

## Australia's Complex Energy Decarbonisation Challenge

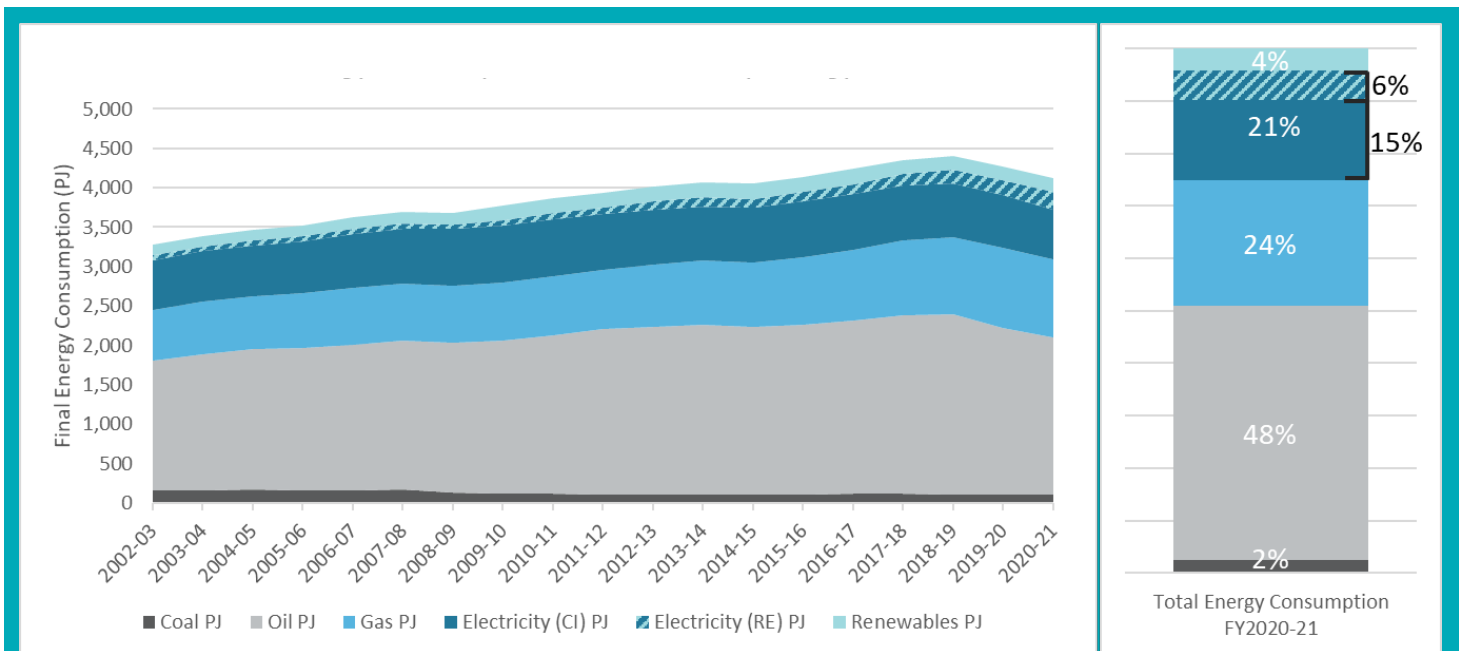
Australia has had comparatively low-cost energy for decades. From the energy that powers and heats our homes, fuels our businesses and industries, and helps transport people and goods around the country, this low-cost energy has helped Australians enjoy a high standard of living and become a major world economy despite our relatively small population. It is from this foundation

that Australia must change to achieve its net-zero emissions goal.

### How Australia uses energy today

Half of Australia's energy is consumed as liquid fuels which are predominantly used in transport. Most of the remaining energy is used to fuel homes and businesses with natural gas making up 24 per cent and electricity making up 21 per cent

of total domestic energy demand<sup>1</sup>. This diversity of energy sources has naturally developed over time as businesses and households have chosen the energy sources which best suits their needs. Electricity itself is generated by a range of methods including from coal, natural gas, and renewables such as hydro, wind and solar.



**Figure 1: Total final energy consumption in Australia, by energy medium**

It is this naturally developed mix of energy choices which lays at the heart of the Australian energy decarbonisation challenge. Decades of renewable energy progress has led to 29 per cent of Australian electricity being generated by renewable sources in 2021 – but this relates

only to the electricity portion of all Australian energy use, accounting for 5.5 per cent of all energy used in Australia.

Finding the lowest cost, most reliable solution for the remaining 89 per cent of carbon intensive energy use

is an extremely complex challenge. Decarbonising Australia's energy use should not jeopardise energy security and must maintain our low-cost energy advantage. It is unlikely there will be a single solution, rather many parts will combine to achieve the outcomes Australians need.

## How do we get to a decarbonised energy system?

There has been a single practical option to decarbonise energy use in Australia: renewable electricity. This option meant that we had to make sacrifices for the greater good: we would all have to spend money to change our homes and businesses to run on renewable electricity. However, technological leaps have helped us progress beyond this point, and we now have a wider range of practically viable options which can help avoid these personal and business sacrifices.

