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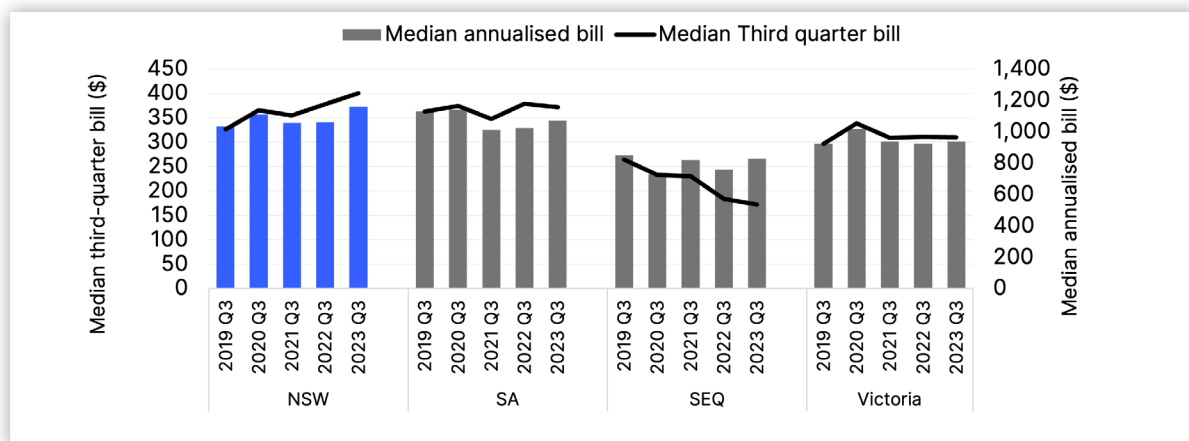
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Eight ways NSW could cut energy bills during the cost-of-living crisis, and beyond

- High energy costs are a key factor impacting the cost of living in New South Wales, but deploying a range of sensible measures could deliver lasting energy bill savings.
- Transitioning households to efficient electric appliances can reduce costs for consumers, while improving energy security. The savings would be maximised if coupled with thermal efficiency upgrades, greater deployment of consumer energy resources, and by unlocking the potential of flexible demand.
- Electricity network costs could be reduced via better utilisation of networks, and by curtailing the supernormal profits made by the networks.
- To protect consumers from stranded asset risks, further growth of the gas distribution network should be halted, and a plan urgently developed to manage the phase-down of the existing network.

The cost-of-living crisis is being felt all across Australia, but in New South Wales (NSW), energy costs are having a disproportionately large impact. According to [research by the Justice and Equity Centre](#), increasing numbers of households are struggling to pay energy bills, with many at risk of disconnection. A [recent Australian Competition and Consumer Commission \(ACCC\) inquiry](#) observed that NSW was the only jurisdiction with a competitive retail electricity market where third-quarter (and annualised) bills have consistently increased over the last five years.

Figure 1: Median residential electricity bills by region



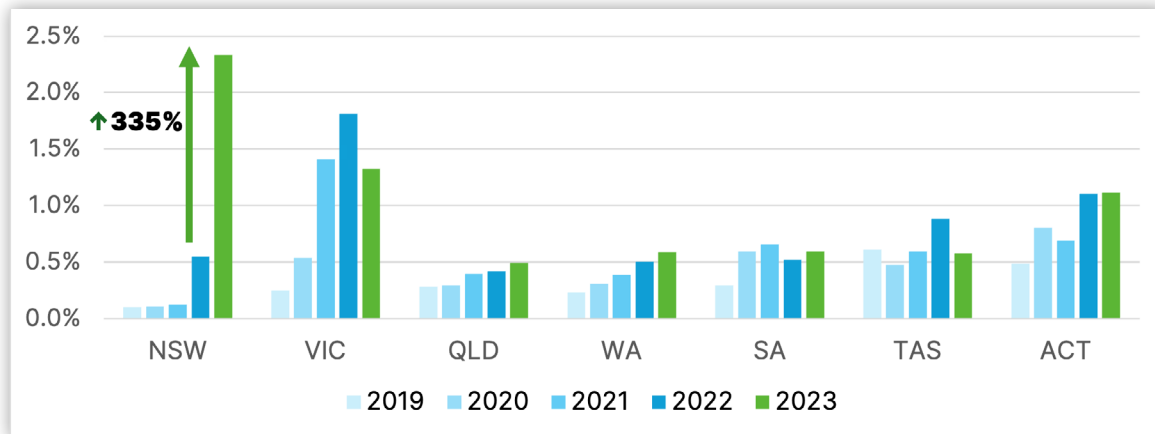
Source: [ACCC Inquiry into the National Electricity Market](#). Note: Residential electricity consumption is highest in the third quarter of the year.



