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Household energy use and costs

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Household energy use and costs

Energy plays a major part in Australians' lives, with both households and businesses relying on various types of energy for heating, cooling, cooking, transport and machinery operation.

Growth in Australia's economy has led to increases in energy use, particularly in expanding industries such as the mining industry.¹ Other factors, including an expanding population, and the subsequent increase in the number of households requiring power and heating, have also contributed to this increase. While energy use affects household and business related costs, it also impacts the environment, accounting for more than three quarters (77%) of Australia's total greenhouse emissions in 2009.²

Legislation setting the foundation for a carbon price was passed through the Senate in 2011. This was aimed at reducing greenhouse gas emissions (carbon pollution) and moving Australia to a clean energy future.³ This legislation, coupled with widespread media coverage on the potential financial impact on households, has fuelled public interest in energy consumption and related costs.

This article looks at current household energy use and costs, as well as how Australians are implementing household energy saving practices.

What types of energy and how much did we use?

In 2009–10, Australia's net energy consumption, including both industry and household energy use, was 3,962PJ. This was an increase of 39PJ (1%) from 2008–09. The main fuels consumed were natural gas (24%), electricity (22%), diesel (18%) and petrol (16%), while solar energy accounted for less than 1% of Australia's net energy consumption.

The majority of energy consumption in Australia is by industry, accounting for nearly three quarters (74% or 2,947PJ) of total net energy consumption in 2009–10. Natural gas (27%), electricity and diesel (both 22%) were the main energy sources used by industry.

The remaining one quarter (26%) of Australia's total net energy use in 2009–10 was by households (1,014PJ). Despite this being an increase of 2% since 2008–09, household energy use per capita remained unchanged over this time (46GJ). The types of energy most commonly used by households, including fuels used for transport purposes, were petrol (45%), electricity (21%) and natural gas (14%).

Data sources and definitions

Information in this article comes from a variety of sources including the:

- ABS Energy Account 2009–10
- Bureau of Resources and Energy Economics (BREE) [Australian energy statistics data - Table F](#)
- ABS 2003–04 and 2009–10 Household Expenditure Survey
- ABS Environmental Views and Behaviours Survey 2007–08
- ABS Energy Use and Conservation Survey 2011

ABS Energy Accounts data for total net energy use for households includes energy used by households for transport. BREE Energy Balances data assigns all energy used in transport, including that used by the Residential sector, to the Transport sector. Therefore, the total net energy use for households reported by BREE is substantially lower than ABS estimates.

This conceptual difference must be taken into account when analysing data from these sources.

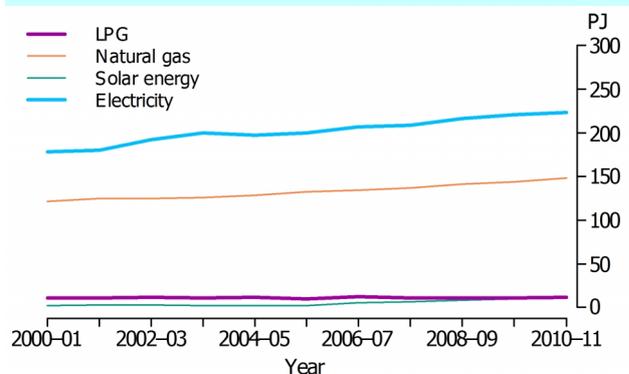
Australia's net energy consumption is equal to total primary energy consumed less energy consumed or lost in conversion, transmission and distribution.

In this article, energy units are measured in **joules (J)**. A **gigajoule (GJ)** is one thousand million joules of energy. A **petajoule (PJ)** is a large unit of energy equivalent to one thousand million million joules of energy, or nearly 288 million kilowatt hours (KWh).

A household is a group of residents of a dwelling who share common facilities and meals or who consider themselves to be a household.

