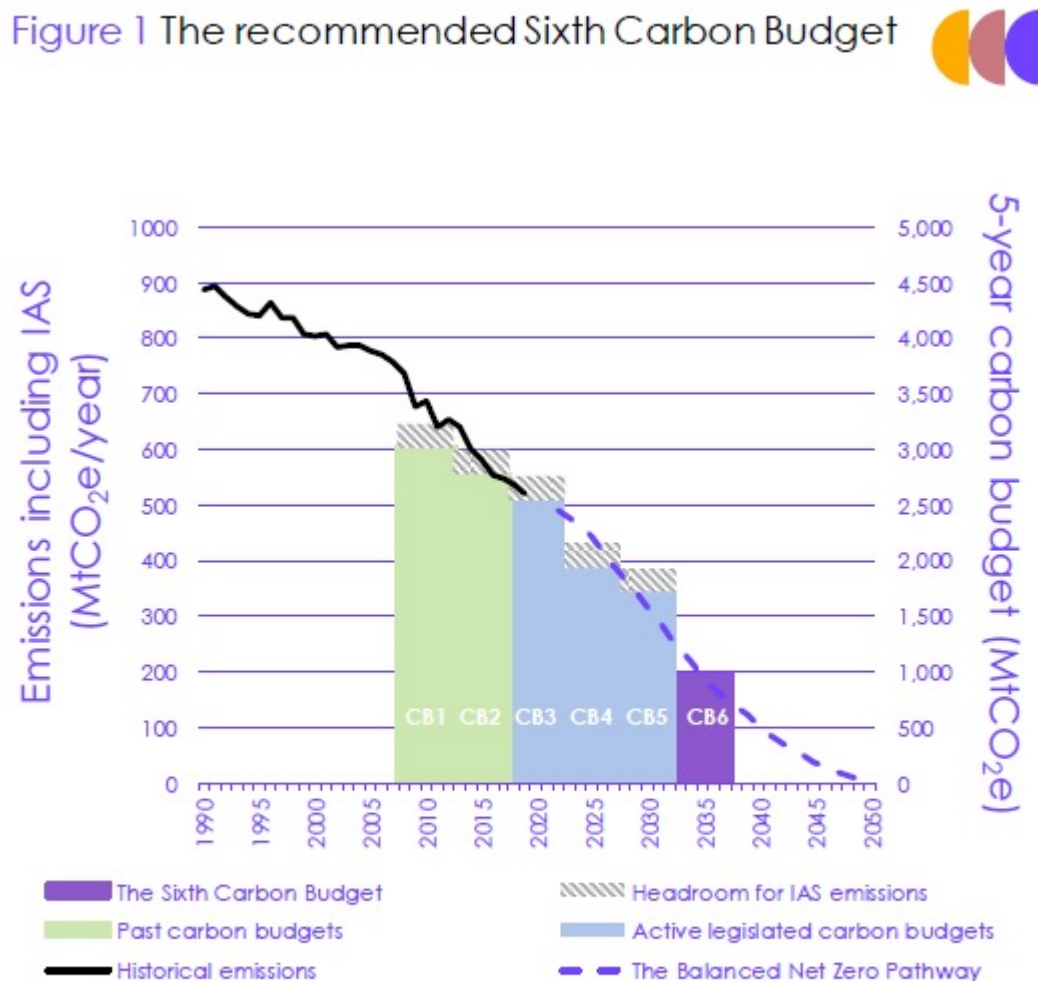




NET ZERO TRANSITION

Transition to Net Zero

Figure 1 The recommended Sixth Carbon Budget



Source: BEIS (2020) Provisional UK greenhouse gas emissions national statistics 2019; CCC analysis

