



**Institute for Energy Economics  
and Financial Analysis**

# Efficient electrification

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The South Australian opportunity

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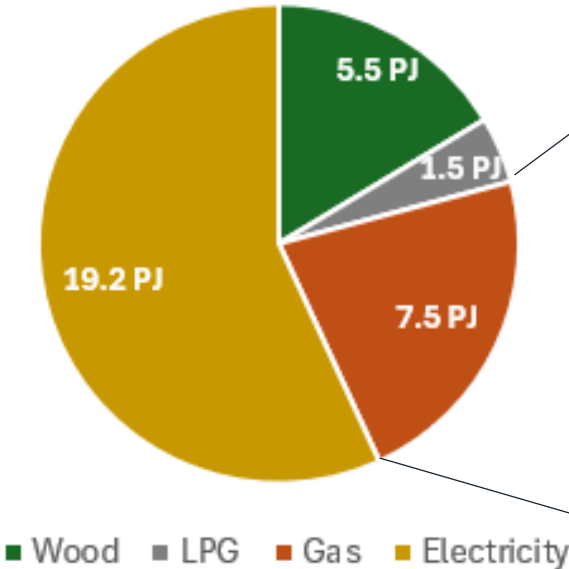


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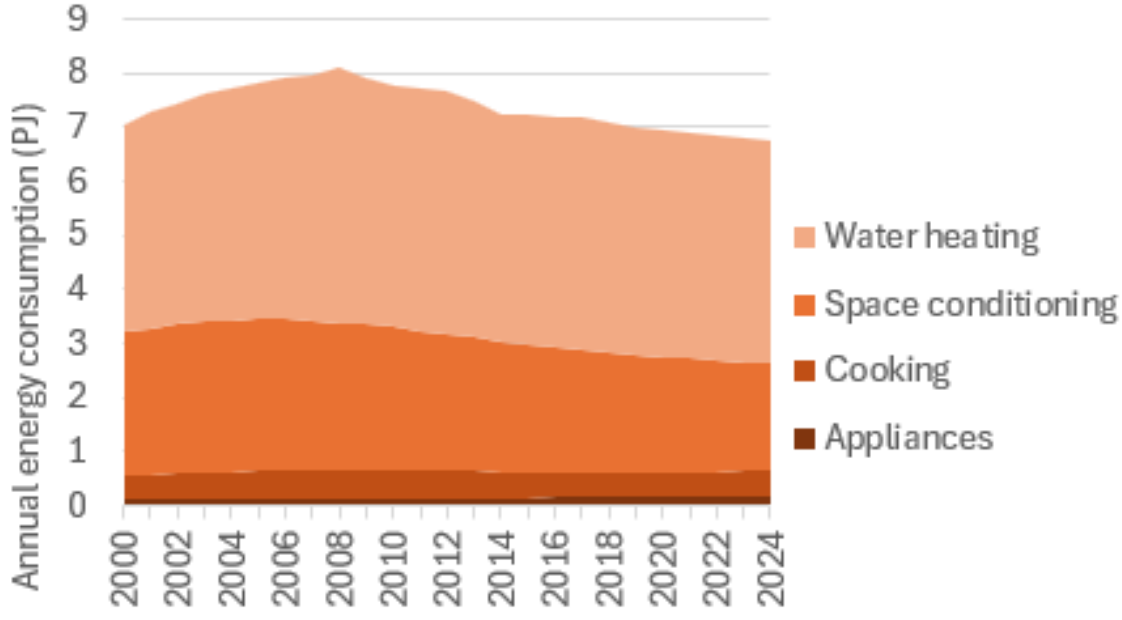
## **The financial case for efficient electrification**