Australia's household energy consumption has increased slightly over the last decade. According to data from the Bureau of Resources and Energy

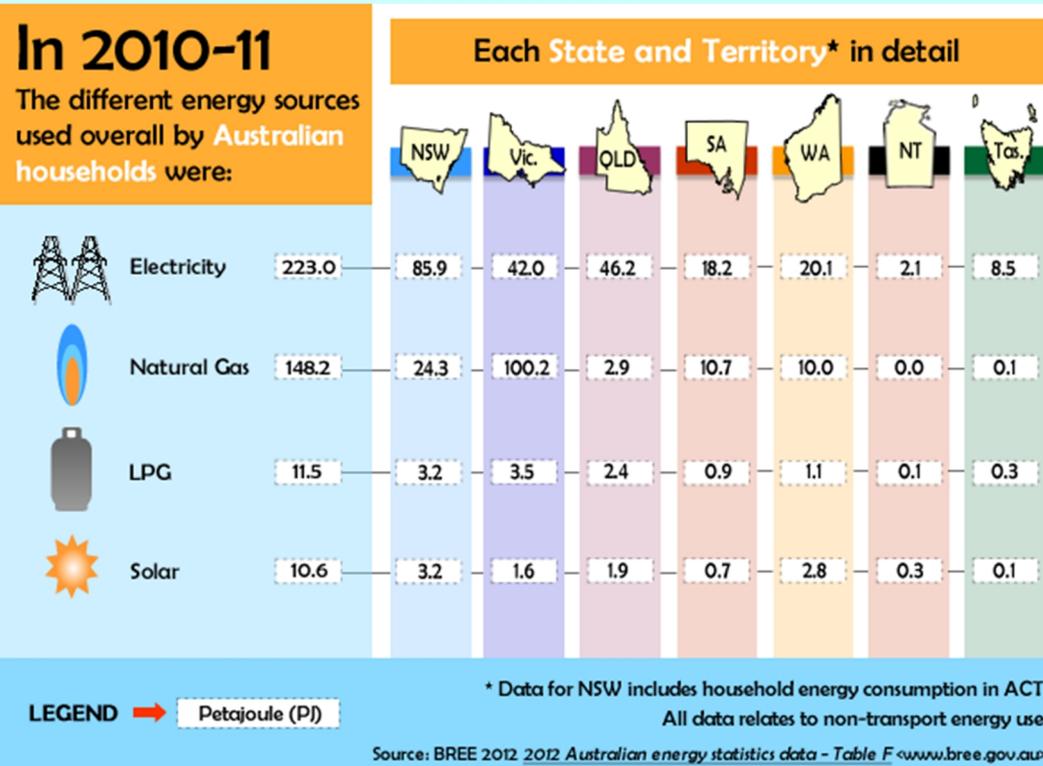
Household energy consumption(a) – 2000-01 – 2010-11



(a) Excludes fuels used for transport purposes.

Source: BREE 2012 [Australian energy statistics data - Table F](#), <www.bree.gov.au>

Household energy consumption, by fuel type, by state and territory – 2010-11



Source: BREE 2012 *Australian energy statistics data - Table F*, <www.bree.gov.au>

Economics (BREE), Australian households' energy consumption, excluding fuels used for transport purposes, grew by 54PJ (14%) between 2000-01 and 2010-11 (from 398PJ to 452PJ). The fuels with the greatest increase in household consumption over this period were electricity (25%, from 179PJ up to 223PJ) and natural gas (22%, from 122PJ up to 148PJ).

...state and territory variations

Although household energy consumption across the states and territories remained relatively stable over the last decade, there are variations in the types and amounts of fuels most commonly consumed across the states and territories. This is partly influenced by the size of their populations.

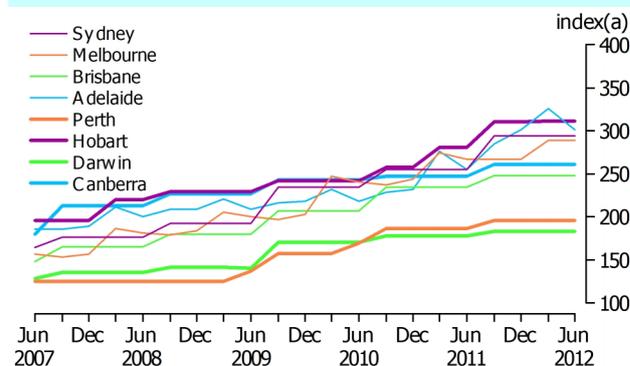
BREE data showed that, in 2011, households in New South Wales (NSW), combined with those in the Australian Capital Territory (ACT), consumed the most electricity in 2010-11, with 86PJ, while the Northern Territory (NT) had the lowest electricity consumption across the states and territories with 2.1PJ.⁴

Natural gas consumption was highest in Victoria, home to Australia's most extensive reticulated gas network,⁵ with 100PJ in 2010-11. The NT and Tasmania used virtually no natural gas (with 0PJ and 0.1PJ respectively).

