Managing the transition to all-electric homes

An economical solution to Victoria’s fossil gas dilemma

Jay Gordon – Energy Finance Analyst, Australian Electricity
Victoria’s reliance on fossil gas in the home puts it in a challenging situation.

Gas is no longer an affordable household fuel. AEMO has forecast gas supply shortfalls within four years. Victoria has some of the most ambitious emissions targets in Australia.

Source: AER
Source: AEMO
Source: DEECA
Meanwhile, 340,000+ gas appliances are up for replacement each year

- 66,000 gas heating systems
- 124,000 gas hot water systems
- 154,000 gas cooking appliances

It will be hard for Victoria to avoid a gas shortfall, and reduce its emissions, if these continue to be replaced with new gas appliances.

Consumers also incur

~$931 million

in avoidable locked-in costs for each year gas appliances are installed rather than electric.
Electrifying all gas appliances at end-of-life from 2025 would reduce residential gas by ~93% by 2045

Residential gas demand, VIC

Source: IEEFA modelling drawing from Residential Baseline Study (EnergyConsult 2022)
It would also reduce and delay long-term gas supply shortfalls.

Source: IEEFA analysis based on internal modelling and AEMO forecasts
And represents a minimum action required to reduce residential emissions

Residential gas emissions, VIC

- **Scope 2 emissions**
  - (IEEFA analysis; from electric appliances replacing gas)
- **Scope 1 emissions**
  - (IEEFA analysis; from gas appliances retired at end-of-life)
- **No electrification**
  - (From AEMO’s 2023 5SOO)
- **Victoria’s emissions targets**
  - (mapped to residential gas)

Source: IEEFA modelling
Ending the sale of gas appliances by 2025 would bring financial benefits to Victorians

- End-of-life electrification is already highly economical
- It would be equitable for the 28% of Victorian households who rent

Source: ABS
Source: IEEFA analysis, assuming gas connection is abolished after cooking electrified
This could lead to a rapid scale-up of electric appliance installations.

4-fold increase in induction cooktop sales

28% increase in air conditioner sales

10-fold increase in heat pump water heater sales

Source: IEEFA unpublished analysis. Data for all states and territories.
Mirroring what we are seeing elsewhere in the world

Increase in heat pump sales, 2022-23:

- Poland: 112%
- Czechia: 106%
- Belgium: 118%

Source: European Heat Pump Association
There will be implications for gas infrastructure, which is not compatible with electrification

In the interim, the AER has approved:
- Accelerated depreciation
- Abolishment tariffs

However -

“Further work is required across the sector to develop a more sustainable solution.”
– Clare Savage, Chair, AER
Recovering full costs from consumers is no longer sustainable

Source: IEEFA modelling
Gas distribution networks face high unrecovered costs, but not as high as the consumer savings

This amounts to ~$3.5 bn across all networks over 2023-50

However, the consumer savings from switching to electric appliances could be ~$17 bn.

Source: IEEFA modelling assuming a 2.5% per annum price cap. Consumer savings considers difference in upfront and running costs of gas and electric appliances.
Networks’ returns on equity reflect their risks

Real return on regulated equity

Source: AER
A plan is needed to wind down gas distribution networks

Victorians are not at risk of losing their gas overnight.

However, it is in everyone’s interest to manage the wind-down of networks as efficiently as possible.

Source: AER
Hydrogen is not a viable solution for gas distribution networks

- Current and proposed blending programs only displace 3% fossil gas
- Switching networks to 100% hydrogen presents logistical challenges
- There is increasing recognition that hydrogen doesn’t make sense in the household
Biomethane could play a niche role, but is heavily supply constrained

Victoria’s recoverable biogas potential is enough to displace 5-12% annual fossil gas consumption

Source: IEEFA. Percentages reflect proportion of biomethane feedstock available in each region.
Both gases are far more costly than electrification
Solutions will need to support, not hinder the transition

- Reduce barriers for homes to leave the gas network
- Provide appropriate financing solutions
- Incentivise networks to wind down, not expand
- Prevent promotion of hydrogen or biomethane as widespread solutions
- Support development of strong workforces and supply chains
- Understand the size and solutions for hard-to-electrify homes
Key recommendations to governments

1. Require gas appliances to be replaced with efficient electric alternatives at end-of-life in 2025 in all applicable homes
2. Support consumers to retire their gas appliances early where it makes financial sense
3. Develop a plan to wind down gas distribution networks
4. Identify solutions for hard-to-electrify homes
5. Implement appropriate minimum standards for energy efficiency and demand-response capabilities
6. Develop a strong electrification workforce and supply chain
Thank you

Contact

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