# **Electric Savings**

The case for NSW councils to reduce emissions and energy bills through electrification.





RESEARCH PREPARED BY STRATEGY POLICY RESEARCH REPORT BY 350 AUSTRALIA



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## Summary

This report demonstrates how NSW homes and businesses could reap substantial cost and emissions savings if councils required new developments to be all-electric and gas-free.

This report, based on a technical analysis commissioned by 350 Australia and prepared by Strategy Policy Research, is one of the first studies to model the benefits of electrifying new buildings. This builds on the body of research demonstrating the benefits of electrification for existing buildings.

This report demonstrates that electrifying new buildings is a high reward, no regrets policy. Electrification requirements for new developments would cost local councils almost nothing, deliver significant energy bill savings to residents and small businesses, improve health outcomes for local residents, and reduce climate pollution.

Electrification requirements for new developments would deliver significant energy bill savings, improve health outcomes and reduce climate pollution.

As cost of living pressures continue to

impact on households across the country, we know that more people are struggling to pay their increasing energy bills.<sup>[1]</sup> Requiring new developments to be fully electric is one way that councils can help future residents, especially renters and low-income people, to reduce their energy bills and ease cost of living pressures.

NSW local councils can implement these electrification requirements for new developments via their planning powers without waiting for the state government to act – and many are already doing so.

## **Key findings**

The report compares a 'business as usual' (BAU) scenario where new homes and businesses in NSW continue to be connected to gas at the current rate, versus a 'no new gas' (NNG) scenario where all new homes and businesses are allelectric from financial year (FY) 2024 (See Appendix 1 - Methodology).

The results show that:

- If all NSW councils connected to the gas network required new residential buildings to be fully electric by FY2024, each newly built home would save \$608 per year on average, over a typical economic life of a building (40 years).
- At a household level, every household would save an average of \$7,900 over the 40 year period in present value terms.<sup>[2]</sup>
- At a state level, these household savings total to \$5.3 billion over the same 40 year period in present value terms (Fig. 6).

#### **TOTAL SAVINGS \$6.6 BILLION**



**FIGURE 1:** Total statewide energy cost savings if all new residential and commercial buildings were electrified between FY 2024–64



TOTAL EMISSIONS savings for commercial and residential sectors over 40 years = 39 million tonnes of CO2-e.



This is the equivalent of taking 313,000 cars off the road every year for 40 years.

- New commercial buildings would save a total of \$6.5 million across the state in FY2024, totalling to \$1.3 billion over the 40 year period (Fig. 8).
- Together, these cost savings for both the commercial and residential sectors represent \$6.6 billion dollars in reduced energy costs across the state, over the 40 year period (Fig. 1).
- Electrifying new homes and businesses would also be a win for the environment. The same modelling shows that greenhouse gas emissions from the residential sector would reduce by 24.1 million tonnes cumulatively over the 40 year period, representing a 90.6% reduction on BAU (Fig. 2).
- For the commercial sector, the avoided emissions are 14.9 million tonnes cumulatively over the same period (Fig. 3), representing a 77% reduction compared with the BAU scenario. Cumulatively, these avoided emissions total to almost 39 million tonnes of avoided greenhouse gas emissions across the state for both sectors, over the 40 year period. This is the equivalent of taking 313,000 cars off the road each year for 40 years.

The results demonstrate that electrifying new developments is a no regrets policy intervention which would cost councils almost nothing, deliver huge energy bill savings to residents and local businesses, improve health outcomes for local residents, and cut climate pollution.



**FIGURE 2:** Statewide emissions for the residential sector FY2024–64, business as usual versus no new gas scenarios.



**FIGURE 3:** Statewide emissions for the commercial sector FY2024–64, business as usual versus no new gas scenarios.

#### Recommendations

- 1. That local councils in NSW change their Development Control Plans to require new residential and commercial developments, and substantial alterations, be fully-electric.
- 2. That the NSW state government follow Victoria's and ACT's lead in requiring all new residential developments to be fully electric, plus new commercial buildings.

