

JULY 2023

RESEARCH REPORT

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.



SUMMARY

Victoria uses significantly more gas than any other state in Australia, and most of that is for the 2 million Victorian households and businesses hooked up to the gas network. Infrastructure Victoria has found space heating accounts for almost two-thirds (60%) of Victoria's household gas use.

As winter bites and with gas bills skyrocketing, there has never been a better time for Victorians to switch to efficient, electric appliances in our homes.

New research from Renew shows by switching from gas to efficient electric heating, Victorians can save up to 75% on their heating bills over winter.

In Moorabbin for example, an average home currently pays around \$717 using ducted gas heating in an uninsulated space, but the cost for heating the same space using efficient reverse cycle air conditioner (RCAC) electric appliances reduces significantly to just a

quarter of that, at \$169 – and those savings are even greater with insulation.

Renew’s analysis is based on the amount of energy needed to heat a living space of 50m² in a typical rental home in various Victorian locations throughout winter (June, July and August). It focuses on Frankston, Moorabbin, the Latrobe Valley, Ballarat, Geelong and Bendigo.

The analysis shows heating with electric RCAC already produces fewer greenhouse gas emissions than gas ducted or wall heating. As we use more renewable energy in our grid, electric heating emissions will keep decreasing. This means that an electric appliance installed today will produce far fewer emissions than a gas appliance throughout its lifespan.

This research adds to a growing recognition that Victoria needs to rapidly accelerate its transition away from the gas addiction of previous decades.

Many Victorians, like renters and people living in social housing, do not have the option to switch away from gas, and so are locked out of the cost and emissions savings of living in a home heated with electric.

METHODOLOGY – ABOUT SUNULATOR

The scenarios in this report have been selected to represent realistic heating use for typical rental homes in Victoria, and the findings also apply to similar owner-occupied homes. This analysis uses Renew’s energy modelling platform Sunulator to simulate the gas and electricity used by a home for heating.

Sunulator simulated the operation of heating appliances, creating half-hourly consumption data. Detailed climate data was used to calculate heating across the range of locations. Variations in expected temperatures over time in different locations can result in different patterns of energy consumption and resultant energy costs and emissions.

Renew assumed an ideal indoor temperature of 21 degrees, with heating turning on when thermostat falls below 18 degrees (the WHO minimum healthy temperature). Based on modelling using FirstRate5 software, Renew assumed that insulation would increase NatHERS thermal efficiency ratings from 1.4 to 4.1.

Electricity tariffs were calculated using the Victorian Default Offer (VDO). A flat rate is assumed, rather than time of use. The VDO increased by 25% on July 1, 2023; costs for June use the 2022-23 rate while costs for July and August use the 2023-24 rate. Note that cheaper offers than the regulated default offer are generally available from retailers, so this price may be higher than consumer offers (generally by up to 5%).

Gas tariffs were calculated using June standing offers from Origin Energy, including tiered prices according to the amount of gas used. Gas prices are not subject to the Victorian Default Offer, so price rises are less certain and may not occur during winter months. Renew conservatively assumed a 4% tariff increase for the months of July and August to account for possible rises.

RESULTS

The table and graph below show the cost of heating a typical rental home in Frankston, Moorabbin, the Latrobe Valley, Ballarat, Bendigo and Geelong throughout the months of June, July and August 2023.