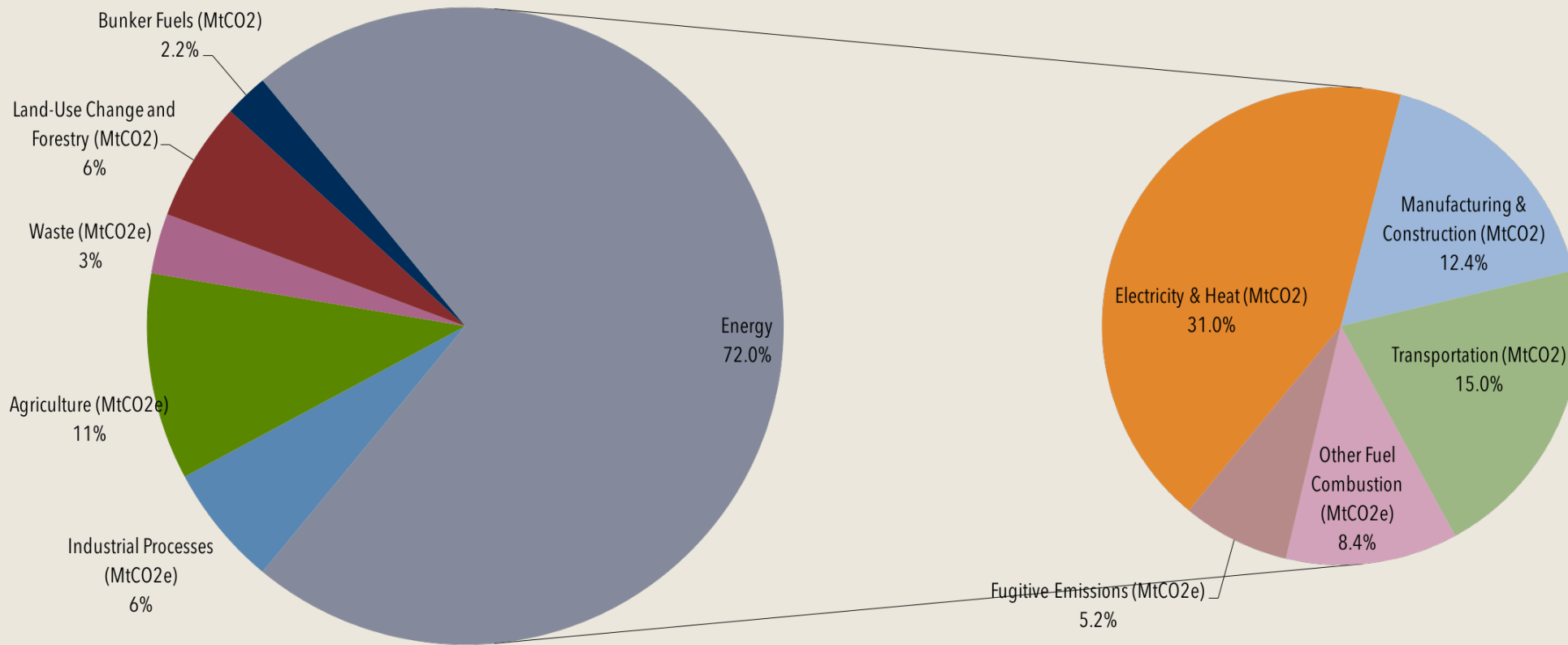
Notes: Emissions shown include emissions from international aviation and shipping (IAS) and on an AR5 basis, including peatlands. Adjustments for IAS emissions to carbon budgets 1-3 based on historical IAS emissions data; adjustments to carbon budgets 4-5 based on IAS emissions under the Balanced Net Zero Pathway.

- “More than ever before, future emissions reductions will require people to be actively involved”
- People need help to make low carbon choices on:
 - *travel*
 - *heating*
 - *energy consumption*
 - *food*
 - *involvement in decision-making*
 - *Fairness*