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## **Glossary of terms**

**BAU SCENARIO:** business as usual scenario.

**C02-e:** Carbon dioxide equivalent is a unit used to compare the global warming potential of different greenhouse gases.

COMMERCIAL DEVELOPMENT: this is a land use term used in the planning system to describe buildings used for the purposes of commercial activities including hospitality venues (cafes, restaurants etc), schools, hospitals, warehouses, office buildings etc. The terms 'businesses' and 'commercial buildings' are used interchangeably throughout the report.

**CONNECTED TO THE GAS NETWORK:** homes which have mains gas supplied to the home from the centralised gas network, as opposed to bottled or decentralised gas supply systems.

FY: financial year.

LGA: local government area, a term used interchangeably with 'local council'.

**NNG SCENARIO:** no new gas scenario.

**RESIDENTIAL DEVELOPMENT:** this is a land use term used in the planning system to describe buildings used for the purposes of residential-style accommodation. The terms 'homes' and 'residential buildings' are used interchangeably throughout the report.

## Introduction

350 Australia's Electrify Your Council campaign works with local councils in New South Wales to create all-electric new developments. The purpose of the campaign is to encourage local councils in NSW to use their planning powers to transition away from gas towards all-electric new neighbourhoods.

Countless studies demonstrate that all-electric buildings provide significant energy bill savings for residents and local businesses (see Appendix 3 – Further Resources). Given that we are living through a cost of living crisis, electrifying new developments represents a major opportunity for local councils to help those struggling, particularly renters and low income people, by reducing their energy bills.

Councils in NSW have the power to ensure that new buildings, like homes, shops, schools, offices and local businesses, are built all-electric without gas connections. This means that councils don't need to wait for the state government and can pass on the benefits of electrification to residents and local businesses in their local government area (LGA).<sup>[3]</sup>

350 Australia recently commissioned independent energy consultants, Strategy Policy Research, to quantify the cost savings and emissions reduction impacts of electrifying new homes and businesses in NSW. There are many studies that quantify the impacts of residential electrification, particularly in terms of household energy savings, however these studies focus on electrifying existing homes rather than new homes. This report fills this gap by quantifying the cost and emissions savings produced from electrifying new residential and commercial buildings in NSW.

While many NSW councils have ambitious net zero policy commitments and have made solid progress on reducing their own corporate emissions, reducing emissions from the community sector remains largely beyond the powers and budgets of local councils.

Mandating new developments to be all-electric represents one of the only policy interventions available to local councils to meaningfully reduce community emissions and energy bills at virtually no cost to council.

Requiring new developments to be fully electric therefore represents a no regrets policy intervention for the NSW local government sector from both an emissions and cost perspective.

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## **Actions being taken by NSW Councils**

In 2022, Waverley and Parramatta Councils became the first councils in NSW to implement planning rules to require new developments in their LGAs to be electrified, shortly followed by Canterbury-Bankstown Council.

In March 2023, 350 Australia launched their <u>Electrify Your Council</u> campaign to support communities across NSW in calling on their councils to join the council-led movement towards electrification. This grassroots community campaign has led to a number of additional councils moving towards all-electric requirements for new developments:

- Lane Cove Council recently implemented new planning laws which require all new developments and major renovations across the municipality to be fully electric. This is the first NSW council to implement all-electric requirements for all new developments and major renovations across a whole council area. This is the ideal pathway towards all-electric new development and provides a model for other councils across NSW.
- In December 2023, City of Newcastle implemented new planning laws that will require new multi-unit residential developments be fitted with indoor electric appliances (cooktops, ovens and space heaters).
- City of Sydney, Inner West, Canada Bay, and Ryde Councils are in the process of making similar changes to their local planning laws (for a full summary of all councils, view <u>350 Australia's Council's Tracker webpage</u>).

