

'CUTTING COSTS AND CUTTING CARBON IN THE HOME'

A special event for Chichester District homeowners
Organised by Chichester DC



Chichester college 29.11.21

Paul Ciniglio, Refurbishment Lead - National Energy Foundation



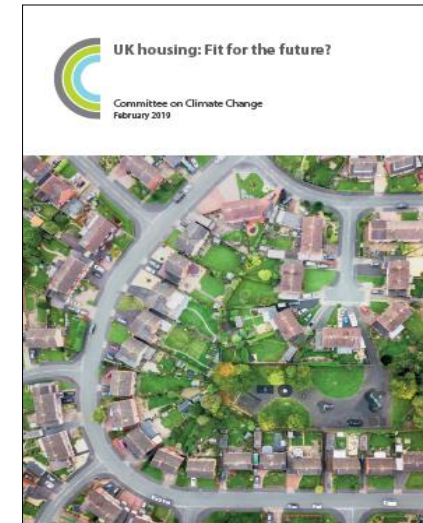
PRESENTATION OVERVIEW

1. Introduction and NEF
2. The UK retrofit challenge in context
3. Government 'Clean Growth strategy'
4. 'Retrofitting dwellings for improved energy efficiency' (BSI PAS 2035)
5. Contractors and installers (PAS 2030, MCS & Trustmark)
6. The 'SuperHomes' network and Rating Scheme
7. Typical homeowner retrofit journey (SuperHomes)
8. Energy hierarchy
9. Key renewable energy technologies
10. Retrofit case studies – 'hard to treat' examples



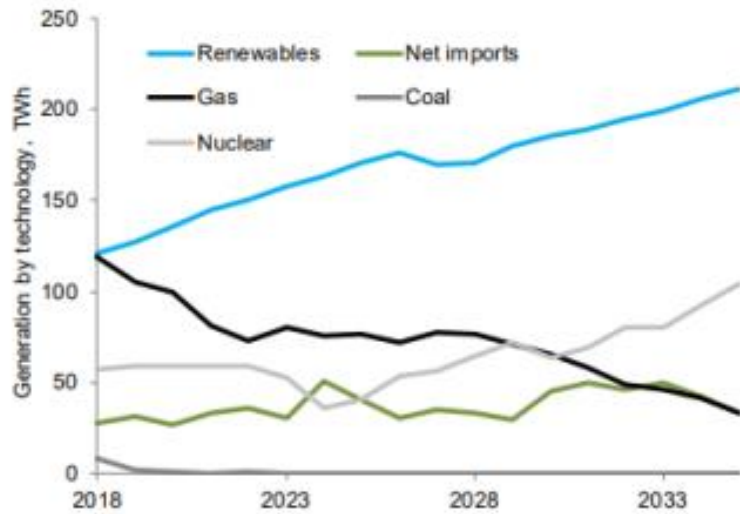
THE RETROFIT CONTEXT IN UK

- 29 million existing homes
- ~14% of UK emissions (Committee on Climate Change - until recently 27%)
- ~85% of extg homes still be in occupation at 2050 (new build housing adding less than 0.01% pa to stock)
- ~1 million deep retrofits each year needed until 2050! (COP26)
- Voluntary action or legislation? (Building Regulations, MEES)
- EPC band 'C' 2030, EPC band 'A/B' by 2050? ('hard to treat homes'?)
- Energy supply price increases (affordable warmth & fuel poverty)
- Co-benefits or retrofit e.g. health, jobs, disposable income etc
- Need for a national retrofit strategy?



'CLEAN GROWTH STRATEGY' – AN ELECTRIC FUTURE

UK energy supply projections



Source: Energy and Emissions Projections 2018 (BEIS)

Gas replacement boilers to be phased out:

- New homes 2025
- Existing homes from 2035

Hydrogen??