Committee on Climate Change
December 2020

Energy & Carbon Emissions

Globally, energy consumption produces the vast majority of carbon emissions

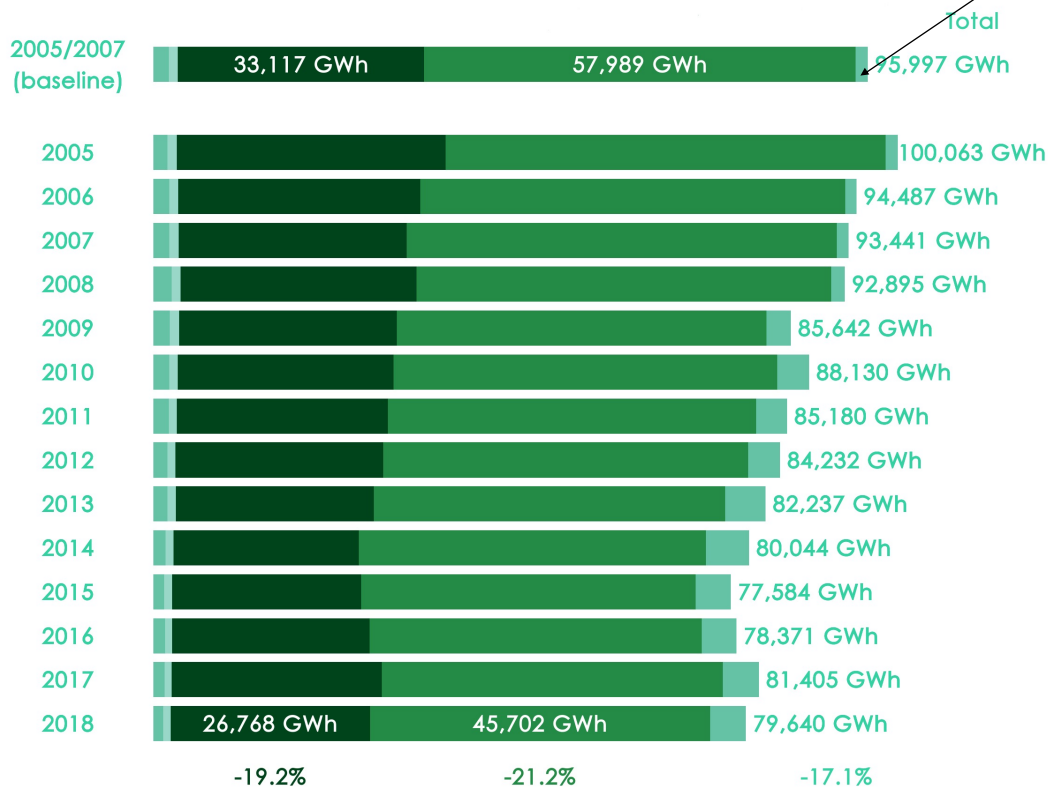


This means energy must be at the heart of any solution

Biggest Challenges - HEAT?

Non-electrical heat demand by fuel

Scotland, 2005 - 2018



Source: BEIS

Bioenergy, coal & other manufactured products

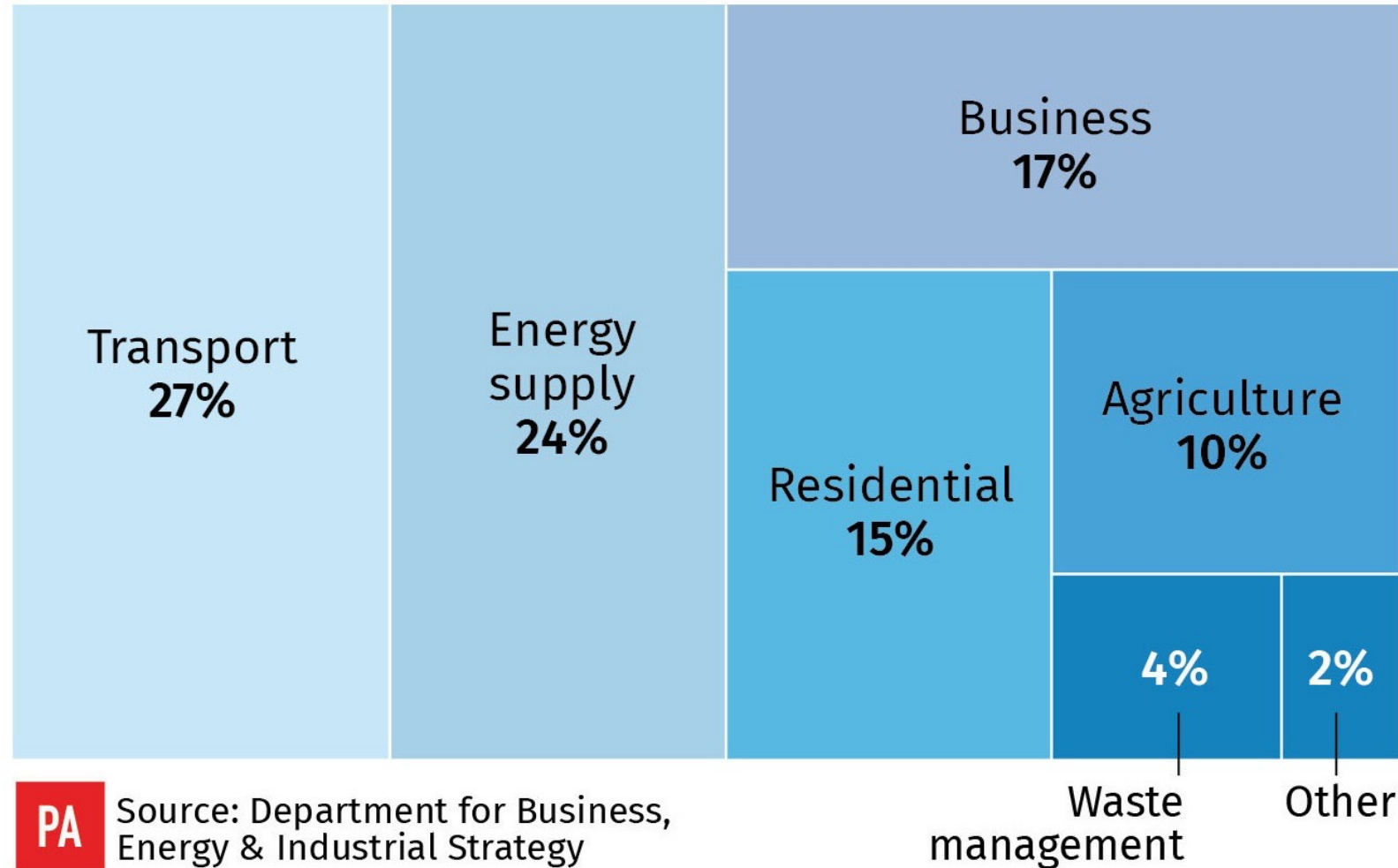
- The transition to renewable electricity is nearly complete: in 2020, 97% of Scotland's electricity demand was met by renewables.

