



Australian Government
**Department of Climate Change
and Energy Efficiency**



Quarterly Update of Australia's National Greenhouse Gas Inventory **March Quarter 2011**



thinkchange

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The Australian National Greenhouse Accounts are available on the Internet at the following address:

<http://www.climatechange.gov.au/en/climate-change/emissions.aspx>.

Suggestions and comments would be appreciated. They should be addressed to:

The Director
National Inventory Team
Department of Climate Change and Energy Efficiency
GPO Box 854, Canberra ACT 2601.

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August 2011

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Australia's National Greenhouse Gas Inventory: Update

The report provides estimates of Australia's national greenhouse gas inventory based on the latest available data and the accounting rules that apply for the Kyoto Protocol.

Preliminary estimates and trends in Australia's National Inventory up to the March quarter of 2011 are shown in this report. The quarterly National Inventory estimates includes emission sources listed under Annex A of the Kyoto Protocol - *energy, industrial processes, agriculture and waste sectors* - but does not include emissions from the Land Use, Land Use Change and Forestry (LULUCF) activities under article 3.3 of the Kyoto Protocol, for which data are not yet available.

These preliminary emission estimates have been compiled by the Department of Climate Change and Energy Efficiency using the estimation methodologies incorporated in the Australian Greenhouse Emissions Information System (AGEIS) in conjunction with a range of other activity and economic indicators. Seasonal adjustment and trend analysis is conducted using the Australian Bureau of Statistics (ABS) SEASABS tool. More information is provided in the notes section at the end of the document.

Summary – Emissions Growth Rates

Table 1: Change in National Greenhouse Gas Inventory: March quarter 2011

	March Quarter	Year to March
Emissions Growth Rate, Quarterly Change – Trend	0.5%	
Emissions Growth Rate, Quarterly Change - Seasonally Adjusted	1.4%	
Emissions Growth Rate, Annual Change through to March Quarter		-0.6%

- Emissions for the 12 months to March 2011 were 0.6% lower than the previous 12 months reflecting in particular a decrease in black coal generation and an increase in generation from natural gas and hydroelectricity sources.
- Climatic factors have been important in affecting emissions in key sectors such as electricity generation. For example, a record wet spring in 2010 resulted in high levels of hydroelectricity generation, lowering emissions. Over the short term, as normal seasonal conditions resume, emissions from electricity generation are likely to rebound due to underlying increases in economic growth, population and industrial production.
- A rebound has been evident in the latest quarterly data, which shows trend emissions rising by 0.5% in the March quarter, as the temporary fuel switching seen in recent quarters has been reversed to a certain extent. Black coal and natural gas generation increased for the quarter as hydro generation decreased.
- The long term growth in emissions over the last decade is shown in Figure 1 as well as the effect of recent temporary factors such as the global financial crisis in 2008-09 and the effects of climate variations in 2010-11.

Figure 1: National Inventory, actual and trend emission estimates¹



Quarterly Change in Emissions – Key Points

- Positive growth in seasonally adjusted emissions in the March quarter is mainly due to a rebound in emissions from electricity generation.
- Trend emissions for the March quarter, which account for seasonal factors, rose 0.5%, mainly as a result of electricity generation fuel switching back from hydro electricity to black coal – a reversal of the previous quarter’s temporary trend.
- The quarterly change in the national emissions growth rate from March 2005 to March 2011, in both trend and seasonally adjusted terms, is shown in Figure 2.

