



Green Growth: EPRG panel discussion

Decarbonising heating in the UK

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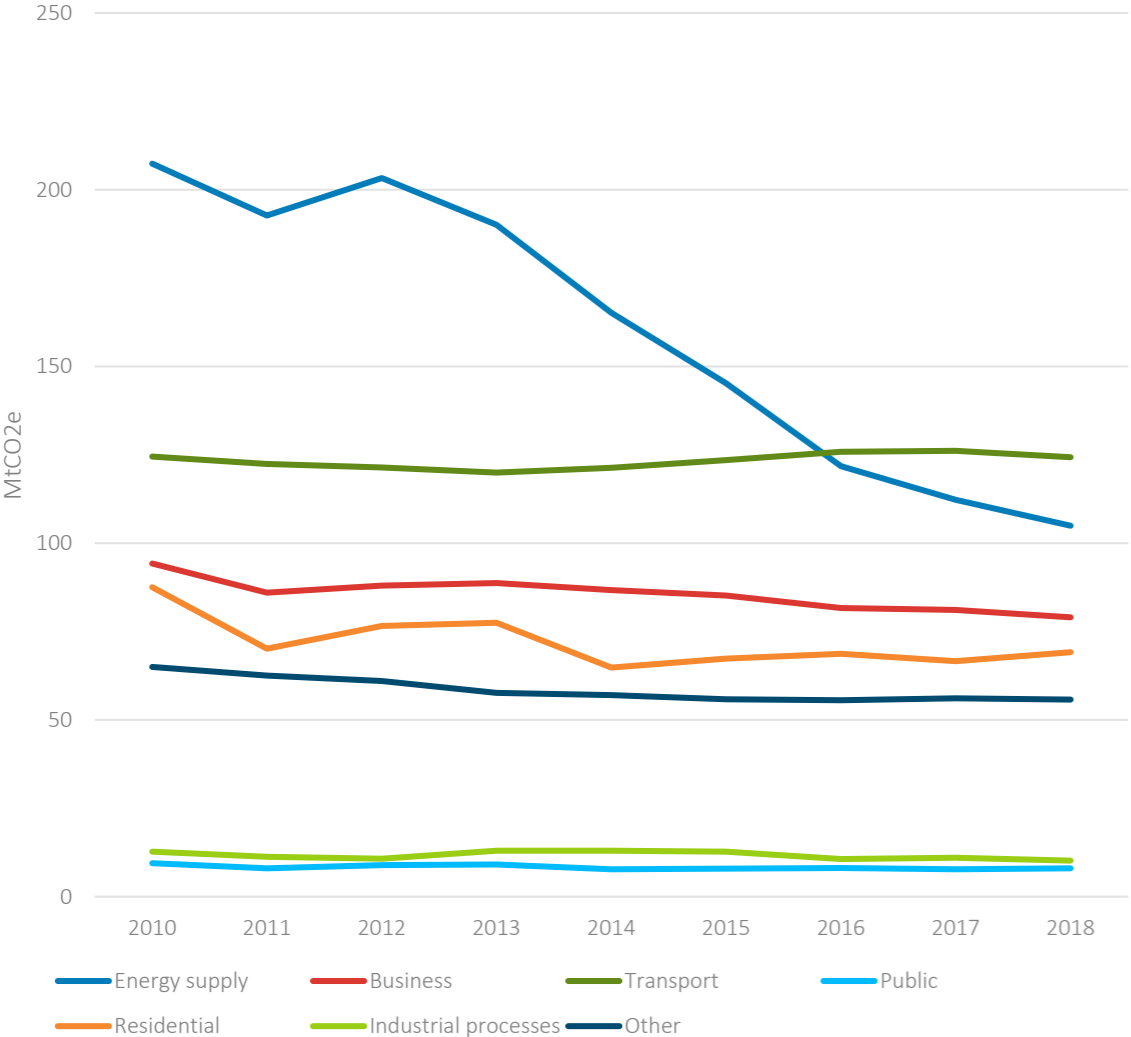


OUTLINE

- **Domestic heating** accounts for around a fifth of UK carbon emissions.
- The **barriers to decarbonising heat successfully** and economically are substantial – particularly for hydrogen.
- But there are **good examples to learn from**, and excellent opportunities.
- To date, **politicians have willed the end but not the means**. Will the White Paper change this?