Several governments in Australia have moved to provide consumers with [one-off energy rebates](#). However, these provide only temporary relief. A wider range of options, including household energy upgrades, could be deployed to deliver ongoing, long-term energy bill reductions.

Energy consumers in NSW have shown they are ready and motivated to take advantage of household energy upgrades. In 2023, NSW broke Australian records for [heat pump hot water system sales](#), seeing a 335% increase in sales in one year on a per-dwelling basis.

Figure 2: Heat pump hot water system installations (as a percentage of dwellings)



Source: [Clean Energy Regulator](#) (heat pump installations) and [Australian Bureau of Statistics](#) (dwelling projections).

This was spurred on by supportive state government initiatives including the [Energy Savings Scheme](#), [Peak Demand Reduction Scheme](#), and recent updates to the [BASIX framework for new dwellings](#). However, many consumers still face barriers to accessing home energy upgrades.

[One third of households in NSW are rented](#), and renters cannot choose to upgrade the fixed appliances in their homes. Meanwhile, many owner-occupiers do not have access to the upfront capital to invest in household energy upgrades.

Even for households that have the capacity to make these investments, accessing reliable and objective information to compare the cost-effectiveness of different upgrades is not straightforward.

NSW sits ready to embark on a transition to efficient, all-electric homes. However, realising the benefits will require conscious planning. Here are eight steps that NSW could take to deliver lasting reductions in energy bills to its consumers.

1. Ensure energy supplies and save costs by going all-electric

Efficient electric appliances consume [much less energy](#) (and money), to do the same work as gas appliances. In addition, they offer a solution to ensuring the future security of our energy supplies.

The fundamental economics of Australia’s east coast gas market are shifting. The depletion of cheap southern fossil gas reserves means that southern states, including NSW, [may not be able to keep up with projected levels of gas demand](#).

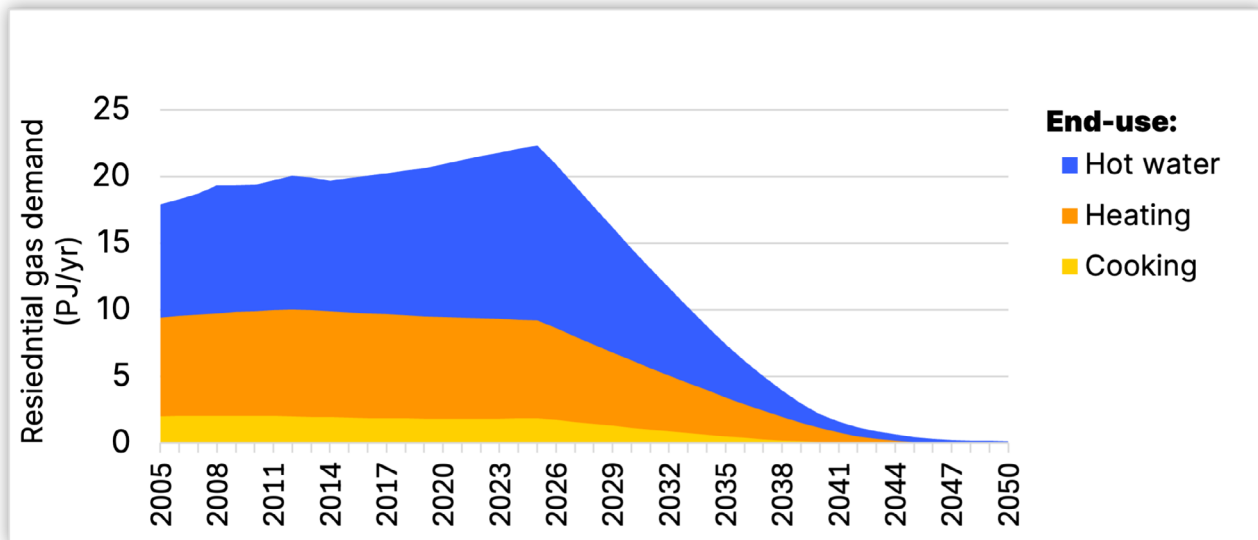
IEEFA’s research has shown that [reducing gas demand is a cost-effective way to avert supply shortfalls](#). It could avoid the need for costly new gas supply infrastructure to be developed at the expense of NSW households and businesses.



