales grew. In contrast, this Summer Report shows a significant reduction in emissions from petroleum products of 960,000 tonnes across the eastern seaboard, when compared with the 2007/08 summer, down to 23.582 million tonnes. This was due to 4.6 per cent less emissions from petroleum in Victoria, 3.6 per cent less in NSW and 3.7 per cent less in Queensland.

High petrol prices during 2008 are likely to have reduced sales and may have had some ongoing impact on travel habits despite prices subsequently falling. These reductions in petroleum sales come despite positive population growth in each of the states, which has been greater in Victoria and Queensland than in NSW.

Over 2008 there was a trend towards diesel use and declining petrol sales across the states – this continues to be noticeable over the 2008/09 summer. Petrol sales decreased by 9 per cent in Victoria, 12 per cent in NSW and 14 per cent in Queensland, while diesel sales rose in NSW by 5 per cent and in Queensland by 3 per cent. In Victoria diesel sales fell by 2.5 per cent. Sales of aviation fuel have also risen by 6 per cent compared with the previous summer, with 10 per cent growth in NSW and Victoria and 1 per cent growth in Queensland.

ELECTRICITY

Across the three states the total electricity generated during the 2008/09 summer was 1.7 per cent higher than 2007/08. However, emissions from electricity grew slightly more at 2.1 per cent. While absolute levels of coal, gas and renewable electricity generation all grew, gas and renewable generation grew at a faster rate than coal, meaning that the share of coal-fired electricity of total electricity generation fell from 93 to 92 per cent. However, as more emissions intensive brown coal-fired generation from Victoria grew strongly while black-coal generation from NSW fell, this meant that the average emissions intensity of coal-fired generation over the summer increased. This increase outweighed the impact of its lower overall share in generation.

In Victoria, electricity demand fell by 1 per cent in the 2008/09 summer compared with the previous summer. However, generation from more emissions intensive coal-fired generators increased by 4.1 per cent, while electricity produced from gas-fired generation was 21 per cent lower. Falling demand and rising generation meant that Victoria's net export of electricity to other States was 102 per cent higher this summer compared with 2007/08.

In NSW, electricity demand increased by 1.2 per cent in the 2008/09 summer. Generation from coal-fired generators in NSW fell by 0.8 per cent with gas-fired generation doubling. Net imports from other states fell 19 per cent compared with 2007/08 levels.

In Queensland, electricity demand increased by 3.9 per cent this summer compared with last summer. Generation from coal-fired generators increased by just 0.1 per cent while output from hydro was 17 per cent higher and gas-fired generation grew by 0.6 per cent. The net export of electricity to other states from Queensland was 37 per cent less than the amount exported in 2007/08, due to the increased demand and more of it being used locally.

Interestingly, the Victorian heatwave during the first week of February affected emissions levels from electricity generation in New South Wales rather than Victoria. Sustained high temperatures in Victoria corresponded with the highest level of demand for electricity seen in Victoria since the Indicator began in 2007. However, because power stations were operating below full capacity in Victoria that week, Victoria imported additional electricity from NSW. This resulted in New South Wales exporting power and recording its highest weekly emission level for coal-fired electricity during summer and its highest total weekly Indicator of 2.03 million tonnes.

GREENHOUSE GAS INDICATOR, VICTORIA

Summer 2008/09: 25.379 million tonnes CO_{2e} up 0.483 million tonnes on 2007/08

Coal-fired electricity: 16.066 million; 63.3 per cent (up 5.6 per cent on 2007/08)
Natural gas: 2.406 million; 9.5 per cent (down 1.6 per cent on 2007/08)
Petroleum: 6.908 million; 27.2 per cent (down 4.6 per cent on 2007/08)

The 2008/09 Summer Victoria Indicator was 1.9 per cent higher than 2007/08 levels.

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 for this period are estimated to be approximately 4.6 million tonnes.

Total weekly emissions were fairly stable over the summer at between 1.9 and 2.0 million tonnes. Despite the low levels of petroleum emissions the 2008/09 summer's emissions were still higher than the previous summer due to the growth in coal-fired generation. The Weekly Indicator recorded a slightly (0.4 per cent) higher figure in the first week of summer in 2008/09 (2.044 million tonnes) than any week in the previous summer. This was due to very high emissions from coal-fired generators that week. The lowest Weekly Indicator (1.855 million tonnes) was recorded during mid-January and was due to a very low level of emissions from coal-fired generators that week. This was 7.5 per cent higher than the lowest week in the previous summer. Victoria exported 102 per cent more electricity to other states (or 8 per cent of total generation in Victoria) over the 2008/09 summer due an increase in generation combined with a fall in local demand.