# Around 57% of South Australian homes have a gas connection

Residential energy use, SA



Residential gas consumption in SA



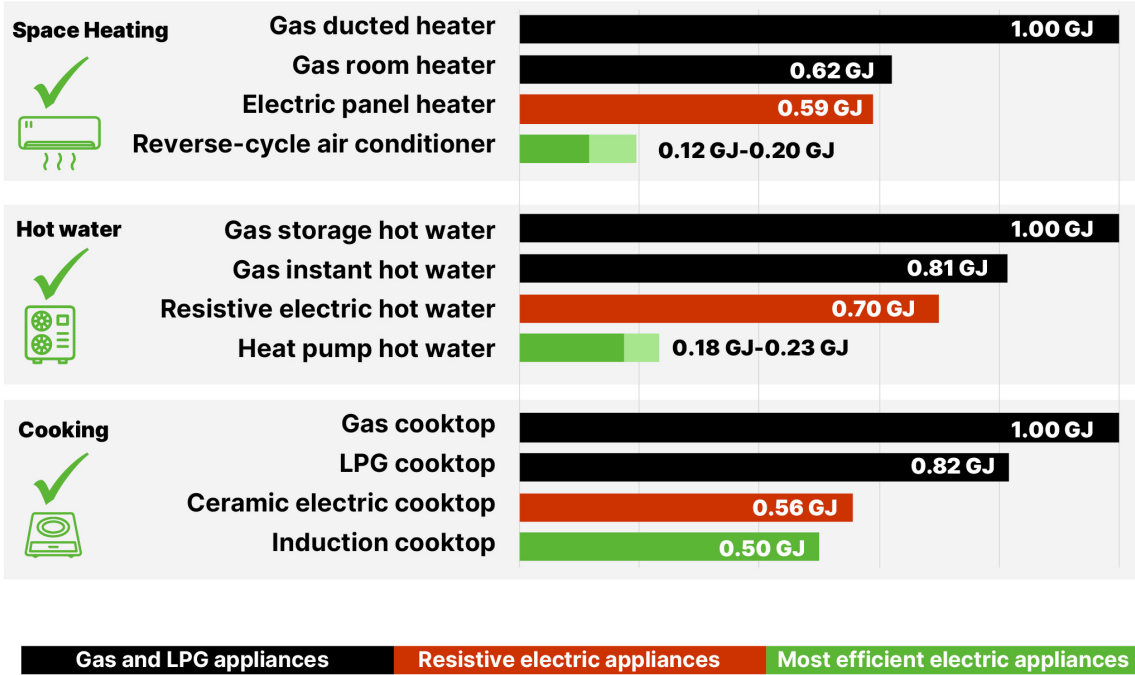
Source: DCCEE Australian Energy Update 2023 – Table F

Source: EnergyConsult 2021 Residential Baseline Study

# Efficient electric homes are the most cost effective option in South Australia

Step change efficiency gains are achieved by switching to heat pump based appliances from gas or resistive electric appliances.

## Relative energy consumption by type of appliance



Sources for appliance efficiencies outlined in IEEFA – Managing the Transition to All-Electric Homes Technical Appendix (p.24).

IEEFA

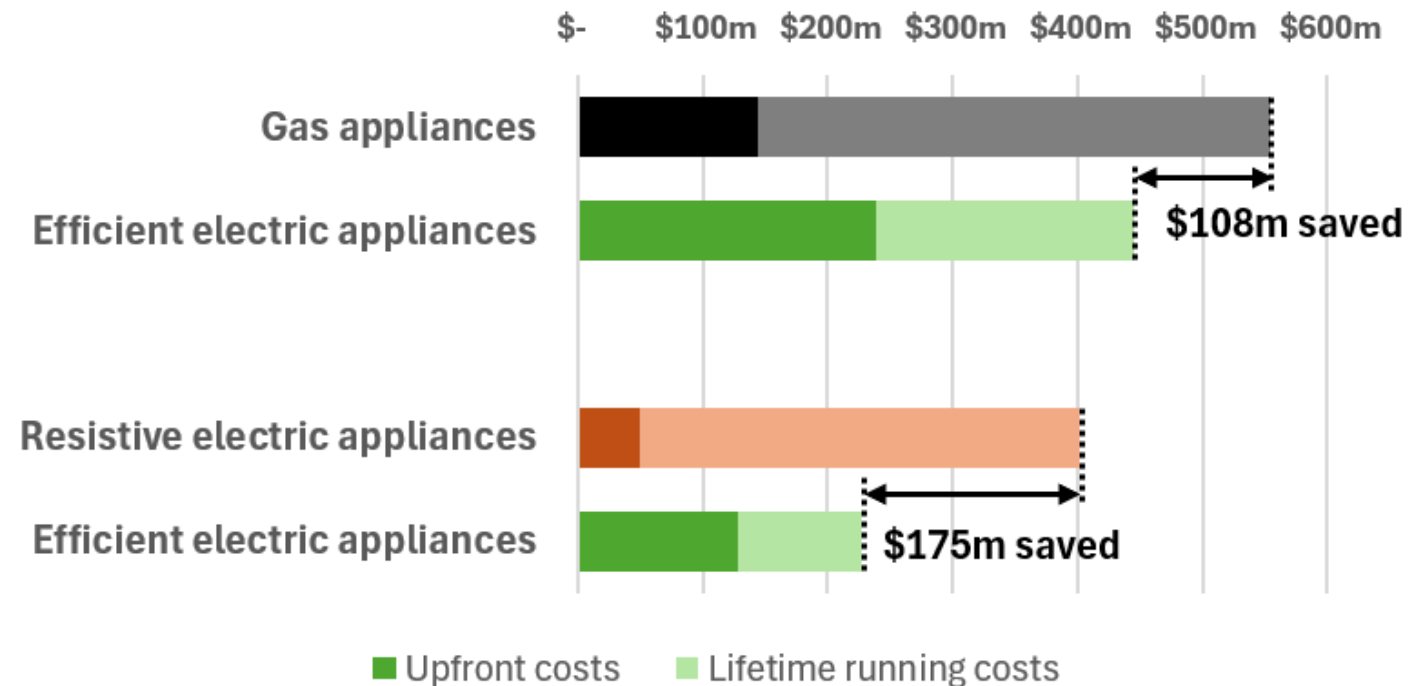
Source: IEEFA - Appliance standards are key to driving the transition to efficient electric homes