This council-led momentum has been achieved with widespread support amongst the community. Thousands of local residents have engaged with their local councils to encourage them to adopt electrification policies, while local health professionals from Doctors for the Environment and Healthy Futures have actively supported the campaign for all-electric new developments. The Global Cooksafe Coalition continues to encourage local restaurants, cafes and hospitality venues to go all-electric by demonstrating the superiority of electric cooking instead of antiquated gas cooking.

## Scope

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The analysis was condicted for every local government area (LGA) in NSW that is connected to the gas network. There are 128 LGAs in NSW, plus 'Unincorporated NSW'. Of the 128 LGAs and Unincorporated NSW, 93 are connected to mains gas, while 34 are not. The total population of these 93 LGAs is 6.9 million, representing 86% of the total population of NSW (currently at 8.3 million).<sup>[4]</sup> This research does not assess the impacts of electrifying new developments in the 34 LGAs that rely on bottled or decentralised gas supply systems, due to data constraints. 350 Australia nonetheless encourages councils where bottled/decentralised gas

is used by homes and businesses to change their planning laws to require new developments be fitted with all-electric appliances. In essence, the policy pathway is the same for councils with centralised and decentralised gas supply systems. For more detail, read the legal advice provided by the Environmental Defenders Office (Ruddock, K. (2023).

The analysis covered the residential and commercial sectors only, not the industrial sector.

Given the plethora of studies showing the benefits of electrifying existing buildings, this analysis is one of the few to investigate the cost and emissions savings from electrifying new buildings.

The analysis is restricted to the state of NSW, given that legal analysis demonstrates that in NSW, unlike in other states and territories, councils possess the relevant regulatory powers to change their planning laws to achieve all-electric new builds without state government approval.<sup>[5]</sup>

# **Key Findings**

## Statewide cost savings

If all NSW councils connected to the gas network required new residential and commercial buildings to be fully electric, the cost savings to residents and businesses would be just under \$6.6 billion over the next 40 years (Fig. 1).

The savings would be \$30.2 million in financial year (FY) 2024, rising to \$2.2 billion in FY2064 (Fig. 4).



**FIGURE 4:** Combined residential and commercial cumulative cost savings from no new gas scenario FY2024–64.

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#### Statewide emissions savings

If all NSW councils connected to the gas network required new residential and commercial buildings to be fully electric by FY2024, greenhouse gas emissions would be reduced by 39 million tonnes over the next 40 years – the equivalent of taking 313,000 cars off the road every year for 40 years.

The annual avoided emissions would reach 2.24 million tonnes of greenhouse gas emissions by FY2064 (Fig. 5), totalling to 39 million tonnes of greenhouse gas emissions over the 40 year period across both sectors.



**FIGURE 5:** Combined residential and commercial avoided emissions from no new gas scenario FY2024–64.

#### Cost savings for new homes

The hypothetical no new gas (NNG) scenario, where all new homes are required to be fully electric by FY2024, shows that total energy costs for new homes would be lower every year compared with the business as usual (BAU) scenario.

The results show that newly built homes across NSW would save a total of \$15.9 million on their energy bills in FY2024. Over a 40 year timeframe, these savings total \$5.3 billion (Fig. 6).

Gas companies charge households a daily connection or 'supply' fee for being connected to the gas network. For every home that is not connected to the gas network, these homes avoid this daily gas connection fee. Under the NNG scenario, avoided daily gas connection fees make up around 30% of the cost savings, or \$1.6 billion over the 40 year period. The remaining 70% of savings are energy bill savings.



# **FIGURE 6:** Comparison of annual energy costs for newly built homes under the no new gas and business as usual scenarios FY2024–64

For an individual household, the annual energy bill savings are an average of \$608 per year, totalling to \$7,900 in today's dollars over the 40 year period (Fig. 7).





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#### Cost savings for new commercial buildings

The results show that the no new gas scenario produces energy cost savings for new commercial buildings of \$6.5 million in FY2024, rising to \$457 million in FY2064. Over the 40 year timeframe, these savings total to \$1.3 billion (Fig. 8).



# **FIGURE 8:** Statewide annual commercial sector energy costs for no new gas scenario FY2024–64.

It is worth noting that these savings do not take into account the likely growth of rooftop/behind the meter solar PV uptake in the commercial sector, which would produce even greater savings.

