

Saving money with efficient, all-electric homes

The impact on household costs of connecting new homes to gas

June 2022

Using Renew's in-house energy modelling platform *Sunulator*, Renew has assessed the impact of connecting homes to the gas network on household energy bills.

The following analysis is an update of energy bill analysis presented in Renew's [submission](#) to the Victorian Legislative Council *Inquiry into Renewable Energy in Victoria*. The update uses actual Melbourne gas and electricity tariffs currently offered by major retailers as at 4 June 2022.

Full details of the methodology and assumptions used in this analysis can be found in the above submission and in the Renew and Environment Victoria report [Creating Victoria's First Gas-Free Suburbs](#).

Scenarios

We modelled the costs and benefits of four scenarios:

- 1) A basic 6-Star dual fuel home (connected to gas), with basic appliances and no solar
- 2) A basic 6-Star all-electric home (not connected to gas), with basic appliances and no solar
- 3) An efficient 7-Star dual fuel home (connected to gas), with efficient appliances and solar
- 4) An efficient 7-Star all-electric home (not connected to gas), with efficient appliances and solar

Scenario details

Our new home modelling assumes a medium-large detached home of 200m². A full summary of the features of each home in our new home modelling is as follows:

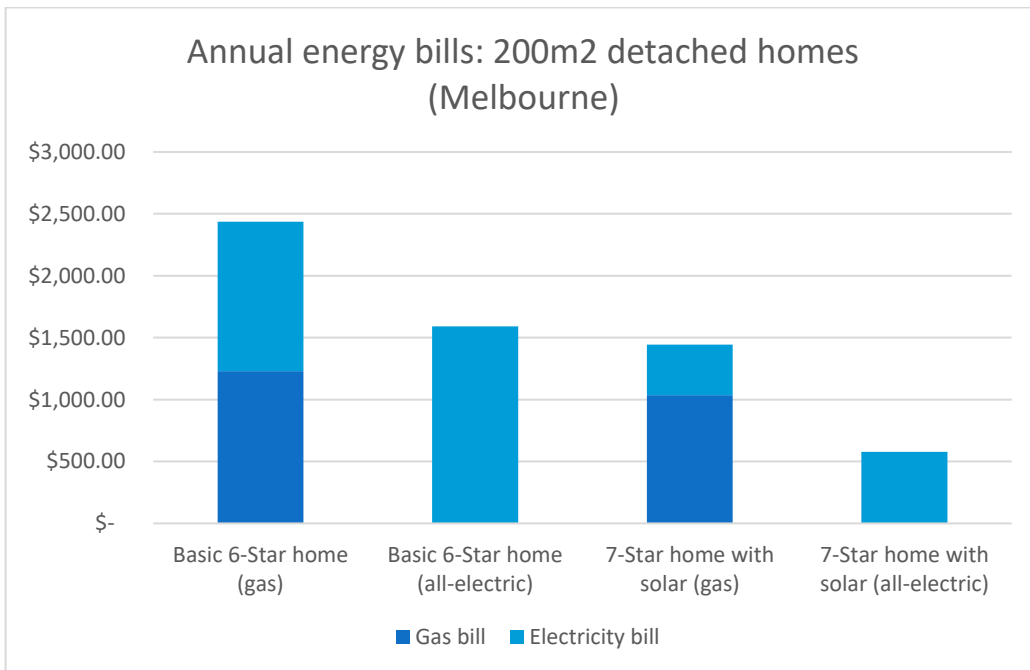
	6-Star basic dual fuel	6-Star basic all-electric	7-Star efficient dual fuel with solar	7-Star efficient all-electric with solar
NatHERS rating	6	6	7	7
Hot water	Gas instantaneous	Heat pump	Gas instantaneous	Heat pump
Heating	Gas	Heat pump (basic)	Gas	Heat pump (efficient)

Cooling	Evaporative	Heat pump (basic)	Heat pump (efficient)	Heat pump (efficient)
Cooking	Gas	Induction	Gas	Induction
Other appliances	Electric	Electric	Electric	Electric
Solar	None	None	6.6 kW	6.6 kW

Findings

Energy bills

Annual energy bills were as follows:



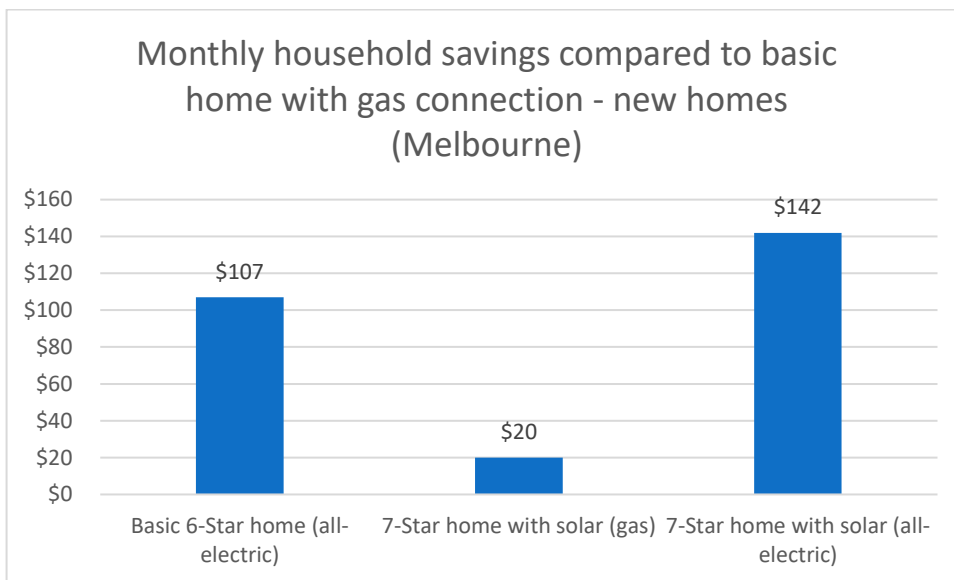
	Gas bill	Electricity bill	Total	Savings from business-as-usual
Basic 6-Star home (gas)	\$1,229.68	\$1,206.97	\$2,436.65	-
Basic 6-Star home (all-electric)	\$0	\$1,591.02	\$1,591.02	35%
7-Star home with solar (gas)	\$1,034.42	\$408.66	\$1,443.08	41%
7-Star home with solar (all-electric)	\$0	\$576.90	\$576.90	76%

Household cash flow

One way of understanding the impact of choosing gas or all-electric new homes is to consider a household's monthly cash flow.

Cutting out gas when building a new home cuts down the costs of building and connecting to the network. It often also reduces the initial spend on appliances, as (for example) reverse cycle air conditioning can be used for both heating and cooling and removes the need to install gas ducted heating. These savings are here assumed to reduce the overall amount borrowed for a newly built home, and therefore the monthly home loan payments.

When taking into account *both* monthly energy bills *and* savings on monthly home loan payments due to avoiding the cost of building a home with gas connections, the monthly cash flow savings for residents in a new home are as follows:



These findings show that Melbourne households building a new home will be financially better off with all-electric appliances and no gas connection.

Along with the lower running costs of efficient electric appliances, ditching *all* gas appliances (including heating, hot water, and cooking) allows households to avoid the daily gas network connection charge, currently offered by major retailers at around 90c a day or roughly \$300 a year.

Replacing gas appliances in existing homes

Replacing gas appliances with efficient electric appliances (heat pump hot water, reverse cycle air conditioners, and induction stovetops) leads to long term savings through reduced energy bills.

However, unlike for new homes, there is an upfront cost to replace existing appliances in existing homes. This upfront cost deters many households.

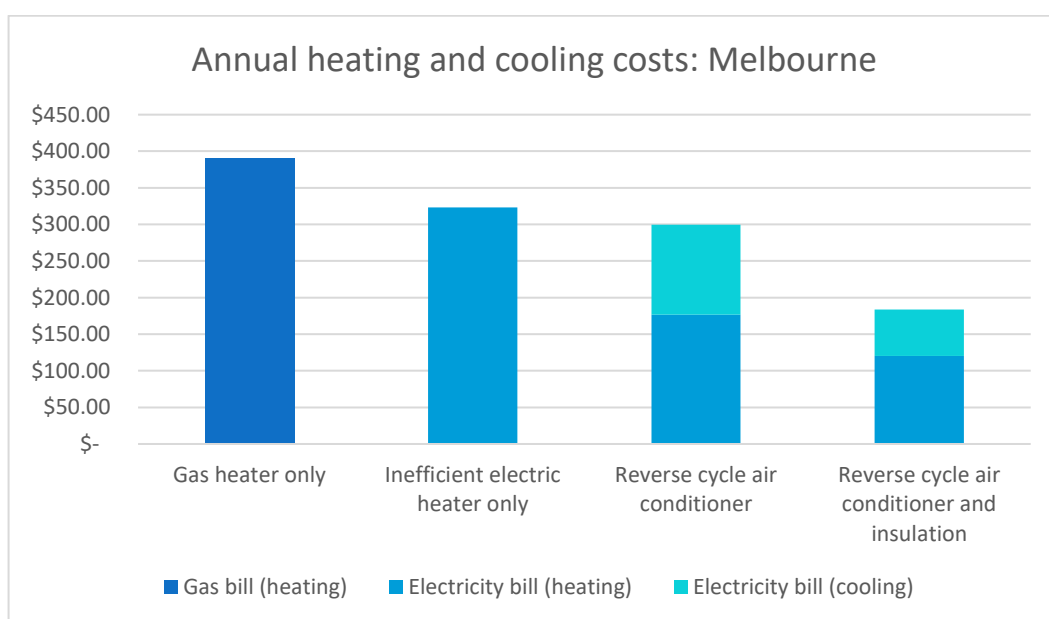
Perversely, homeowners on low incomes are less likely to be able to afford the upfront cost so are locked into higher bills in the long term. Renters and social housing residents are dependent on their landlords to replace appliances, meaning that they also pay disproportionately higher energy bills. Governments need to act to reduce these unfair barriers, including through rebates to replace gas appliances¹, better minimum energy efficiency standards for rental homes², and public retrofit programs.