The residential sector is responsible for [a quarter of NSW's gas demand](#), and is the sector with the most potential for cost-effective reduction of gas demand today. Supporting more households to go all-electric would free up critical supplies of gas that are needed by commercial and industrial customers, who may not be ready to switch to electricity or alternative fuels today.

The most economical way to transition to these appliances is to ensure that when an existing gas appliance (like a heater, cooktop or hot water system) reaches the end of its useful life, it gets replaced with an efficient electric alternative. IEEFA's modelling shows that if all new appliances purchased in NSW were electric from 2026, residential gas consumption would gradually phase down to near-zero by 2050.

Figure 3: Impact of retiring gas appliances at end-of-life, NSW



Source: IEEFA modelling based on [EnergyConsult \(2021\)](#). Note: Assumes all new appliance sales are electric from 2026.

[Appliance standards](#), in combination with other policy supports, could be a highly effective approach to support this pathway.

The NSW government should engage with the federal government on the implementation of updates to the federal GEMS Act, to ensure the changes work for NSW consumers by valuing the benefits of efficient electrification. NSW should also update its minimum standards for rental properties to ensure all new appliances are efficient and electric.

2. Stop wasting electricity on inefficient appliances

Electric appliances for heating and hot water are already commonplace in many homes in NSW. However, the [appliance stock](#) is dominated by resistive electric heaters and hot water systems, which can consume [three to five times the amount of energy as efficient heat pump-based alternatives](#).