#### Emissions savings for new homes

The modelling shows that requiring new homes to be all-electric would reduce greenhouse gas emissions by 90.6% by FY2064 compared with BAU.

In the BAU scenario, greenhouse gas emissions from the residential sector would reach a high of 1.5 million tonnes in FY2064, versus 0.15 million tonnes in the same year under the no new gas scenario (Fig. 9). This represents a 90.6% reduction in emissions under the NNG scenario compared with BAU.

Over the next 40 years, all-electric new homes would cut residential emissions by 24.1 million tonnes across the state – the equivalent of taking 193,975 cars off the road each year for 40 years.

Under both the BAU and NNG scenarios there is a slight uptick in emissions between FY2034–38 (Fig. 9 and Fig. 10). This is related to a projected increase in the emissions intensity of the electricity grid at this time due to a range of factors

outlined in the Australian Energy Market Operator's (AEMO) Step Change Scenario, including statewide emissions targets, energy demand expectations, energy efficiency savings, and the timing of major coal-fired power generator closures.<sup>[6]</sup> This underlines the importance of state and federal governments adopting increased emissions reduction targets and policies that can accelerate the transition to renewable energy.



**FIGURE 9:** Annual residential greenhouse gas emissions business as usual versus no new gas scenarios

#### **Emissions savings for new commercial buildings**

The modelling shows that requiring all-electric new commercial buildings would reduce greenhouse gas emissions from commercial developments by 77% by FY2064 compared with the BAU scenario.

Under the NNG scenario, greenhouse gas emissions would reduce from a high of 1.1 million tonnes in FY2064, to 247,000 tonnes in the same year under the BAU scenario, a difference of 853,000 tonnes (Fig. 10). This represents a 77% reduction on emissions for the NNG scenario compared with BAU. Cumulatively, 14.9 million tonnes of greenhouse gas emissions would be avoided under the NNG scenario compared with BAU over the 40 year period.

In other words, over the next 40 years, all-electric new commercial buildings would avoid 14.9 million tonnes of greenhouse gas emissions compared with BAU, the equivalent of taking 119,926 cars off the road each year for 40 years.

This reduction comes from the elimination of new emissions from gas in new commercial builds, plus the effects of the projected reduced emissions intensity of the electricity grid by FY2064. Again, these reductions do not take into account the likely growth of rooftop/behind the meter solar PV uptake in the commercial sector, which would produce greater reductions if included.

Note that there is a slight uptick in emissions under both the NNG and BAU scenarios between 2034–38, as in the residential section above, due to similar assumptions projected by AEMO discussed above.<sup>[7]</sup>



**FIGURE 10:** Annual commercial greenhouse gas emissions business as usual versus no new gas scenarios 2024–64

## Conclusion

Requiring all-electric residential and commercial developments is a high reward, no regrets policy for NSW councils which would will result in significant benefits for NSW homes and businesses. The policy would result in \$6.6 billion in cost savings for households and businesses across the state over the next 40 years, and save each household an average of \$608 per year on their energy bills.

The financial benefits of electrification will flow overwhelmingly to disadvantaged and low-income householders, especially renters, by cutting their energy bills during a time when daily living costs are rapidly rising.

The benefits for the climate are also clear – by requiring all–electric new developments, NSW councils could contribute to cutting greenhouse gas emissions from newly built homes and businesses by an average of 85%, or 39 million tonnes over the next 40 years.

Local councils in NSW have the regulatory powers to achieve the electrification of new commercial and residential developments (and significant renovations), at the stroke of a pen, at virtually no cost to council. The only cost involved for local councils to achieve this would be internal resourcing to coordinate a change of local planning policies.

Many NSW councils have made excellent progress toward reducing their corporate emissions as part of their emissions reduction targets. However, we know that council corporate emissions represent around 1% of a municipality's emissions.<sup>[8]</sup> The remaining 99% of emissions come from the community sector where local councils have extremely limited regulatory and financial influence. Electrifying new homes and businesses is a major opportunity for councils to put downward pressure on community emissions at virtually no cost to council.

