

Housing Energy
Efficiency Programme
(HEEP)

Why the Programme?

Roughly 28% of UK greenhouse gas emissions come from domestic sources

Domestic property emits over 140million tons of CO2 a year across the UK

In Wiltshire, homes produce approximately 800,000 tons of CO2 a year or around 4 tons per property

To Reduce the amount of CO2 produced across our stock by 15,000 tons

EPC B pledge

To help reduce fuel poverty

What are we doing?

Completed work to 90 properties with funding from central government

Running a programme of retrofit through the voids process (where time and resource constraints allow)

Running a programme of retrofit on around 800 properties with current Air Source Heat Pumps, and the other properties on the street with the already completed properties

Once completed we will move onto a programme focussing on areas with low rated energy performance certificate (EPC) properties and ensuring all our properties can reach an EPC B.

Plan is for all properties to be completed by 2030

5 Stages of domestic retrofit

1. Bring the building fabric into good repair (deal with damp, etc).

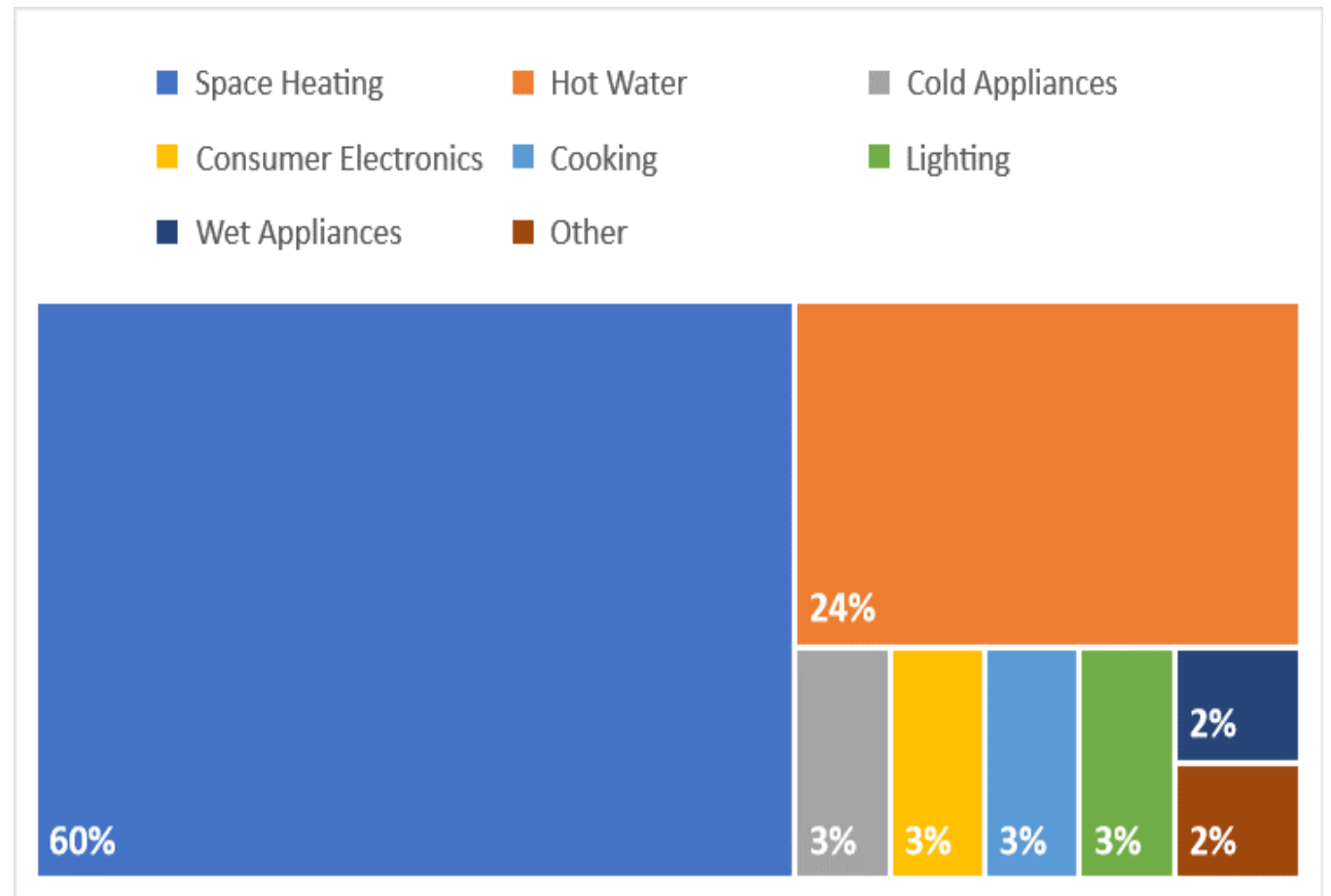
2. Reduce current energy consumption (install LED lighting and low energy appliances, etc).