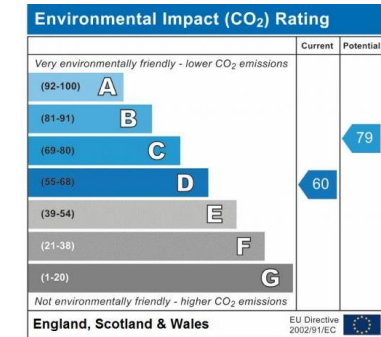
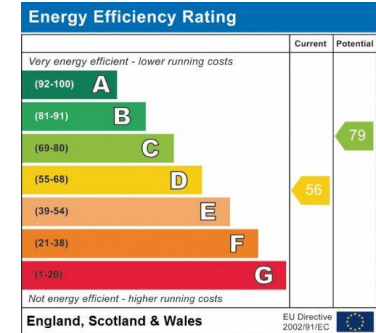
New carbon factors

Fuel	CO ₂ (SAP 2012)	CO ₂ (SAP 10.1)
Mains Gas	0.216	0.21 (-5%)
Oil	0.298	0.298 (0%)
LPG	0.241	0.241 (0%)
Electric	0.519	0.136 (-73%)
Electric sold to grid	0.519	0.136 (-73%)
Wood Logs	0.019	0.028 (+53%)

NB: Electricity running costs!

WHERE TO BEGIN?

Homeowner motivation to retrofit? What are the aspirations? Who can help me achieve? Budget?



BSI PAS 2035

'Retrofitting dwellings for improved energy efficiency'

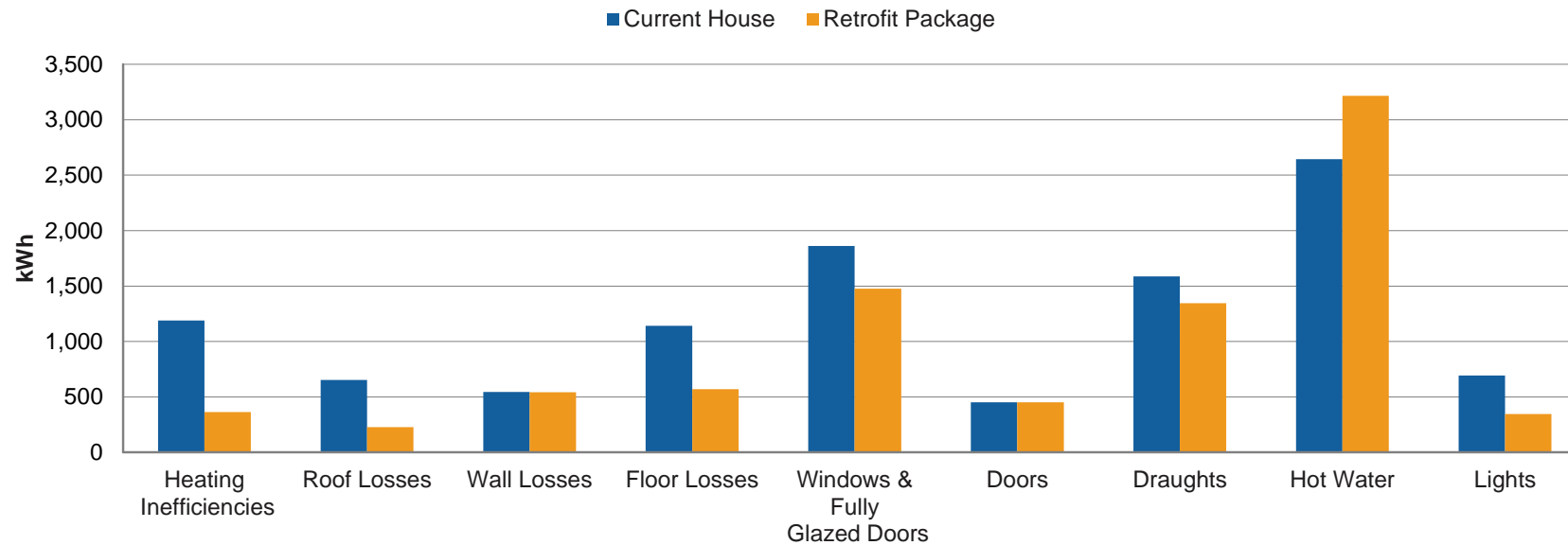
- A retrofit standards and methodology framework
- New professional roles e.g. Retrofit Coordinators (level 5 diploma)
- Whole House Retrofit Plan ('medium term improvement plan')
- Considers all viable retrofit measures for the home and their benefits at draft plan stage (e.g. running cost and emissions reductions; installation costs & projected payback periods)
- Final plan agreed with homeowner in dialogue with Coordinator
- Order of retrofitting (incrementally / phased or single operation retrofit)
- Risk assessment (risk pathway determined and ventilation assessment)
- Plan is very much a detailed option appraisal
- It is not the full retrofit design and specification (other roles e.g. Retrofit Designer).