Heat:

- In Scotland, heat is the largest single source of our carbon emissions (47%)
- Natural gas is still the main source of heat for both domestic and commercial use across the UK.
- In 2018, natural gas satisfied 57% of Scottish non-electrical heat demand and petroleum products accounted for 34%.

Biggest Challenges - TRANSPORT?

Greenhouse gas emissions in the UK 2017



Other challenges...

- **High cost of new technologies:**
 - *Heat pumps, electric vehicles, battery storage*
 - *Exacerbated by subsidy cuts e.g. removal of Feed-In Tariffs*
- **Heat & Transport:**
 - *Transitioning to electric vehicles and electric heat systems will put huge pressure on the grid*
- **Inadequate supply chain/skilled labour**
- **Lack of awareness among general public of new technologies/required behaviour change**

How do we address these challenges?

■ Reduce our demand:

- *In terms of heat this means more energy efficient buildings*
- *New builds built to higher standards*
- *Older buildings improved via retrofit measures*

What does that look like?

- *Draught proofing & insulation*
- *Heating system upgrade- newer, more efficient model*
- *Fit better, smarter controls to make existing systems more efficient*
- *Avoid over-heating spaces that do not need to be heated or are used infrequently*

How do we address these challenges?

- Reduce our demand - for transport this means:
 - *fewer private cars on the road*
 - *increased use of public transport*
 - *increased use of car sharing/car clubs/cycling and other green forms of travel*