Figure 2: National Inventory, seasonally adjusted emissions growth rates, quarterly change

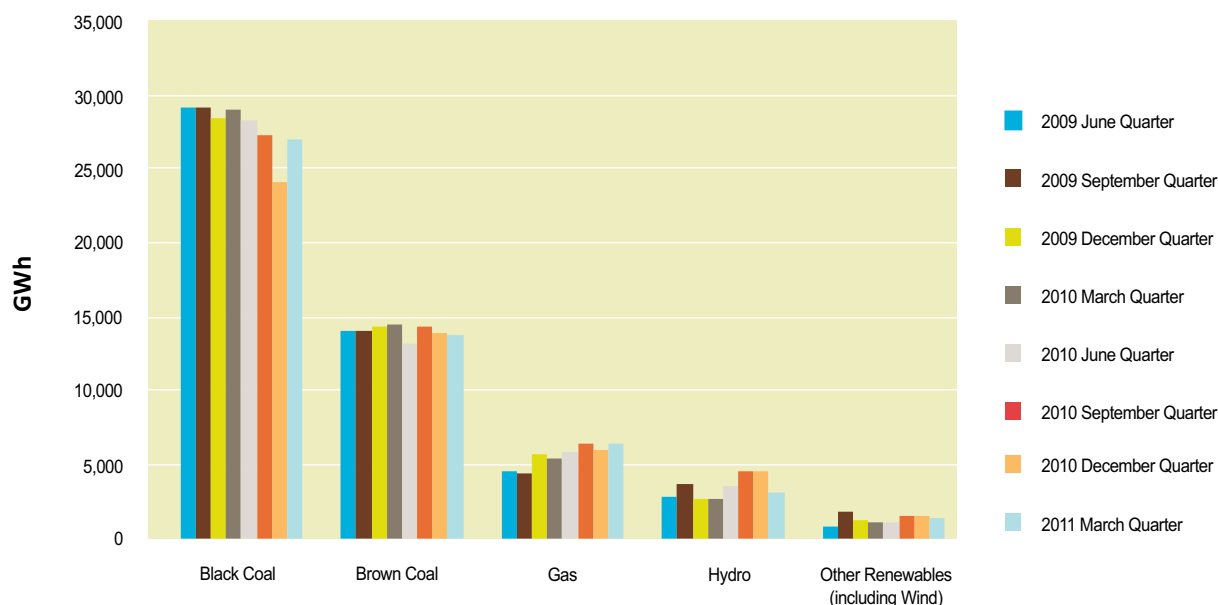


- Hydroelectricity generation on the National Electricity Market (NEM) fell in the March quarter from a historical peak in the December 2010 quarter.

¹ In Figure 1, the actual emissions estimate and the trend emissions estimate for each quarter is shown. The March quarter tends to have lower emissions reflecting relatively lower levels of economic activity particularly in the manufacturing, commodities and transport sectors. Actual emissions fluctuate during the year as a result of seasonal weather patterns and variations in economic activity. The September quarter corresponds to the winter months and generally has higher emissions due to a higher level of electricity use. Higher emissions in the June and December quarters from economic activity tend to be offset by relatively low emissions from electricity generation in those quarters. The March quarter tends to have lower emissions reflecting relatively lower levels of economic activity particularly in the manufacturing, commodities and transport sectors.

- Black coal generation recovered by 11.9% in the March quarter, following a fall of 11.4% in the December 2010 quarter. Generation from brown coal remained relatively steady while natural gas generation increased by 6.9%, as shown in Figure 3.

