



Institute for Energy Economics
and Financial Analysis

Managing the transition to all-electric homes

An economical solution to Victoria's fossil gas
dilemma

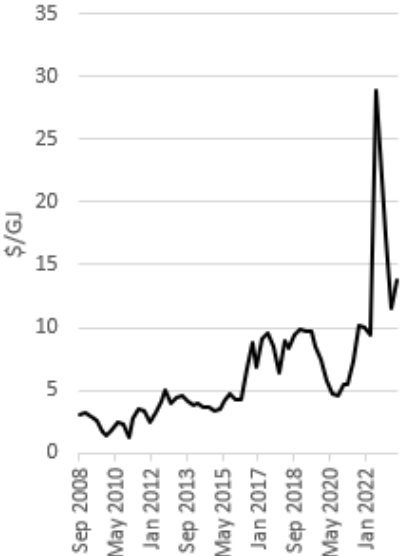
Jay Gordon – Energy Finance Analyst, Australian Electricity



Victoria's reliance on fossil gas in the home puts it in a challenging situation

Gas is no longer an affordable household fuel.

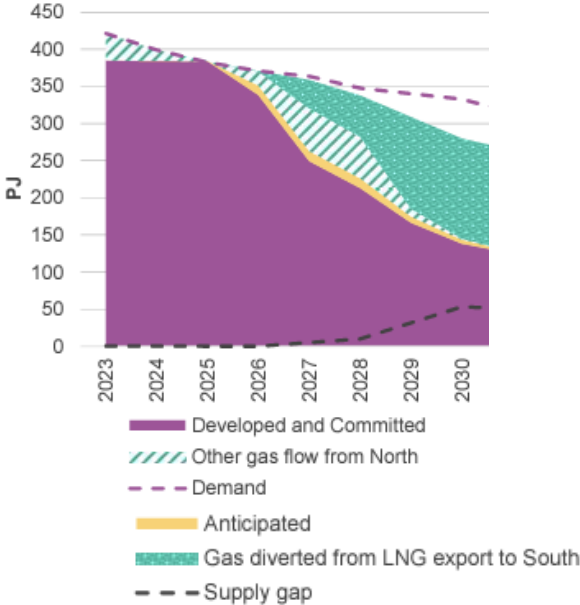
Wholesale gas price, Victoria



Source: AER

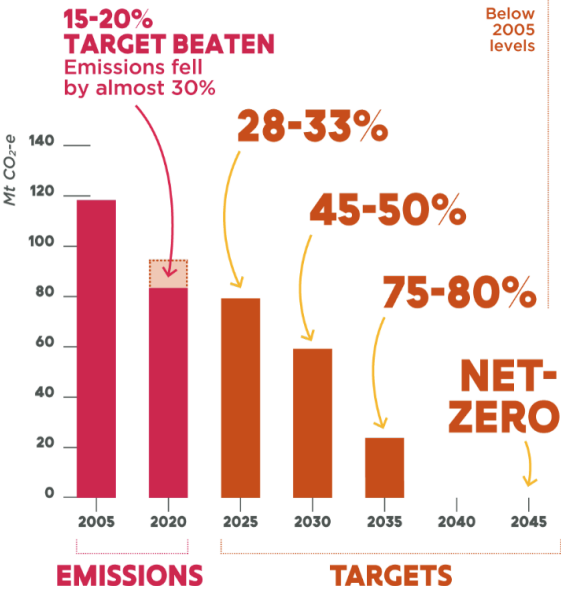
AEMO has forecast gas supply shortfalls within four years.

Gas flows, southern regions



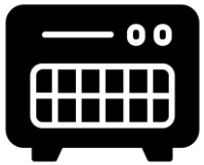
Source: AEMO

Victoria has some of the most ambitious emissions targets in Australia.



