



# Insulating Expectations

## Can ceiling insulation actually reduce greenhouse gas emissions?

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Retrofitting insulation *does* improve the thermal efficiency of a house, but it doesn't necessarily change the behaviour of the inhabitants.

If we rely on technology to 'solve' our planetary problems, we had better test our assumptions about the technology.

### Why do people install insulation?

For a number of reasons, largely to be 'warmer in winter' and 'cooler in summer'. In the recent Home Insulation Program, over 1 million houses had insulation retrofitted, many because of a generous rebate.

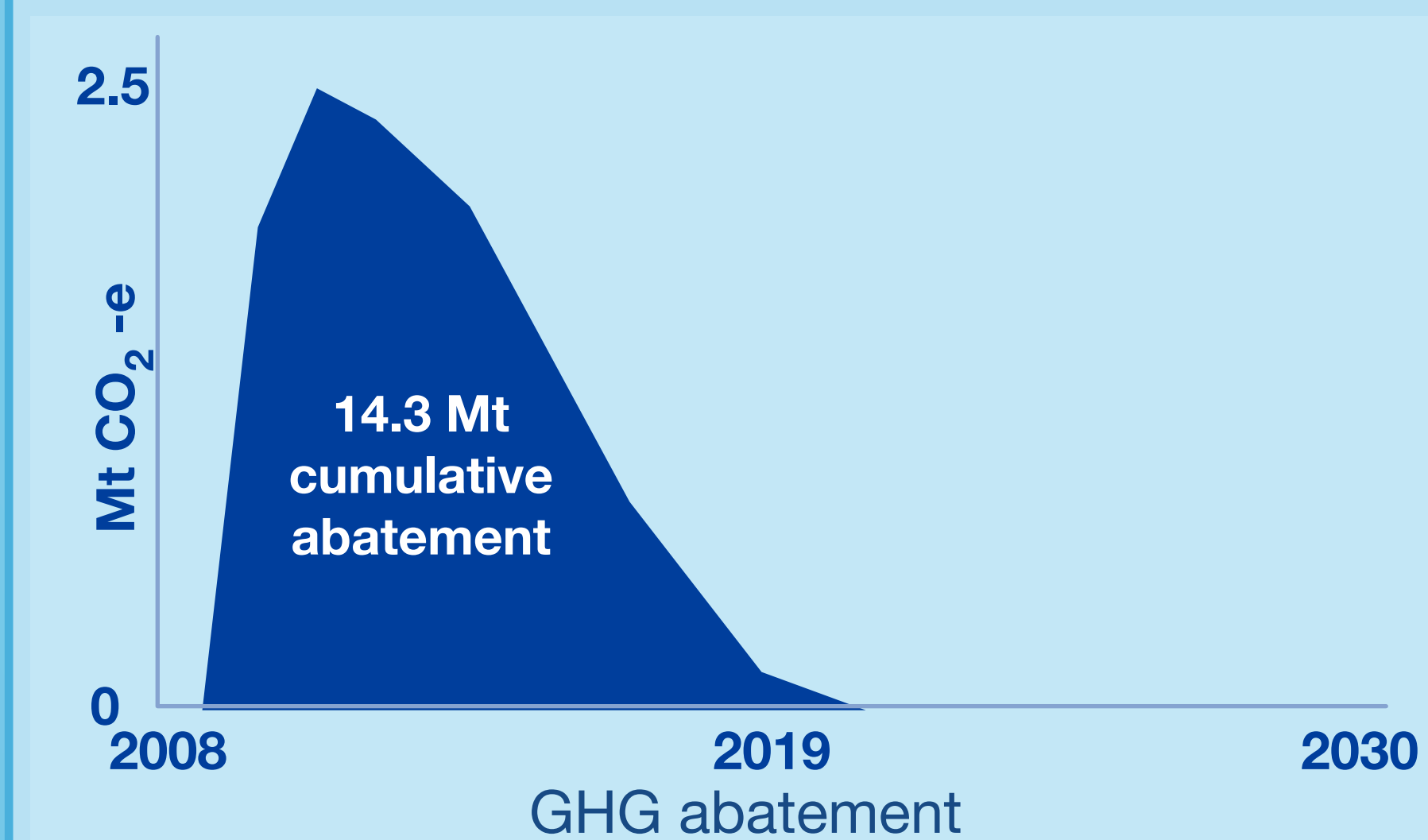
### What happens after insulation is installed?

There is very little known about the behaviour of inhabitants after it is installed. Some people reduce consumption, others take off their jumper and become more comfortable, others heat more space.