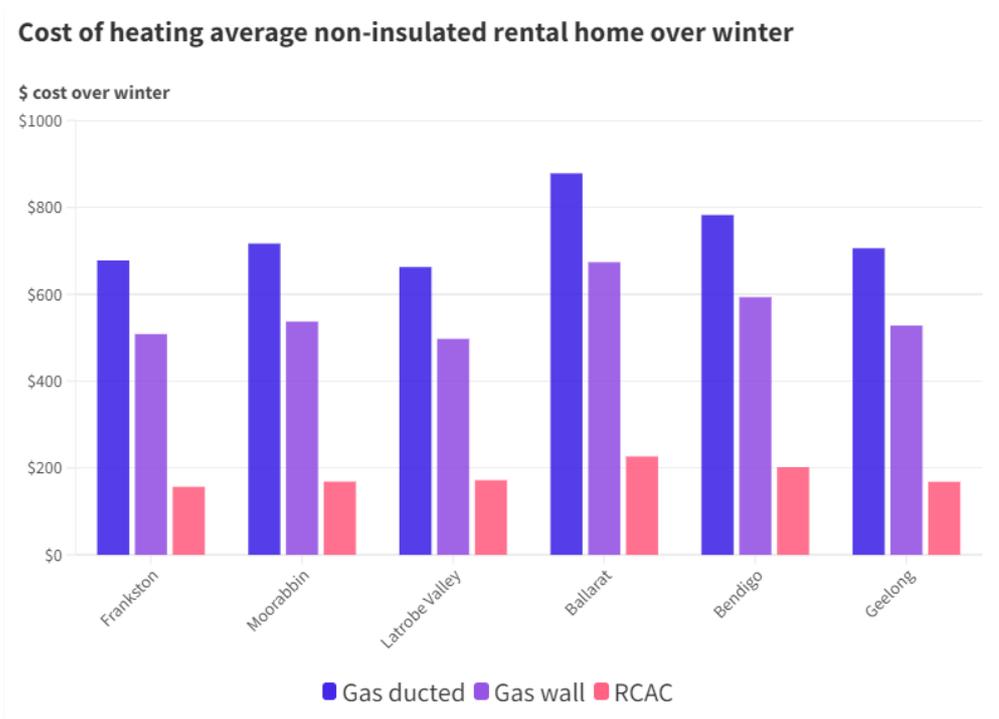


Figure 1: Cost of heating an average non-uninsulated rental home over winter using gas ducted, gas wall and RCAC heating

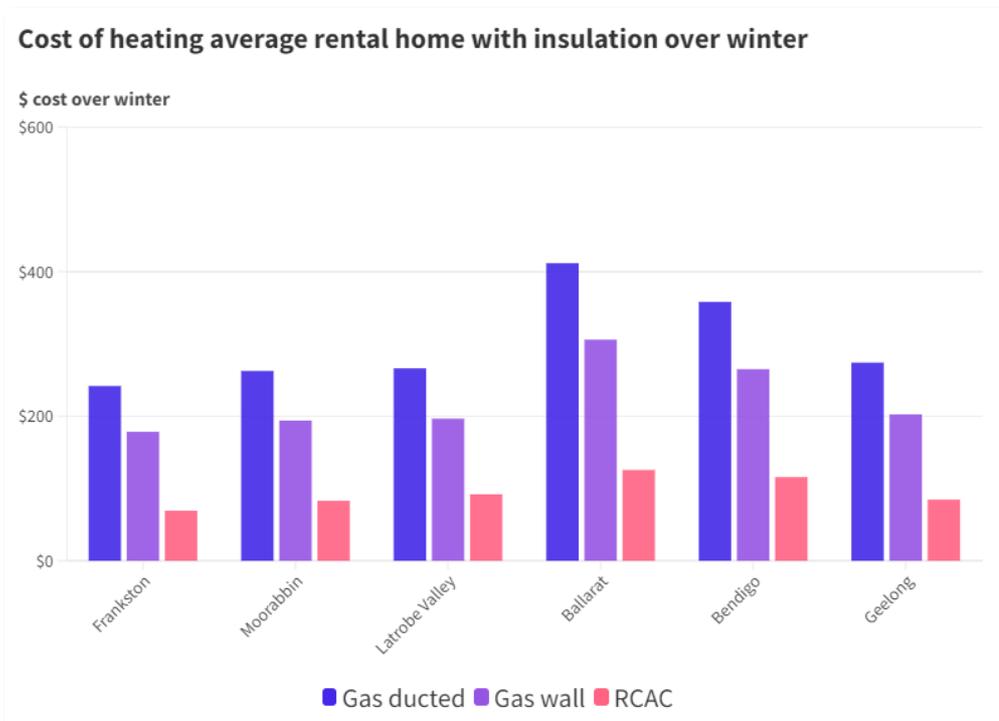


Figure 2: Cost of heating an average insulated rental home over winter using gas ducted, gas wall and RCAC heating