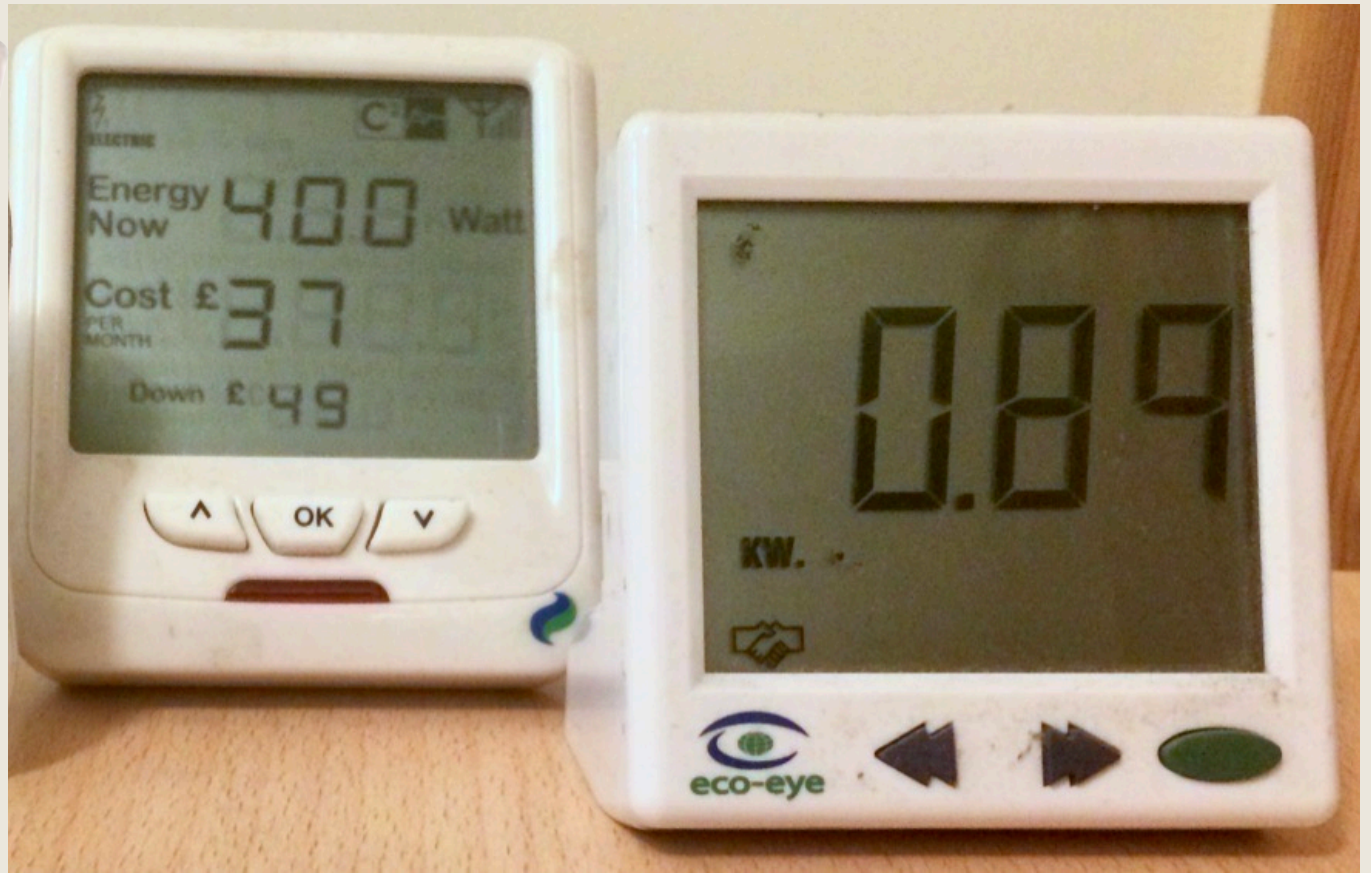
THE FUTURE HOME

What will it look like?



- Buildings will have a 'smart meter' and digital display which shows how much electricity you are using in real time in both kilowatt hours and in pounds and pence.
- Many appliances in our homes will also be 'smart' which means they will be controlled and monitored remotely and programmed to perform specific tasks at certain times.

What will it look like?



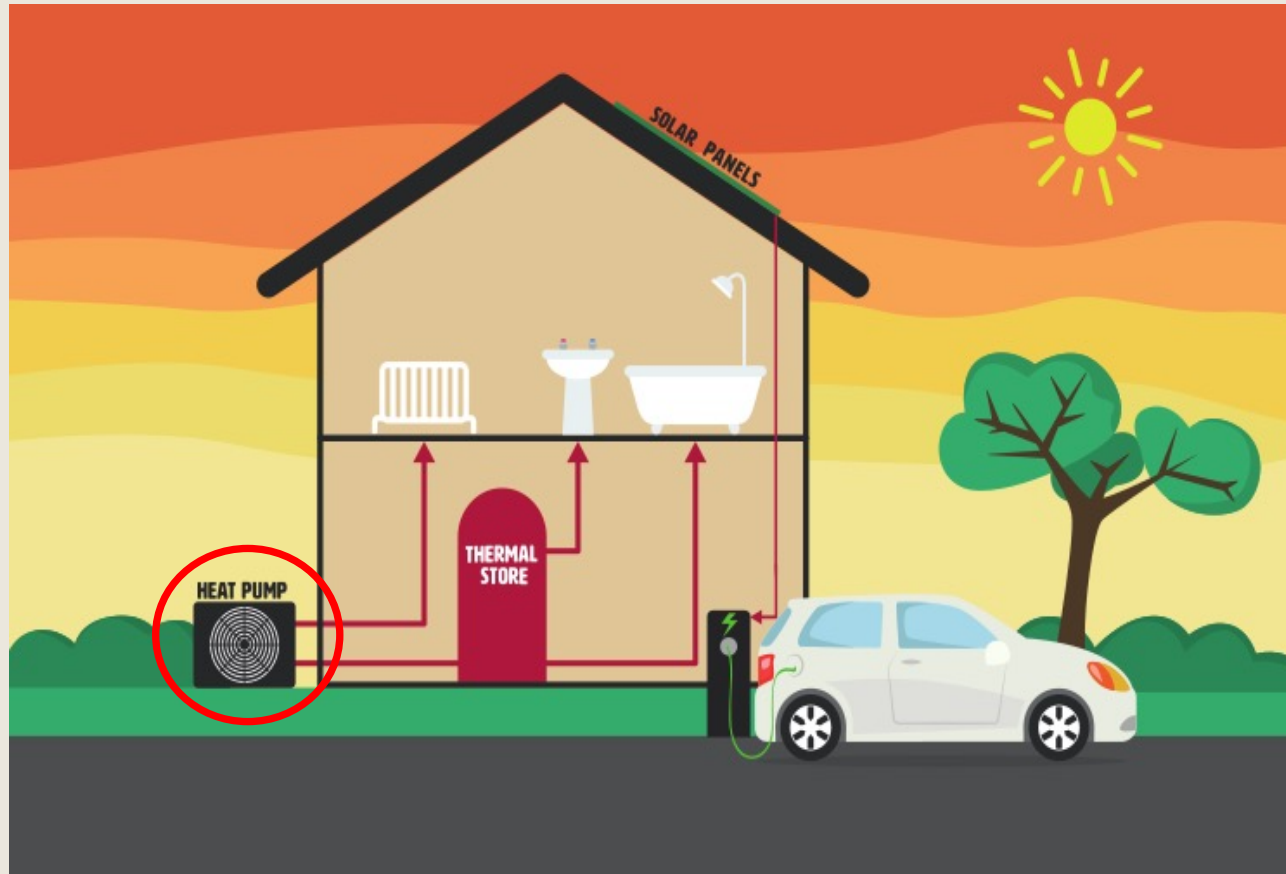
- Some of us already have appliances which are semi-smart e.g. most heating systems include a basic timer which allows us to set when the heat comes on and for how long. In 2030, many of us will have heating systems with smart thermostats which will be programmed to switch on and off when the outside temperature reaches a predetermined point.