350 Australia recommends that all NSW councils change their local planning policies to require the electrification of new residential and commercial developments. This action is one of the most powerful interventions available to local councils to support a more sustainable built environment, with significant benefits for households and communities. This action would also deliver immediate, cost-of-living relief to every new resident that moves into a new home in NSW.

The full technical report is available to download here

To view the results on an individual council level, see this webpage.

## **Appendices**

## Appendix 1 - Methodology

The model compares a 'business as usual' (BAU) scenario where newly built residential and commercial buildings in NSW continues to be connected to the gas network at the current rate, versus a 'no new gas' (NNG) scenario where all new residential and commercial buildings are electrified from financial year 2023/24.

There are 128 councils in NSW, plus 'Unincorporated NSW', but only 93 LGAs are connected to the mains gas network. The remaining LGAs largely use bottled gas on an individual household/building level, or other forms of decentralised gas supply systems. This study only analysed the 93 LGAs connected to mains gas due to data limitations in obtaining data for the LGAs that use bottled/decentralised gas supply systems.

The analysis period goes from financial year 2023/24 to financial year 2063/64 (40 years). The reason the first financial year is 2023/24 is because the analysis was commenced in March 2023. Thus, the following financial year (2023/24) was chosen to commence the analysis period. Councils that implement measures in later years would miss out on the savings estimated for FY2024 – but still realise savings over the balance of the forecast period.

A 40 year period was used because this is the standard, economic life of a building used by economists.

Another key factor built into the model is the daily connection fees, or 'supply charges'. These are the daily fees charged by gas companies to their customers for being connected to the gas network. These fees are separate from gas usage fees and are a fixed, daily charge.

Other factors that the model considers are:

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**NEW DWELLINGS AND BUILDING STOCK –** projected number of new dwellings to be built over the 40 year period in NSW, and projected increases in floor space for commercial buildings over the period.

**CURRENT FUEL USE -** the average electrical and gas use per dwelling (for residential) and per square metre (for commercial) in each LGA.

**EXISTING ELECTRICITY CONNECTIONS BY LGA –** it is assumed that all existing residential and commercial buildings have an electricity connection. The data shows there were 3.5 million residential electricity customers in NSW in 2022, and 369,214 commercial customers in the same year.

**EXISTING GAS CONNECTIONS –** unlike heavily gas-dependent states like Victoria, large parts of NSW are not connected to the reticulated gas network. The analysis only models the benefits of electrifying new buildings in LGAs connected to the reticulated gas network. Out of the 128 LGAS in NSW (plus Unincorporated NSW), 34 LGAs were excluded on this basis, leaving a total of 93 LGAs in the analysis.

**NEW GAS CONNECTIONS –** under the BAU scenario, new gas connections are projected to continue at the current rate, while under the NNG scenario, new gas connections are projected to be zero.

**EMISSIONS INTENSITY OF THE ELECTRICITY GRID -** this takes into account the current and projected rate of rooftop solar uptake across NSW and the expected closure of fossil fuel-fired generators. The amount of renewable energy in the electricity grid is projected to put downward pressure on electricity prices and emissions.

**ROOFTOP/BEHIND THE METER SOLAR -** the model assumes more solar will continue to be fed into the electricity grid to feed the residential sector. For the commercial sector, behind the meter solar is excluded from the analysis due to data limitations, making the model's cost saving projections for the commercial sector fairly conservative.

**BIOGAS AND HYDROGEN -** the model considers that biogas is unlikely to be blended in the future gas supply at any meaningful scale for a range of technical and economic reasons (see technical report). Hydrogen is expected to be incorporated into the energy mix in future but largely for industrial uses, so is excluded from this analysis which models the residential and commercial sectors.