DOMESTIC HEATING ACCOUNTS FOR AROUND A FIFTH OF UK CARBON EMISSIONS

Evolution of Co2 emissions by sector in UK

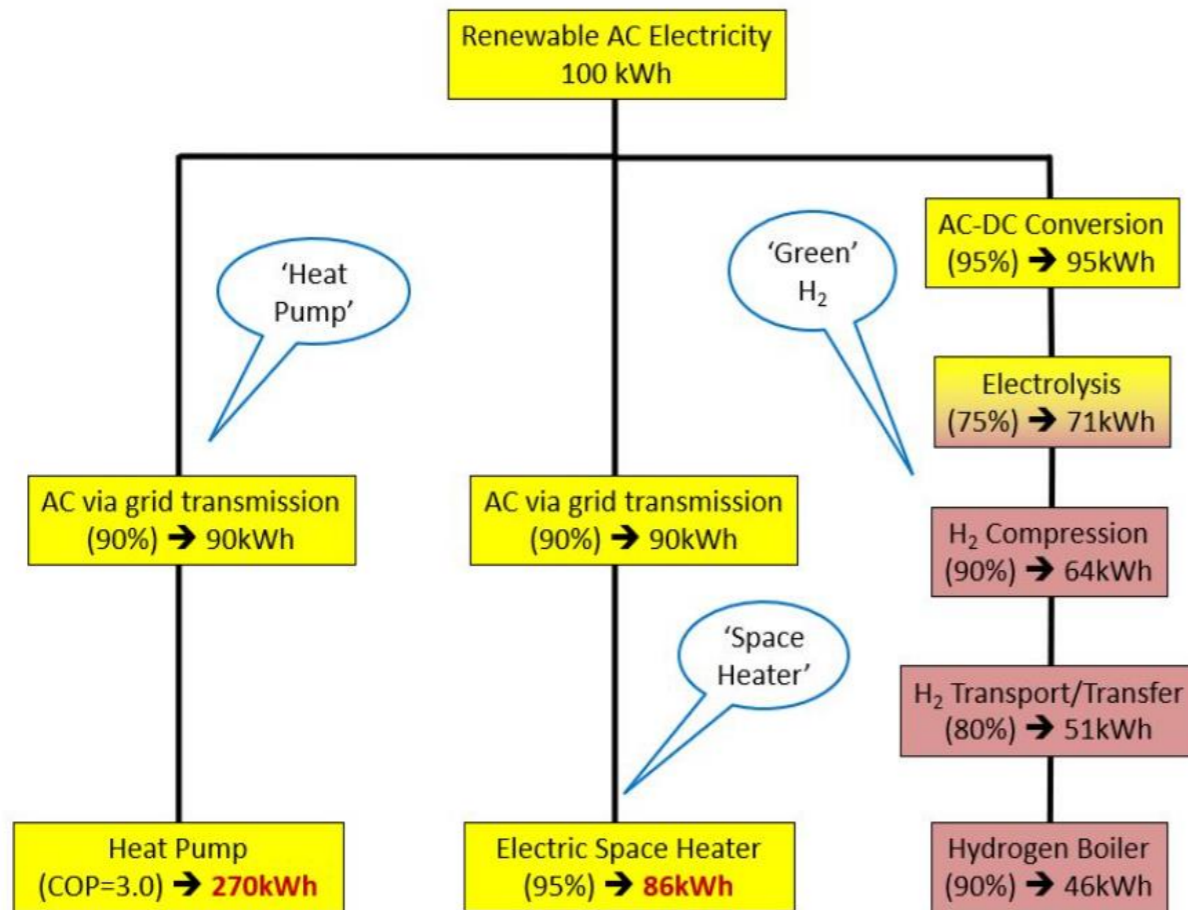


Domestic consumption by fuel type



BARRIERS TO SUCCESSFUL DECARBONISATION - HYDROGEN

Estimated energy efficiency differences in heating buildings



- Low-carbon hydrogen reliant on several immature industries:
 - Hydrogen production (electrolysis or methane reformation?)
 - Transportation (extent of reuse of existing infrastructure?)
 - Use / storage of carbon produced
- **Affordability therefore highly uncertain** and few signs of the reductions in costs that have been seen in other industries.
- **There are security concerns**, given reliance on increase in imported gas.
- **Substantial increase in electricity generation and infrastructure** also likely required to produce hydrogen