3. Improve the building fabric (insulation, new windows, doors and ventilation)

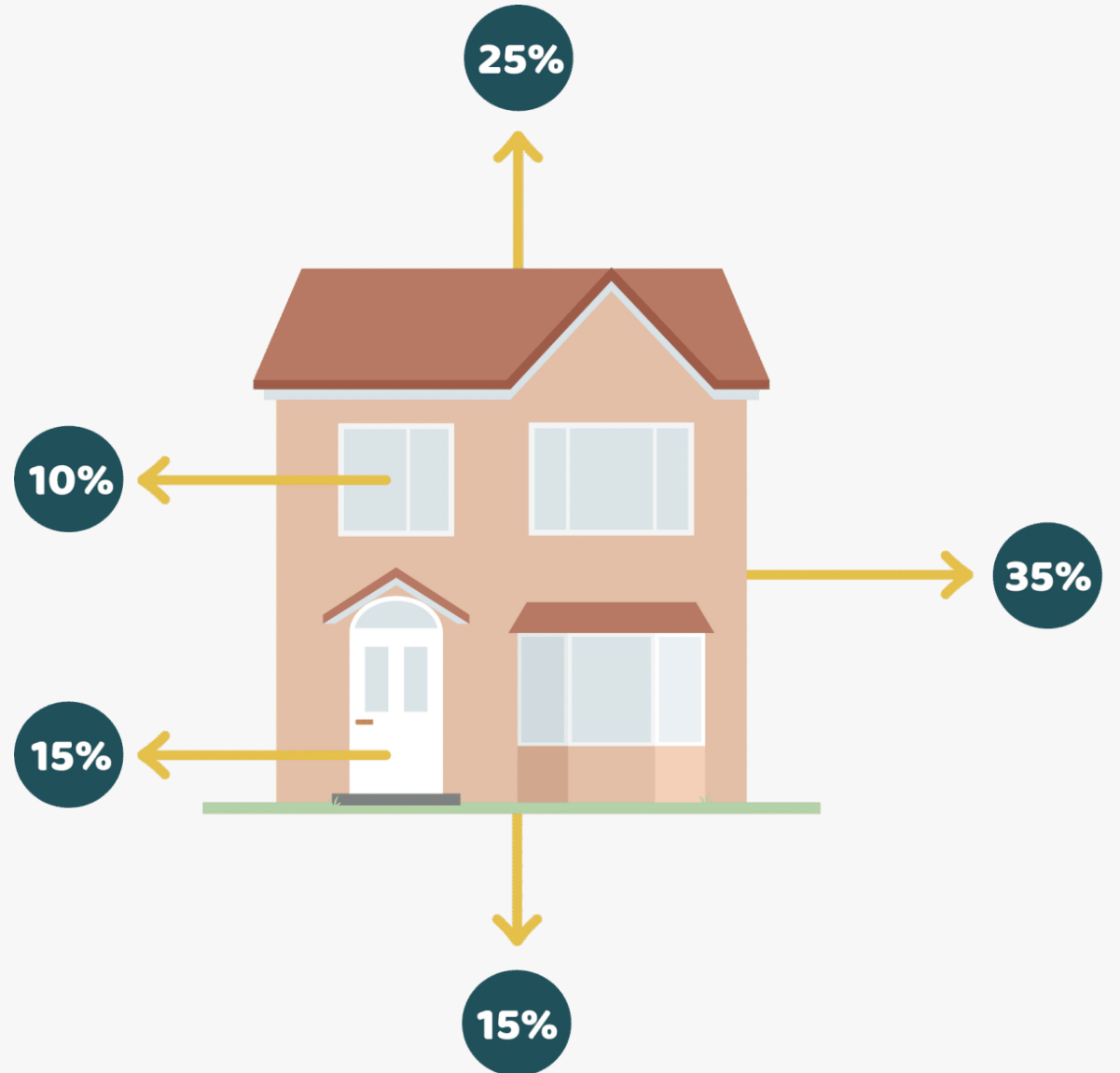
4. Redesign and install new heating and hot water sources with good controls (shouldn't need to be as large now)