How has the cost of energy changed over time?

The cost of electricity, gas and other household fuels has risen in recent years. In the five years to the June quarter in 2012, the ABS Consumer Price Index (CPI) rose by 15% (from 157.5 to 180.4). During the same period, Australia's retail electricity prices rose by 72%, while the price of gas and other household fuels rose by 45%.

Cost of electricity, by capital city – 2007-2012



(a) Reference period of index: 1989-90 = 100.0.

Source: ABS *Consumer Price Index, Australia, Jun 2012* (cat. no. 6401.0)

Real expenditure

Expenditure expressed in real terms, or **real expenditure**, takes into account the increase caused by inflation.

In this article, amounts for average weekly household expenditure for 2003–04 from the ABS Household Expenditure Survey are adjusted using changes in the Consumer Price Index and expressed in 2009–10 dollars.

Increases in retail electricity prices varied across the capital cities. Between June 2007 and June 2012, the largest increase in the retail price of electricity was in Melbourne (84%), followed by Sydney (79%). Darwin and Canberra had the smallest increases in retail electricity prices, with 42% and 45% respectively.

Between June 2007 and June 2012, the retail price of gas and other household fuels also rose across the capital cities. The largest increase was in Perth, where prices rose by 88%, followed by Canberra (48%). The smallest increases were in Darwin and Hobart, with 21% and 20% respectively.

How much are we spending on energy?

According to results from the ABS Household Expenditure Survey (HES), in 2009–10 electricity, gas, heating oil and wood accounted for \$32 per week of household expenditure. Although this was a real increase of nearly \$5 per week (at 2009–10 prices) since 2003–04, the amount as a proportion of real total household expenditure remained the same, at 2.6%.

Some Australian households reported being under financial stress in 2009–10, with more than one in ten households (13%) reporting being unable to pay electricity, gas or telephone bills on time.

...in the states and territories

Despite the varying tariff schemes in place across the country, and variations in

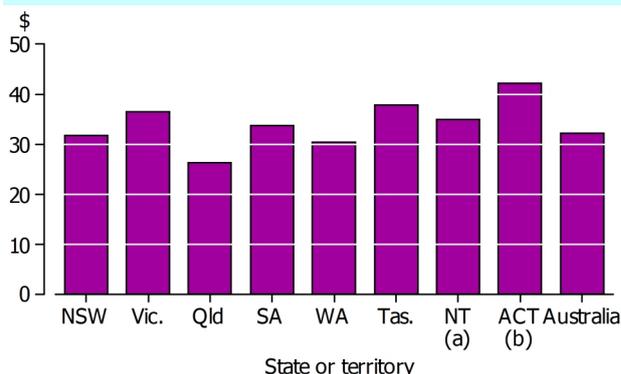
Under the pump

With motor vehicles being a part of daily life, the cost of fuelling our vehicles is a matter of concern for many people.

In 2009–10, average weekly household expenditure on motor vehicle fuels, lubricants and additives was \$51 per week. This was a real increase of \$12 (at 2009–10 prices) since 2003–04. As a proportion of real total average weekly household expenditure on goods and services, expenditure on these items rose from 3.7% to 4.1% during this time. However, this increase could partly be due to the inclusion of salary sacrificed expenditure on motor vehicles and associated running costs in the ABS 2009–10 HES.

There was little difference between state and territory households' expenditure on these items as a proportion of their total expenditure on goods and services.

Average weekly expenditure on electricity, gas, heating oil and wood by state or territory – 2009–10



(a) Households in collection districts defined as Very Remote or Indigenous communities are excluded, accounting for about 23% of the population in the NT.

(b) As the balance of state is not available for the ACT, estimates for the ACT are the same as those for Canberra.

Source: ABS [Household Expenditure Survey, Australia: Summary of Results, 2009–10](#) (cat. no. 6530.0)

households' heating and cooling requirements across climate zones, there was little difference between state and territory households' expenditure on electricity, gas, heating oil and wood.

In 2009–10, Tasmanian households had the highest expenditure on electricity, gas, heating oil and wood as a proportion of their total expenditure on goods and services, with 3.6%.

How are we reducing our energy use?