# SA consumers would avoid \$283m in costs for each year new appliances are efficient and electric

Efficient electric appliances have **higher upfront costs** than gas or resistive electric appliances.

However, their **total cost of ownership** is lower.

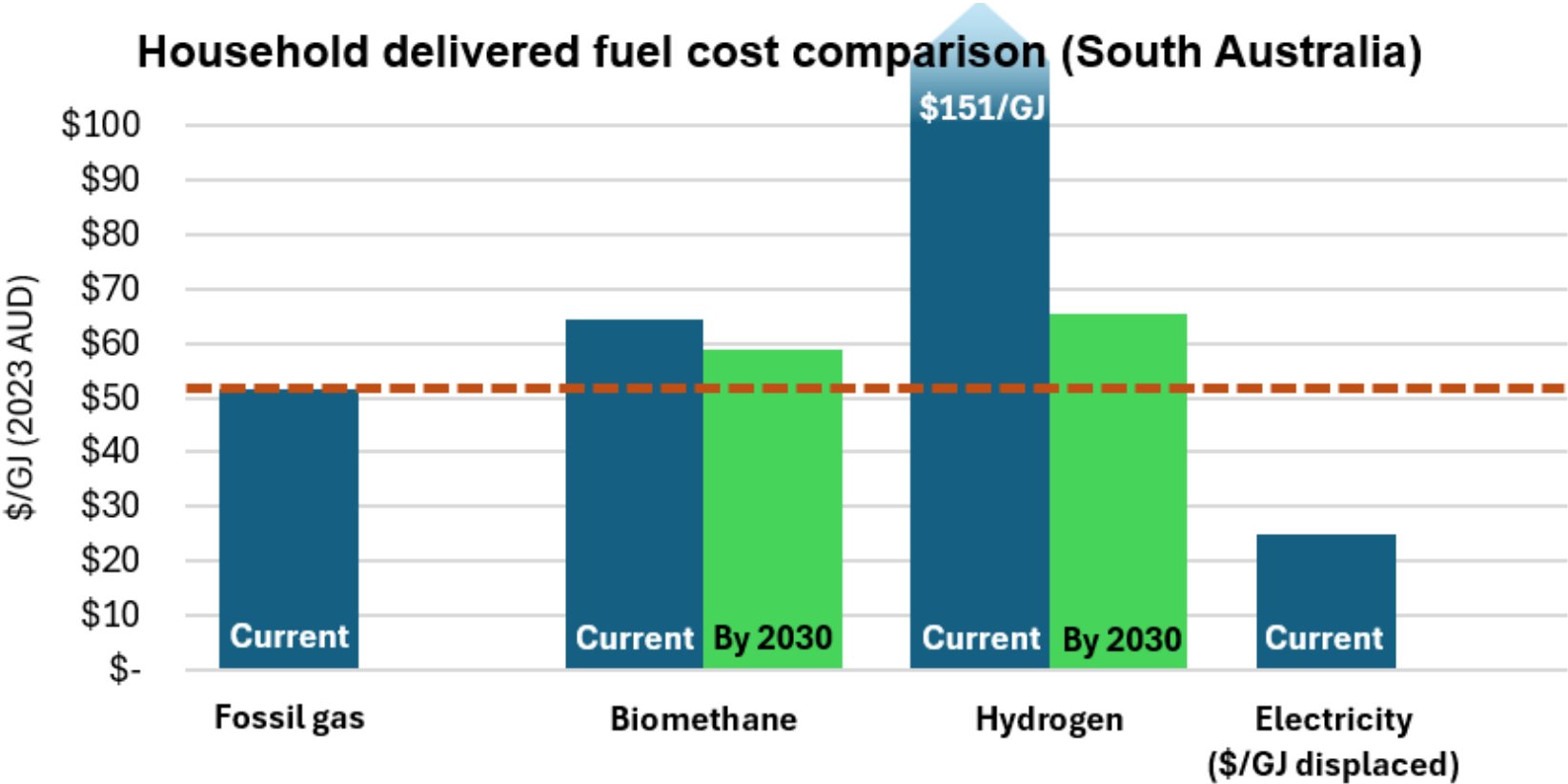
Lifetime costs of household appliances installed each year (South Australia)



