



Energy update 2009

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August 2009

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Schultz, A 2009, *Energy update 2009*, Canberra, August.

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ABARE is a professionally independent government economic research agency.

ABARE project 1646

Acknowledgements

The author gratefully acknowledges the assistance of Dianne Stefanac, Richard Brownlee, Suwin Sandu and Clara Cuevas-Cubria in the preparation of the statistics that underly this update.

Funding for this update was provided by the Energy and Environment Division of the Australian Government Department of Resources, Energy and Tourism.

Energy update 2009

Australian energy production, consumption and trade, 1973-74 to 2007-08

- Australia's energy production, in energy content terms, rose by 1.6 per cent in 2007-08 to 17 360 petajoules, largely as a result of a 5.3 per cent increase in uranium oxide production.
- Australia's energy exports rose by 3.9 per cent in 2007-08 to 13 559 petajoules. This reflected strong growth in uranium oxide and coal exports, partially offset by a fall in LNG and oil product exports. Coal continues to provide more than half of Australia's energy export trade.
- Total electricity generated in Australia grew by 2.5 per cent in 2007-08 to around 925 petajoules (257 000 gigawatt hours).
- Australia's energy consumption rose by an estimated 1.5 per cent in 2007-08, to 5772 petajoules.
- Growth in energy consumption in 2007-08 was driven by the electricity generation sector, the transport sector and the residential sector. The only sector to record a fall in energy consumption in 2007-08 was the manufacturing sector.
- In energy content terms, in 2007-08 the fuel type to record the strongest consumption growth was gas (up 5 per cent) followed by renewables (up 3 per cent). Oil was the only fuel to record negative consumption growth (down 1 per cent).

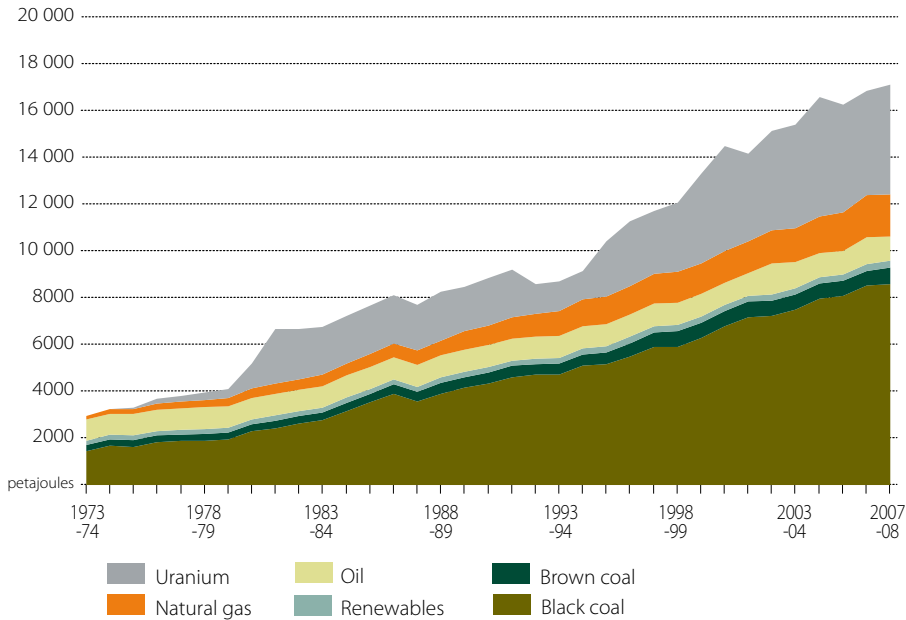
Production and trade

In 2007-08, Australia produced 17 360 petajoules of primary energy, which was three times more than was consumed domestically. Growth in energy production of 1.6 per cent during this period exceeded growth in energy consumption of 1.5 per cent.