Source: DEECA

Meanwhile, 340,000+ gas appliances are up for replacement each year



66,000
gas heating systems



124,000
gas hot water systems



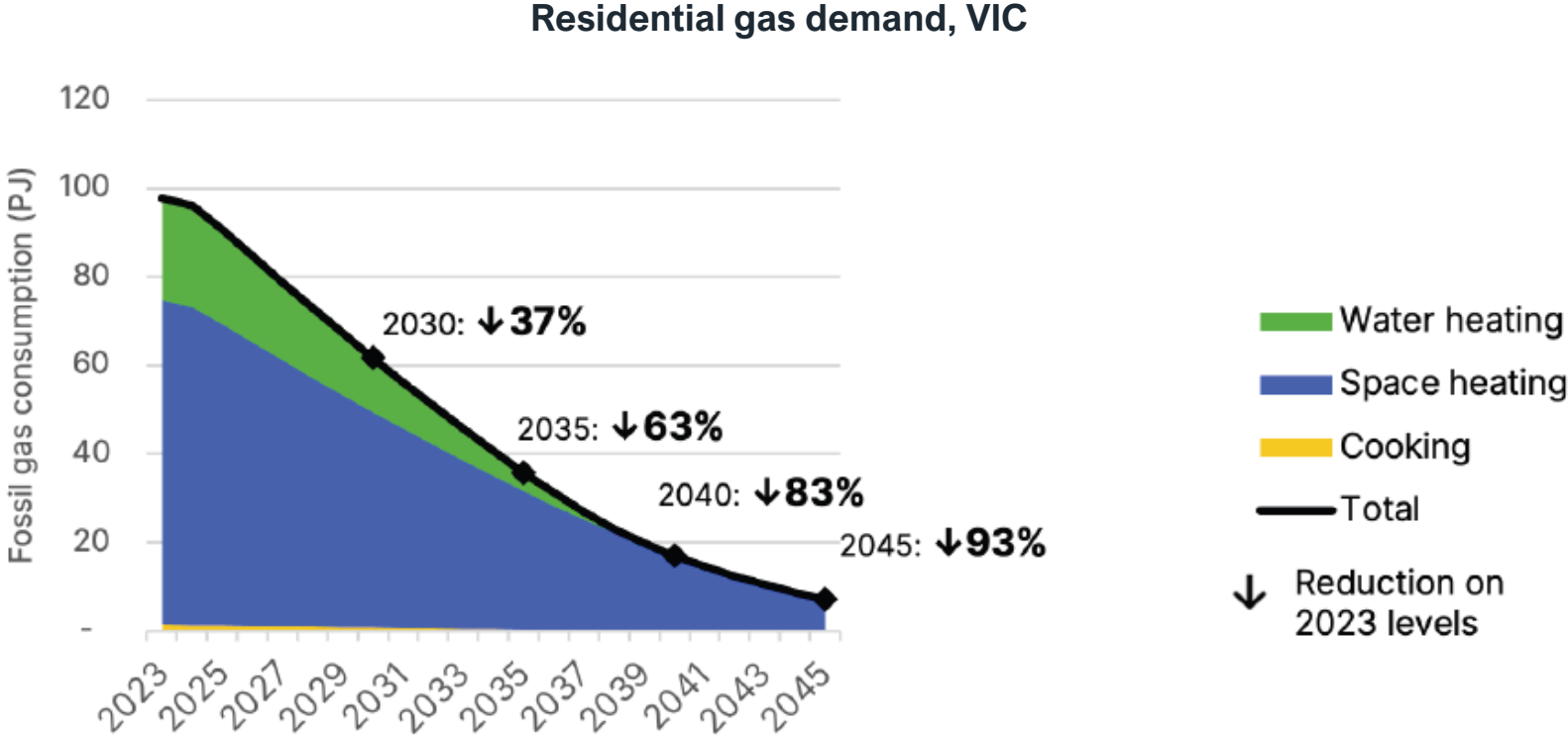
154,000
gas cooking appliances

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

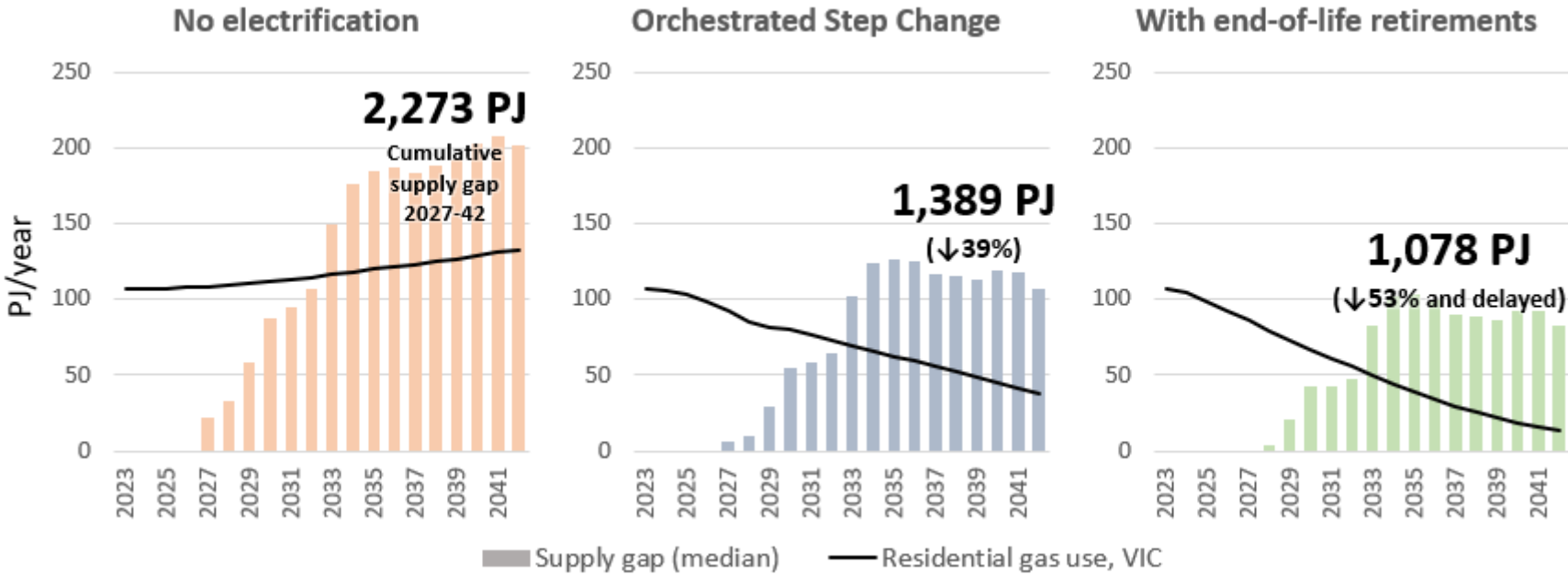
in avoidable locked-in costs for each year gas appliances are installed rather than electric

Electrifying all gas appliances at end-of-life from 2025 would reduce residential gas by ~93% by 2045



