

Is gas heating really cheaper than electric?



Kate Leslie

Kate Leslie, Alternative Technology Association | 5 May 2016

It's autumn, the weather is finally starting to cool, and in some homes in Australia ducted heating systems are being switched on for the first time this year, sending hot air through chilly rooms.

What many people who switch on gas heating won't realise is that their bills will be higher – possibly significantly higher – than if they were warming their homes with an electric reverse-cycle airconditioner.

The old perception that gas is cheaper than electricity is, sadly, still prevalent, despite the fact that gas prices are rising and the latest electric appliances are many times more efficient in their use of energy than their gas counterparts.

Clever electric technology like heat pumps for hot water and reverse-cycle airconditioners for space heating can use one megajoule of energy to transfer between 4-5 MJ of heat. With gas, by contrast, 1 MJ becomes at best 0.9 MJ of heat in a burner. If a home uses ducted heating, about one-third of that heat will be lost under the floor and one-third will go up the flue to mitigate against carbon monoxide.

Part of the problem when it comes to public perception is the misleading messaging coming from the gas industry. Battered by low commodity prices and the unpopularity of coal seam gas, the industry is trying to shore up its product by continually asserting that gas is “cheaper” than electricity.

Last month the Australian Pipelines and Gas Association put out a statement saying Australian households use about the same amount of energy from electricity as gas but pay much less for the latter, so “if we are looking to reduce our household energy bills, we should use gas for as much of our energy needs as possible,” the statement concluded.

What is patently misleading about this claim is that, while gas is cheaper per unit of energy than electricity, it is much less efficient and so – both from an economic and environmental point of view – it makes more sense to be using efficient electric appliances for a home's space heating and hot water.

The gas industry has been slow to acknowledge this fact, at least publicly. The Alternative Technology Association has written to the ACCC alerting it to misleading claims being made by gas companies about the cost and efficiency of gas. One gas company website, for instance, carried the following assertions: "Far more efficient than electric heating systems, natural gas solutions can save you money and provide a comfortable temperature more quickly," and "[Gas ducted heating] is a far more efficient and less obtrusive way to heat multiple rooms compared to operating several portable or wall-fixed heaters."

In 2014 the ATA conducted exhaustive research on the comparative economic and environmental benefits to households of using gas appliances versus electric ones. We found many households in Australia would reduce their bills by switching from gas to efficient electric appliances. Switching would also be environmentally beneficial, reducing carbon emissions.

Our research analysed the economics of new, high-efficiency gas appliances compared with equivalent new efficient electric appliances for space heating, water heating and cooking. By "efficient electric appliances" we mean heat pumps for water heating, reverse-cycle airconditioners for space heating, and induction cook tops and efficient electric ovens.

The analysis was conducted across different states and climate zones, household types and gas pricing zones to understand the potential costs and benefits.

We found that it is no longer economic for any new home, or existing all-electric home, anywhere in Australia to connect to mains or bottled gas compared with installing and operating efficient electric appliance alternatives. And this finding held true even without the installation of solar panels at the residence (which now provide electricity cheaper than from the grid).

Another major finding was that for many existing dual-fuel homes in warmer climates, progressively switching all appliances from gas to efficient electric – when they are due for replacement, and in some cases beforehand – is more cost-effective than replacing the same appliances with efficient gas ones.

Gas just isn't as competitive against electricity as it used to be. So a word of caution this autumn and winter: if you rely on gas for heating but you also have a reverse-cycle airconditioner, think twice before flicking the switch on the gas appliance. Using a reverse-cycle air-conditioner to heat your home will almost certainly lower your bills.

Kate Leslie is an energy and water analyst at the Alternative Technology Association, a national not-for-profit organisation that promotes sustainable living.

Comments

6 Responses to "Is gas heating really cheaper than electric?"

Zorana says:

13 May 2016 at 9:20 am

F As Jack says – there is a distinct difference between the room heated

with gas and the one heated with split system. On top of this there is another very significant difference – the ducted gas heating with properly acoustically insulated ducts is quiet – one can barely hear it, compared to the split systems which are invariably noisy.