Extract from a Whole House Retrofit Plan

Comparison	Energy Rating	Fuel Bills	tCO ₂	kWh/m ²
Before	72 C	£580	2.32	78.01
After	91 B	£150	1.27	57.68

Your potential energy use after your retrofit



CONTRACTORS AND INSTALLERS

- Trustmark
 - Gov endorsed quality, installers vetted for consumer protection
- PAS 2030 accreditation
 - Provides a robust, uniform industry specification for energy efficiency installers,
 - Helps demonstrate customer requirements are satisfied,
 - Required for energy efficiency measures funded under Gov initiatives such as ECO and LAD e.g. solid wall insulation.
- MCS (Microgeneration Certification Scheme)
 - For domestic renewables such as Heat Pumps and Solar
- PAS 2030, 2035 and MCS are inter linked
- Always check grant funding requirements!



HOME ENERGY EFFICIENCY

**PAS 2030
CERTIFIED**

Approved Installer



Microgeneration
Certification Scheme



SUPERHOMES - HISTORY



- Started in 2007
- A SuperHome was retrofitted to reduce CO₂ emissions by at least 60%.
- 222 homes reached SuperHome status
- Accessible to the public to learn and be inspired by their peers
- Largely dormant for the last couple of years



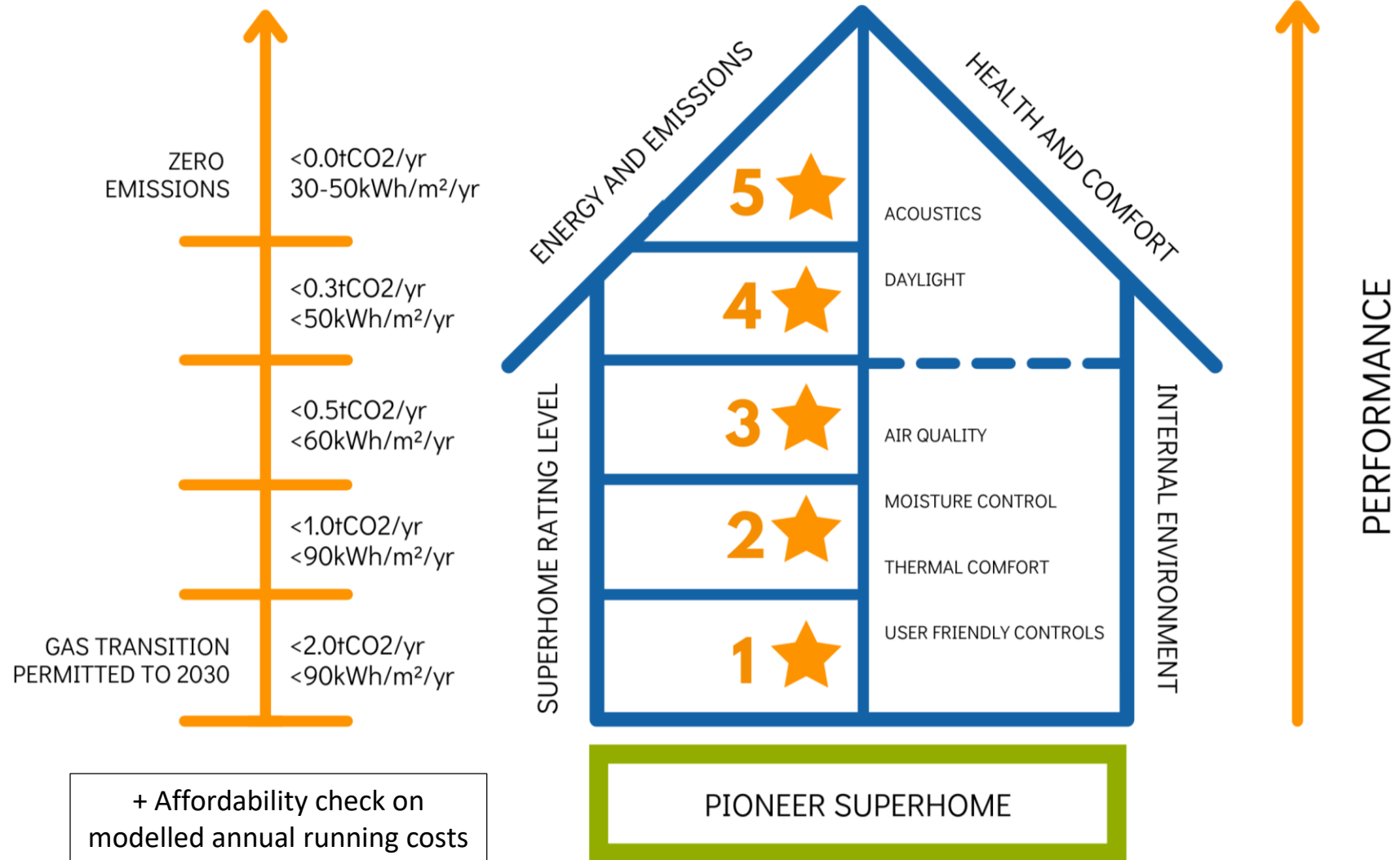
OUR AMBITION

Our ambition is to:

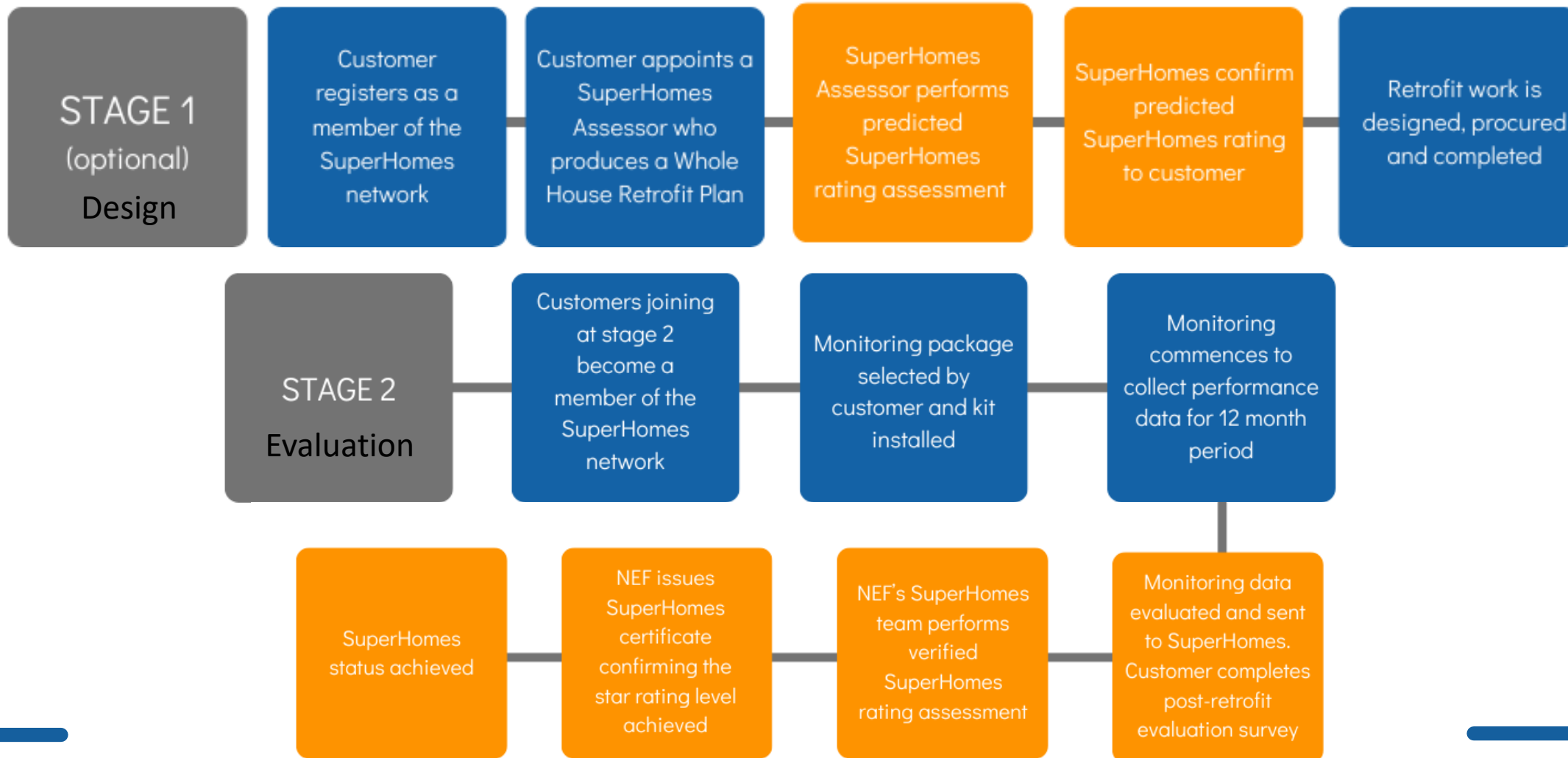
- Encourage net zero retrofits
- Share best practice through SuperHomes Network membership
- Evidence the link between property value and retrofit
- Work with lenders on financing retrofit
- Reach one million SuperHomes by 2030
- For membership enquiries visit www.superhomes.org.uk (£50 year 1)