**ENERGY COSTS -** the model considers the current and projected cost of gas and electricity when comparing the BAU and NNG scenarios. It is important to note that, while gas prices can be cheaper on a per unit basis compared with electricity prices, all-electric buildings are on average, cheaper to run because electric appliances use far less energy than gas ones. This distinction between the unit price of energy (gas and electricity) versus the efficiency of electric versus gas appliances, is a key factor that influences the model's finding that all-electric buildings are cheaper to run than those connected to gas.

**PRICES OVER TIME –** the model takes into account the impacts of inflation, as well as the fact that the value of money reduces over time, which is why financial savings projected over the 40 year period are provided in 'present value' terms (see section 2.3.4 in the technical report for more detail).

**GAS CONNECTION FEES –** daily gas connection fees (or 'daily supply charges') are eliminated under the NNG scenario, but continue to apply in the BAU scenario based on current gas connection rates.

**ENERGY EFFICIENCY –** the energy efficiency of new building stock is expected to improve over time in line with existing minimum energy efficiency standards under federal and state building codes (recently increased to 7 stars NatHERS).

## Appendix 2 - Top 20 councils

These are the results for the top 20 councils that stand to benefit the most from electrifying new homes and businesses in terms of reduced energy costs and avoided greenhouse gas emissions. To view the results for all councils, <u>visit this</u> webpage.

#### **Residential cost savings**

#### Total cost savings for the residential sector over the 40 year period

RANK	LGA	TOTAL SAVINGS (\$m)
1	Blacktown	516.59
2	Sydney	371.03
3	Liverpool	268.32
4	Campbelltown	249.29
5	Parramatta	243.77
6	Canterbury-Bankstown	242.67
7	Central Coast	173.43
8	Bayside	171.68
9	The Hills Shire	165.64
10	Penrith	160.63
11	Cumberland	151.18
12	Inner West	144.99
13	Wollongong	138.46
14	Lake Macquarie	137.84
15	Camden	134.86
16	Sutherland Shire	130.79
17	Ryde	114.19
18	Albury	112.03
19	Newcastle	109.91
20	Georges River	108.99

## Commercial cost savings

Total cost savings for the commercial sector over the 40 year period

RANK	LGA	TOTAL SAVINGS (\$m)
1	Sydney	173.20
2	Snowy Monaro Regional	84.00
3	Queanbeyan-Palerang Regional	73.40
4	Blacktown	72.70
5	Penrith	48.60
6	Parramatta	46.60
7	Woollahra	43.80
8	Cumberland	42.80
9	Canterbury-Bankstown	40.50
10	Central Coast	39.80
11	Liverpool	38.10
12	Fairfield	32.30
13	Newcastle	30.00
14	Campbelltown	28.80
15	Bayside	25.90
16	Lake Macquarie	21.60
17	Tamworth Regional	19.20
18	Sutherland Shire	18.50
19	Northern Beaches	18.00
20	The Hills Shire	17.70

#### Avoided emissions - residential

Cumulative residential emissions savings over the 40 year period

RANK	LGA	AVOIDED EMISSIONS (tonnes C02-e)
1	Blacktown	2,349,884
2	Sydney	1,684,397
3	Liverpool	1,212,541
4	Campbelltown	1,133,881
5	Parramatta	1,111,998
6	Canterbury-Bankstown	1,096,955
7	Bayside	774,112
8	Central Coast	750,084
9	Albury	745,560
10	The Hills Shire	737,418
11	Penrith	707,598
12	Cumberland	688,227
13	Inner West	649,637
14	Wollongong	613,834
15	Camden	613,473
16	Lake Macquarie	601,339
17	Sutherland Shire	598,340
18	Ryde	522,555
19	Georges River	493,276
20	Newcastle	492,472