Climate change has been identified as one of the biggest issues facing the nation⁶ and the world. Results from the 2007–08 Environmental Views and Behaviours component of the ABS Multipurpose Household Survey showed that nearly three quarters (74%) of Australian adults were concerned about climate change. This, in addition to concerns about rising energy costs, has led to greater attention being focused on ways in which households and individuals can reduce their carbon footprints.

...installing solar energy units

Greater environmental awareness, and a desire for cheaper alternatives for powering homes, may be responsible for the considerable increase in the

Types of solar energy units

Small generation units are eligible to create small-scale technology certificates under the Small-scale Renewable Energy Scheme.

Small solar units (a small-scale photovoltaic system) may have a capacity of no more than 100 kilowatts (kW) and have a total annual electricity output of less than 250 megawatt hours (MWh).⁷

number of renewable energy generation units installed in households over the last decade.

Between 2001 and 2011, Renewable Energy Certificate data shows that the number of households installing solar energy units greatly increased, rising from 118 in 2001 to 85,550 in 2009, before sharply increasing to 639,803 in 2011.

Across the states and territories in 2011, NSW and Queensland had the highest number of households with solar units, with 168,167 and 166,395 households respectively. The NT had the fewest number of households with these units installed, with 1,462 households.

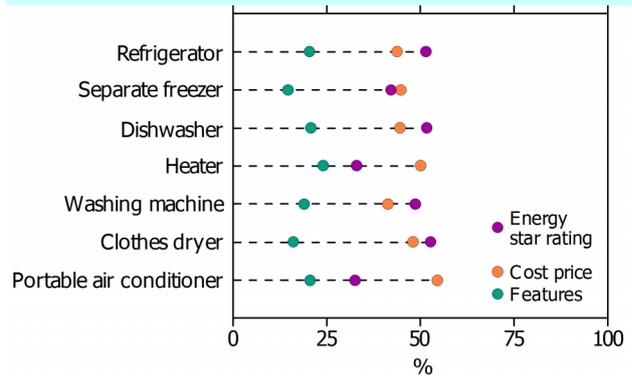
While household renewable energy units have low operating costs, initial installation can be expensive.⁸ A range of different government grants and rebates have been available to households to help reduce installation costs and encourage the use of renewable energy in the home. Differences between these policies and rebate schemes can impact household consumption of energy sources, and should be taken into account when comparing trends across the states and territories.

...selecting household appliances

Many households are conscious of the amount of energy consumed by their household appliances and are adjusting their purchases accordingly.

The ABS 2011 Energy Use and Conservation Survey showed that many households considered cost price and energy star rating to be the most important considerations when purchasing household appliances in the last 12 months, with nearly half of households citing these factors as having influenced their purchases (with 47% and 45% respectively). Other factors such as the features of the appliances (19%) also influenced households' purchasing choices.

Factors considered when purchasing appliances in the last 12 months – March 2011



Source: ABS *Environmental Issues: Energy Use and Conservation, Mar 2011* (cat. no. 4602.0.55.001)

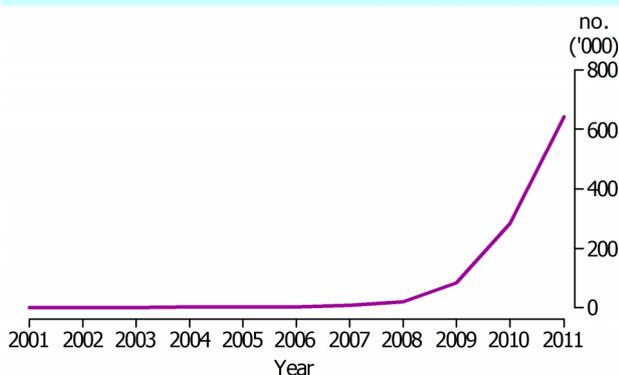
...insulating our homes

Insulation helps to ensure dwellings are warm in winter and cool in summer, and can assist in reducing household power bills and greenhouse gas emissions.

In 2011, more than two-thirds (69%) of Australian households had insulation, a 9% increase since 2005. Insulation was most common in separate houses, with more than three-quarters (77%) of these dwellings being insulated, compared with less than one-third (29%) of flats, units and apartments.