Source: IEEFA - Appliance standards are key to driving the transition to efficient electric homes

# The reality of 'renewable gases' in the home

# Alternative gases are not economical at home



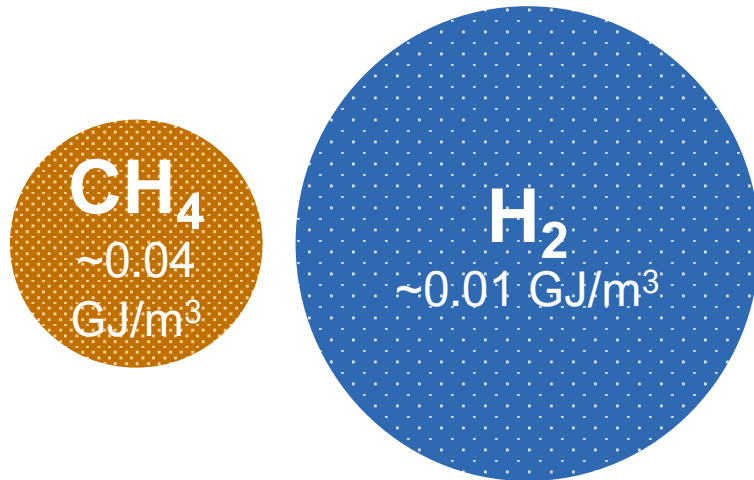
- Excludes:**
- Additional **distribution network costs** to incorporate hydrogen
  - Constructing a **hydrogen transmission network** (estimated at \$10 bn)\*
  - **Appliance switchover costs**

\*Australian Hydrogen Centre

Source: SA figures translated from IEEFA - 'Renewable gas' campaigns leave Victorian gas distribution networks and consumers at risk

# Delivering hydrogen or biomethane to homes is very technical challenging

10% hydrogen volume blends only displace ~3% gas.



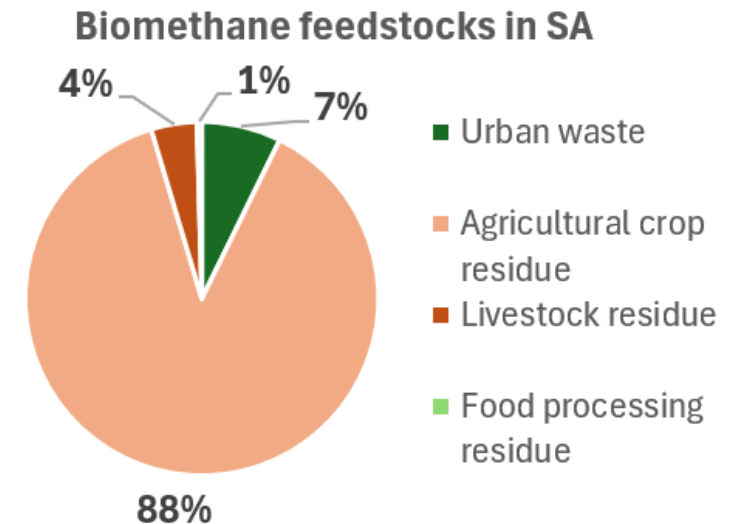
Source: [National Greenhouse Accounts Factors](#) / [The Physics Factbook](#)

Networks **cannot exceed** the 3% limit until **all users** upgrade to hydrogen appliances.