#### Avoided emissions - commercial

RANK	LGA	AVOIDED EMISSIONS (tonnes CO2-e)
1	Sydney	1,969,992
2	Snowy Monaro Regional	978,915
3	Queanbeyan-Palerang Regional	855,149
4	Blacktown	828,020
5	Penrith	554,079
6	Parramatta	530,728
7	Woollahra	499,603
8	Cumberland	487,599
9	Canterbury-Bankstown	461,108
10	Central Coast	452,985
11	Liverpool	434,006
12	Fairfield	368,410
13	Newcastle	341,592
14	Campbelltown	328,387
15	Bayside	294,974
16	Lake Macquarie	246,532
17	Tamworth Regional	221,776
18	Sutherland Shire	210,645
19	Northern Beaches	204,828
20	The Hills Shire	201,478

Cumulative commercial emissions savings over the 40 year period

#### **Appendix 3 – Further resources**

There are many recent studies by various environment, union, consumer advocacy, tenant, and social sector organisations which demonstrate that electrifying and upgrading existing homes with energy efficiency measures, significantly reduces household energy bills. Some of the recent studies include:

Tilderman, T., Bradshaw, S., Rayner, J., and Arndt, D. (2023). Smarter Energy Use: How To Cut Energy Bills & Climate Harm, Climate Council.

This report models the bill savings from electrifying residential cooking, heating and hot water, plus basic energy efficiency upgrades like insulation and draught sealing for various capital cities for an average 1.5 star home. Total bill savings from electrifying appliances for Sydney are \$898/year, thermal efficiency upgrade savings are \$539/year, totalling \$1436/year.

Monash Climate Change Communication Research Hub. (2023). Switching On: Benefits of Household Electrification in Australia, Monash University, Australia.

This report shows that electrifying all existing homes across the country would save a total of \$4.9 billion annually, or \$450 per household per year. The gas network fees alone cost Australian households \$1.3 billion per year alone, excluding any gas usage. Electrifying all homes across NSW would save households a total of \$751.1 million, according to the research.

**Energy Consumers Australia.** (2023). *Stepping Up: A smoother pathway to decarbonising homes*, https://energyconsumersaustralia.com.au/publications/stepping-up.

This research found that households that go fully electric, including the uptake of electric vehicles, would save up to \$2,250 per year on household energy bills compared with a typical, dual fuel home.

**Renew and Environment Victoria.** (2023). It's a Gas: How ditching gas this winter can cut heating bills by 75%: comparing the costs and emissions of gas and electric heating over winter demonstrates how Victorian households can benefit from phasing out gas. https://renew.org.au/research/its-a-gas-howditching-gas-this-winter-can-cut-heating-bills-by-75/.

This report shows that homes in Melbourne that switch gas heaters for electric heat pump heaters could save up to 75% of on their winter heating bills.

**Renew.** (2023). Efficient heating and cooling in Adelaide homes: an analysis of energy bills and emissions, commissioned by South Australian Council of *Social Services*. https://renew.org.au/research/adelaide-households-paying-too-much-to-heat-and-cool-homes/

This report commissioned by Renew compares the heating and cooling costs for different sized homes in Adelaide, finding that households that switch from gas to efficient electric heaters/coolers can save up to \$556 per year for a three bedroom home.

Victorian Department of Environment, Land, Water and Planning. (2022). Gas Substitution Roadmap, Melbourne.

This report shows that switching from a dual fuel home to an all-electric home (excluding solar PV) produces annual bill savings of around \$1020/year. Add solar panels and the savings are \$1250/year. These savings exclude energy efficiency upgrades, which would make the savings even higher.

Australian Sustainable Built Environment Council. (December 2022). Rapid and Least Cost Pathways for Decarbonising Building Operations – Final Report, p. ix, https://www.asbec.asn.au/wordpress/wp-content/uploads/2022/11/SPR2123-Final-Report-20221014.pdf

Demonstrates shows that electrifying all homes (existing and new) in NSW would generate \$91.82 billion in operational energy cost savings by 2050 compared with business as usual. This report does not provide the data at an individual household level.

**Tidemann, C., Rayner, J., and Cheung, H.** (2022). *Switch and Save: how gas is costing households,* Climate Council, https://www.climatecouncil.org.au/wp-content/uploads/2022/10/CC\_MVSA0323-CC-Report-Switch-and-Save-Gas-vs-Electricity\_V6-FA-Screen-Single.pdf

This modelling shows that homes in Sydney could save \$924 per year on their energy bills if they switched gas appliances like hot water units, heaters, ovens and stoves, for electric ones.