What will it look like?



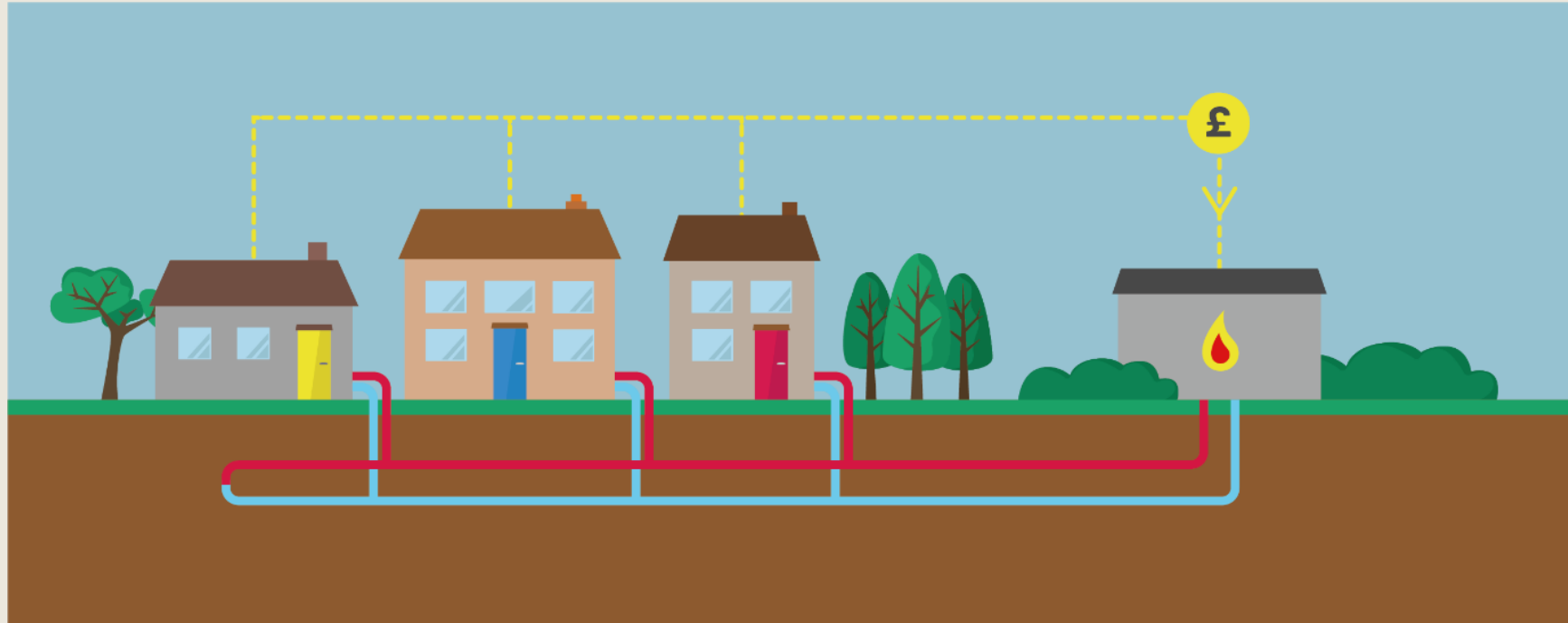
- Many buildings, particularly those with south or south east facing roofs, will have solar panels (thermal/PV)
- These will generate electricity or heat when the sun is shining for immediate use or to be stored within batteries/water tanks.
- Electricity from solar PVs can be used to power not only lights and appliances but also the heat pumps which heat our homes, and electric vehicles.

