

# Insulate the nation activity sheet

## 39 Ways to Save the Planet

### The problem

Around 80% of the existing building stock in Europe standing today will still be there in 2050. These buildings lose significant amounts of heat and energy. Worse still, newbuild houses are still being built and connected to fossil fuel infrastructure.

Whilst there is a clear CO<sub>2</sub> reduction pathway to a carbon-free energy mix by 2050, there is not a similar plan for replacing household fossil fuel reliance (i.e. gas).

The amount of energy we need to decarbonise in this sector is enormous. About 25% of the total energy consumption in Europe is used by buildings (for heating, hot water, and cooking). The situation is further complicated because energy demand significantly fluctuates through the year. A typical January month uses roughly half the amount of heating consumed in total per annum, therefore, the winter months are a huge challenge in the UK.

### The renovation wave: net-zero retrofit

Have you unrolled fibre glass into the attic?; injected polystyrene balls into the walls?; stuffed balloons into the chimneys?; fitted solar panels on the roof? In the BBC Radio 4 episode [Insulate the Nation](#) Tom Heap investigates how we can solve the problem of heat loss from our homes.

Energiesprong is a Dutch firm which has developed a revolutionary approach to retaining building heat. The firm specialise in creating made-to-measure building covers which are prefabricated facades.



Figure 1

Figure 1 shows how these facades literally encase the building with a new 20cm thick new shell. Ideally the building is also simultaneously fitted with a ground-source heat pump. The whole Energiesprong retrofit process is nicknamed an 'external wrap'.

12,000 properties have been completed across Europe and a new pilot project with Nottingham City Homes has delivered 155 net-zero retrofits, shown in Figure 2. Tenants have responded extremely positively as heating bills have halved with monthly energy bills dropping from about £120 to £60-£70.



Figure 2 one house remains to be retrofitted in Nottingham © Tracey Whitefoot Energiesprong

1. Read the BBC Bitesize page on [Conduction, convection, and radiation](#) and label where heat escapes on Figure 3.
2. Watch [the Energiesprong video](#). In a different colour annotate what the company offers as a net-zero retrofit solution to a property like Figure 3.

Current cost is £30-50,000 per property however Energiesprong say homeowners should expect to pay close to nothing for their energy bills over the next 50-years. Outgoings instead will go direct to Energiesprong to pay for the net-zero retrofit, and do not rise above current energy bills, therefore the cost of living does not go up. It is described by Nottingham City Homes as being self-financing.



Figure 3

3. In the most optimistic future scenario, if we retrofitted all 28 million homes in the UK to the best possible standard, what does Dr. Tasmin Edwards say we could reduce greenhouse gas emissions by?

Watch the [Deep Home Retrofit](#) video from the Institute of Engineering and Technology and jump to 3:02.

4. What does Emily Braham, Head of Sustainable Energy Nottingham City Home, say we have we been doing typically in UK homes?
5. What does David Adams, technical director of Melius Homes, say is 'quite shocking' about some UK homes?
6. What type of housing is being targeted to start in the UK?

### Further reading

- Rethinking 'downward spiral' recycling [www.theconversation.com/a-third-of-our-waste-comes-from-buildings-this-ones-designed-for-reuse-and-cuts-emissions-by-88-147455](http://www.theconversation.com/a-third-of-our-waste-comes-from-buildings-this-ones-designed-for-reuse-and-cuts-emissions-by-88-147455)
- Energiesprong [www.energiesprong.uk/projects/nottingham](http://www.energiesprong.uk/projects/nottingham)
- Dutch eco-initiative halves energy bills in first UK homes in Nottingham <https://www.theguardian.com/society/2019/jan/07/dutch-eco-homes-idea-arrives-in-uk-and-cuts-energy-bills-in-half-nottingham-energiesprong>
- The My2050 Carbon Calculator has a 'Buildings' lever [Royal Geographical Society - Geography resources for teachers \(rgs.org\)](http://Royal_Geographical_Society_-_Geography_resources_for_teachers_(rgs.org))
- Watch the Energiesprong Factory Zero starts at 24.00 minutes [www.vimeo.com/464213810](http://www.vimeo.com/464213810)

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## Suggested questions for Insulate the nation

- a. What does presenter Tom Heap say he has done to save energy and heat loss from his home?
- b. What is the current cost of an Energiesprong net-zero retrofit?

## Answers

1. When you look at a thermogram of a property it is clear that heat escapes through windows and the roof of buildings. This property in particular has large glass windows, a heated pool and has a big surface roof surface area.

Energiesprong offers a retrofit which insulates the house fully, transforming the property into a net-zero building. This property is detached and is spacious so a ground source heat pump would be a beneficial addition to the retrofit. Watch [Ground Source Heat Pumps explained](#) for more.

2. An Energiesprong retrofit will completely eradicate building waste heat and will remove building reliance on fossil fuels. Lowering energy and heat usage in the home.
3. Greenhouse gas emissions could be reduced by as much as 70%. More realistic standards would achieve half this figure (35%).
4. Emily Braham says we have typically installed 'incremental measures' i.e., single measures like loft insulation, without thinking about the future and with no route map to 2050. For example, there are still constructions companies putting gas into properties even though this will be phased out over the coming decade.
5. Any moisture from breath or cooking condenses on the walls, which leads to mould and spores and health issues.
6. Social housing, which has traditionally been a hard to heat type of home. It is an opportunity to scale up quickly as there are around 4 million households socially renting. It offers low earners reliable, long-term, energy to heat their homes and water.

## An RGS-IBG expert

Go to [What our experts say](#) to hear further analysis from Professor Stephen Peake from the Open University and Kate de Selincourt, a writer on the environment, sustainable buildings, and energy.