Location	No insulation, gas ducted	No insulation, gas wall	No insulation, RCAC	Insulation, gas ducted	Insulation, gas wall	Insulation, RCAC
Frankston	\$677.88	\$508.40	\$156.81	\$241.77	\$178.58	\$69.36
Moorabbin	\$716.75	\$537.24	\$168.74	\$262.61	\$193.97	\$83.06
Latrobe Valley	\$662.79	\$497.38	\$171.91	\$266.30	\$196.70	\$91.95
Ballarat	\$878.47	\$673.89	\$226.58	\$411.61	\$305.97	\$125.66
Bendigo	\$782.55	\$593.33	\$202.12	\$358.07	\$265.15	\$115.86
Geelong	\$705.96	\$528.15	\$168.41	\$274.18	\$202.52	\$84.62

Figure 3: Cost of heating an average home over winter

These figures reveal that in Melbourne suburbs, including Moorabbin and Frankston, you would currently pay around \$700 throughout the winter months using ducted gas heating in an uninsulated space, but that reduces to around \$160 in the same space using efficient reverse cycle electric appliances. Those energy costs more than halve again with proper insulation.

In regional areas, such as Ballarat and Bendigo, where colder winter temperatures are recorded and gas bills are higher, there are even greater savings to be made. In Ballarat, for example, a living space would cost around \$878 to heat over the winter, but that could be reduced to just \$227 with electric reverse cycle air conditioning and further reductions with proper insulation.

In Geelong and the Latrobe Valley, savings were also found. Geelong winter heating costs were over \$700 with no insulation and gas ducted heating; these costs were cut by 88% to just \$85 with insulation and efficient, electric reverse cycle air conditioning.

These graphs provide more specific breakdowns for various locations in Victoria.