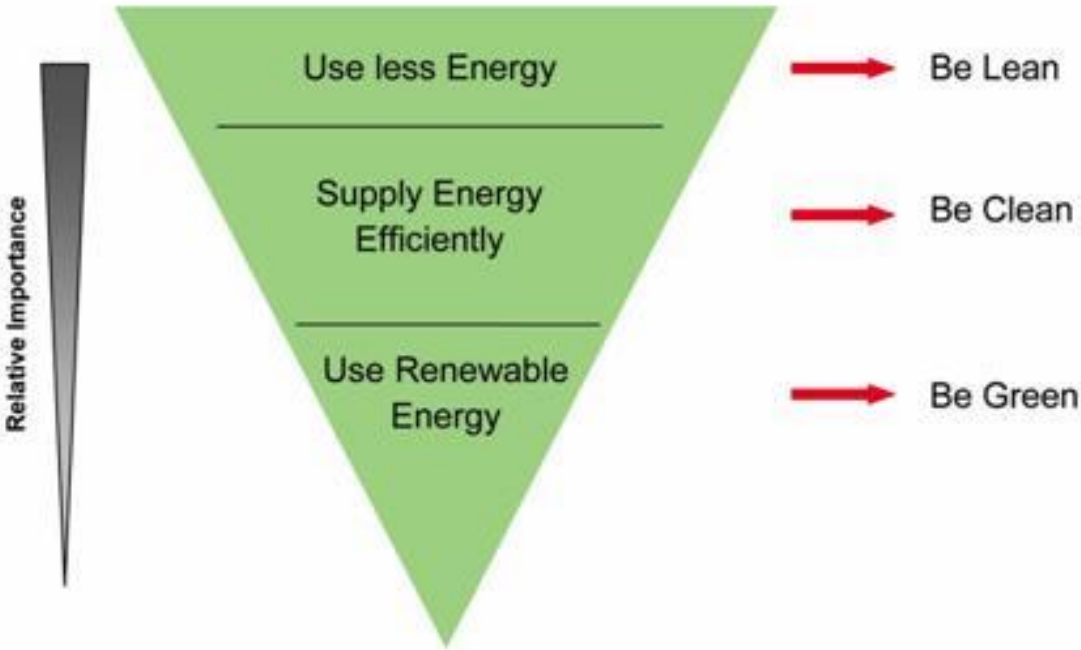
SUPERHOMES RATING SCHEME



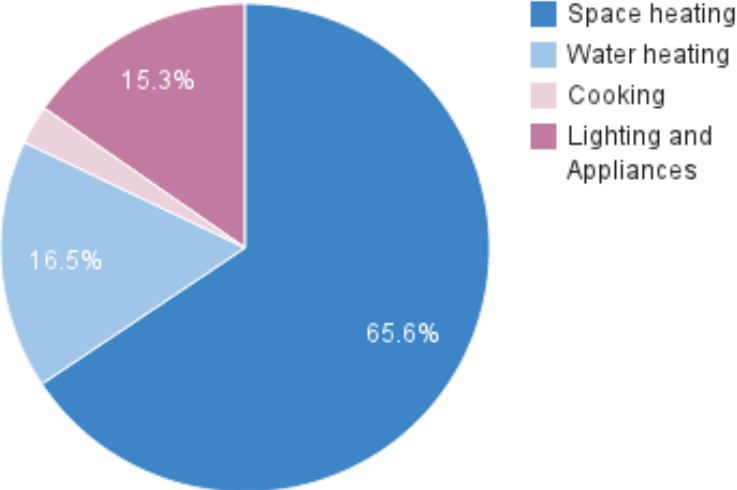
Typical customer retrofit journey



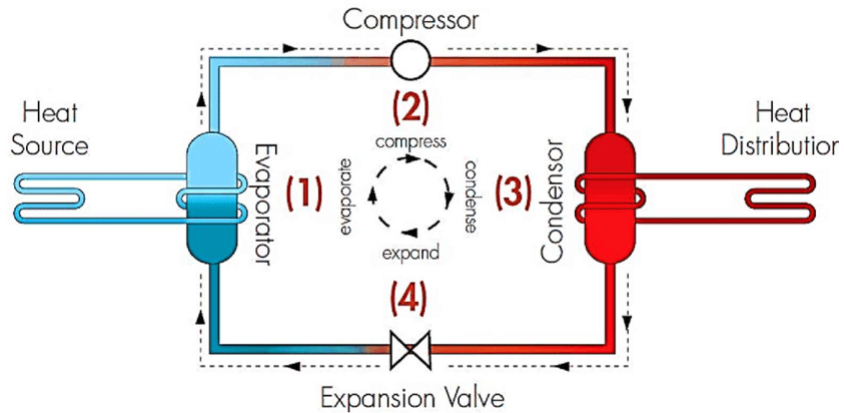