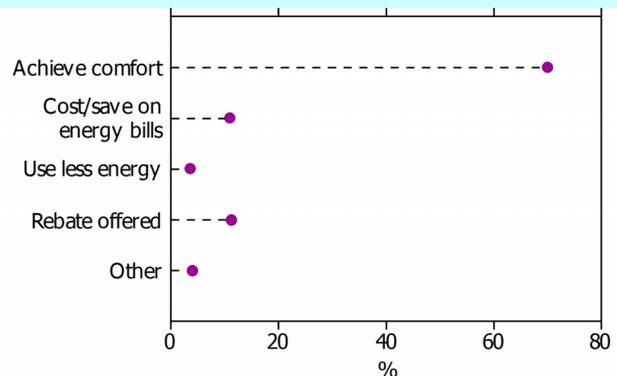
The ACT (81%), Tasmania (79%), SA (78%) and Victoria (77%) had the highest proportions of households with insulation across the states and territories, while less than half of NT households were insulated (44%). Across the states and territories, comfort was the most commonly reported main reason for households having installed insulation (70%), with 3.6% of households citing reducing energy use as their main reason.

Number of households with small solar generation units installed – 2001-2011



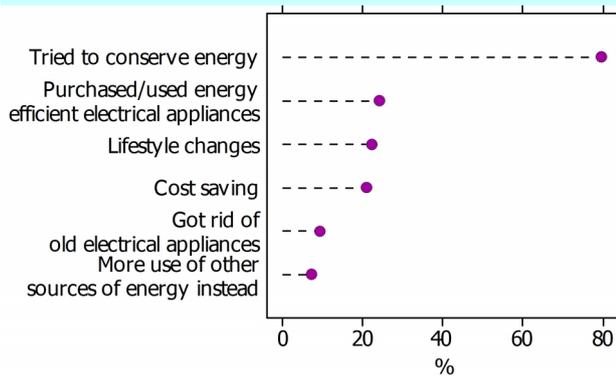
Source: Renewable Energy Certificate Generation Data 2001-2011, Clean Energy Regulator

Main reasons for installing insulation – 2011



Source: ABS *Environmental Issues: Energy Use and Conservation, Mar 2011* (cat. no. 4602.0.55.001)

Reasons why personal electricity use decreased – 2007-08



Source: ABS *Environmental Views and Behaviour, 2007-08* (cat. no. 4626.0.55.001)

...limiting our electricity use

Findings from the Environmental Views and Behaviours Survey showed that, of people who reported that they were concerned about climate change in 2007–08, most (92%) said that they had taken steps to limit their personal electricity use. However, a large proportion (78%) of those not concerned with climate change had also taken steps to limit their electricity use, reflecting many Australians' concerns about the rising cost of energy.

Older Australians were more likely than younger Australian adults to take steps to limit their electricity use. Nearly nine in ten (88%) people aged 65 years and over took steps, compared with more than seven in ten (74%) people aged 18–24 years. People aged 18–24 years were more likely than older people to report that they did not care how much electricity they used, with 5% of people in this age group, compared with 1% of other adults.

The most commonly reported reason for people aged 25 years and over not having taken steps to limit their electricity use was that they felt their electricity consumption was already low enough (38%), with nearly half (48%) of people aged 65 years and over giving this reason. Conversely, the most commonly reported reason among people aged 18–24 years was that they had not thought about saving electricity (37%). Young people's tendency to be less mindful of electricity saving practices could partly be due to a greater likelihood of them still living in the family home and not bearing the responsibility of paying electricity or gas bills. In 2006–07, around half of young men (49%) and young women (45%) aged 18–24 years had never left the parental home, with more than two fifths (41%) staying for financial reasons.⁹

For people whose electricity use decreased, four in five (80%) reported that this was due to efforts to conserve energy. While this was the most common reason given across all age groups, other reasons such as the purchase or use of energy efficient electrical appliances (24%), lifestyle changes (22%) and cost saving (21%) were also commonly reported.

Looking forward

The Australian Government has committed to achieving a Renewable Energy Target of 20% of Australia's electricity coming from renewable sources by 2020.³ Although the Australian Government's carbon price policy is targeted at Australia's largest polluters,³ policies such as this, coupled with the rising cost of energy, are seeing Australians become more aware of their own energy use in the home.

This increased awareness of energy consumption, and the financial costs involved, is likely to see households continue to engage in energy saving practices into the future.

Endnotes

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