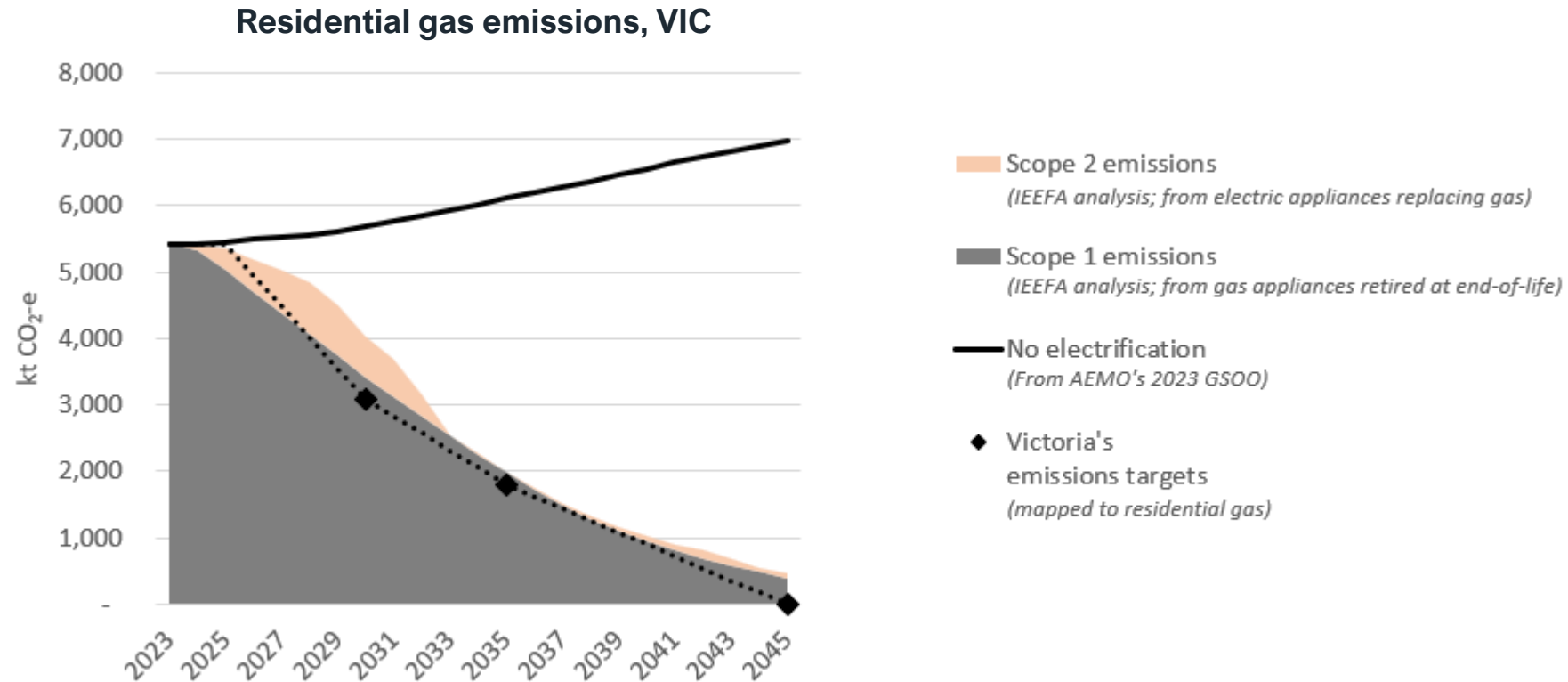
Source: IEEFA modelling drawing from Residential Baseline Study (EnergyConsult 2022)

It would also reduce and delay long-term gas supply shortfalls



Source: IEEFA analysis based on internal modelling and AEMO forecasts

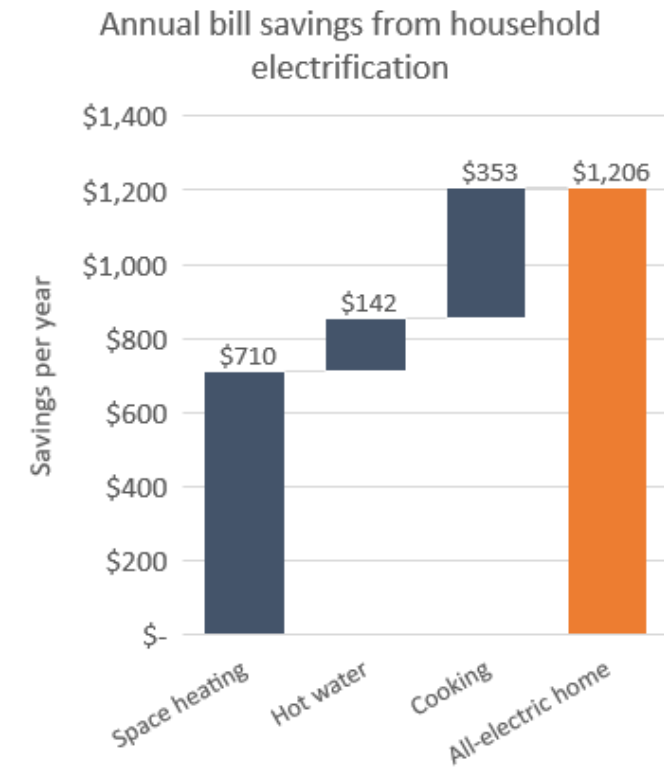
And represents a minimum action required to reduce residential emissions



Source: IEEFA modelling

Ending the sale of gas appliances by 2025 would bring financial benefits to Victorians