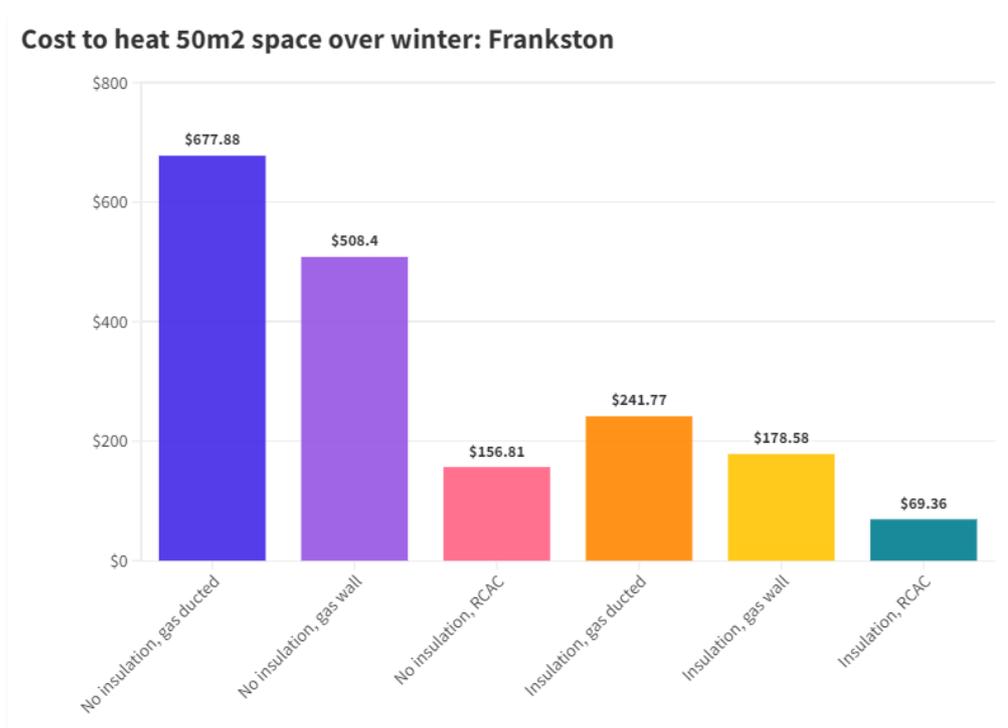


Figure 4: Cost to heat a 50m² space over winter: Frankston

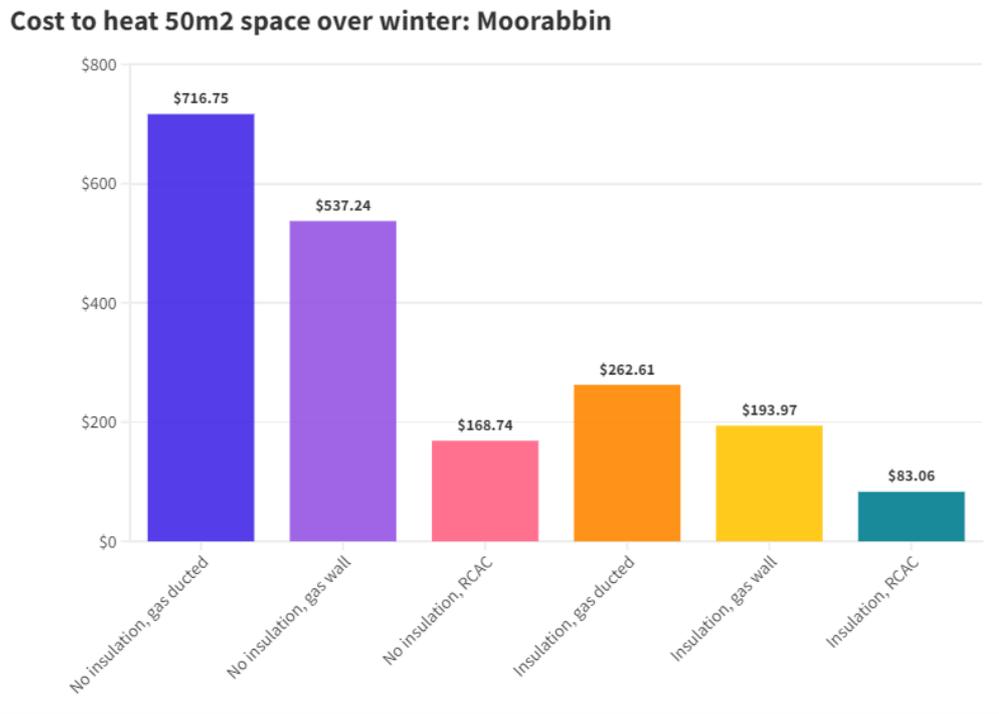


Figure 5: Cost to heat a 50m² space over winter: Moorabbin

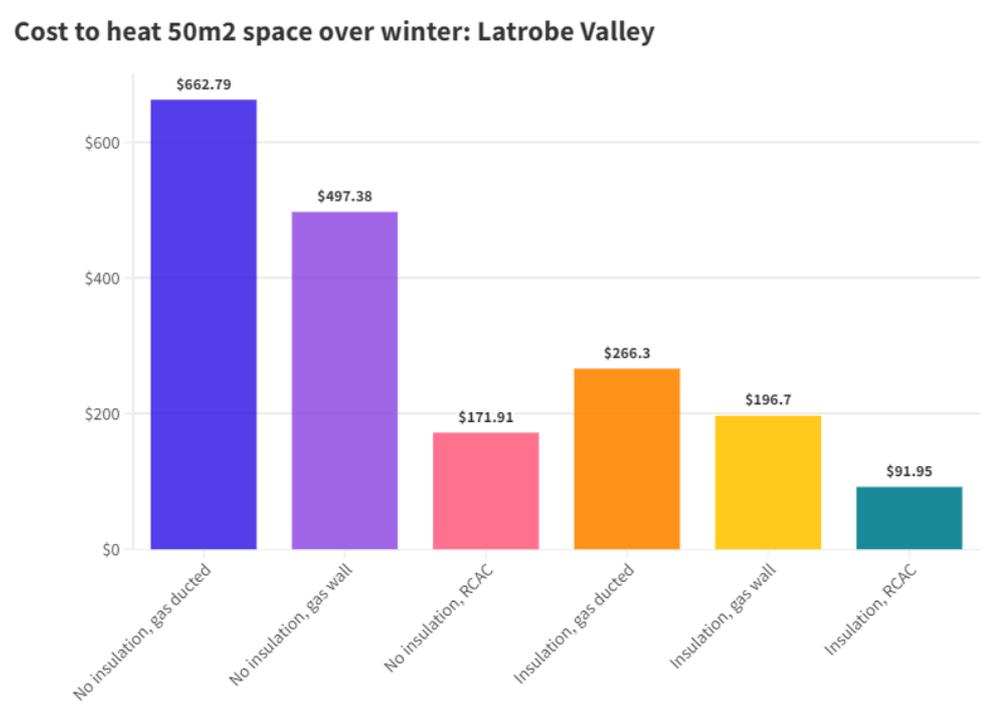


Figure 6: Cost to heat a 50m² space over winter: Latrobe Valley

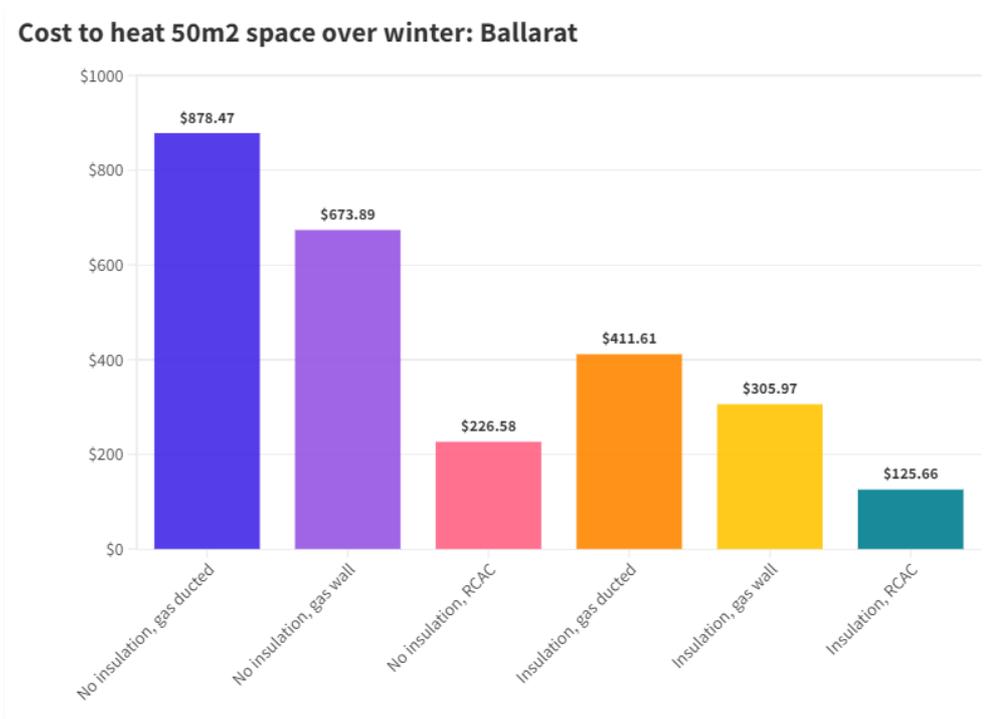


Figure 7: Cost to heat a 50m² space over winter: Ballarat

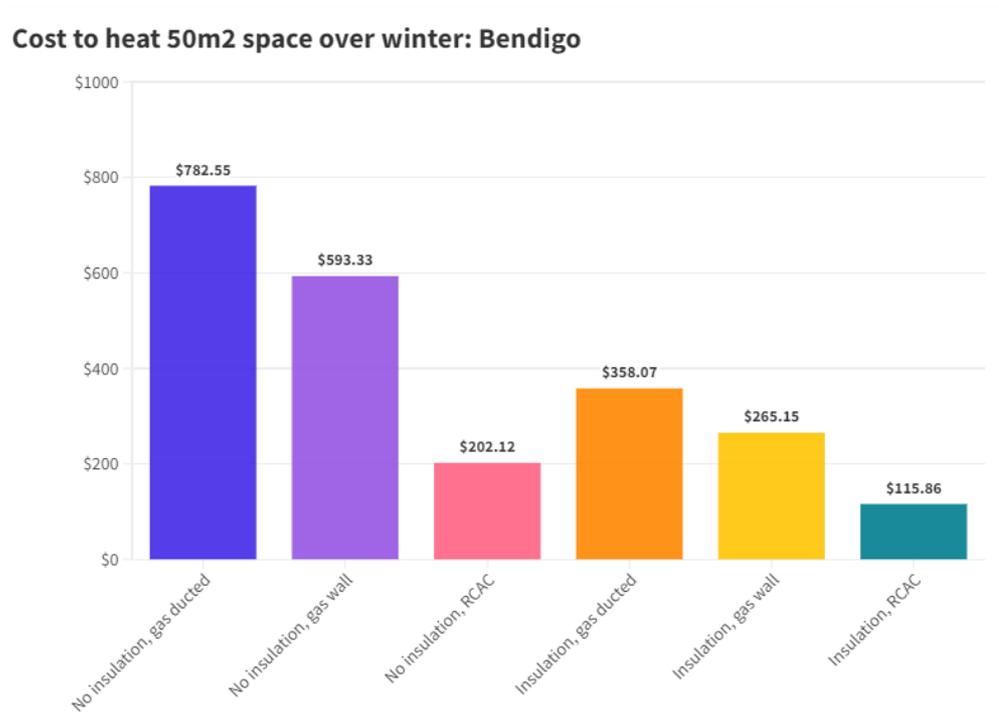


Figure 8: Cost to heat a 50m² space over winter: Bendigo