## Case study: Australia's Home Insulation Program

### What was claimed...

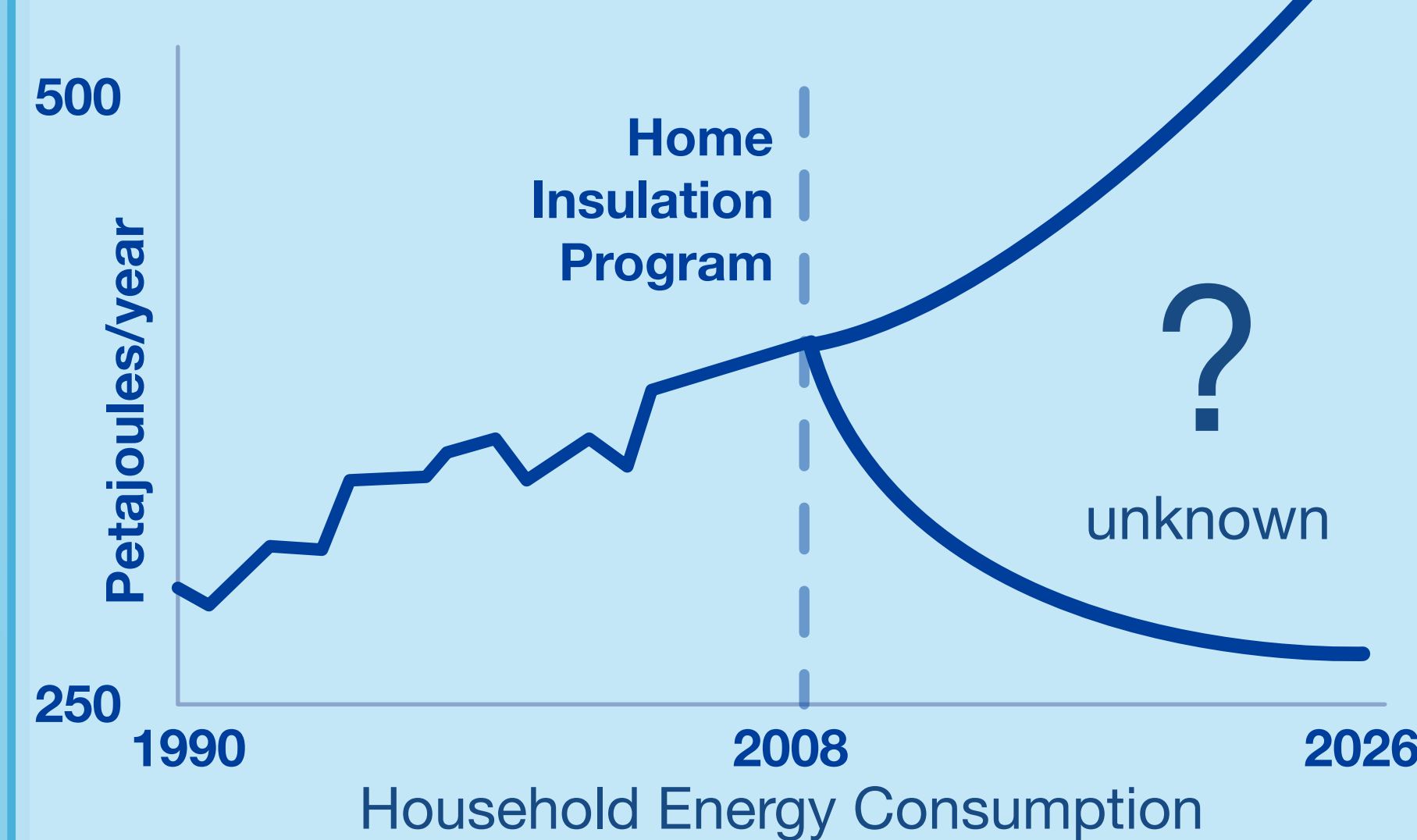
The Department of Climate Change claimed that the Program would generate 14.3 Mt of CO<sub>2</sub> equivalent in abatement.



Source: [www.climatechange.gov.au](http://www.climatechange.gov.au)

### What did we know?

Houses are getting bigger, with fewer occupants, with an increasing demand for electricity and unknown thermal behaviour.



Source: (1990-2008) [www.energyrating.gov.au](http://www.energyrating.gov.au)

### What can we learn?

The Home Insulation Program was designed based on the assumption that **insulation reduces energy consumption**. Engineers - as designers of technology - have the responsibility to question the assumptions of policy-makers about technology.

In a complex system, with many unknown behaviours and motivations, pushing the lever one way, can provide a surprising result. Using system dynamics, we show that **installing insulation can increase energy demand**, and conclude that the aim of the policy would have been an unlikely outcome.