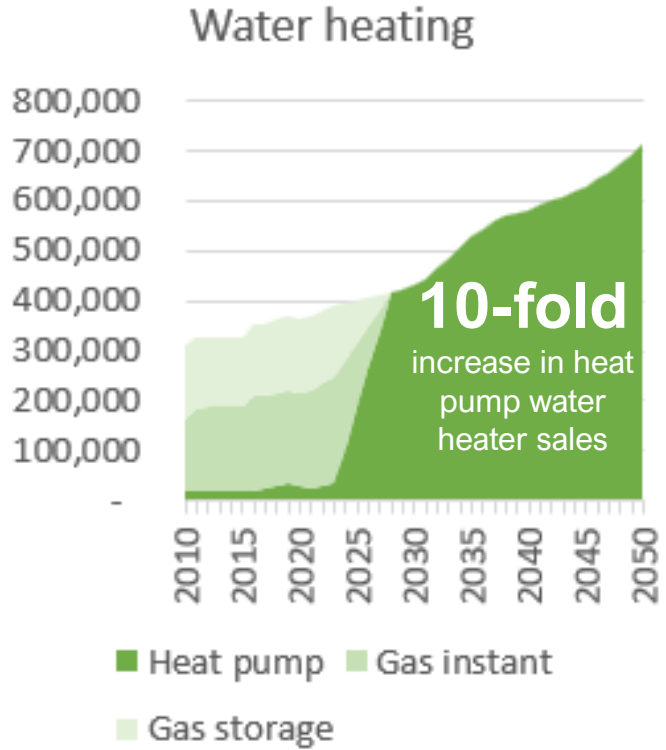
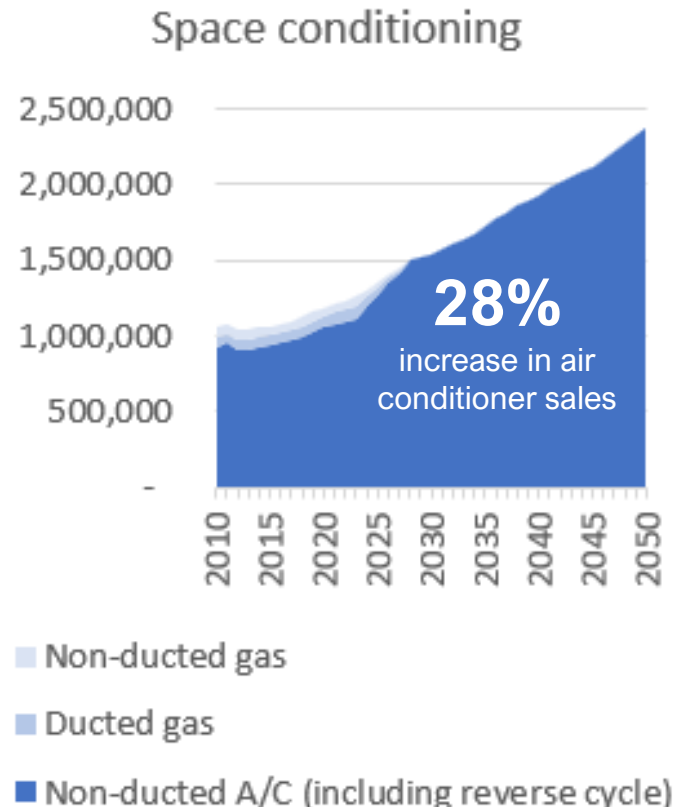
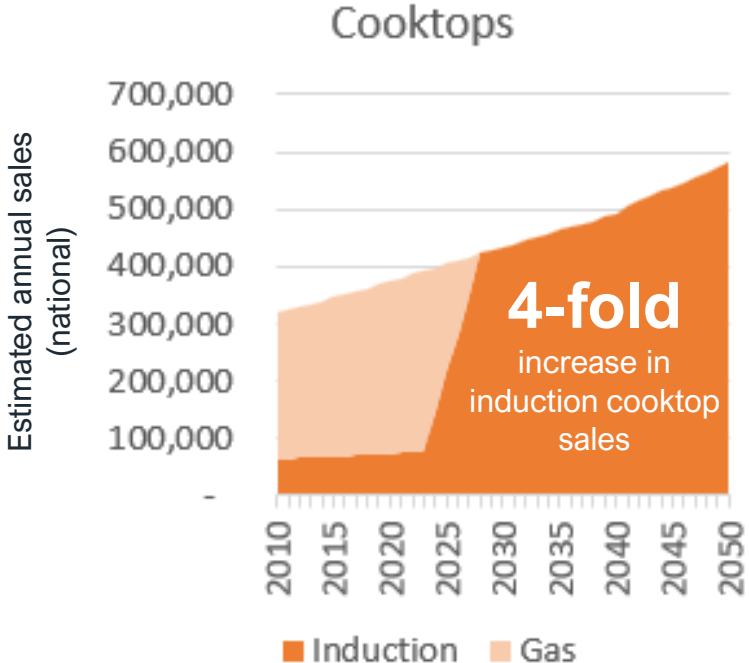
- End-of-life electrification is already highly economical
- It would be equitable for the **28%** of Victorian households who rent



Source: ABS

Source: IEEFA analysis, assuming gas connection is abolished after cooking electrified