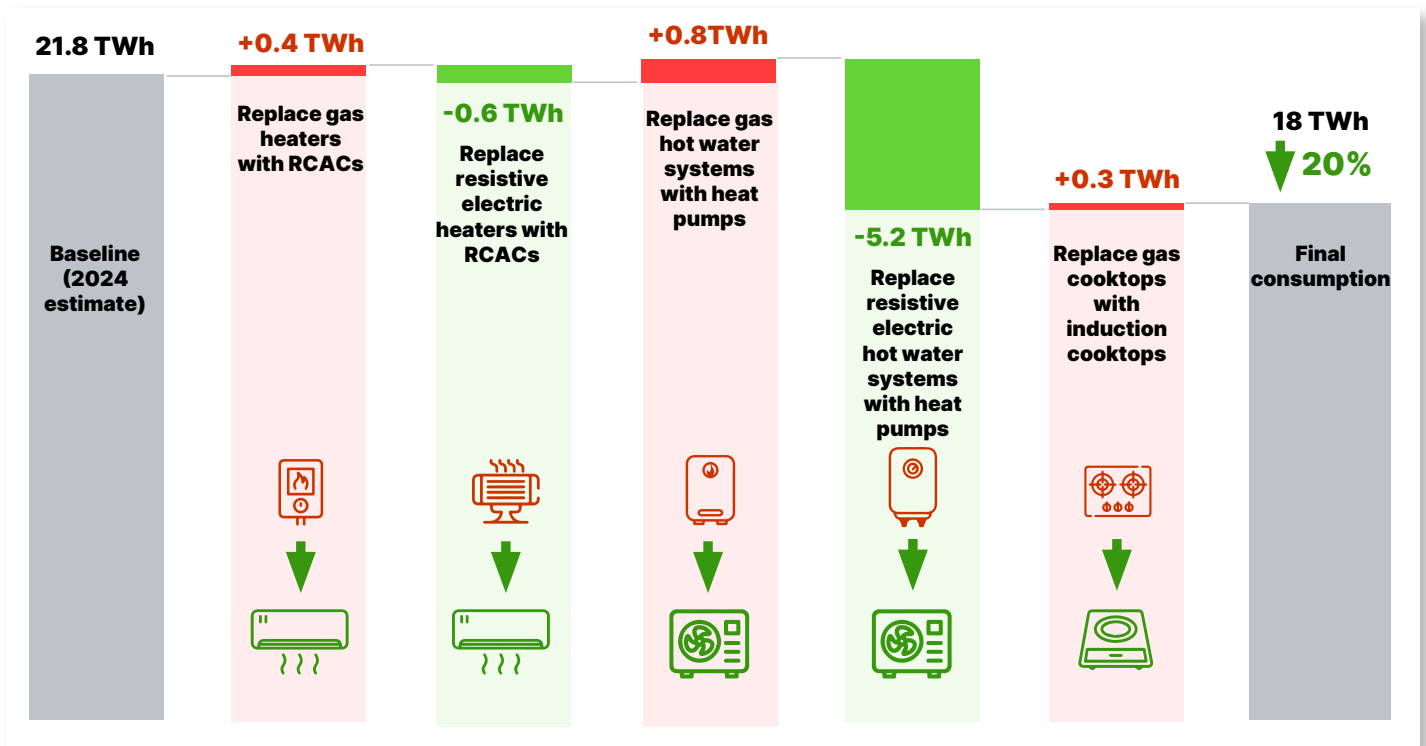
Resistive electric appliances appear attractive due to their low upfront costs, but they have some of the most expensive running costs of any appliances. IEEFA has estimated that NSW households are locking in nearly [\\$1.1 billion in avoidable future costs for each year](#) they continue to purchase resistive electric space heaters and water heaters.

We also found that if all of NSW's resistive electric heating and hot water appliances were transitioned to heat pump-based appliances, annual electricity demand could be reduced by a huge 5.8 terawatt-hours (TWh). This would result in a 20% reduction in residential electricity



demand on today’s levels, even after accounting for any increases from switching gas appliances to efficient electric appliances.

Figure 4: Impact of appliance upgrades on residential electricity demand (NSW)



Source: IEEFA analysis. Note: RCAC = reverse-cycle air conditioner. Reduction in electricity demand from replacing resistive electric cooktops with induction cooktops was not modelled, and is likely to be negligible.

3. Make homes easier to heat and cool

Australian homes are notoriously inefficient. Although NSW’s BASIX standards require new homes to meet a [seven-star rating](#) (out of ten), its existing housing stock likely falls well below this benchmark.

NSW hosts the [largest share of old homes in the country](#). While we don’t have detailed data on the thermal efficiency of the existing housing stock, CSIRO has noted that the [average star rating of an Australian home built in 2003](#) was only 1.8.

This means that during extreme temperatures, the typical NSW household must face the decision to pay far more than ought to be necessary to heat or cool their home, or endure uncomfortable and unhealthy conditions.

A range of options exists to significantly improve the thermal efficiency of existing homes, with short payback periods. They include installing or upgrading ceiling insulation, installing wall insulation and sealing gaps.