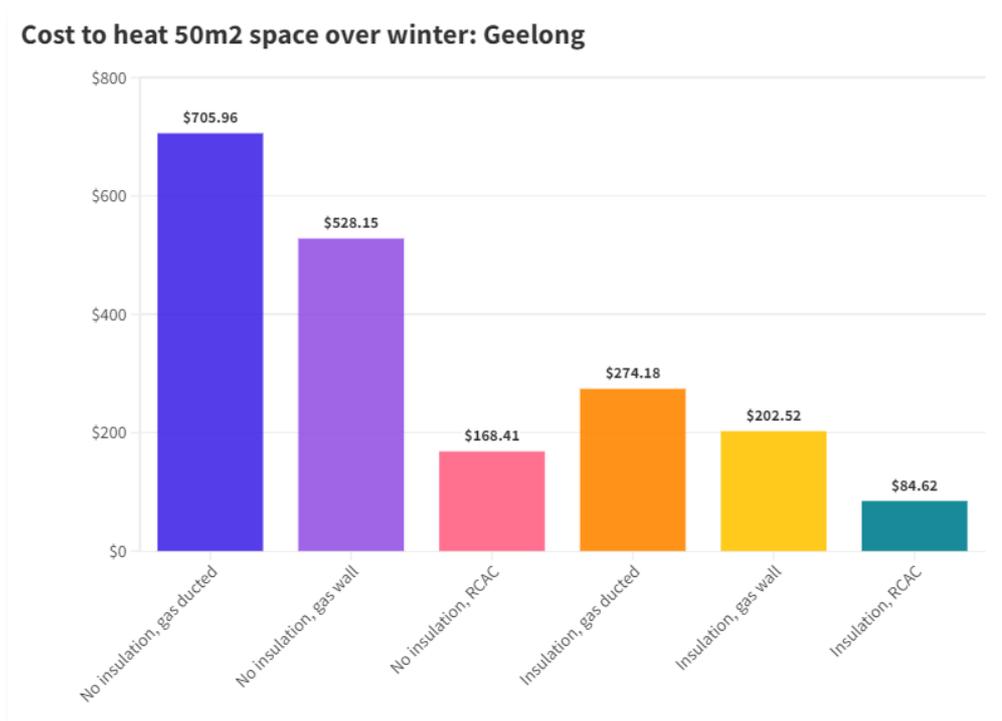


Figure 9: Cost to heat a 50m² space over winter: Geelong

COMPARING EMISSIONS OF GAS AND ELECTRIC HEATING

Renew has also calculated the emissions associated with energy used for heating in the same scenarios as those listed above over the winter period.

Electricity emissions are falling over time due to the growth in renewable energy, while emissions from gas remain relatively constant, as the table below shows.

Victoria has a legislated Renewable Energy Target of 40% by 2025, and stated commitments of 65% renewables by 2030 and 95% renewables by 2035. These commitments allow us to project future reduction in emissions intensity of electricity used to power homes.

The calculations presented in this report assume a household has no rooftop solar and is drawing all its energy from the grid. If electric appliances are powered with onsite renewable energy this would increase early emissions savings from using reverse cycle air conditioners.