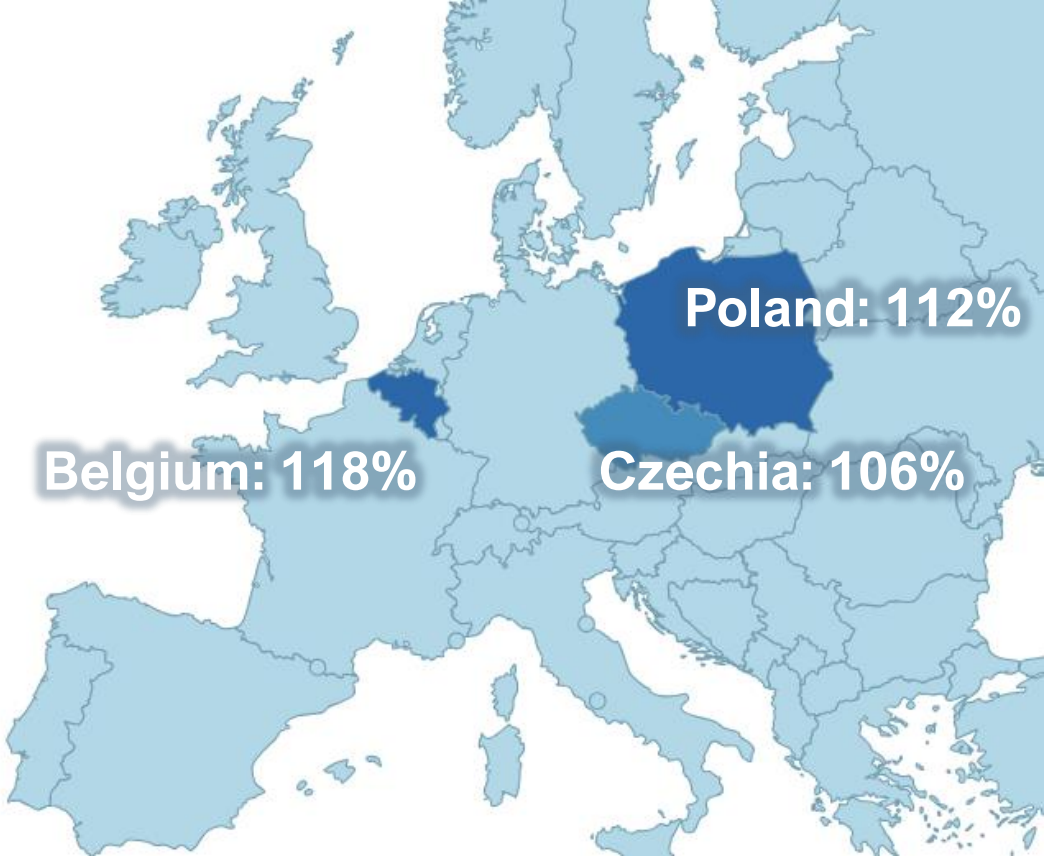
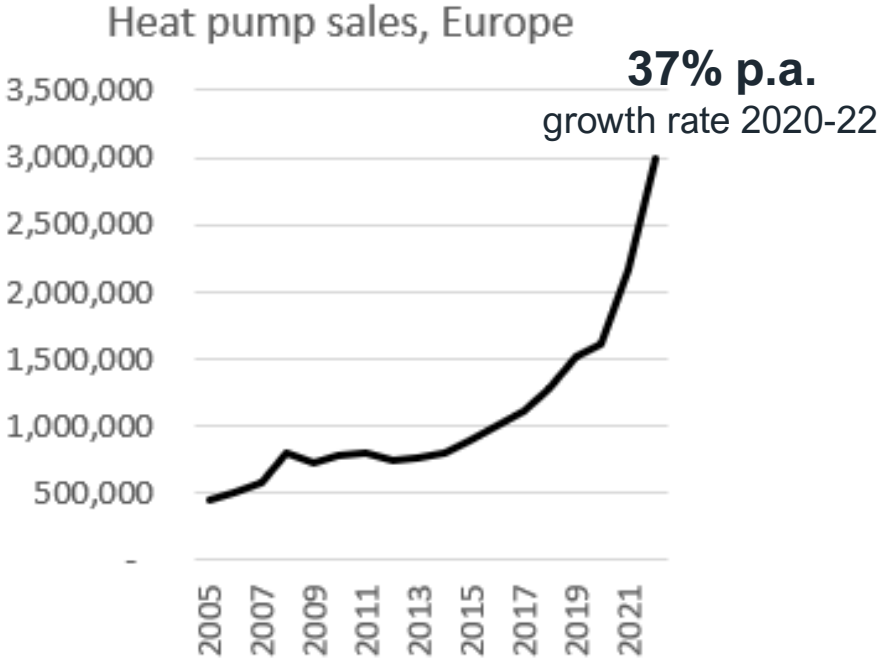
This could lead to a rapid scale-up of electric appliance installations



Source: IEEFA unpublished analysis. Data for all states and territories

Mirroring what we are seeing elsewhere in the world

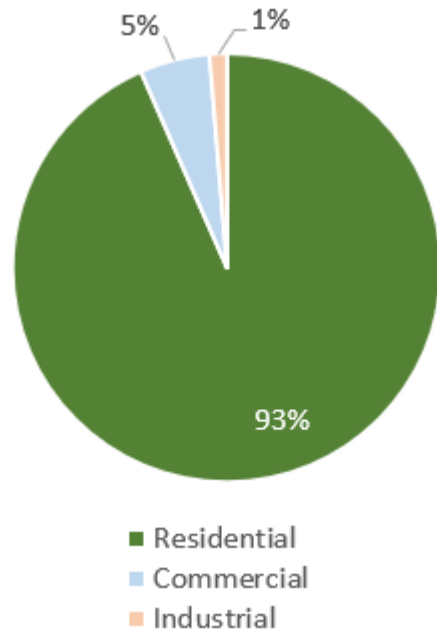
Increase in heat pump sales, 2022-23:



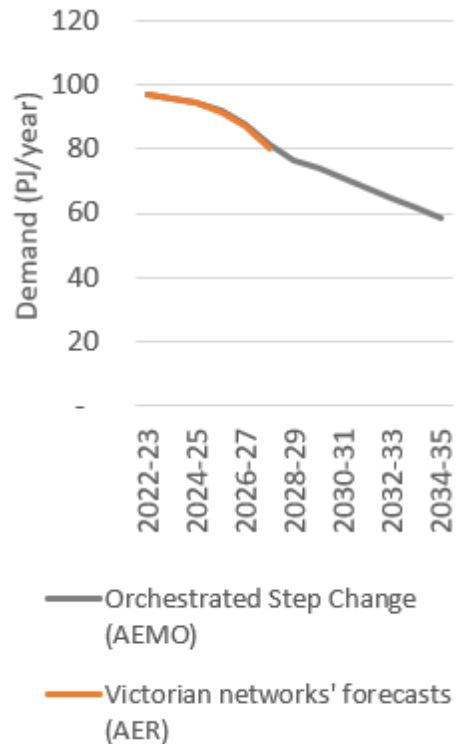
Source: European Heat Pump Association

There will be implications for gas infrastructure, which is not compatible with electrification

Revenue recovery by segment



Forecast residential demand



In the interim, the AER has approved:

- Accelerated depreciation
- Abolishment tariffs

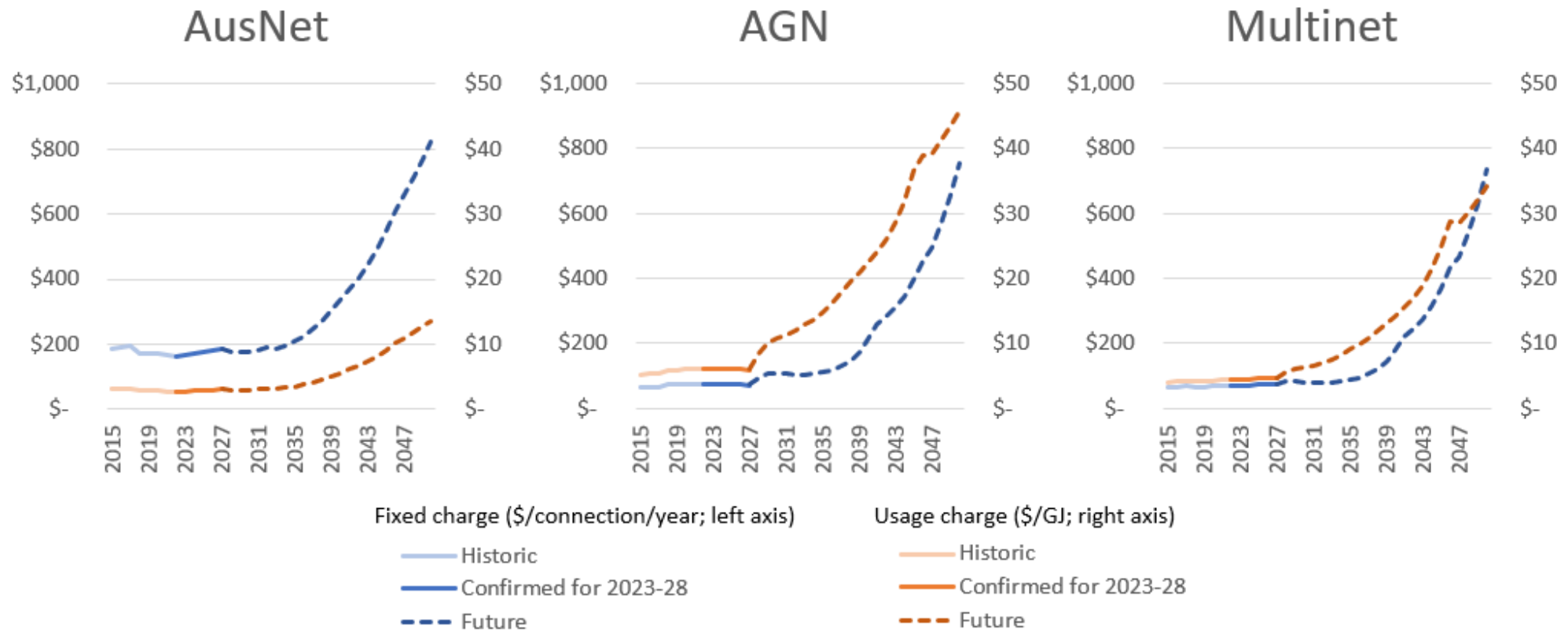
However -

“Further work is required across the sector to develop a more sustainable solution.”