[Research by Climateworks Centre](#) found that “Thermal upgrades save significantly more energy than electrification alone” and could “represent well over half of possible energy savings” from a full household energy upgrade.

However, despite thermal efficiency upgrades being one of the most cost-effective measures to reduce energy costs (and peak demand), they are not supported via NSW’s Energy Savings or Peak Demand Reduction schemes.



There is also very little to incentivise rental providers to improve the thermal efficiency of their investment properties, as NSW has [no minimum standards for thermal efficiency](#) of rental properties.

The NSW government should update its existing energy upgrade schemes, and its rental minimum standards, to include thermal efficiency upgrades for homes.

4. Unlock the cost-saving potential of flexible demand

As [renewable generation in NSW increases](#), it is becoming increasingly economical to shift demand from evening peak periods, to the middle of the day when solar energy is abundant.

Households can play a key role in providing that flexible demand. In fact, household hot water systems (which make up [more than half of residential gas consumption](#) in NSW) represent the [largest near-term source of flexible demand](#) in the electricity system.

Storage hot water systems, including heat pumps, can be set to run at any time of day while still delivering a reliable supply of hot water to the household as needed. This can be enabled using simple wireless control systems, or even more simply, a timer.

Using hot water as a flexible source of demand helps to reduce overall costs of the energy system, by avoiding adding to peak demand. [Research by the University of Technology Sydney](#) found that the operating costs for hot water systems in NSW could be nearly halved by 2040 under a scenario involving rapid, flexible electrification.

It can also result in immediate bill reductions for consumers who opt into time-of-use tariffs that include lower ([or in some cases zero](#)) charges during off-peak periods.

IEEFA's research has explored how [appliance standards](#) could play an instrumental role in unlocking the potential of efficient and flexible electrification. [Unlocking the potential of flexible demand](#) will require governments to develop demand response requirements for key appliances ([aligned to international best practice](#)), accelerate the electrification of hot water systems, and enable more demand response revenue streams for consumers.

5. Help households to produce, and use, more of their own energy

The Australian Energy Market Operator (AEMO) has projected that consumer energy resources (CER) including rooftop solar, household batteries and electric vehicles (EVs) will make up [half of the NEM's total capacity by 2050](#). It's feasible that actual uptake could exceed these forecasts, as IEEFA has observed that AEMO's assumptions on the growth of solar system size are [conservative compared with historical trends](#).

A [study by the University of New South Wales \(UNSW\)](#) found that the average annual bill savings from installing rooftop solar in NSW could range from \$526 to \$1,658. Over a quarter of all households in NSW already have rooftop solar. However, the state is [lagging behind other jurisdictions](#). More action is needed to ensure all households in NSW can take advantage of rooftop solar, particularly those that face higher barriers such as rental properties.

On a good day, a typical household can produce much more solar energy than it can consume during daylight hours. The most efficient way to make use of it is to utilise it as much as possible in the home.

Many of the actions in this paper could help homes to do just this – for example, by using it to operate heat pump hot water systems during the middle of the day.



Household batteries take this a step further, by absorbing excess solar energy produced during the day, and allowing it to be used later – for example during the traditional evening peak period. This is beneficial both for the household and the broader energy system, as it reduces peak demand on the grid. Even further opportunities could be unlocked if consumers are able to sell energy back to the grid at times when it is needed. This can be coordinated via virtual power plants (VPPs), which have been [successfully demonstrated in Australia](#).

As [household battery costs rapidly decline](#), now is an ideal time for NSW to consider how it can best support households to take advantage of them. This must not exclude the projected [seven million ‘batteries on wheels’](#) NSW could host by 2050 (in AEMO’s Step Change scenario), with EVs potentially able to [fulfill many of the roles of a household battery](#) if enabled by the right technology and regulations.