The energy contained in uranium oxide production contributed the most to the overall increase in energy production, rising by 5.3 per cent to 4747 petajoules. While energy produced from coal grew by only 1.5 per cent to 9431 petajoules in 2007-08, it maintained its 54 per cent share of Australia's total primary energy production. Following strong growth in 2006-07, the production of energy from crude oil and condensate fell by around 11 per cent in 2007-08. Further declines in the production of hydroelectricity were more than offset by continued strong growth in wind energy and bioenergy, resulting in energy produced from renewables rising by more than 3 per cent to 290 petajoules in 2007-08. The 1 per cent increase in energy produced from natural gas was lower than longer run annual average growth, reflecting lower growth in LNG production (figure a, table 1).

Australia is a significant exporter of energy commodities and in 2007-08 energy exports grew by 3.9 per cent to 13 559 petajoules. Uranium oxide contributed the most to total energy export growth in 2007-08, rising by almost 300 petajoules to 4765 petajoules (10 139 tonnes). In energy terms, coal exports remained Australia's largest energy export in 2007-08,

a Australian energy production

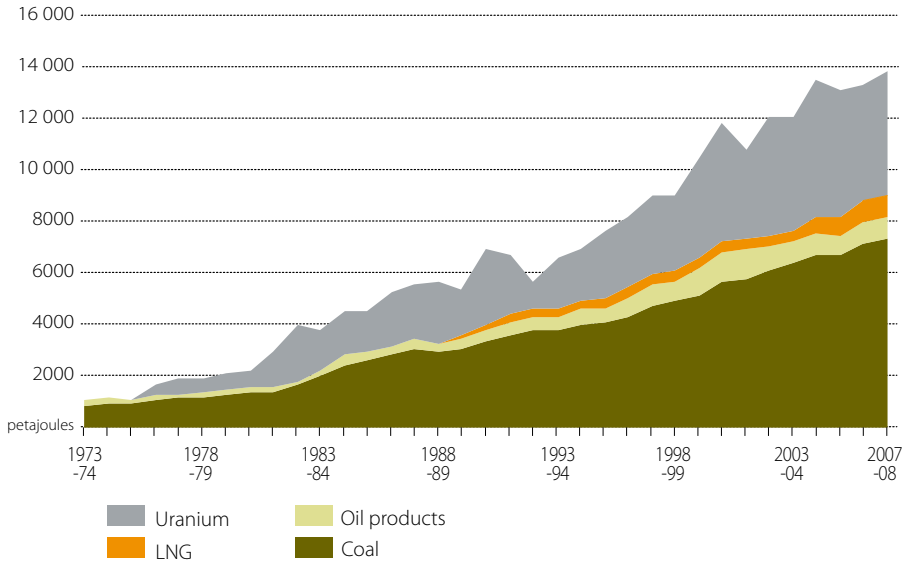


1 Australian energy production, by fuel

	PJ	growth		share %	contribution to growth (percentage points)
		%	%		
	2007-08	2007-08	5 year annual average growth	2007-08	2007-08
Black coal	8 722	0.8	3.5	50.2	0.4
Brown coal	709	10.3	1.6	4.1	0.4
Renewables	290	3.1	1.7	1.7	0.1
Crude oil and condensate	1 059	-10.7	-4.8	6.1	-0.7
Natural gas	1 833	1.1	4.9	10.6	0.1
Uranium	4 747	5.3	1.9	27.3	1.4
Total	17 360	1.6	2.5	100.0	1.6

accounting for 7183 petajoules or 53 per cent of Australia's total exports of primary energy. Reflecting stable LNG processing capacity in 2007-08, the energy value of LNG exports fell slightly by 3 per cent to 802 petajoules in 2007-08 (figure b, table 2).