Image source: [Rinnai](#)

Biomethane is **heavily supply-constrained**.



Source: [Deloitte for Energy Networks Australia](#)



# ‘Renewable gas’ is widely considered unlikely to feature in homes

“Most stakeholders want spending on hydrogen readiness to be minimised in this access arrangement period, given the **widespread pessimism** around the viability of a Hydrogen Hero pathway” – [AusNet, 2022](#)

“using electricity directly may provide a more efficient means of providing residential heating given the **energy loss that is inevitable** in the production hydrogen with renewable electricity.” – [DCCEEW, National Hydrogen Strategy Review Consultation Paper, 2023](#)

“The development of hydrogen or bio-methane (sustainable gases) as substitutes for natural gas is **at an early stage and is highly uncertain**. There are **economic and technical barriers** for large-scale production for both hydrogen and bio-methane.” – [AER, 2021](#)

“the scientific evidence pertaining to hydrogen heating is **unambiguous. None of the independent studies analyzed** in this review suggests a significant role for hydrogen in space or hot water heating, points to a pathway dominated by hydrogen as the least-cost pathway, or suggests lower consumer costs for hydrogen compared with the alternatives such as electrification and district heating.” – [Rosenow 2024, A meta-review of 54 studies on hydrogen heating](#)

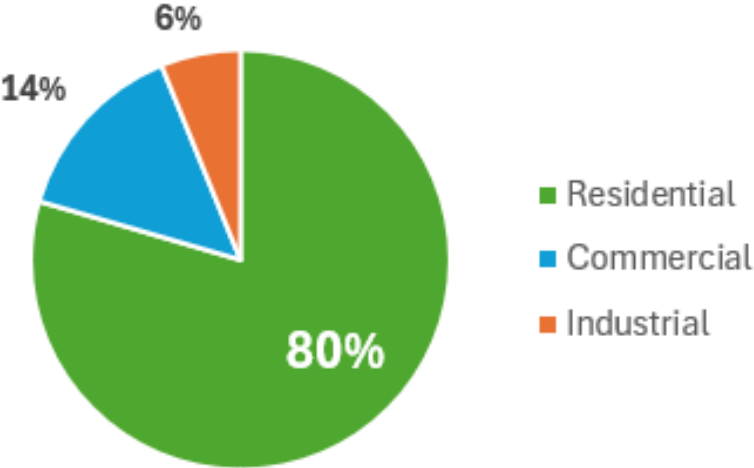
“[8 stakeholders] expressed **concern regarding the assumed potential levels of hydrogen** in the gas distribution network” [...] “Recognising the potential cost implications to appliances and other devices of high hydrogen blends, and in response to stakeholder feedback, **AEMO has reduced the ceiling of hydrogen blending** in the gas distribution network from 100% to 10% (by volume) for the Green Energy Exports scenario.” – [AEMO, 2023](#)

“there is **great uncertainty** about the large-scale substitution of renewable hydrogen and biomethane for natural gas, particularly given the **economic, technical, and logistical constraints**.” – [Essential Services Commission \(VIC\), 2024](#)