- Clare Savage, Chair, AER

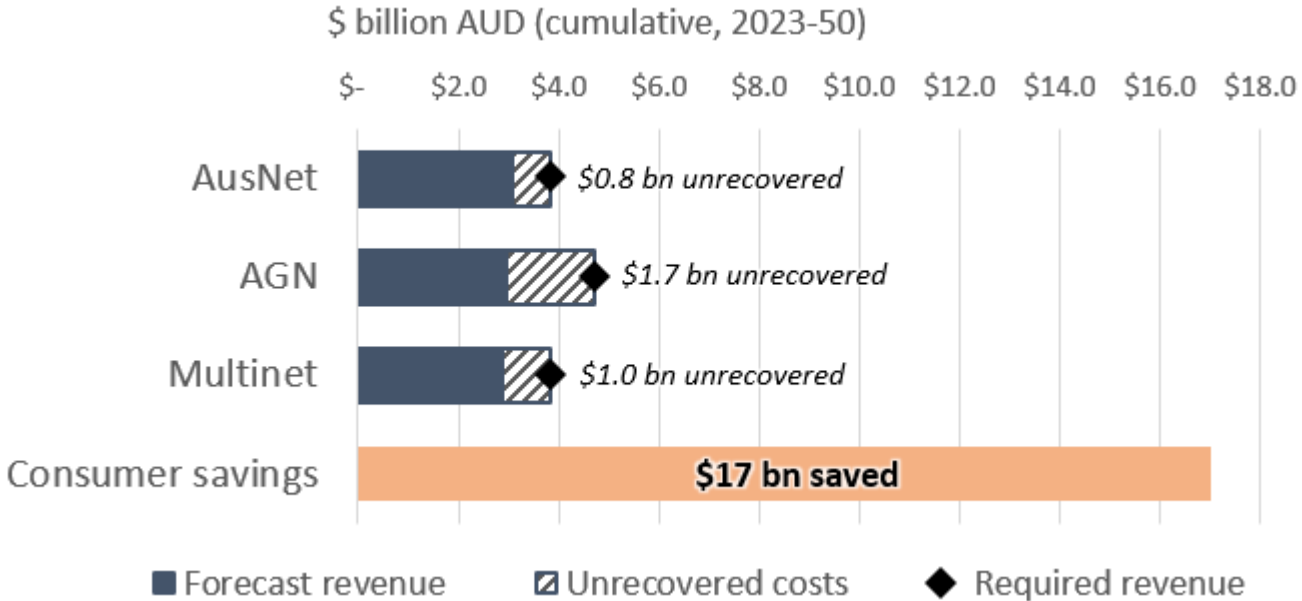
Source: AER

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

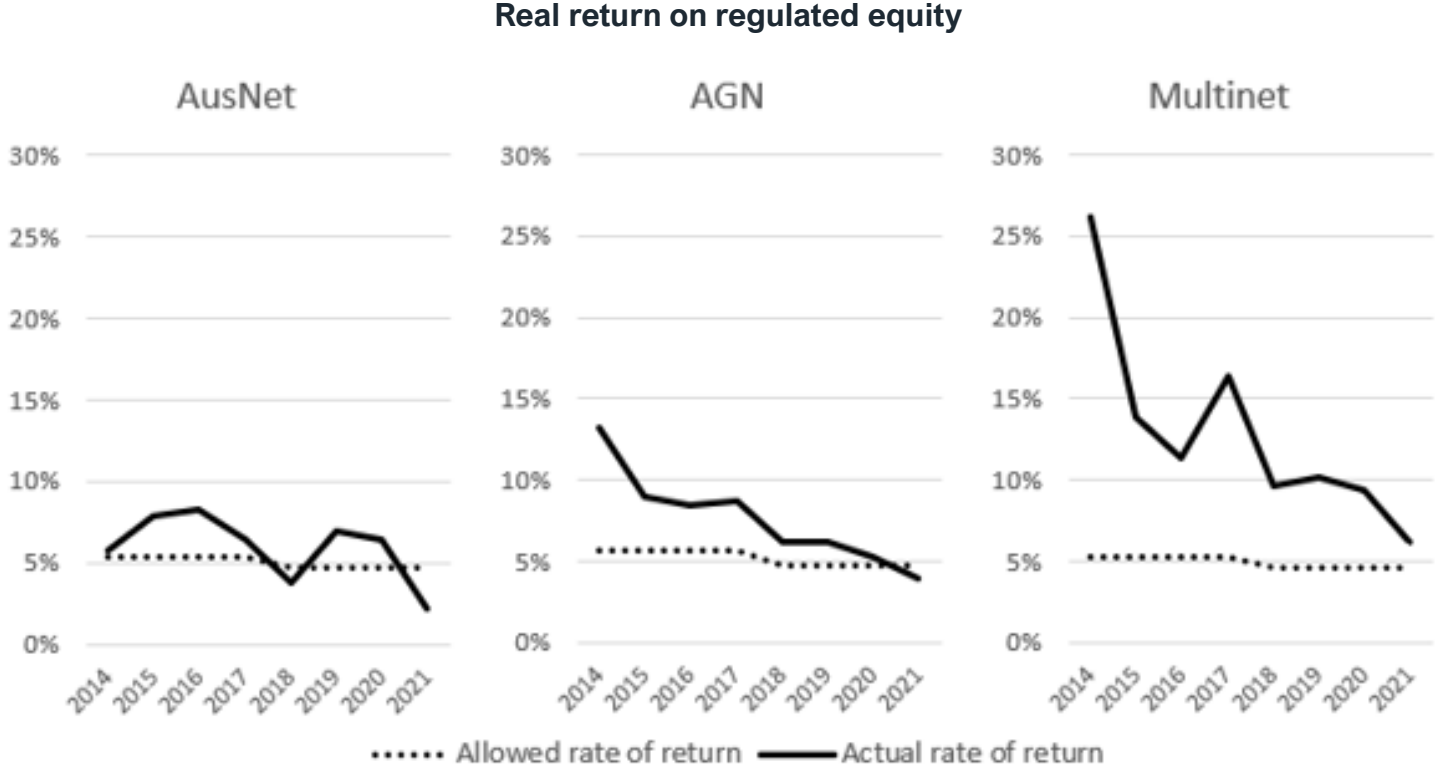


This amounts to ~\$3.5 bn across all networks over 2023-50

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



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.

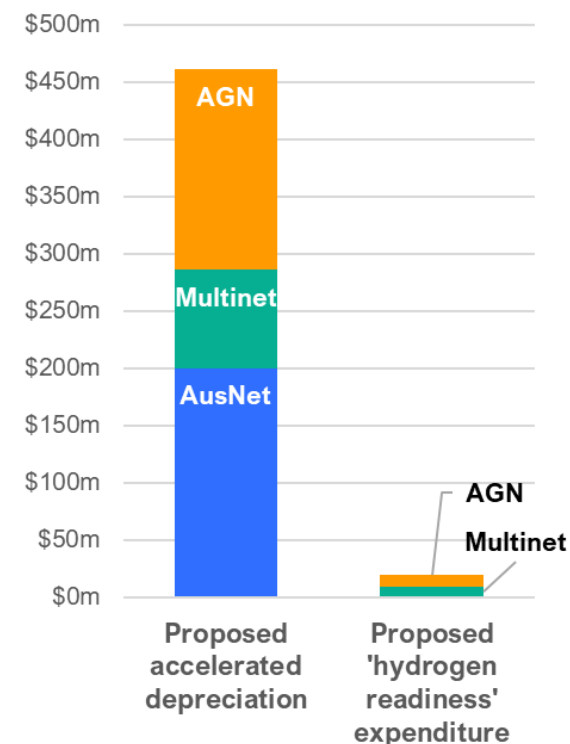


Source: AER

Hydrogen is not a viable solution for gas distribution networks

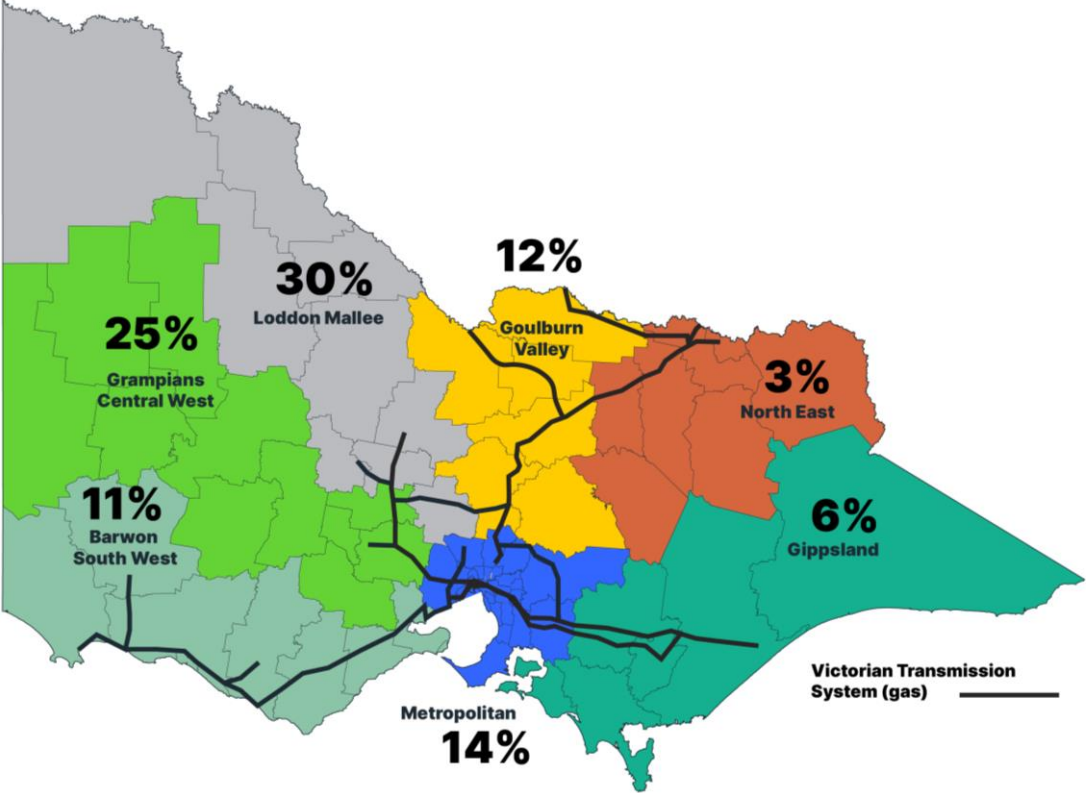
- Current and proposed blending programs only displace **3%** fossil gas
- Switching networks to 100% hydrogen presents logistical challenges
- There is increasing recognition that hydrogen doesn't make sense in the household