When appliances get to the end of their life, households benefit by choosing efficient electric appliances to replace them. Buying a new gas appliance will lock in higher costs (as well as higher emissions).

In many cases, replacing inefficient gas appliances with efficient appliances such as reverse cycle air conditioners will still make financial sense over time regardless of how old the gas appliance is.

Scenario:

We have analysed the annual running costs of heating a 50m² space in a typical older unit³ in Melbourne:



¹ The Victorian government last year introduced a \$1000 rebate for low income households to replace gas heaters with efficient reverse cycle air cons: <https://www.heatingupgrades.vic.gov.au/>

² Victorian minimum rental standards include a requirement that new heaters are rated at least 2 stars; this is low and does not prohibit gas. The government has promised to introduce minimum requirements for insulation in rental homes, but not yet acted on this promise. These standards are a start, but urgently need to be strengthened.

³ 2 Star NatHERS rating, around the Melbourne average for homes built before national minimum energy standards were introduced in 2003.

	Gas bill (heating)	Electricity bill (heating)	Electricity bill (cooling)	Electricity bill (year) - total heating and cooling
Gas heater only	\$ 390.50	\$ -	\$ -	\$ -
Inefficient electric heater only	\$ -	\$ 323.05	\$ -	\$ 323.05
Reverse cycle air conditioner	\$ -	\$ 176.76	\$ 122.75	\$ 299.51
Reverse cycle air conditioner and insulation	\$ -	\$ 120.29	\$ 63.45	\$ 183.74

Reverse cycle air conditioner of this size and efficiency are advertised online in Melbourne for \$1,599. Assuming an installation cost of \$600, the total cost is \$2,199. Households with a concession card or a combined income below \$90,000 are eligible for a Victorian government rebate of \$1,000, bringing the total cost for these households to \$1,199.

At this cost, it would take less than 6 years for the replacement of a gas heater with reverse cycle air conditioning for heating to pay for itself. Nonetheless, it should be

Our analysis finds that the running costs of heating *and* cooling with a reverse cycle air conditioner are less than heating alone with a gas heater. Benefits are increased by also installing insulation.

Additional comments

Soaring wholesale energy prices are set to hit households, with states like Queensland and NSW that are highly dependent on coal and gas particularly hard hit. The Victorian Default Offer electricity tariff is increasing by 5% from July 1, with gas tariffs expected to rise by a similar or greater amount. There is a risk that the wholesale price crunch could have a major effect on smaller retailers, impacting their customers in the short term while reducing competition for the big retailers in the longer term.

Higher gas and electricity tariffs make the potential savings from efficient electric appliances, rooftop solar, better energy efficiency, good insulation, and getting off gas even more important for cutting household cost of living pressures.

It generally costs *less* to build a new home as all-electric with no gas connection, so there is really no reason to build new homes with gas. For homes with an existing gas connection there is a cost to transition. Connecting new homes to gas is locking in this transition cost for future residents or governments.

Our serious concern is that renters, social housing residents, and people on low incomes will be hit hardest by gas price rises. Government action is needed to make sure that these households aren't locked out of the energy transition.

Renew is pushing for:

- A moratorium on gas connections for new homes
- Changes to planning laws to ensure that new homes are not required to connect to gas
 - In Victoria, this requires changing plumbing laws to remove requirements for gas-boosted solar hot water, and Victorian Planning Provisions that may lead to greenfield developments having unnecessary gas connections
- Lifting thermal energy efficiency standards to 7 Stars as a minimum in the National Construction Code
- Minimum energy efficiency standards for rental homes
- Retrofit programs and rebates to ensure renters, social housing residents, and homeowners on low incomes are included in the energy transition
- Better consumer information and mandatory energy labelling and disclosure for homes

Appendix: data and assumptions

Full methodology is available in Renew’s [submission](#) to the Victorian Legislative Council *Inquiry into Renewable Energy in Victoria*.

Retail tariff offers

The following retail price offers were sourced from the websites of major energy retailers on 4 June 2022. Offers include retail discounts and (where available) are weighted for peak/off-peak rates according to typical household behaviour. Prices are for an inner Melbourne location. Our analysis applies the average price of the three retailers.

	Melbourne	AGL	EnergyAustralia	Origin	Average
Electricity	Per kWh	\$0.2036	\$0.2090	\$0.2020	\$0.205
	Daily supply charge	\$0.9794	\$1.0230	\$1.1180	\$1.040
	FiT	\$0.0670	\$0.0710	\$0.0670	\$0.068
Gas	per MJ	\$0.0219	\$0.0242	\$0.0260	\$0.024
	Daily supply charge	\$0.8932	\$0.8360	\$0.7691	\$0.833