b Australian energy exports



2 Australian energy exports, by fuel

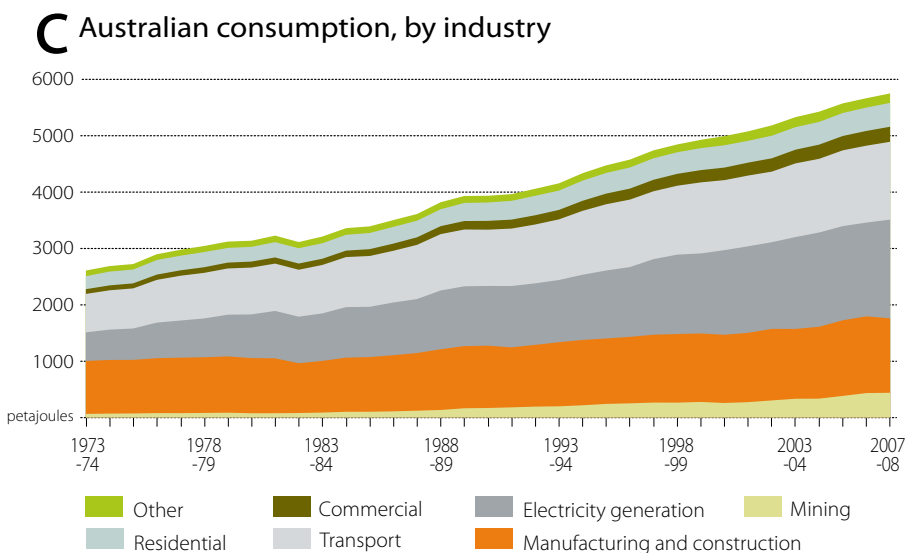
	PJ	growth		share %	contribution to growth (percentage points)
		%	%		
	2007-08	2007-08	5 year annual average growth	2007-08	2007-08
Coal	7 183	3.5	4.0	53	1.8
Oil products	808	-0.3	-4.0	6	0.0
LNG	802	-3.0	13.5	6	-0.2
Uranium	4 765	6.5	1.1	35	2.2
Total	13 559	3.9	2.7	100	3.9

Australia is a net importer of liquid hydrocarbons, which include crude oil, LPG and petroleum products. In 2007-08, Australia exported 808 petajoules of liquid fuels (excluding LNG but including international bunkers) and imported around 1680 petajoules. For the seventh consecutive year, the change in exports of liquid hydrocarbons was exceeded by the change in imports, resulting in a 4 per cent rise in net imports of liquid hydrocarbons in 2007-08.

Total electricity production in Australia is estimated to have risen by 2.5 per cent in 2007-08 to around 925 petajoules (257 000 gigawatt hours). The production of hydroelectricity fell by 17 per cent in 2007-08, to slightly more than 43 petajoules (12 000 gigawatt hours), reflecting continuing dry conditions. Wind generated electricity rose by 51 per cent to over 14 petajoules (3900 gigawatt hours) during the year.

Consumption

Australia's primary energy consumption (total domestic availability) is estimated to have risen by 1.5 per cent to 5772 petajoules in 2007-08. The major energy using sectors of electricity generation, transport and manufacturing together accounted for more than 75 per cent of Australia's energy consumption. Next in terms of energy consumption were the mining, residential and commercial and services sectors (figure c, table 3).



3 Australian energy consumption, by industry

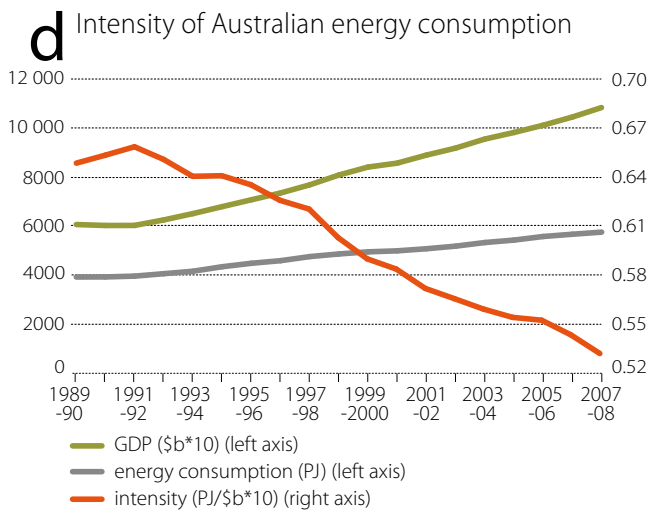
	PJ	growth		share %	contribution to growth (percentage points)
		2007-08	5 year annual average growth		
Mining	436	1.2	7.8	7.6	0.1
Manufacturing and construction	1 327	-3.0	0.8	23.0	-0.7
Electricity	1 760	5.3	2.6	30.5	1.5
Transport	1 388	1.2	2.0	24.0	0.3
Commercial	268	2.2	2.5	4.6	0.1
Residential	426	2.2	1.1	7.4	0.2
Other	168	1.0	-1.7	2.9	0.0
Total	5 772	1.5	2.1	100.0	1.5