# The risks for gas distribution networks

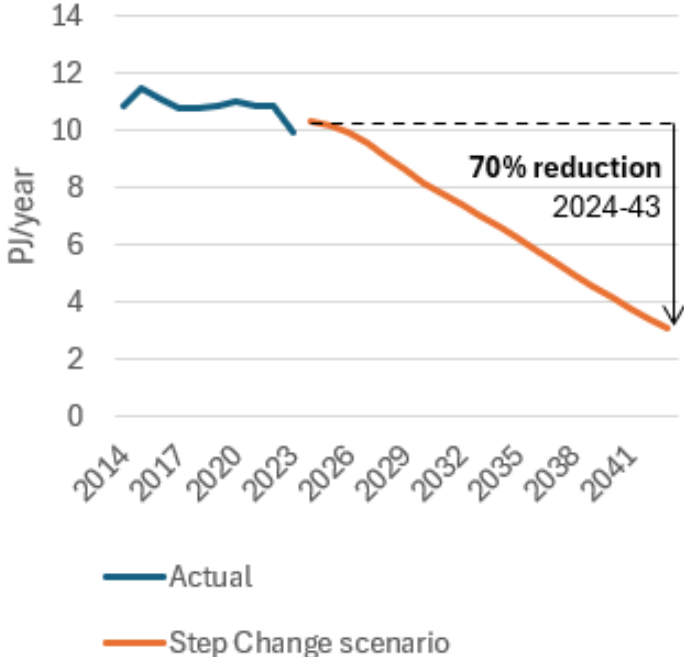
# Residential electrification presents an existential threat to gas networks

AGN (SA) Revenue by customer type



Source: AGN (SA) 2022-23 RIN response

Residential + commercial gas demand, SA



Source: AEMO 2024 Gas Statement of Opportunities

“we can see the potential for **more competition in the future** (as renewable energy becomes less expensive.)” – [AGN \(SA\)](#)

“**significant stranding risks** could emerge by 2040” – [AusNet](#)

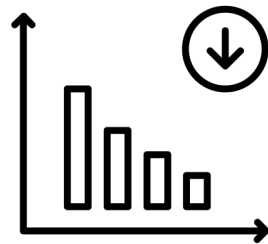
“the end result of a death spiral demand reduction is the loss of whatever assets have not been recovered; referred to as **economic asset stranding**” – [AGN \(Albury/Victoria\)](#)

“Future demand for gas networks is expected to decline due to changing consumer behaviours, and as a direct result of government policy [...] This **may lead to our network becoming stranded**” – [Jemena](#)

# How are networks and the regulator responding?

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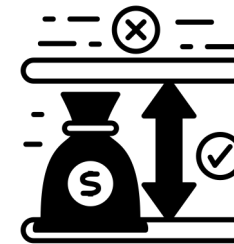
## Accelerated depreciation



Consumers **pay off** gas networks' assets sooner.  
Networks shielded from **stranded asset risks**.

Already approved across multiple networks.