Many more practical ways of decarbonising energy use are now emerging. All will include using more renewable energy, but we can diversify the types of renewable energy we use. The opportunity to use different forms of renewable energy in existing and like-for-like appliances can help deliver renewable energy while avoiding the cost and imposition of electrification. Top of the list of the types of energy which we can use in existing and like-for-like appliances are renewables gases like biomethane and hydrogen. These can be used to decarbonise the gas

used by homes and businesses and can even replace the liquid fuels used in transport and industry.

A diverse mixture of forms of renewable energy is more likely to be the most cost-effective approach to deliver secure carbon neutral energy. This is because the way we generate and the way we use energy is not always the same. Customers should have the right to choose the most cost effective and reliable decarbonisation options for their household or business.

### Where does this matter in the real world?

One key example of where renewable gas options can lead to lower cost decarbonisation outcomes is in the management of seasonal energy demand. Household energy use is greater in winter as we need additional energy to heat our homes. Natural gas has naturally filled this role due to its flexible, low-cost transport and storage, an advantage that the electricity system lacks. Similarly, delivering the volume of renewable energy required to decarbonise liquid fuels will likely be less costly through renewable

gas infrastructure. Considering the volume and variations in total Australian energy consumption, using a more diverse mix of renewable energy options can only help Australia along its pathway to net-zero energy.

### Diversity of energy is a key to decarbonisation

With such a monumental task ahead of us, Australia needs all decarbonisation options to work together to achieve the least-cost net-zero outcome for the nation. The challenge of energy decarbonisation can be most effectively tackled by having a diverse mixture of different forms of renewable energy available to us and ensuring that we have effective interconnection between different regions, States and Territories, and energy systems. The option to convert one type of energy to the other as happens with gas power generation, provides an added layer of energy security through integration of the diverse energy pathways.

Luckily, Australia has more renewable energy options than renewable electricity alone. Renewable gases such as hydrogen and biomethane can be transported through existing infrastructure networks to deliver a more cost-effective renewable energy pathway for many applications<sup>2</sup>. Tackling the complex Australian energy decarbonisation challenge with both renewable gas and renewable electricity together means that more practical and cost-effective solutions can be found for decarbonising the entire energy system.

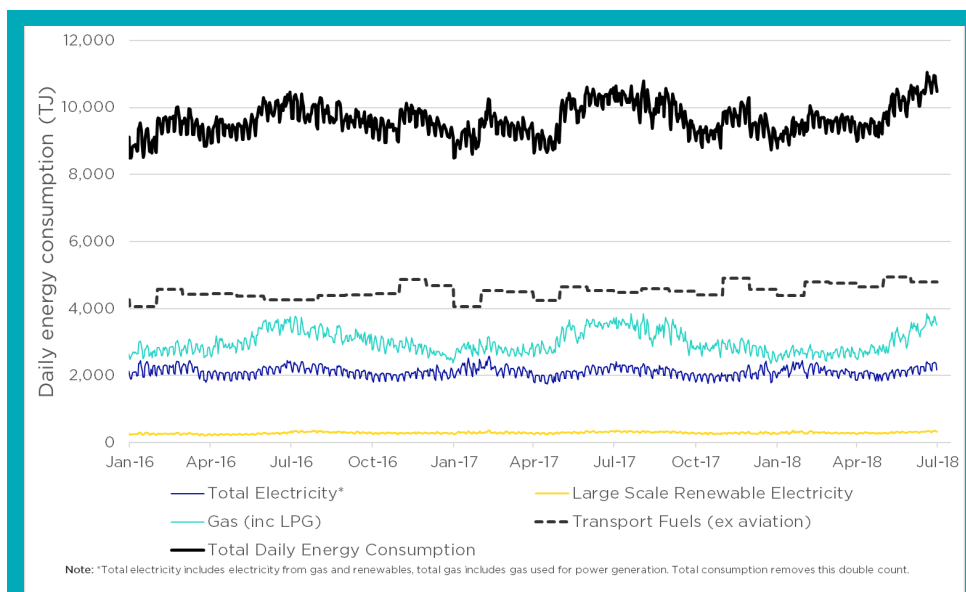


Figure 2: Australia's Daily Energy Consumption (2016 - 2018)

## References:

- 1 Australian Energy Statistics, Federal Department of Industry, Science, Energy and Resources  
<https://www.energy.gov.au/publications/australian-energy-update-2022>
- 2 Gas Vision 2050, Australian Pipelines and Gas Association  
[https://www.apga.org.au/sites/default/files/uploaded-content/website-content/gasinnovation\\_04.pdf](https://www.apga.org.au/sites/default/files/uploaded-content/website-content/gasinnovation_04.pdf)

## For further information



1st Floor, 7 National Circuit, Barton ACT

P: 02 6273 0577

E: [apga@apga.org.au](mailto:apga@apga.org.au)

F: 02 6273 0588

W: [www.apga.org.au](http://www.apga.org.au)