Figure 3: National Electricity Market (NEM) generation by fuel type

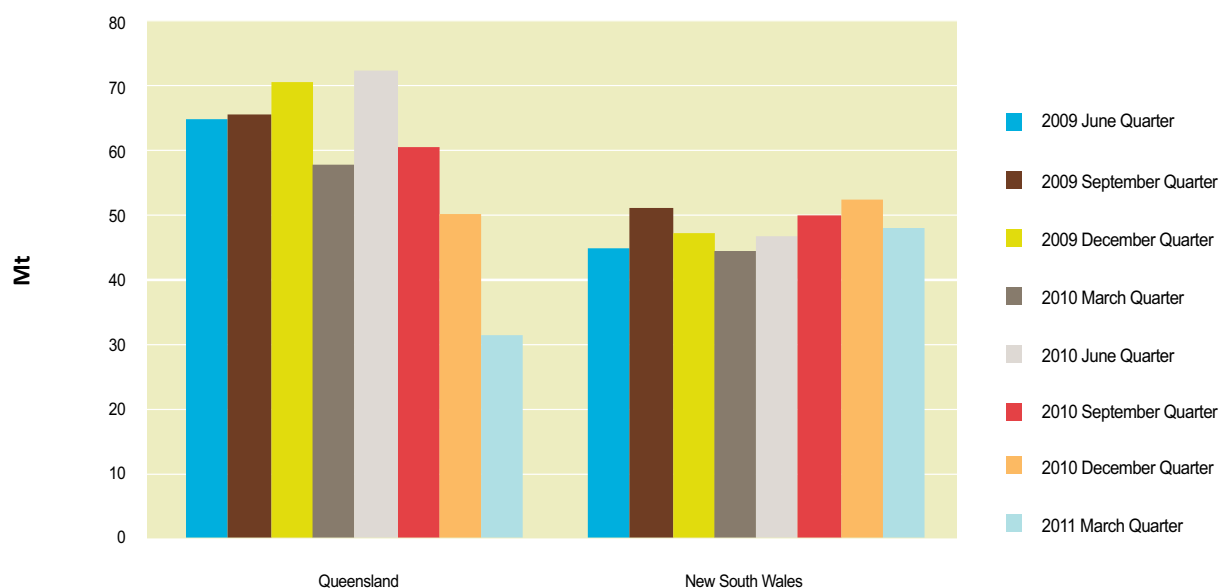


Source: Australian Energy Market Operator, obtained using NEM Review. The NEM constitutes over 80% of the total Australian electricity market.

- In line with historical trends for March quarters, aggregate emissions from other sectors fell on the previous quarter. The largest falls occurred in fugitive emissions and industrial processes.
- Fugitive emissions associated with coal mining fell markedly, recording a 20% drop from the December 2010 quarter. This unusual fall correlates with a 21% reduction in Australian black coal mining for the March quarter², attributed to extensive flooding in Queensland.
- The falls in black coal mining activity were focused on Queensland, where coal mine flooding contributed to a 36% drop in output for the March quarter. Coal mining in NSW and Qld accounted for 96.2% of national coal mining in the March 2011 quarter (Figure 4).

² Source: Australian Bureau of Agricultural and Resource Economics and Sciences, Australian Mineral Statistics 2011, March Quarter 2011

Figure 4: Raw black coal mined - June 2009 quarter to March 2011 quarter



- Iron and Steel production reported by ABARES³ fell by 10% in the March quarter, resulting in a 10% drop in emissions.
- Emissions from agriculture continue to moderately fall in line with the long term trend.

Annual Emissions to March Quarter – Key points

- Over the four quarters to the March quarter of 2011, Australia’s national inventory was an estimated 542 Mt CO₂-e (million tonnes of carbon dioxide equivalent), down 0.6% on the previous year (see table 2).