The gas industry states that it seeks to reduce the emissions of household gas, however unlike electrification there is little evidence that significant emissions reductions of residential gas can be achieved in the short term. The analysis below assumes a best-case scenario of 5% reduction in emissions intensity for residential gas by 2035.

The example presented below is for a household in Moorabbin. While exact emissions levels vary depending on location and energy use, the overall trajectory of emissions for each scenario is similar in each location.

Emissions from heating over winter months (kg): South East Melbourne (Moorabbin) without insulation

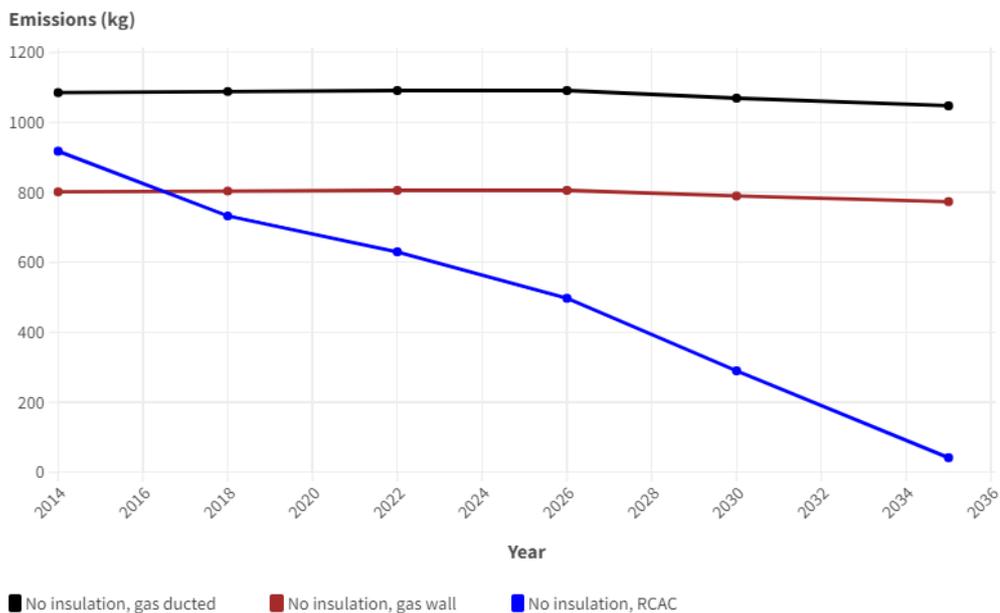


Figure 10: Emissions of heating 50m² uninsulated space in Moorabbin over winter

Emissions from heating over winter months (kg): South East Melbourne (Moorabbin) with insulation