Cooking on gas is something that all chefs around the world use (if they can). There are very good reasons for that – instantaneous temperature control, faster cooking etc. Different for ovens – they are better electric.

I live in inner East Melbourne. My place has highly efficient gas ducted heating and equally efficient instantaneous flow gas boiler, gas stove and gas oven. I use electricity for lighting (all fluoerescents), fan in the central heating machine, and an umber of other small white goods (hair drier, kettle, toaster, computers, TV). If I total gas and electricity bills over one year, the electricity is about 30% less. I pay around \$1200/an gas (all big users are gas) and around \$900 electricity (almost nothing).

It might be that switching to electricity from old inefficient appliances is cost effective, but it is certainly not true generally.

Jack says:

12 May 2016 at 8:21 pm

F Challenging topic.

We have both AC unit and gas fire.

A gas fire, we have one in an old wood fireplace that makes a great red coal look alike, radiates infa red warmth that heats not only your body but the walls the couch the table everything in the room. Not only is it proven that warm surfaces near your body make you physically hotter the psycholocal effect far exceeds being near cool surfaces.

What people don't often realize is that the AC unit heats only air and has limited to no heating effect on the surfaces of objects around you.

So a room that is heat to 25C by AC and a room at 25C heated by radiant heat like gas the latter is always sensed as warmer. It is because of the surfaces being hotter.

Also the AC heated room once the unit turns off goes down in temp straight away. The Gas heated room particularly if it has thermal mass and insulation takes a long period of time to cool down slowly tackling out the embedded warmth.

Gas is a clean energy zero carbon burn however electricity in most of Australia burns Co2 from coal generated power.

Be warm stay warm and be gentle on the planet – use gas!

Zorana says:

11 May 2016 at 9:44 am

F Is this true for 5 star central gas heaters and instantaneous gas boilers which turn piezo turn on (no pilot)?

Kate Leslie says:

12 May 2016 at 5:19 pm

H Hi all,

☐ Thanks for contributing to the conversation and adding your comments. You can read our 2014 study, with all its assumptions (in the Appendices) at <http://www.ata.org.au/news/are-we-still-cooking-with-gas>.

☐ Zorana, Our study compared the same level of service from efficient appliances readily available, whether gas or electric. Yes, the gas hot water system was '5 star' (I believe gas energy labelling is an Australian industry-led scheme). With respect to space heating, I'm not sure exactly what star rating it is, but our report (p79) says "The 2012 EnergyConsult report showed that the sales were clustered around 25MJ-30MJ gas wall furnaces with 67%-70% efficiency."

☐ Nathan, space heating demand is of necessity modelled. Have a look at our report – Section 7. It addresses most of your questions. We also did supplementary research into the carbon emissions of a household choosing gas or efficient electric appliances. <https://www.ata.org.au/ata-research/emissions-down-in-switch-from-gas-to-electric-report>

☐ Colin, no we didn't look at hydronic or geothermal. As an economic study, we just compared gas to the lower cost efficient electric alternatives.

Nathan Rogers says:

6 May 2016 at 9:01 am

F Did you measure the energy use in real life conditions or use the designers specs, because heat pump efficiency is extremely variable with outdoor climate and only in a few areas meet the expected efficiency. I would very much doubt that a heat pump in southern Victoria operating as a heater would provide the same level of operational efficiency (eg heat the room adequately in quick time), have the environmental benefits (eg scope 2 and 3 carbon emissions from gas in Victoria is markedly less than electricity) and even provide a greater energy efficiency than a well designed and installed gas heating system.

Colin Hayes says:

6 May 2016 at 12:39 am

F Interesting article

Did the study include underfloor hydronic heating with high efficiency condensing boilers ? Or Geothermal heat pumps ?

That's something I would like to see, can we do a study on these ?

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Image: Landcare group Macquarie 2100



Where's Australia in the Top 10?

The answer is, it isn't. What Top 10 are we referring to? The 10 countries leading the world in the shift to renewable energy.