**Rewiring Australia** (2022). *Castles and Cars: Savings in the Suburbs through Electrifying Everything*, Discussion Paper.

Report shows that households could save \$5,000 per year on their energy bills by replacing their fossil fuelled cars with electric vehicles, switching all gas appliances (water, heating, and cooking) with electric ones and adding rooftop solar.

**Renew** (August 2021). Households Better Off: Lowering energy bills with the 2022 National Construction Code.

Renew modelled the energy costs savings of 6 star homes connected to gas compared with 7 star, all-electric homes powered by renewable energy with energy efficiency upgrades. The annual average energy bills for a 6 star, gasconnected home in Sydney was \$2,213, compared with \$1,221 for the 7 star, allelectric home. In other words, 7 star, gas-free homes were shown to be \$1,110 cheaper to run per year than gas connected homes.

ACIL Allen Consulting (November 2020), *Households Energy Choice in the ACT*, commissioned by ACT Department of Environment, Planning and Sustainable Development Directorate, https://www.climatechoices.act.gov.au/\_\_data/assets/pdf\_file/0011/1784315/Household-energy-choices-in-the-ACT-Modelling-and-analysis.pdf

This study found savings of up to \$593 for homes in Canberra with no solar, and between \$307 and \$985 for homes with solar.

**Ruddock, K.** (2023). Further advice on Electrify your Council campaign. Environmental Defenders Office. https://350.org.au/files/2023/10/New-EDO-Legal-Advice\_Gas-Bans-and-DCPs\_Oct-2023.pdf

These studies demonstrate the benefits of programs designed to upgrade existing homes and/or businesses with electrification and/or energy efficiency upgrades

The purpose of this report is to complement these studies and fill a gap in existing research by modelling the cost and emissions impacts of electrifying new homes and businesses in NSW at both a household and state level.

#### Links

Electrify your Council campaign https://350.org.au/electrify-your-council/

<u>350 Australia's Council's Tracker webpage https://350.org.au/electrify-your-</u>council-council-tracker/

<u>Full technical report</u> https://350.org.au/files/2024/05/Electrifying-new-residential-and-commercial-buildings-in-NSW\_Final.pdf

Individual Council level results https://docs.google.com/ spreadsheets/d/1XMuG0N19Ax4\_ZYxPU-0WfKcPamqEQbhf/ edit?usp=sharing&ouid=114166600762646589061&rtpof=true&sd=true

#### Endnotes

<sup>11</sup> **Australian Energy Regulator** (August 2022), CRG *Consumer Survey 3: Update* on insights into energy consumers' price - service priorities and price impacts.

<sup>[2]</sup>All present value figures are provided at a 7% discount rate, which is the typical rate used by the Federal Treasury.

<sup>[3]</sup> **Ruddock, K.** (2023). *Further advice on Electrify your Council campaign*. Environmental Defenders Office. https://350.org.au/files/2023/10/New-EDO-Legal-Advice\_Gas-Bans-and-DCPs\_Oct-2023.pdf

<sup>[4]</sup> **Australian Bureau of Statistics** (September 2023), *National, state and territory population: Statistics about the population and components of change (births, deaths, migration) for Australia and its states and territory*, accessed 9 April 2024, https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release#states-and-territories

<sup>15]</sup>**Ruddock, K**. (2023). *Further advice on Electrify your Council campaign*. Environmental Defenders Office. https://350.org.au/files/2023/10/New-EDO-Legal-Advice\_Gas-Bans-and-DCPs\_Oct-2023.pdf

<sup>[6]</sup> **Australian Energy Market Operator.** (June 2022). Integrated System Plan for the National Electricity Market.

<sup>[7]</sup>lbid

<sup>[8]</sup> Darebin City Council. (2017). Darebin Climate Emergency Plan 2017-22, p. 22.



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