The largest contribution to the growth in primary energy consumption in 2007-08 was from the electricity generation sector, where energy input grew by 5.3 per cent. Most of this growth was because of an increase in the use of black coal in New South Wales electricity generation and natural gas in Western Australian electricity production. Also influencing growth in this sector for 2007-08 was a revision of the methodology for determining fuel use in this sector, in which a greater use of electricity generation data has been adopted.

Following strong growth over recent years, energy use in the mining sector grew by a more modest 1.2 per cent in 2007-08, largely as a result of more moderate growth in oil and gas extraction and slightly lower LNG production during the year. Energy use in the transport sector, which accounts for around one-quarter of Australian primary energy consumption, grew by 1.2 per cent in 2007-08.

Energy use in both the residential and commercial and services sectors rose by 2.2 per cent in 2007-08. Driven largely by lower energy consumption in the petroleum refining sector, total energy consumption in the manufacturing sector fell by 3 per cent in 2007-08.

Since the early 1990s, growth in energy consumption has generally remained below the rate of economic growth. This indicates a longer term decline in the ratio of energy use and economic growth (energy intensity) of the Australian economy, which can be attributed to two main factors; greater efficiency has been achieved through technological improvement and fuel switching and; there has been rapid growth of less energy-intensive sectors, such as commercial and services, relative to the more moderate growth of the energy-intensive manufacturing sector (figure d).



Reflecting lower growth in energy use in the mining sector in 2007-08, positive contributions to energy consumption growth were relatively balanced across all states. The strongest growth in energy consumption was recorded in Western Australia (up 3.2 per cent), followed by New South Wales (up 2.3 per cent) and Tasmania (up 2 per cent). Also contributing to Australia's growth in energy consumption were South Australia (up 1.9 per cent) and Queensland (up 1.8 per cent) (table 4).

4 Australian energy consumption, by state

	PJ	growth		share %	contribution to growth (percentage points)	
		2007-08	%			5 year annual average growth
New South Wales	1547	2.3	1.2	26.8	0.6	
Victoria	1371	-0.6	0.0	23.7	-0.1	
Queensland	1336	1.8	4.4	23.2	0.4	
South Australia	366	1.9	1.9	6.3	0.5	
Western Australia	920	3.2	3.1	15.9	0.1	
Tasmania	125	2.0	4.1	2.2	0.0	
Northern Territory	107	-3.5	7.7	1.9	-0.1	
Australia	5772	1.5	2.1	100.0	1.5	

Overall, the fuel mix in Australia's domestic energy use was largely unchanged between 2006-07 and 2007-08. Black and brown coal maintained the greatest share of the fuel mix, at 40 per cent. The share of oil remained at around 34 per cent, while the share of natural gas continued its upward trend, rising slightly from 21 per cent to 22 per cent (table 5).

5 Primary energy consumption in Australia, by fuel

	PJ	growth		share %	
		2007-08	%		5 year annual average growth
Coal	2 292	0.9	1.4	39.7	
Oil	1 941	-0.9	1.6	33.6	
Gas	1 249	5.0	4.1	21.6	
Renewables	290	3.1	3.0	5.0	
Total	5 772	1.5	2.1	100.0	

6 Australian renewable energy consumption, by fuel

	PJ	growth
		%
	2007-08	2007-08
Biogas / Biofuels	18	73.6
Hydro	43	-16.9
Solar / Wind	21	38.2
Biomass	208	2.1
Total	290	3.1

Despite the decline in usage of hydroelectricity, which fell by 17 per cent in 2007-08, renewable energy maintained its share of the fuel mix in 2007-08 with a rise in bioenergy, solar and wind energy (table 6). However, in total, biogas, biofuels, wind and solar energy accounted for less than 1 per cent of Australian energy consumption.