1. Sweden: With increased investments in solar, wind, energy storage, smart grids and clean transport, it aims to become the world's first 100% fossil fuel-free country.
2. Costa Rica: 99% of its electricity in 2015 came from renewables—primarily hydroelectric, solar, wind and geothermal.
3. Nicaragua: Renewable energy investments over the last eight years saw 54% of its electricity needs by June 2015 met by renewable sources; the goal is 90% by 2020.
4. Scotland: 97% of household electricity needs were met by wind power.
5. Germany: Up to 78% of electricity demand can be met by renewables, and it is the world leader in solar PV capacity.
6. Uruguay: Wind and solar investments in the last 10 years have seen 95% of electricity needs met by renewables in 2015.
7. Denmark: Wind power provides 42% of its electricity and it's aiming to be 100% fossil fuel free by 2050.
8. China: The world's largest carbon emitter, but also the largest wind energy capacity installed and the second-largest solar PV capacity; it's committed to phasing out coal and cleaning up its air.
9. Morocco: A combination of the world's largest concentrated solar plant, and wind and hydro plants, will provide 50% of this country's electricity by 2020.
10. USA: Fifth-highest solar PV capacity, second-highest wind power capacity; renewables accounted for only 13% of electricity needs in 2014 but potential to reduce emissions by 80% by 2030.

www.climaterealityproject.org

Global investors mobilising the billions needed to counter climate change

United Nations Secretary-General Ban Ki-moon, speaking at the 2016 Investor Summit on Climate Risk that followed the international climate talks in Paris, urged the gathering of 500 global investors (collectively managing assets of more than \$22 trillion) to help significantly increase clean energy investments by 2020, so that the Paris climate accord's goal of limiting global temperature rises to below 2°C might be met.

Although clean energy investments hit a record high of \$329 billion in 2015, he said, at a minimum, the level of investment would need to double, "to prevent excessive global warming that would trigger profound economic disruption and human suffering".

Other speakers at the all-day meeting, organised by non-profit Ceres, the United Nations Foundation and the UN Office for Partnerships, talked about the progress made to date in facilitating a shift in the global economy towards more clean energy and far less carbon, and the further commitments they would make in pursuit of this. Delegates also explored the growth areas for clean energy investments; for example, in India and China, and in solar and wind power, and therefore where it would make financial and environmental sense for capital to flow.

Michael Liebreich, chairman/founder of Bloomberg New Energy Finance, noted that the level of investment required over the next five years "will not be delivered by business-as-usual; closing the gap is both a challenge and an opportunity for investors".

Reinforcing this move towards much greater investment in sustainable operations, a recent report by AXA Investment Managers stated that responsible investment would move from being a specialist area to a must-have by institutional investors in 2016, as environmental issues, divestment and impact investment become more pervasive.

www.3blmedia.com

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ATA Gas Preferences Survey

The ATA (*ReNew's* publisher) has been collecting information about gas preferences to facilitate consumer advocacy. The findings will be variously submitted to and discussed with state and federal governments, regulatory bodies and other advocacy organisations to raise awareness about gas usage trends and highlight concerns regarding extension and regulation of gas networks around Australia.

So far, around 1000 people have responded to our survey (thank you!). Of these, 65% are ATA members, 90% are homeowners and 54% are from Victoria (the state with the highest demand for residential gas).

Initial survey results have revealed that gas is significantly less the energy source of choice than it was 5 or 10 years ago, with nearly two-thirds saying they would now opt for electric appliances. Of the nearly one-third of households using less gas than three years ago, reasons included installing electric appliances and more efficient appliances, improving their home's thermal efficiency and installing solar hot water.

When it comes to space heating, 43% of respondents heat their homes using mains gas ducted heating. Interestingly, 36% of these also have a reverse-cycle air conditioner (RCAC) that they could use to heat their home instead. Mains gas is used for heating water in about half the surveyed households, with 41% of these being existing systems when the house was bought and 37% chosen partly for environmental reasons. Of the 8% who replaced their HWS in the last year, most replaced it with something different.

The Gas Preferences Survey is still open so if you want to help influence the industry and its regulators, share your opinions and experience (and feel free to encourage others to do so) at www.surveymonkey.com/r/LPLZKF5. And for a full overview of the survey results, keep an eye out on the ATA's website www.ata.org.au.