THE ENERGY DESIGN HIERARCHY



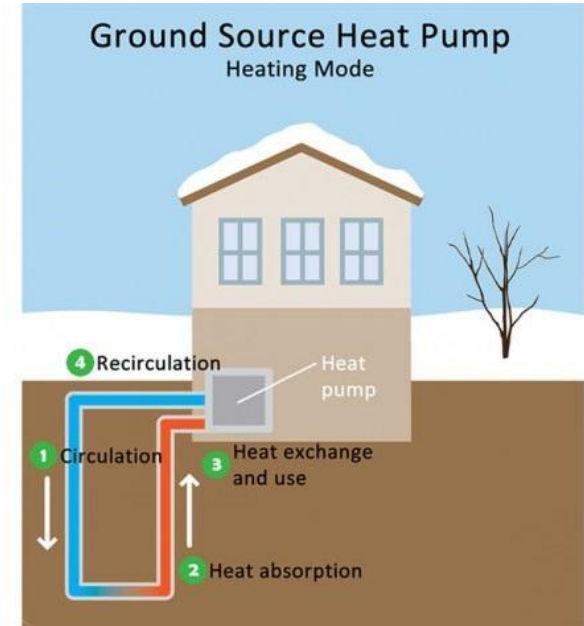
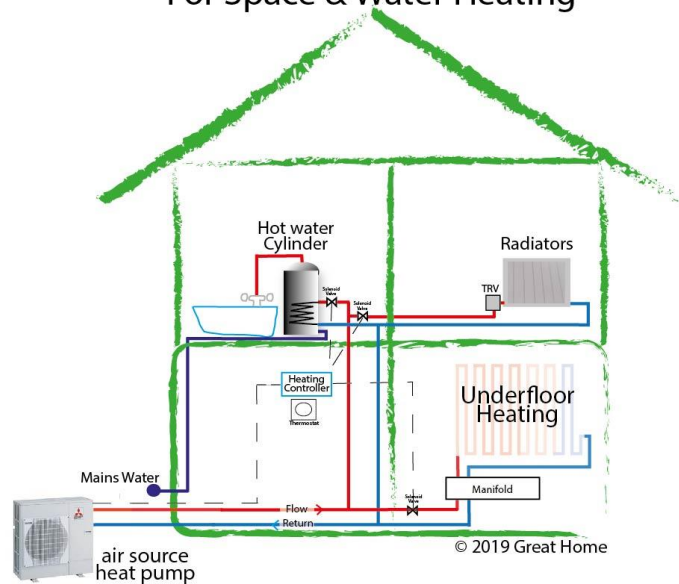
Typical energy consumption in a UK home