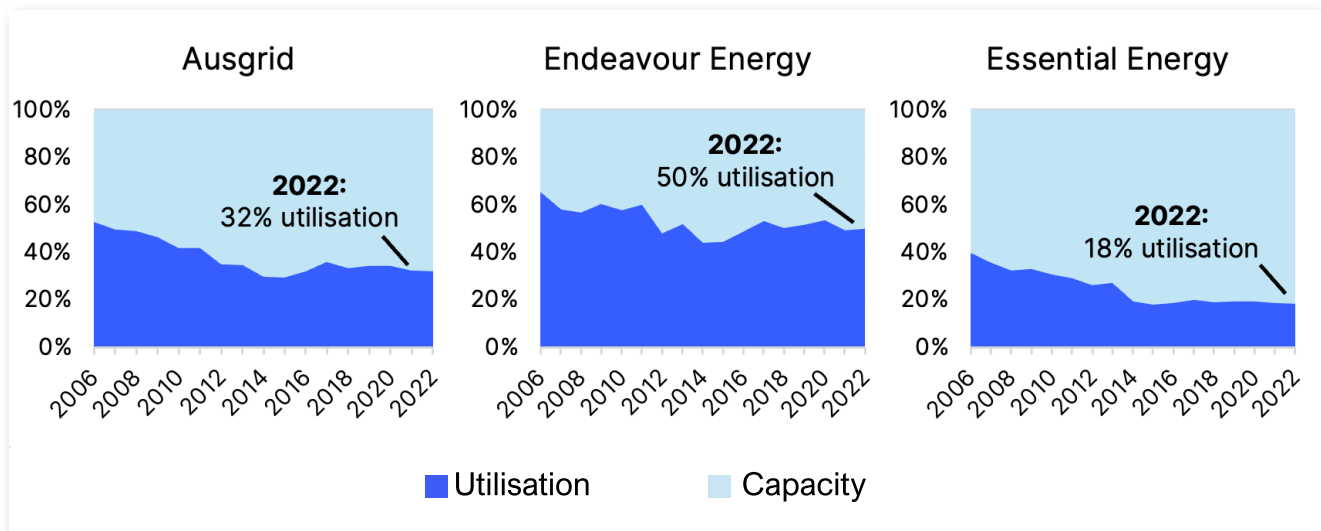
6. Use electricity networks more effectively and efficiently

Network costs are the largest component of a typical electricity bill in NSW, comprising [46% of total costs](#).

Electricity networks in NSW are designed to supply reliable electricity to consumers under worst-case conditions where demand is very high. This [usually occurs in summer](#), when demand for air conditioning peaks.

[Data from the Australian Energy Regulator \(AER\)](#) shows that electricity distribution networks in NSW are rated several times higher than their peak demand, and utilisation (based on maximum demand, not averaged) has declined over time – currently ranging from 18% to 50%.

Figure 5: Electricity distribution network utilisation, NSW



Source: [AER](#).

Switching gas appliances to efficient electric appliances is unlikely to contribute to a significant increase in peak demand in NSW, given that heating loads do not coincide with the summer peak, and hot water loads can be electrified flexibly.

However, to make better use of network assets in NSW, more demand should be shifted away from peak times, and future loads (such as EVs) should be set up to be as flexible as possible.

[Research by CSIRO for Energy Consumers Australia](#) found that under a high electrification scenario, increasing the utilisation of electricity distribution networks resulted in lower costs for all consumers.



There are other steps that NSW could take to reduce network costs for energy consumers.

IEEFA research has identified that Australian electricity networks made [\\$11 billion in supernormal profits between 2014 and 2022](#), in addition to the \$16 billion profit allowance set by the AER. An estimated 46% of supernormal profits in 2022 occurred in NSW. The magnitude of these supernormal profits was well above the range expected for a regulated business.

Effective incentive regulation rewards networks for delivering productivity benefits for consumers. However, contrary to the [AER's position](#), IEEFA found [no evidence](#) that supernormal profits had led to such benefits.

The NSW government should engage with the AER to improve the regulation of electricity networks, and curtail their excess supernormal profits.