Electricity from coal causes most of the emissions in Victoria and accounted for 96 per cent of electricity generated in the state in the 2008/09 summer. The average weekly emissions from coal-fired power stations was 1.236 million tonnes, up 5.6 per cent on 2007/08. Peak emissions from coal were recorded during the first week of summer, with 1.323 million tonnes emitted that week from a large number of generation units operating. This was 3.7 per cent greater than the highest Indicator during the previous summer. The lowest weekly level recorded this summer was in mid-January and was 1.127 million tonnes, 13 per cent higher than the lowest level during the previous summer. This was due to several generation units not operating and Victoria importing electricity that week.

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. Gas use is traditionally low during summer due to low heating needs, although gas-fired electricity generation may be higher, especially during particularly hot periods resulting in high electricity demand. During the 2008/09 summer the average weekly emissions from gas use was 185,000 tonnes, down 1.6 per cent on 2007/08. A reduction in gas-fired generation of 21 per cent compared to the previous summer was a primary contributor to this.

Petroleum emissions during summer 2008/09 were on average 531,000 tonnes per week – 4.6 per cent less than in 2007/08 – the largest decline in sales of the three states. These emissions include sales of LPG, automotive transport fuels, aviation fuel, industrial diesel and fuel oil. This is particularly notable as it has occurred despite positive population growth in the state. Victoria was the only state where diesel use fell (by 2.5 per cent) alongside petroleum use, which fell by 9.0 per cent.

GREENHOUSE GAS INDICATOR, NEW SOUTH WALES

Summer 2008/09: 24.382 million tonnes CO_{2e} down 0.309 million tonnes on 2007/08

Coal-fired electricity: 14.958 million; 61.3 per cent (down 0.7% on 2007/08)
Gas-fired electricity: 0.253 million; 1.0 per cent (up 126% on 2007/08)
Petroleum: 9.170 million; 37.6 per cent (down 3.6% on 2007/08)

The 2008/09 Summer NSW Indicator was 1.25 per cent lower than 2007/08 levels.

The Greenhouse Indicator accounts for more than 80 per cent of NSW's emissions from energy and 60 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. 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 approximately 25 million tonnes for the period covered.

Total weekly emissions fluctuated over the summer between 1.7 and 2 million tonnes. Total emissions for NSW in the 2008/09 summer fell compared with the previous year, due to falling emissions from both coal-fired generation and petroleum. The highest Weekly Indicator recorded was 2.028 million tonnes in early February and was 2.1 per cent more than the highest Indicator during the previous summer. This was due to very high emissions from coal-fired generation and occurred despite lower than average emissions from petroleum. The lowest Weekly Indicator recorded was 1.678 million tonnes - the same as for the previous summer. This was for the week ending in New Year's Day and was due to very low emissions from coal-fired generation that week. NSW experienced a 1.2 per cent increase in demand for electricity compared with the previous summer, however due to an increase in electricity generation from gas and large hydro power, NSW reduced its net imports of electricity from other states.

Electricity from coal causes the most emissions from energy for NSW and accounted for 92 per cent of electricity generated in the 2008/09 summer. During the 2008/09 summer the average weekly emissions from coal-fired power stations was 1.151 million tonnes, down 0.7 per cent on the previous summer. This was the result of a 0.8 per cent fall in coal-fired generation. Peak emissions from coal occurred during early February, with 1.298 million tonnes emitted that week, 4.8 per cent higher than the peak for the previous summer. This was the result of a significant rise in electricity demand that week in NSW and Victoria with Victoria in particular recording extremely high demand following a period of high temperatures, which resulted in NSW exporting electricity to other states. The lowest trough recorded this summer was 966,000 tonnes and was 2.3 per cent greater than the lowest indicator recorded in the 2007/08 summer. This occurred during the time of low demand due to low business activity 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 the 2008/09 summer the average weekly emissions from gas-fired generation was 19,000 tonnes. While this is up significantly from the 2007/08 average due to the commissioning of two new gas-fired generators, this is still a very small contributor to emissions.