Methodology and coverage

This year's *Energy update* reflects the addition of 2007-08 data to the *Australian energy statistics* (AES), database

which can be found on the ABARE website at http://www.abare.gov.au/publications_html/data/data/data.html. For some series, the AES extends back to the early 1960s, however the most detailed AES information relate to the period 1973-74 to 2007-08.

ABARE's energy database provides detailed energy consumption and production statistics by state and by fuel at an industry specific level. The greatest coverage of industries is provided in the energy-intensive manufacturing sectors and for Australian totals. In some cases, particularly at the state level, specific industry detail is not able to be released for confidentiality reasons. The overview tables also include less industry specific detail.

The general methodology used in ABARE's AES is the process of balancing energy consumption with production and trade, where much of the production and trade data are sourced independently. This check for internal consistency has been an important component of *Australian energy statistics* and ensures ABARE's estimates of energy consumption at an aggregate level are as accurate as possible.

The construction of ABARE's historical statistics is based primarily on the voluntary *Fuel and electricity survey* (FES), conducted in the second half of each year. The FES can be described more accurately as a partial census of energy users in Australia. With the introduction of the National Greenhouse and Energy Reporting Scheme (NGERS), survey year 2008-09 represents the final year that the FES will be conducted. For the 2008-09 survey year, AES will be informed using both NGERS and FES data, before NGERS data fully replace the FES for survey year 2009-10.

In energy terms, the FES provides consumption and derived production statistics for slightly more than half the national total. A further 25 per cent comes from other state and Australian Government agencies and industry associations. The remainder is estimated using the energy balance process and a variety of economic indicators, based on the assumption that statistics for energy production and trade are reliable.

Some changes to the historical series occurred when ABARE's FES was benchmarked to a one-off statistical collection for 2001-02 by the Australian Bureau of Statistics (ABS). The results of this ABS benchmarking study are located at www.abs.gov.au/ausstats/ (ABS cat. no. 4649.0.55.001). Breaks in some series occurred as a result.

Total energy consumption, as depicted throughout this update, is a net concept. To avoid double counting, the energy used to produce energy products (consumed in other sectors) does not count toward the estimate of total energy consumed in the sector where the products are produced. For example, in the electricity generation sector, total energy consumption comprises fuel inputs of all types less the amount of electricity produced, where one petajoule (PJ) of energy approximates to 278 gigawatt hours (GWh).

The methodology used to determine fuel use in the electricity generation sector has been revised in this update. Enhanced use of detailed primary source electricity generation data has enabled improved annual estimates of both the type and quantity of fuels used in this sector from 2006-07. Additionally, a revision of electricity use in the residential and commercial and services sectors has resulted in a reallocation of electricity consumed by these sectors from 2000-01.

The coverage of industries and fuels provided in ABARE's energy database can be found at the FES website at <http://www.abare.gov.au/interactive/fuelsurveys/>. The industry categorisation for the 2007-08 AES remains unchanged from the categorisation used over the past 16 years. The AES industry classifications are a modified form of the ANZSIC classifications introduced in 1993, containing additional classes in some industries and assuming aggregated energy usage in others. Apart from these distinctions already in place, a change to the new ANZSIC 2006 classifications could compromise confidentialised data in the current tables and would introduce breaks in many of the time series.

RESEARCH FUNDING ABARE relies on financial support from external organisations to complete its research program. As at the date of this publication, the following organisations had provided financial support for ABARE's research program in 2007-08 and in 2008-09. We gratefully acknowledge this assistance.

02.09

AusAid	.Fisheries Research and Development Corporation
Australian Fisheries Management Authority	Fisheries Resources Research Fund
Australian Government Department of Climate Change	Forest and Wood Products Australia
Australian Government Department of the Environment, Water , Heritage and the Arts	Grains Research and Development Corporation
Australian Government Department of Infrastructure, Transport, Regional Development and Local Government.	Grape and Wine Research and Development Corporation
Australian Government Department of Resources, Energy and Tourism	Horticulture Australia
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