7. Stop the growth of stranded gas assets, and future liabilities

As the financial case for efficient electric homes has become more compelling, the financial case for maintaining a secondary parallel energy delivery system – for gas – has weakened.

NSW hosts Australia's largest gas distribution network, Jemena. The company's network includes more than [26,000km of pipelines](#), with an [asset base worth over \\$3.6 billion](#). Jemena recovers [64% of its revenue](#) from households.

Recently, Jemena has sounded warning bells to the AER over a potential existential threat to its business, stating:

*“[Future demand for gas networks is expected to decline](#) due to changing consumer behaviours, and as a direct result of government policy which is focussed on electrification of households and small businesses. **This may lead to our network becoming stranded**, with potential implications for customers who remain dependent on gas.”* (Emphasis added)

However, [Jemena's public-facing messaging](#) claims that its plan is to transition the gas network to 'renewable gas', including biomethane and hydrogen. Its actual activities in this area do little to support these claims.

Jemena has only made small-scale pilot investments in biomethane and hydrogen projects, with funding assistance from the Australian Renewable Energy Agency (ARENA).

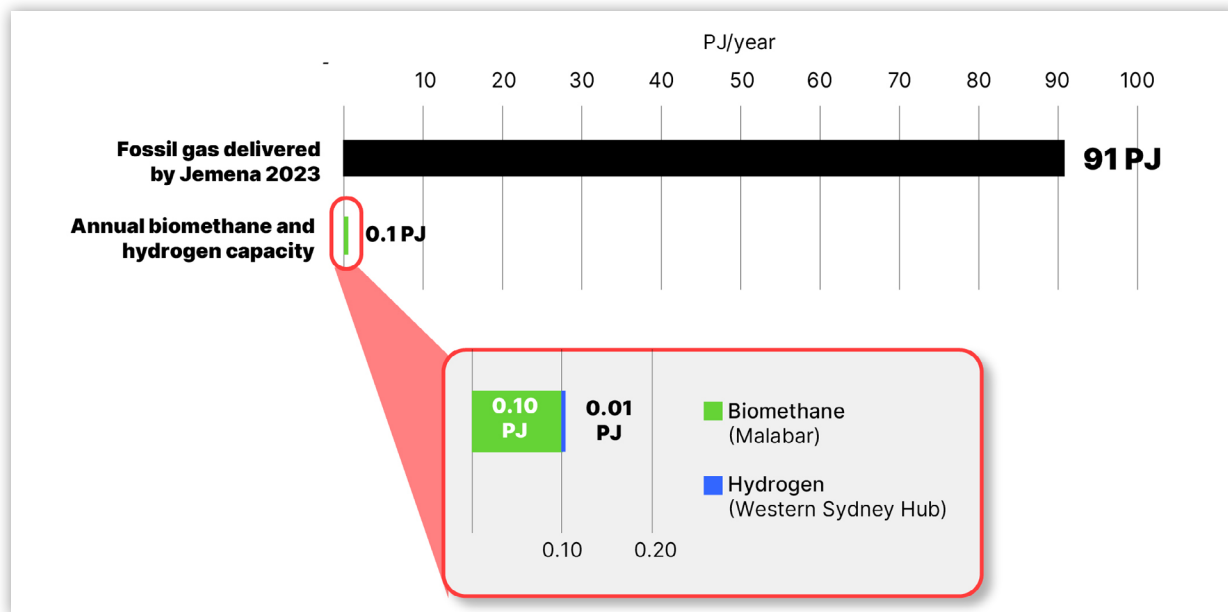
Jemena's biomethane injection plant at Malabar ([\\$12.86m](#)), and green hydrogen hub in Horsley Park ([\\$15m](#)) could, if running at full capacity, inject [95 terajoules \(TJ\) of biomethane](#) and [88 tonnes \(12.5TJ\) of hydrogen](#) per year into Jemena's gas distribution network.