What will it look like?



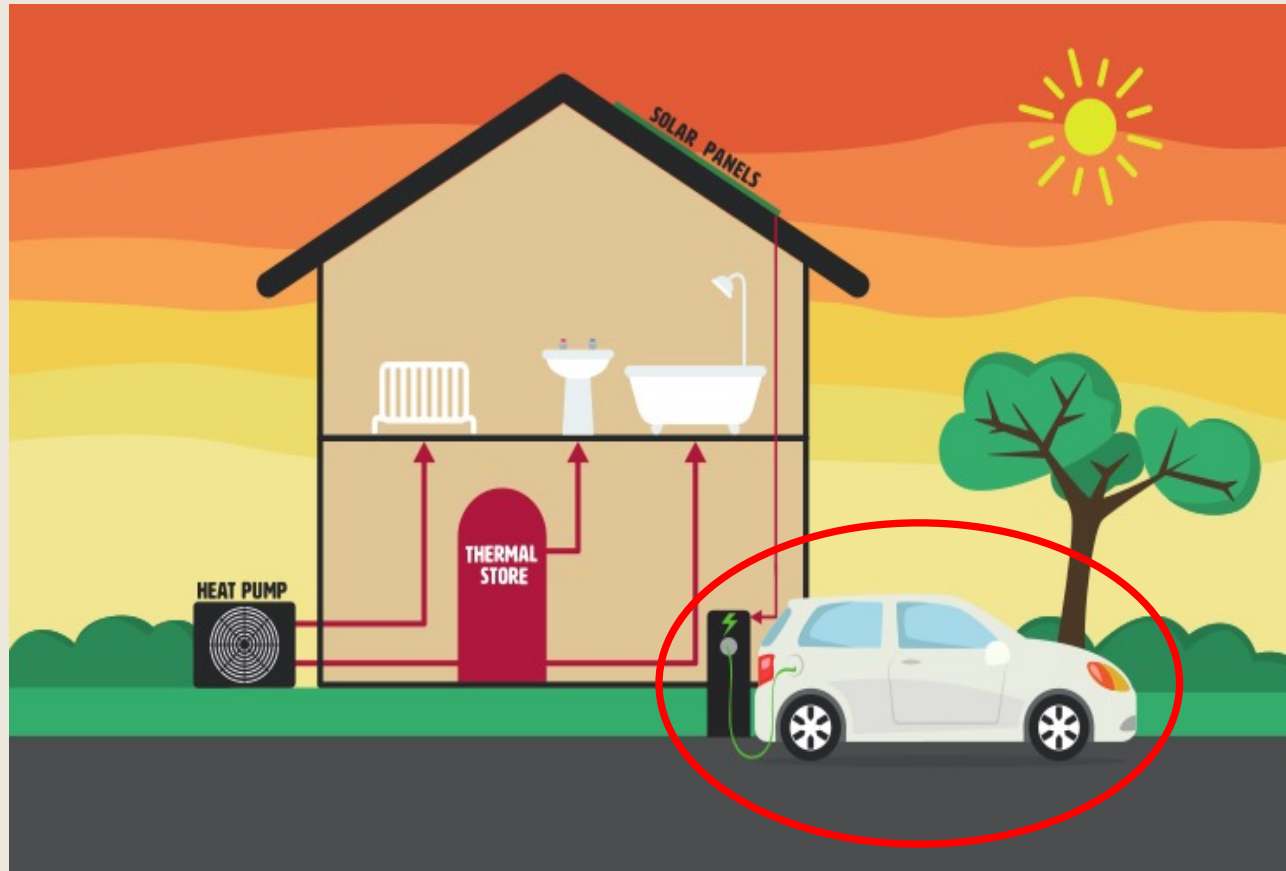
- Buildings will be more energy efficient - we will be using less electrical and heat energy to perform the same everyday tasks.
- Most buildings today in Udný are heated by oil, LPG boilers and electric storage heaters
- By 2030, many of these will have heat pumps to provide heating and hot water to just like a traditional boiler.