Petroleum emissions during 2008/09 were on average 705,000 tonnes per week – this was 3.6 per cent lower than in summer 2007/08. This is particularly notable as it has occurred despite a state population growth of more than 1.0 per cent over the 2007/08 year. Weekly emissions during January and February were all less than those in the corresponding week in 2007/08. The trend towards diesel use was most pronounced in NSW of all the states, with petrol use falling by 12.0 per cent while diesel use rose by 5.4 per cent. Petroleum emissions include sales of LPG, automotive fuels, aviation fuel, industrial diesel and fuel oil.

GREENHOUSE GAS INDICATOR, QUEENSLAND

Summer 2008/09: 18.876 million tonnes CO2e down 0.233 million tonnes on 2007/08

Coal-fired electricity: 10.813 million; 57.3 per cent (up 0.3 per cent on 2007/08)
Natural gas: 0.559 million; 3.0 per cent (up 4.9 per cent on 2007/08)
Petroleum: 7.503 million; 39.8 per cent (down 3.7 per cent on 2007/08)

The 2008/09 summer Queensland Indicator was 1.2 per cent lower than 2007/08 levels.

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 approximately 20.8 million tonnes for the period.

Total weekly emissions in Queensland were fairly stable over the 2008/09 summer at between 1.4 and 1.5 million tonnes per week. Emissions in Queensland over the 2008/09 summer fell as the significant decline in petroleum sales outweighed the increase in emissions from electricity generation. The highest Weekly Indicator recorded was 1.503 million tonnes in early February and was 1 per cent less than the highest Indicator during the previous summer. This was due to very high emissions from coal-fired generators that week, counteracting below average petroleum emissions. The lowest Weekly Indicator (1.410 million tonnes) was in February and was 2 per cent higher than the lowest Indicator in the previous summer. This was due to the combined impact of lower than average emissions from coal-fired generation and petroleum. Queensland experienced a 3.9 per cent increase in demand for electricity over the summer, which was not matched by an increase in generation. This resulted in 37 per cent less electricity being exported to other states compared with the previous summer.

Electricity from coal causes the most emissions in Queensland and accounted for 89 per cent of electricity generated during the 2008/09 summer. The average weekly emissions from coal-fired electricity was 832,000 tonnes, up just 0.3 per cent on 2007/08. Peak emissions from coal occurred during early February with 885,000 tonnes emitted that week, with more coal-fired generation units online over a period of high total electricity demand on the National Electricity Market particularly due to hot weather in Victoria. This peak was 1.1 per cent greater than peak for the previous summer. The lowest Weekly Indicator was in mid January and was 5.4 per cent greater than the lowest Indicator last summer.

Electricity from natural gas causes the lowest level of emissions at only 43,000 tonnes on average per week. However, this is up by 4.9 per cent from summer 2007/08. However, with gas-fired generation only increasing by 0.6 per cent, these emissions were due to more generation from more emissions-intensive generators. 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 577,000 tonnes per week, 3.7 per cent less than in summer 2007/08. This was despite more than 2 per cent population growth in the 2007/08 year and strong economic activity. Petrol use in particular fell by 14 per cent with the trend towards diesel use also notable in Queensland with a 3.1 per cent growth in sales. Petroleum includes sales of LPG, automotive fuels, aviation fuel, industrial diesel and fuel oil.

Appendix 1

Greenhouse Indicator - 2009 Summary

Greenhouse Emissions From Energy Use (mil tonnes CO2 equiv)

	VIC		NSW		QLD		Combined	
Summer 2007/08								
Coal	15.214		15.065		10.783		41.063	
Gas	2.444		0.112		0.533		3.089	
Petroleum	7.238		9.514		7.793		24.545	
TOTAL	**24.897**		**24.691**		**19.109**		**68.697**	
Summer 2008/09		% Change		% Change		% Change		% Change
Coal	16.066	5.60%	14.958	-0.71%	10.813	0.27%	41.837	1.89%
Gas	2.406	-1.57%	0.253	126.43%	0.559	4.91%	3.219	4.19%
Petroleum	6.908	-4.57%	9.170	-3.61%	7.503	-3.71%	23.582	-3.92%
TOTAL	**25.379**	**1.94%**	**24.382**	**-1.25%**	**18.876**	**-1.22%**	**68.638**	**-0.09%**
Est emissions not included by Indicator	**4.6**		**25**		**20.8**			
Change from 2007/08	0.483		-0.309		-0.233		-0.060	
Market share								
Coal	63.3%		61.3%		57.3%			
Gas	9.5%		1.0%		3.0%			
Petroleum	27.2%		37.6%		39.8%			
TOTAL	**100%**		**100%**		**100%**			

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.

For more information visit www.theclimategroup.org/indicator
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