Proposed expenditure, Victorian 2023-28 Access Arrangements



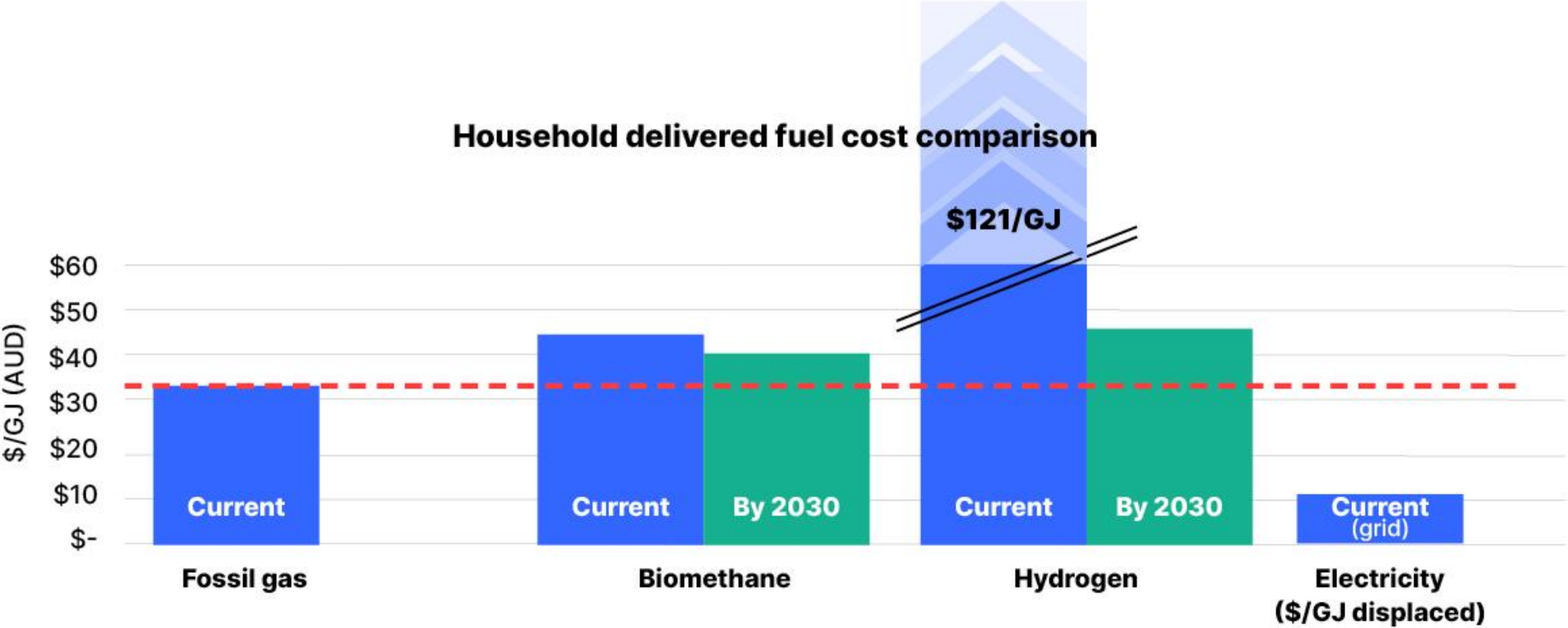
Biomethane could play a niche role, but is heavily supply constrained

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



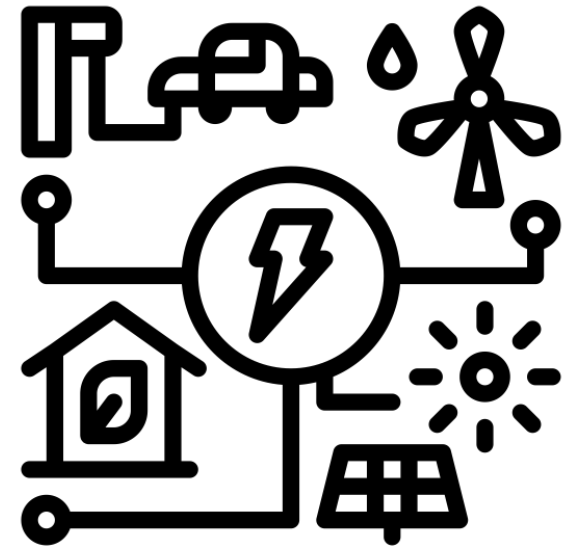
Source: IEEFA. Percentages reflect proportion of biomethane feedstock available in each region.

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

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