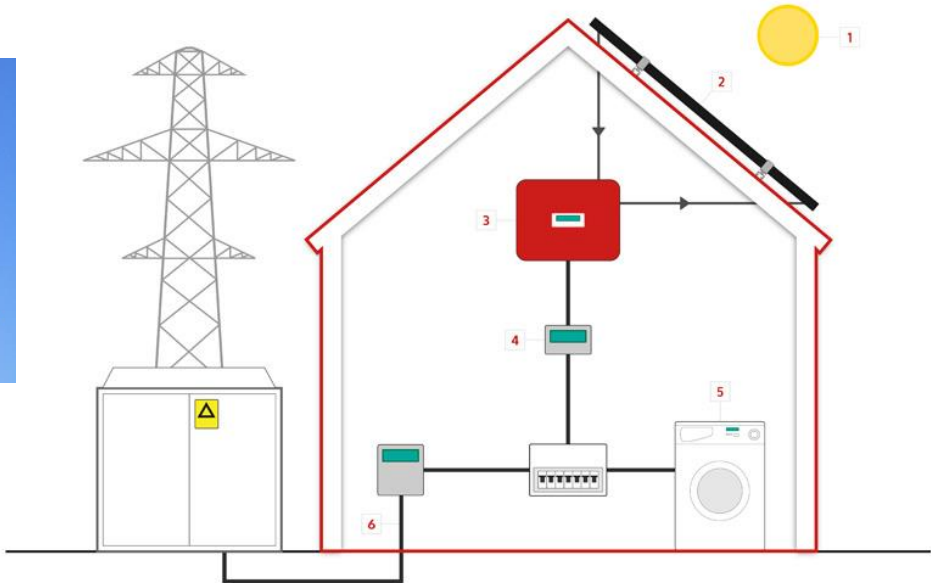
HEAT PUMPS



Air Source Heat Pump System For Space & Water Heating



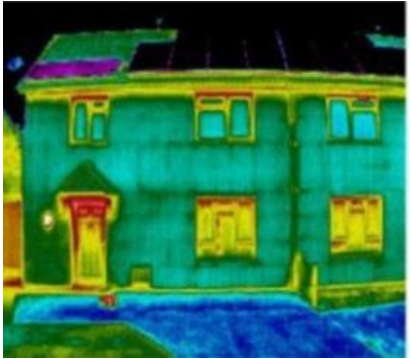
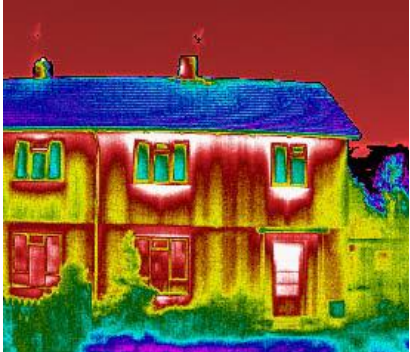
SOLAR PV (Photovoltaics)



- 1 Light**
The sun gives off light, even on cloudy days
- 2 The panels**
PV cells on the panels turn the light into DC electricity
- 3 The inverter**
The current flows into an inverter, which converts it to AC electricity ready to use
- 4 The electricity**
The current is fed through a meter and then into your home's consumer unit
- 5 Powering the home**
Plug in and switch on. Your system will automatically use the free electricity you've generated, then switch back to the grid as needed
- 6 The National Grid**
Any electricity you don't use is exported to the grid for others to use.



RETROFIT CASE STUDIES - #1 Petersfield



CASE STUDY #2 Stroud



- My home - retrofitted in 2009
- Part of SuperHomes network
- Cost: £30,000 for energy efficiency related works.
- Year 1 & 2 feedback on my home.
- Over 500 visitors, many taking action!
- Total emissions = 545kg year 1, 270kg yr 2.
- Running costs = £319 year 1, £274 yr 2.
- ASHP £230 year 1, £190 yr 2.
- Credit with FIT income +£511 year 1, + £658 yr 2. 😊
- Water consumption 68 l/p/d.



CASE STUDY - #3 Bramdean (Swedish Homes)



CASE STUDY #4 & #5– Camden



RETROFIT CASE STUDIES - #5 Nottingham



EnergieSprong, Nottingham



THANK YOU

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