Table 2: National Inventory, for the four quarters to March quarter 2011

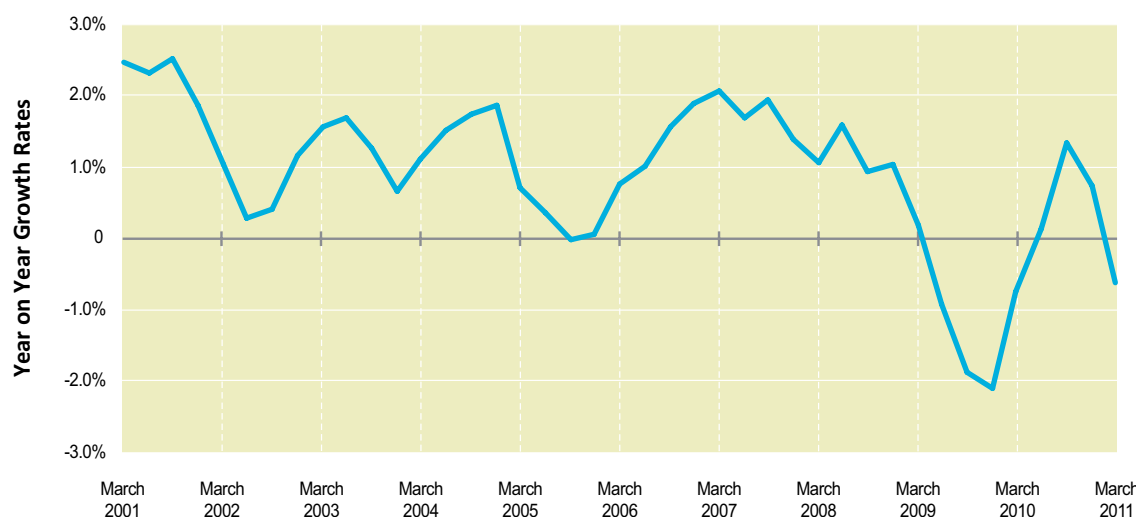
Category	Annual emissions through to the March quarter Mt CO ₂ -e		Per cent change in annual emissions ^b
	2010 March quarter ^a	2011 March quarter ^a	
National Inventory - Annex A sectors			
Energy – Electricity	202	194	-3.9%
Energy - Stationary energy excluding electricity	88	91	3.0%
Energy – Transport	84	85	1.5%
Energy - Fugitive emissions	42	41	-3.4%
Industrial processes	30	33	8.1%
Waste	14	14	1.3%
Agriculture	83	83	-0.6%
National Inventory (excluding LULUCF)	545	542	-0.6%

NOTES: (a) Values are estimates of annual emissions through to the end of the March quarter. (b) The percentage change is the year on year growth rate for the March quarter (i.e. the increase in emissions for the four quarters to the March quarter over the corresponding period of the previous year). Percentage change reflects a higher degree of precision than is listed in the emission estimates, which are rounded to the nearest million tonnes.

³ Source: Australian Bureau of Agricultural and Resource Economics and Sciences, Australian Mineral Statistics 2011, March Quarter 2011

- For the year to the March quarter, emissions have continued to decline from electricity generation and agriculture. This has been offset by growth in emissions from transport, other stationary energy, industrial processes and waste. Annual fugitive emissions are temporarily lower, with coal mining activities disrupted by the recent floods in Queensland.
- The current negative year on year growth is largely attributed to reductions in emissions from electricity generation. Whilst emissions have risen in the March quarter, it has not been sufficient to offset this recent annual trend. Electricity generation represents approximately 36% of the national quarterly inventory.
- Emissions from electricity declined by 3.9% on the previous year, as climate and policy factors influence both demand and supply components of the electricity markets. The significant decline is the result of sustained negative movements in emissions from electricity generation over multiple quarters.
- Increases year on year in generation in the NEM from lower emission technologies, including hydro (33% annual increase in generation) and natural gas (22% annual increase in generation), are offsetting an 8% decline in generation from black coal.
- While growth in emissions from industrial processes has slowed in recent quarters, the recovery from the 2009 drop in production continues to produce high year on year emissions growth numbers. Iron and steel emission are up 20%, correlating with ABARES⁴ estimates that iron and steel production for the year to March 2011 was 7258 kt (while this is up 20% on the previous year due to the recovery, it is largely a return to historical levels).
- Emissions from stationary energy other than electricity have risen by 2.7 Mt CO₂-e (3.0%), driven by increases in emissions from the production of non-ferrous metals and iron and steel. This reflects a 7.5% growth in manufacturing of metal products for the year to March 2011.⁵
- The year-on-year growth rates of emissions for Australia are presented in Figure 5, updated on a quarterly basis. The annual growth rate in emissions for the March quarter 2011 shows a moderate reduction.

