In the home

❖ What is this topic about?

This topic focuses on the changes that are needed to the use of heating, hot water and electricity in the home to reach net-zero greenhouse gas emissions.

❖ What are the sources of greenhouse gas emissions in the home?

At the moment, the main causes of greenhouse gas emissions in the home are:

- **Using fossil fuels** (gas, oil and coal) for heating, hot water and cooking;

- **Using electricity** to power lights and electrical appliances (e.g. fridges, freezers, dishwashers, tumble dryers, IT equipment, TVs etc). At the moment, some of this electricity is generated by burning gas and coal.

❖ What needs to be done to reach net zero emissions?

Homes will need to change in several ways if the UK is to reach net zero greenhouse gas emissions by 2050:

- **The use of fossil fuels (gas, oil and coal) for heating, hot water and cooking needs to be phased out**. It needs to be replaced with energy-efficient, zero-carbon alternatives. These could include efficient electric cookers, and heating systems that use heat pumps powered by electricity or hydrogen.

- **Homes need to be insulated** to make them as 'energy efficient' as possible, so that they are easier to heat. This can be done through adding loft insulation, insulating walls, and installing high-efficiency glazing. New homes need to be built to very high standards of energy efficiency. Ventilation also needs to be considered properly to reduce heat losses, whilst maintaining good internal air quality.

- **Appliances in the home, such as TVs, computers, washing machines, dishwashers, fridges and other equipment, also need to be more efficient**, so they use less electricity.

- **Some equipment can be timed** to operate when there is a large amount of electricity available, for example at night. Fridges, washing machines, and some types of heating could be adjusted in this way.

- **People can make changes to the way they live in their homes**, including turning lights and appliances off. They can also reduce the temperature that their home is heated at and perhaps wear an extra jumper instead.

- **Electricity should be produced through zero-carbon means** (renewable energy or nuclear power) not through burning coal and gas. Some households may be able to generate their own renewable electricity, using solar panels, for example. *(Note that we are not addressing the question of solar panels in the 'In the home' theme. This will be looked at in the 'where our energy comes from' session in weekend four.)*

Taking these steps brings benefits to householders beyond reducing emissions. Homes that are better insulated will be cheaper to heat and typically more comfortable. Many people cannot currently afford to heat their homes properly and would benefit from better insulation. The health cost to the NHS of conditions which are made worse by cold and damp homes is currently estimated to be £1.4 – 2.0 billion per year in England alone. Spending £10 billion to improve all of the 'poor' housing in England has been estimated to pay for itself in just over seven years.[1,2] Shifting away from burning fossil fuels in the home will also make the air indoors cleaner, improving health.

Making these changes is not free. It will need investment, although energy-saving saves money in the long-term.

❖ What are the challenges in making these changes?

There are some difficult issues to be addressed in making these changes:

- The UK's housing is not very energy-efficient compared to some other European countries. We do not have a good record on building or maintaining energy-efficient houses – they are not as well insulated as some other countries. How can we get better at this?

- Older buildings (those that are more than a hundred years old – around 25% of all homes) are more difficult to insulate and heat. They need different treatment to newer buildings. This needs to be taken into account.

- There are lots of different views about the best zero-carbon heating systems. Many think that electric heat pumps are the best solution. Others think that switching from natural gas to hydrogen would be a good way of heating homes. Hydrogen can be generated using renewable energy (sometimes called 'green hydrogen'), or by stripping the carbon out of fossil gas and storing it as carbon dioxide (sometimes called 'blue hydrogen'). There is broad agreement that we will need different approaches in different places.

- People will have to make a number of complex and potentially expensive decisions about changing to different heating systems. These decisions will all vary and there won't always be a 'one size fits all' approach as it will depend on what you can afford and other things like the age and efficiency of your home, whether its a flat or a house, how you live in your home (social or private renters /homeowners /part own etc).

- There will be disruption while building work takes place in homes and streets. This could include changing boilers or installing new pipes. How can this work be done most efficiently support people to make the best decisions and also to minimise the disruption for people?

- Many changes, like improving energy efficiency, will save money in the long run. However there are costs in the short term. Who should pay for energy efficiency measures, and new equipment such as zero-carbon heating systems in the home? Should the government pay, through taxation? Should householders and landlords

[1] Nicol S. et al. (2015), The cost of poor housing to the NHS.
[2] The Academic – Practitioner Partnership (2016) Good Housing Better Health.

pay for improvements to their own houses? What if they cannot afford to, or don't want to pay?

❖ **How can these challenges be overcome?**

Speakers on the 'In the home' topic will suggest a wide range of options and strategies for reducing greenhouse gas emissions in the home. They include:

- **Using central government money to invest in energy efficiency in homes.** This money could be raised through taxes. It could be for all households, or just poorer households;

- **Giving responsibility to local government to co-ordinate reducing greenhouse gas emissions locally**. This could be through giving local government specific targets, additional funding from local taxation or central Government, and/or new planning powers.

- **Asking community organisations to provide energy efficiency and/or low carbon heating to householders.** Householders could pay for this themselves or it could be funded through taxation, loans, or community shares. Community shares are when people buy shares in a co-operative, which operates on behalf of the community and does not make a profit.

- **Requiring energy companies to pay for energy efficiency measures.** These costs would typically then be spread across all energy consumers through energy bills.

- **Passing and enforcing laws to ban heating systems that cause a lot of greenhouse gas emissions** by a certain date. This would include things like gas boilers.

- **Passing and enforcing laws to improve the energy efficiency of products** such as kitchen appliances and washing machines.

- **Passing laws requiring homes to meet a certain standard of energy efficiency** if they are going to be let to tenants, or sold. This would mean that you would have to insulate a home if you wanted to sell it, or let it out.

Many of these options are already in use, but not at the scale needed to get the UK to net zero emissions.

❖ **What will assembly members consider?**

Assembly members will consider this question:

What mix of market, local government-led and community action do we want to get our homes to zero-carbon?

This will include:

- How can we make our homes more energy efficient, and reduce demand for heat and electricity in the home?
- How can we move zero-carbon heating?

- What role could local authorities, community groups and businesses play?
- How can we make sure the changes are fair, and that people are protected?