“ It would take more than 950 Malabar biomethane injection plants or 7,250 Western Sydney hydrogen hubs to meet the 91 petajoules (PJ) of gas demand across Jemena's network in 2023

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Figure 6: Biomethane and Hydrogen Capacity, Jemena Gas Networks



Source: [AER](#), [Jemena](#) and [CSIRO](#).

[Research by IEEFA](#) and [many others](#) has found that alternative gases, particularly hydrogen, are unlikely to be economical, scalable or technically feasible to deliver to homes.

Given the strong case for moving to all-electric homes today, and the fact that alternative solutions are unlikely to be deployed at scale, a top priority for the NSW government should be to prevent continued growth of stranded gas assets.

Gas network assets built today are unlikely to remain in use across their expected lifetime ([often over 50 years](#)), and their costs may need to be prematurely written down by a combination of consumers, networks or taxpayers.

[Several local governments](#) in NSW have already taken the step of introducing or considering legislation that would ensure new buildings are all-electric. The NSW government should implement similar legislation at a state level to ensure all consumers are protected from growing stranded asset risks.

8. Start planning for an efficient, equitable phase-down of gas networks

In June 2025, Jemena will enter a new five-year regulatory period. In its [draft plan](#), it has requested to pass \$300 million in accelerated depreciation charges through to its consumers as a response to asset stranding risks, and to change its overall form of regulation in a way that would allocate more of those risks to consumers.

The AER has already approved \$333 million worth of accelerated depreciation across [Victoria's gas distribution networks](#) in 2023, and signalled that it will consider broader changes to the form of regulation for gas networks [on a case-by-case basis](#).

However, gas networks have already been compensated for some of their risks. IEEFA's research shows that gas networks, including Jemena, made [\\$1.8 billion in supernormal profits](#) between 2014 and 2022, which was 90% higher than the profit allowance set by the AER.

Most of these profits occurred because [networks delivered more gas than the forecasts they provided to the regulator](#) in every year since 2011. Jemena in particular has over-recovered



[\\$490 million in revenue since 2014](#), which is 80% higher than any other network and is equivalent to nearly 14% of its regulated asset base.

As supernormal profits were recovered from consumer bills, [there is no clear case for those same consumers bearing even further costs](#) to shield Jemena from its stranded asset risks.

The NSW government should act urgently to develop guidance on how to equitably phase down its gas distribution network for residential customers. This should include guidance on how costs ought to be equitably shared during the transition, and how to support customers who may face higher barriers to leaving the gas network.

The ACT government has initiated a similar process as part of its [Integrated Energy Plan](#), committing to “work closely with the AER to consider options for how best to apportion future costs.” This could serve as a blueprint to other jurisdictions, including NSW, where the issue is most urgent due to Jemena’s impending regulatory reset.

Recommendations

Although energy costs are exacerbating the cost-of-living crisis in NSW, the state has access to a well-equipped toolbox to reduce energy bills in a long-term, meaningful way that goes beyond one-off energy rebates.

IEEFA recommends that the NSW government:

1. Supports households to switch their gas appliances to efficient electric appliances at end-of-life, as an energy security and cost-saving measure.
2. Supports households to switch their inefficient (resistive) electric appliances to heat pump-based appliances at end-of-life.
3. Introduces minimum energy efficiency standards for rental properties, and updates the Energy Savings Scheme and/or Peak Demand Reduction Scheme to provide rebates for thermal efficiency upgrades.
4. Requires new electric hot water systems (including heat pumps) installed in NSW to be equipped with timers or other smart controls, to enable their use as a flexible load.
5. Implements measures to accelerate the uptake of rooftop solar and household batteries for all consumers.
6. Ensures current and future sources of electricity demand make smart, efficient use of the free capacity in electricity distribution networks; and works with the AER to reduce network supernormal profits to reasonable levels.
7. Ensures all new buildings are all-electric, to prevent continued growth of stranded gas assets.
8. Works with the federal government and the AER to plan for the equitable phase-down of its gas distribution network.



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The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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