Figure 5: National Inventory, year on year emissions growth rate

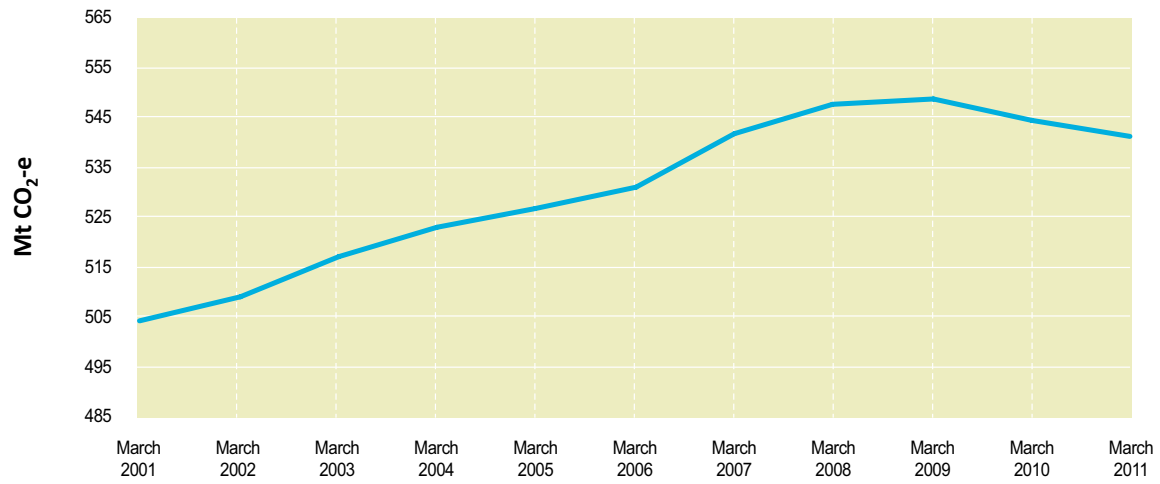


The annual emissions estimates for the four quarters to the March quarter each year from 2001 to 2011 are presented in Figure 6. Whilst absolute levels remain below the 2008 estimates, the long term trend is one of positive emissions growth. The national inventory total has increased from 504 Mt CO₂-e in March 2001 to 542 Mt CO₂-e in March 2011.

⁴ Source: Australian Bureau of Agricultural and Resource Economics and Sciences, Australian Mineral Statistics 2011, March Quarter 2011

⁵ Source: Australian Bureau of Statistics, 5206.0 Australian National Accounts: National Income, Expenditure and Product, March Quarter 2011, Table 37. Indexes of Industrial Production

Figure 6: National Inventory, annual emissions – four quarters to March quarter



NOTES

Quarterly Coverage

This report provides estimates of Australia's National Inventory up to the March quarter of 2011. The quarterly National Inventory includes emission sources listed under Annex A of the Kyoto Protocol - energy, industrial processes, agriculture and waste sectors - but does not include emissions from the Land Use, Land Use Change and Forestry (LULUCF) activities under article 3.3 of the Kyoto Protocol, for which data are not yet available.

Quarterly Methodology

Emission estimates have been compiled by the Department of Climate Change and Energy Efficiency using the estimation methodologies incorporated in the Australian Greenhouse Emissions Information System (AGEIS) and documented in the National Inventory Report.

Preliminary activity data is obtained under the National Greenhouse and Energy Reporting System and from a range of publicly available sources – principally ABARES, the ABS, the Australian Energy Market Operator and the Department of Resources Energy and Tourism. As more data becomes available from the Department's reference sources these preliminary activity data will be replaced and the estimates of emissions revised before submission to the UN.

Seasonal Adjustment

The actual quarterly data has been adjusted using SEASABS to remove the effects of seasonal factors. The trend series reflects the seasonally adjusted series with irregular components smoothed and provides the best indication of underlying movements in the inventory. SEASABS is the main seasonal adjustment tool used by the Australian Bureau of Statistics.

Quarterly Uncertainty

The Department's assessment is that the 90 per cent confidence interval for the national inventory (before taking account of article 3.3 activities) is ± 1 per cent (i.e. there is a 90 per cent probability that future revisions will be limited to ± 1 per cent of the current estimate).

Future releases

The next quarterly estimates including latest estimates from the June 2011 will be released on 31st October 2011.