## Revenue caps (and hybrids)?

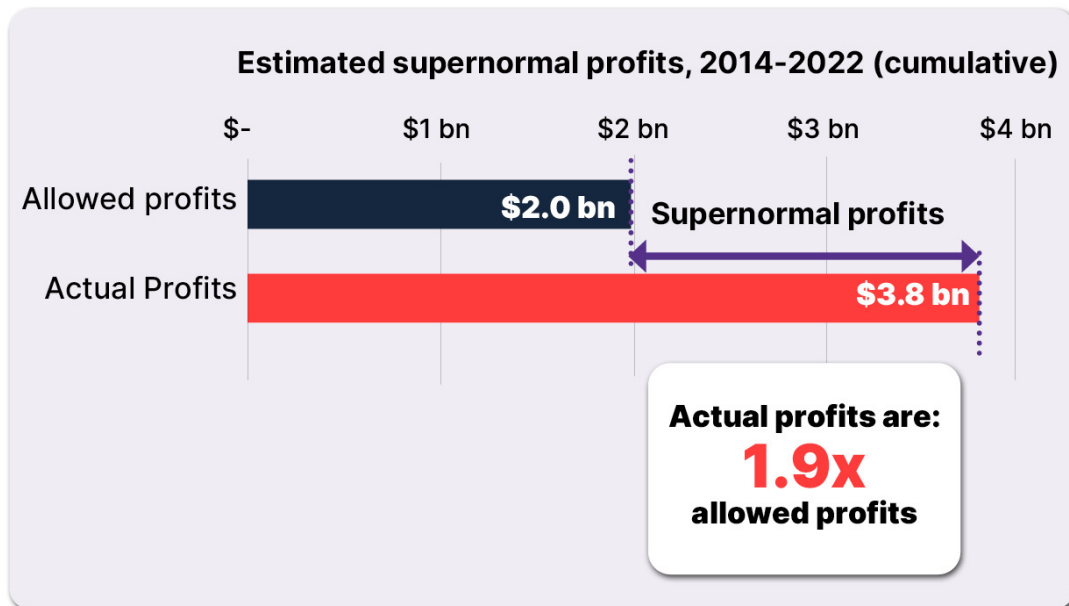


**Tariffs are adjusted** to account for revenue overs-and-unders.

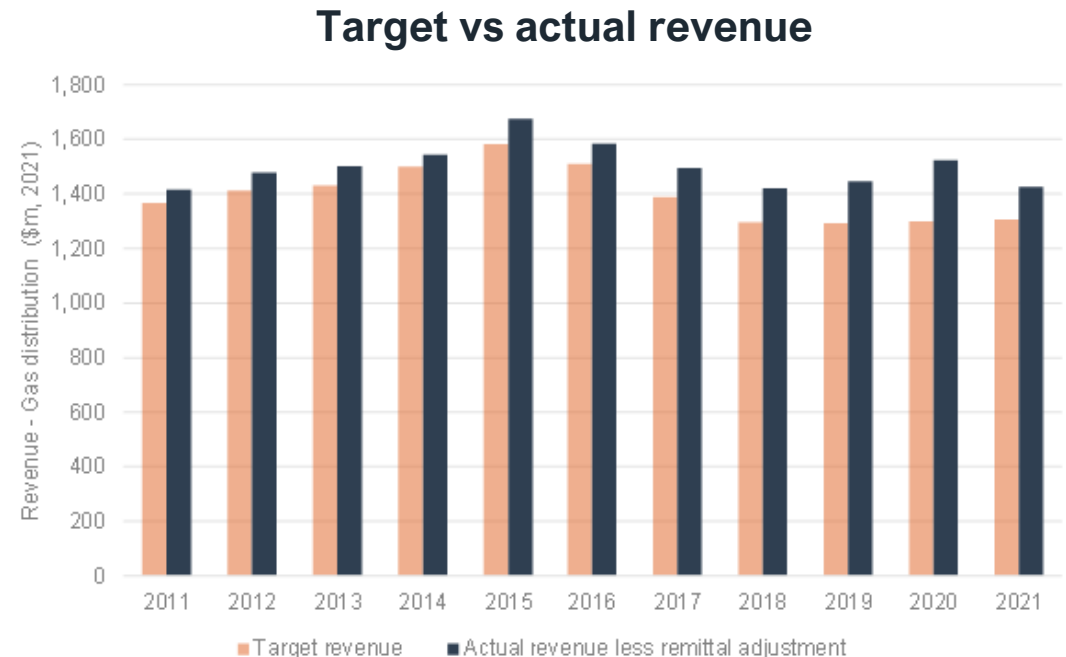
Networks shielded from **volume risks** during a regulatory period.

May be proposed in future regulatory periods.