5. Install low and zero carbon technologies (e.g. PV panels)

Energy usage - Typical poorly insulated property



Heat losses
from a typical
uninsulated
property



Reducing Heat Losses

Replacing Windows and Doors with high efficiency replacements

Installing Insulation

Floor, Loft, Wall

Wall Insulation Hierarchy

1. Cavity
2. External
3. Internal

Will reduce the amount of demand for heating by reducing the amount of losses

By adding insulation we are sealing the property, so we must make sure we have appropriate ventilation

Window trickle vents (open)

Internal door undercuts (a pen fitting under doors)

Extract ventilation in wet rooms (Kitchen and Bathroom)

Purge ventilation in all habitable rooms (openable windows)

Potential Positive Input Ventilation (PIV) system - to push moisture through the property and out of extract fans and trickle vents

Heating - Air Source Heat Pumps (ASHP)

Works in the opposite way to a fridge

Pumps water around radiators at 45-50°C

Weather dispensation (hotter water temp when colder outside)

Aiming for efficiencies of around 300% over the year

No carbon emissions at property

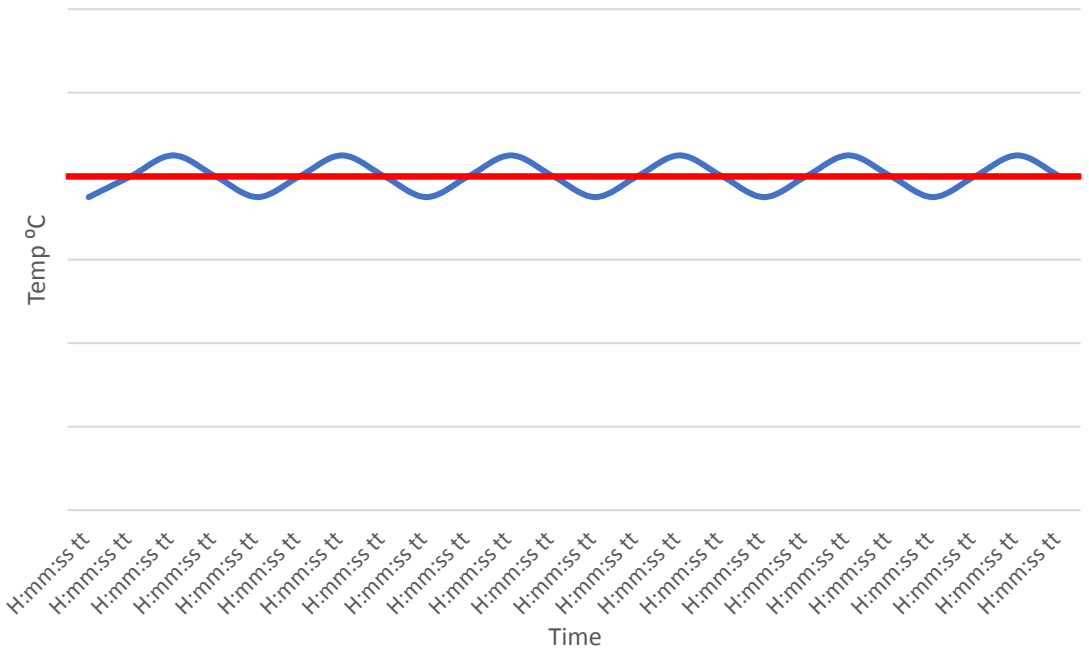
Simple to use (set comfortable temperature and leave on)