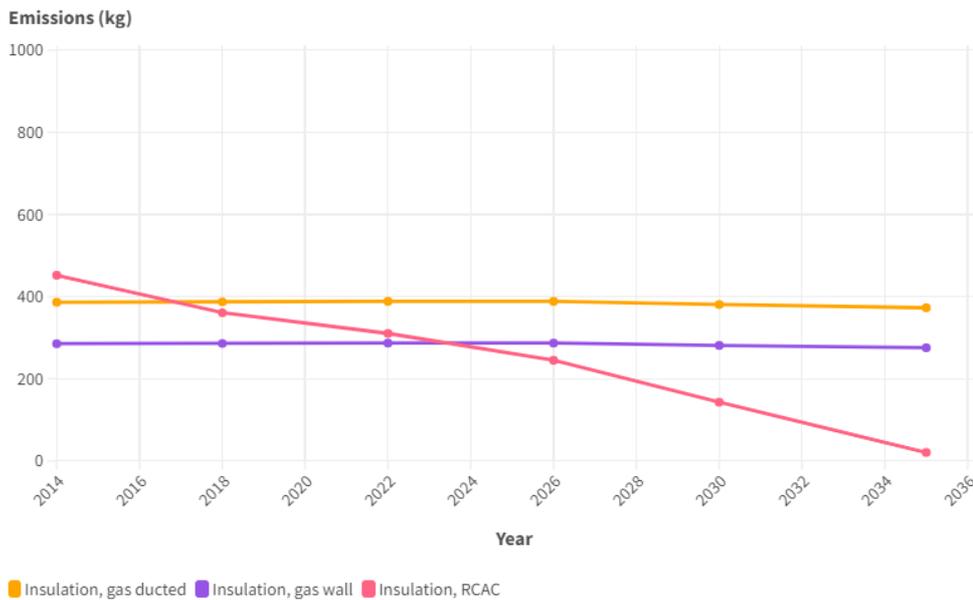


Figure 11: Emissions of heating 50m² insulated space in Moorabbin over winter

Emissions over winter (kg)	No insulation, gas ducted	No insulation, gas wall	No insulation, RCAC	Insulation, gas ducted	Insulation, gas wall	Insulation, RCAC
2014	1085.4	801.7	918.0	386.4	285.4	452.1
2018	1088.3	803.9	733.0	387.4	286.2	361.0
2022	1091.3	806.1	630.3	388.5	286.9	310.4
2026	1091.3	806.1	497.6	388.5	286.9	245.0
2030	1069.5	789.9	290.3	380.7	281.2	142.9
2035	1047.6	773.8	42.0	372.9	275.5	20.7

Figure 12: Emissions of heating 50m² in Moorabbin home over winter

This analysis finds that efficient electric heating already reduces emissions compared to gas, and these emissions reductions are expected to grow.

Emissions from electric appliances have already decreased since 2014, primarily due to the replacement of brown coal generation of electricity with renewables. Insulation results in clear and immediate reductions in emissions through reduced energy use, as well as health and comfort benefits; nonetheless, even uninsulated homes with efficient electric heating will produce lower emissions from 2030 onwards than homes with gas heating.

CONCLUSION

Victoria needs a plan to get off gas – and fast.

Victorian households are struggling under devastating cost of living increases – while massive, polluting gas companies continue to reap record profits. As this report reveals, switching from gas to electric appliances will deliver enormous savings of up to 75% for Victorian households.

Heating homes with electric reverse cycle air conditioners also significantly lowers harmful greenhouse gas emissions. In a climate and cost of living crisis, every effort should be made to ensure homes can be heated with reverse cycle air conditioners, bolstered by proper home insulation.

The Victorian government must help all types of households to switch from polluting gas to efficient electric heating.

It needs to do so with a suite of policies that bring down the upfront cost of replacing appliances and simplify the process for all Victorians to make the shift whilst avoiding

creating a two-class society where Victoria's poorest households are left behind.

The first important step for the Victorian government is to set in motion its *Gas Substitution Roadmap*.

The Roadmap is currently under review and due to come out at the end of 2023. The updated Roadmap must be bold, with targets and milestones for ending the burning of methane gas in Victorian homes.

There are other actions the Andrews government can take while updating the Roadmap: not make the gas problem worse, lead the Victorian community by example in how a state can get off gas, provide support for all Victorians to enjoy the benefits of the renewable energy transition, and educate the Victorian community to understand why we need to get off gas.

This report outlines the massive economic and environmental benefits of rapidly shifting Victorian households away from our historical addiction to gas – it is now up to the Andrews government to get on with the job.



RECOMMENDATIONS

We recommend the Victorian government:

1. **Strengthens and implements its Gas Substitution Roadmap, to lay out an ambitious household electrification plan that includes:**
 - a. Specific goals and timelines for reducing gas use across the state to ensure households are off gas within the decade
 - b. Details about how the 2 million plus homes connected to gas will be retrofitted with efficient electric appliances, starting with replacements of gas heaters; and
 - c. How the upfront cost of switching appliance – by far the biggest barrier to switching appliances – is addressed.
2. **Doesn't make the gas problem worse by:**
 - a. Stopping new gas connections immediately,
 - b. Phasing out the sale of gas appliances by 2025,
 - c. Stopping any gas expansion of the gas distribution network or further gas exploration from happening in Victoria.
3. **Leads by example, by rapidly electrifying its own buildings including public and social housing, government offices, schools and hospitals.**
4. **Makes it physically and financially possible for Victoria to switch away from gas appliances by supporting:**
 - a. *All* households and small businesses to electrify, whether owned, rented, apartments and regardless of location across the state.
 - b. Workforce development, a local manufacturing supply chain and retraining programs for workers to take up electrification jobs.
5. **Educates the public about the dangers of burning gas in homes and how electrification is the answer, and ensures public information is communicated and shared equitably by appropriate methods with all communities in Victoria.**