# Have gas networks been compensated for their risks?

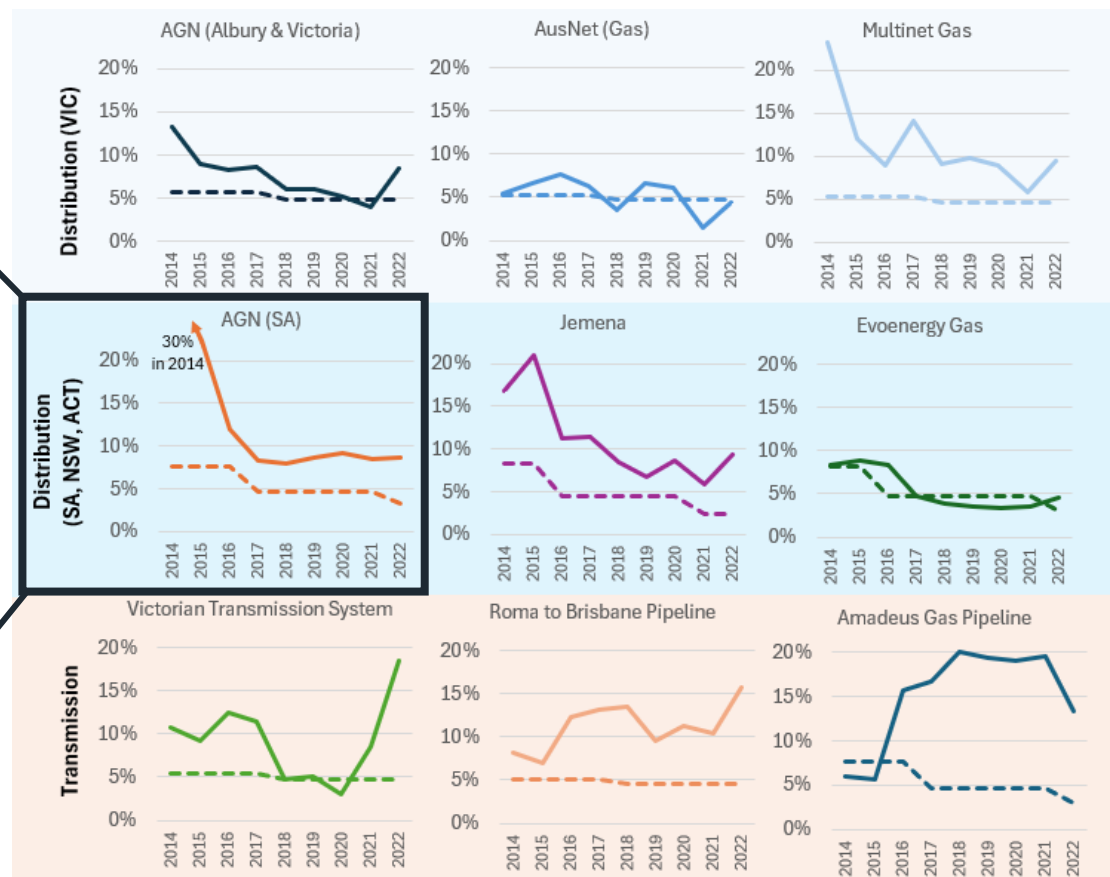
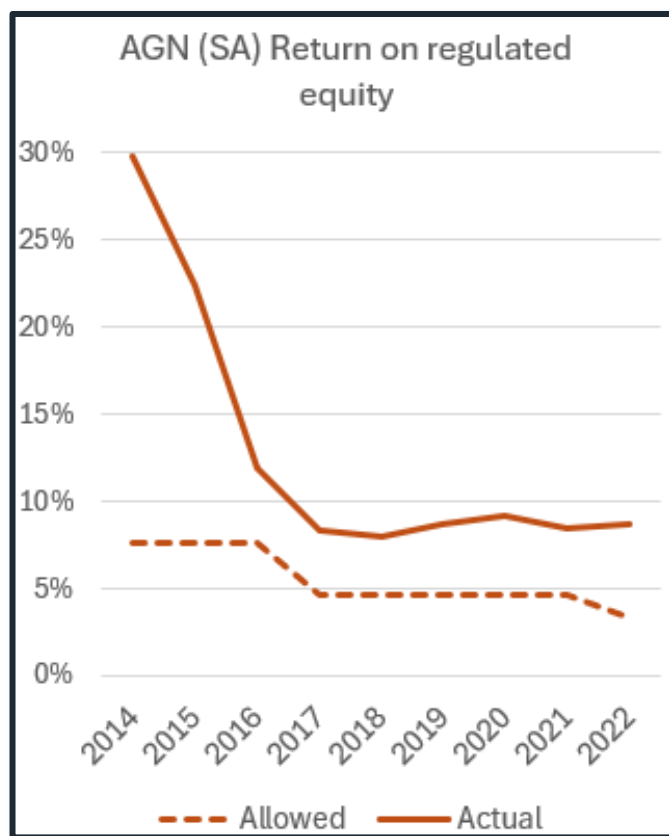


Source: IEEFA – Gas networks are making persistent and significant supernormal profits



Source: AER – Gas distribution network tariff review 2023

# Have gas networks been compensated for their risks?



# Takeaways

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- **All-electric homes** remain the most cost-effective option in South Australia.
- Consumers who remain on the gas network awaiting ‘renewable gas’ are exposed to **higher costs** and **greater stranded asset risks**
- The case for **reallocating gas networks’ stranded asset risks** to consumers is weak; they have already compensated networks to at least **\$1.8 billion**

# Thank you

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[Fact Sheet: As gas bills rise in South Australia, all-electric homes are the most cost-effective solution](#)



['Renewable gas' campaigns leave Victorian gas distribution networks and consumers at risk](#)



[Managing the transition to all-electric homes](#)



[Appliance standards are key to driving the transition to efficient electric homes](#)



[Gas networks are making persistent and significant supernormal profits](#)

## Contact

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