Works most efficiently when left on

ASHP Vs Conventional Boiler

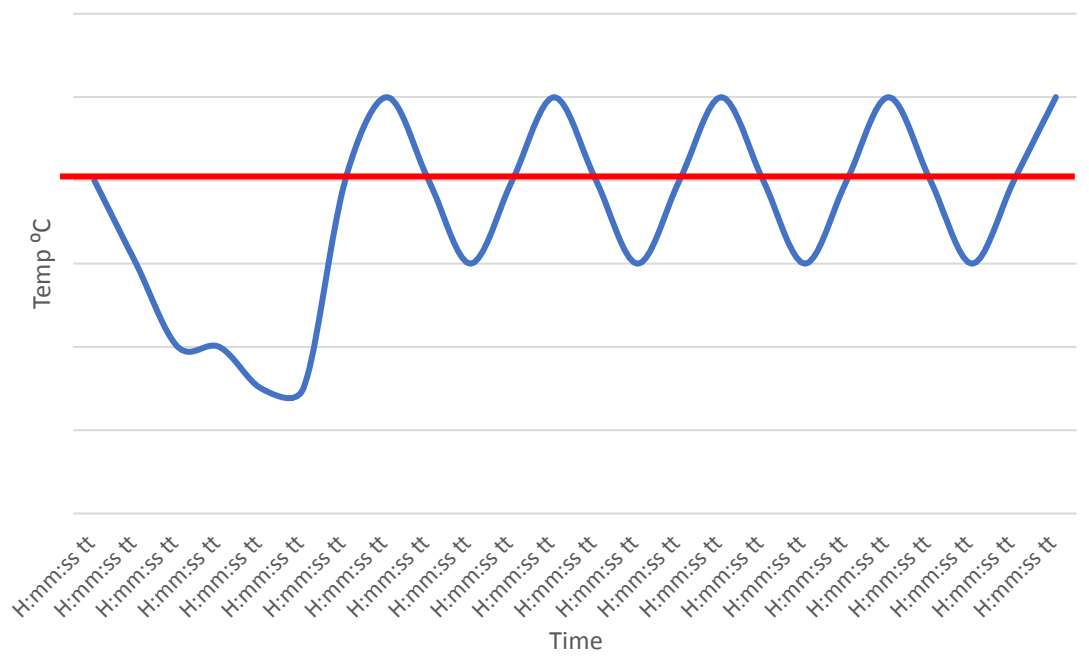
ASHP - Temperature more even throughout day

Temperature of property over day - temperature control
(- desired temperature)



Conventional Boiler - Temperature fluctuates more during day

Temperature of property over day - timer control
(- desired temperature)



Heating - Quantum

High Heat Retention Storage Heaters
– less unwanted heat loss

Works from Economy 7 electricity
rates (cheaper night-time energy)

Heats storage blocks over night for
heat to be released during the day

Controllable with in built timers and
thermostats

More efficient and controllable than
older model storage heaters

Hot Water – Mixergy Smart Cylinders

Learns over time properties hot water demand – With internet connection

Only heats water needed – not whole cylinder

Linked to solar panels to create hot water from the sun

Can boost for extra hot water if needed

More efficient and can have smaller cylinders

Electrical generation – Photovoltaic (PV) panels

To reduce property electrical consumption from the main grid

Will generate all year and from any direction – less efficient when overcast and sun is not shining directly on panels

Supplies about 1/3 of electric demand over a year (does vary, not guaranteed)

About 1/3 of energy generated is used by the house (can vary depending on demand in property and size of array)

Powers house, then heats hot water in cylinder (with a solar divertor), and rest is then sent back to the grid

We are looking at being able to collect Smart Export Guarantee (SEG) payments, tenants may need smart meters, to fund future works and support tenants in hardship