



Challenges of our time – discussing solutions for future energy and sustainable homes

Buildings can be part of the solution

In Worksheet 1, you discovered why buildings are part of the climate problem. In Worksheet 2, you saw why changing them can create conflicts. Now it is time to focus on solutions. You will explore four sustainable building measures, become an expert on one solution and use evidence to develop realistic advice for a particular home.

PART A – What makes a home sustainable? ★

Imagine a sustainable home in 2035. What would you expect to see? Name three features of a sustainable home of the future.

PART B – Become an expert ★ ★

No single adviser can examine every option at the same time. In professional energy advice, information about different technologies has to be compared before a recommendation can be made.

Your class will now work as an energy-advisory team.

Each group becomes the expert on ONE sustainable building measure:

- Group 1 - Solar panels ☀
- Group 2 - Heat pumps 🔥
- Group 3 - Insulation 🏠
- Group 4 - Smart heating controls 🔑

Study your material and prepare a **60-second expert briefing**.

MATERIAL A1 - Solar panels ☀

Solar photovoltaic (PV) panels convert sunlight into electricity. The electricity can be used directly in the home, stored in a battery or exported to the electricity grid.

Solar generation depends on the amount of sunlight available. A home may therefore produce more electricity than it needs at some times but still need electricity from the grid at night or during periods with little sunlight.

Before recommending solar panels, an adviser would need to check: roof orientation, available roof space, shading and roof condition.

Material A1: Solar panels, based on [U.S. Department of Energy, Homeowner's Guide to Solar](#)



YouTube video:
How do solar panels
work for your home?

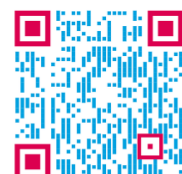
MATERIAL A2 - Heat pumps 🔥

Heat pumps transfer heat from the surrounding air, ground or water into a building. Because most of the heat is transferred rather than generated, heat pumps can be highly efficient. According to the IEA, a typical household heat pump can deliver around four units of heat for one unit of electricity used.

Their climate benefit increases as electricity becomes cleaner. However, installation costs, the heating system and the energy performance of the building must be considered.

Before recommending a heat pump, an adviser would need to check: the building's heat demand, insulation, radiators or underfloor heating and required flow temperature.

Material A2: Heat pumps, based on [International Energy Agency, The Future of Heat Pumps - How a heat pump works](#)



YouTube video: How
a heat pump works



MATERIAL A3 - Insulation 🏠

Insulation slows down heat transfer through the roof, walls and floors of a building. This reduces the amount of energy needed to keep a home warm. In older buildings, improving insulation and reducing unwanted air leakage can lower energy demand and improve comfort.

However, some parts of an existing building are easier to insulate than others, and major retrofit work can be expensive. Better insulation can also reduce the amount of heat that a new heating system has to provide.

Before recommending insulation, an adviser would need to check: where the building loses heat, the existing construction and the condition of the building envelope.



YouTube video:
Insulating the home

Material A3: Insulation, based on [U.S. Department of Energy, Energy-Efficient Home Improvement Credit: Insulation and Air-Sealing Essentials](#)

MATERIAL A4 - Smart heating controls 🔑

Smart heating controls help households control when and where their home is heated. Some systems can be controlled remotely, learn household routines or automatically adjust heating to avoid unnecessary energy use.

They can improve comfort and help reduce wasted energy. However, the benefit depends on the existing heating system, correct settings and how people use the controls.

Before recommending smart heating controls, an adviser would need to check: the existing heating system and controls, compatibility and the household's heating habits.



YouTube video: How
does a thermostat
control the temperature
in a smart home

Material A4: Smart heating controls, based on [Energy Saving Trust, Heating controls](#)

PART C – Compare the solutions ★ ★

You now know ONE solution in detail. But an energy adviser cannot recommend a measure without comparing it with the alternatives.

The other members of your energy-advisory team hold the missing pieces.

Listen carefully to the four other expert briefings and build the overview your team needs for the final consultation.

1. BUILD YOUR OWN COMPARISON GRID

Complete the grid while you listen to the other expert briefings.

Solution	How it works	Main benefit	Limitation	What should an adviser check?
Solar panels				
Heat pump				
Insulation				
Smart heating controls				

2. MAKE A FIRST ASSESSMENT

Based only on the expert briefings, rate each solution from 1 (less promising) to 5 (very promising) for an older detached house.

Important: These are only preliminary ratings. A professional recommendation requires information about the actual building.



PART D – Return to the Miller family – the consultation ★ ★ ★

You have compared four possible solutions. But your ratings were only a first assessment.

Good energy advice does not ask: "Which technology is best?" It asks: "Which technology fits this building?"

1. PREPARE YOUR CONSULTATION

Use the comparison grid from Part C and the key facts about the Miller family.

Prepare your advice below. Use evidence from the materials, not only your personal opinion.

THE MILLER FAMILY - KEY FACTS

1985 HOUSE + POOR INSULATION + OLD GAS HEATING + SOLAR-SUITABLE ROOF + £25,000 BUDGET

The family wants a reliable, comfortable and more sustainable home, but cannot implement every possible improvement at once.

YOUR CONSULTATION PLAN

1. First priority: Which measure should happen first? Explain why it is the most urgent or useful next step for the Miller family.
2. Second priority: Which measure should be considered next? Explain how it could support the first priority. |
3. A measure that can wait: Which measure would you not prioritise at this stage? Explain why.
4. Two on-site checks: What would you need to check before making a final technical recommendation? Explain why these checks matter.
5. One cost or funding issue: Identify one question about costs, the £25,000 budget or possible funding that the family would need to clarify.

2. THE CONSULTATION

Imagine the following scenario: You are a qualified energy adviser from the chimney sweeping trade. The Miller family asks: "What should we do first - and why?"

Use your consultation plan. Then work in pairs. Student A is the chimney sweeper/qualified energy adviser; Student B is a member of the Miller family.

Conduct the consultation for 2-3 minutes. The homeowner should ask at least one follow-up question. Then switch roles or compare two different recommendations.

Your advice must:

- recommend TWO priorities,
- explain why these measures fit this particular building,
- explain how the two measures could work together,
- refer to evidence from at least TWO authentic sources,
- address at least one limitation or cost issue,
- explain why at least one other measure is not a priority now, and
- identify one thing you would need to check on site before making a final technical recommendation.

Useful language:

- Based on the condition of your house, I would recommend ...
- The first step should be ... because ...
- These two measures could work together because ...
- According to the source, ...
- One important advantage is ...
- You should also be aware that ...
- I would not prioritise ... at this stage because ...
- Within your budget, a realistic approach would be ...



3. CLIENT FEEDBACK

As the homeowner, give your adviser brief feedback. Focus on the following points and illustrate them with examples from the consultation:

- Was the recommendation clear?
- Was it realistic for the house and budget?
- Did the adviser explain both benefits and limitations?
- Which argument was most convincing?

PART E – Reflection ★ ★ ★

Across the three worksheets, your professional role has developed:

WORKSHEET 1 – OBSERVE → WORKSHEET 2 – ADVISE → WORKSHEET 3 – HELP SOLVE PROBLEMS

You have moved from understanding the problem to using evidence to develop a realistic solution for a particular building.

Now answer one final question, combining everything you've learned in the last lessons:



Which combination of measures makes sense for a particular building?

Write 80-100 words. Do not simply list technologies. Explain:

- why there is no single best solution for every building,
- why measures should be considered as a system,
- why the building and household must be assessed first, and
- what role professional energy advice can play