What will it look like?



- Urban buildings with heat pumps may be connected to a heat network - a networks of pipes which carry heat in the form of hot water to multiple buildings from a central energy centre.
- The energy centre could use heat from a single source or multiple sources such as heat from the ground, water, waste and biomass. Rather than having a boiler, connected buildings will have a Heat Interface Unit (HIU) which is similar in size to a small domestic gas boiler.

What will it look like?



- Many of us will have replaced our petrol/diesel cars with electric vehicles.
- EVs use an electric motor powered by an internal battery.
- The battery will be charged from either a standard electric socket or a special electric vehicle charge point charged from electricity obtained directly from the grid or from electricity generated by domestic solar panels.



FUNDING: LOANS & GRANTS

Energy Efficiency

■ Home Energy Scotland Loan Scheme:

- *Open to homeowners*
- *Up to 40% cashback for some eligible energy efficiency measures*
- *Maximum funding for energy efficiency measures is £15,000 (including a maximum cashback amount of £6,000).*
- *Supported measures include solid wall insulation, glazing, insulated doors, flat roof or room-in-roof insulation, and loft-floor or cavity wall insulation.*

Low Carbon Heat

■ Renewable Heat Incentive (RHI Domestic):

- *Financial incentive scheme to encourage uptake of renewable heating*
- *Scheme participants receive quarterly payments for seven years for the amount of clean, green renewable heat their system produces*
- *Ends 31st March 2022*

■ Clean Heat Grant:

- *Details still to be confirmed but....*
- *Opens April 2022 until at least March 2024 – effectively replaces the RHI.*
- *Offers upfront grants of up to £4000 to install renewable heating systems*
- *Supports domestic and non-domestic installations up to a capacity of 45kW.*
- *Biomass will only be allowed in properties deemed not suitable for a heat pump.*
- *No support for solar thermal or hybrid heat pumps.*

Low Carbon Heat

- **Home Energy Scotland Loan Scheme:**
 - *Funding operates on a first-come, first-served basis*
 - *Loans up to £17,500 for renewable systems*
 - *Also 75% cashback for certain renewable heating systems*
 - *Renewable system must be recommended in an EPC or in a report issued by a Home Energy Scotland specialist advisor*
 - *Includes support for energy storage systems*

Low Carbon Electricity

- **Smart Export Guarantee:**
 - *Effectively replaces the Feed-in-tariff*
 - *Pays small-scale generators for the renewable electricity they export to the grid*
 - *Eligible technologies include solar PVs, wind turbines, hydro, anaerobic digestion (all up to 5MW) and micro CHP systems up to 50kW.*
 - *All licenced energy companies with 150,000 or more customers must provide at least one SEG tariff.*
 - *Tariffs vary according to supplier but most range between 3 - 5.5p/kW*

Transport - Vehicles

- **Interest-Free Electric Vehicle Loan** - funded by Transport Scotland which offers drivers loans of:
 - up to £28,000 to cover the cost of purchasing a new pure electric vehicle
 - up to £10,000 to cover the cost of purchasing a new electric motorcycle or scooter
- **Plug-In Grant (OLEV)**
 - Grant is automatically deducted from the retail price when an eligible vehicle is purchased
 - 35% off the cost of new, eligible low emission cars up to a max of £2500
 - 20% off the cost of new, eligible low emission motorcycles up to a max of £1500

Transport – EV Chargers

- **Electric Vehicle Homecharge Scheme (UK)**
 - Grant funding of up to 75% towards the cost of installing electric vehicle chargepoints at domestic properties across the UK (up to a maximum of £350).
- **Domestic Charge Point Funding (Energy Saving Trust)**
 - Offer an additional £250 towards the cost of home charge points for electric vehicles over and above the EV HomeCharge Scheme (above), with an additional £100 available for those in the most remote parts of Scotland
 - Reimbursement payment
 - Installation by an approved installer

Community Energy Scotland

Empowering Communities, Improving Lives

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