BARRIERS TO SUCCESSFUL DECARBONISATION - ELECTRIFICATION

Curtailment a growing problem even in largely fossil-fuel based energy systems

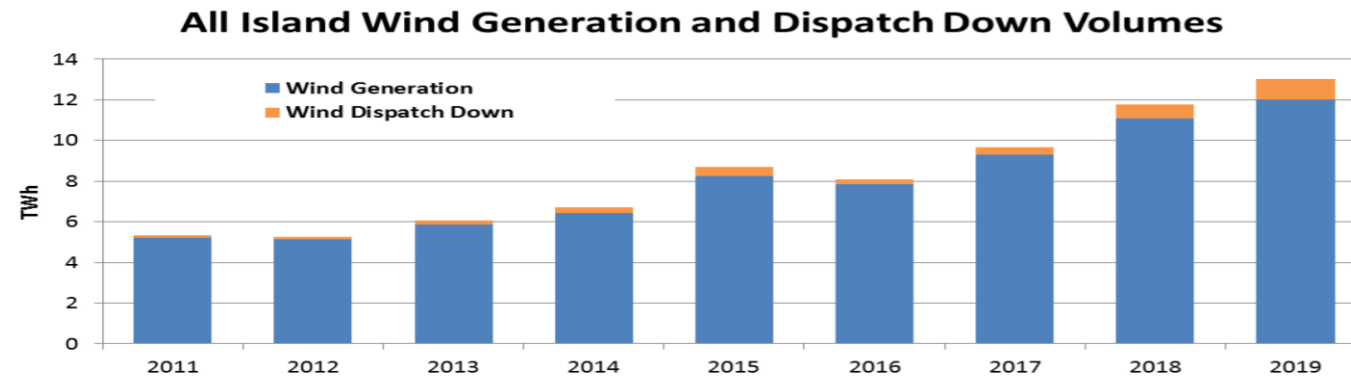


Figure 1: All Island Annual Wind Generation and Dispatch Down Volumes

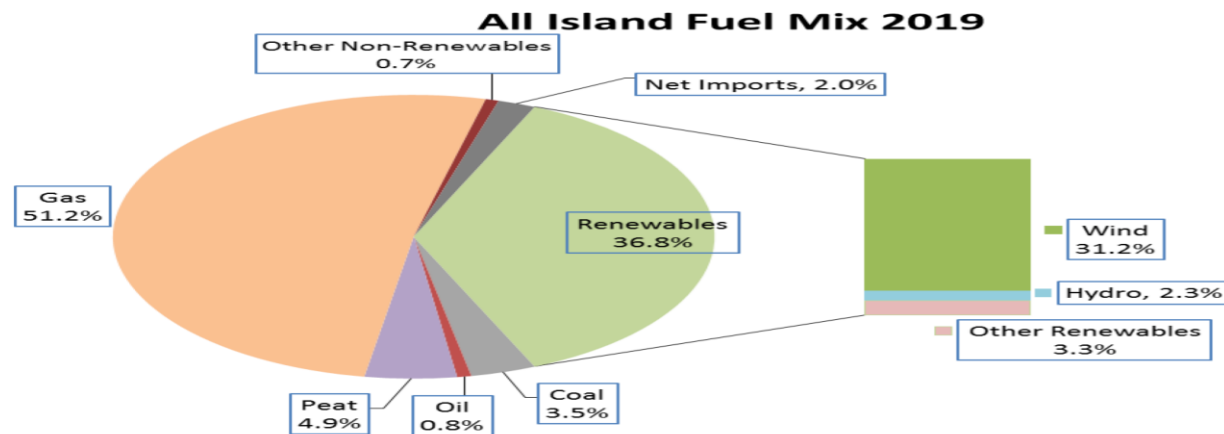
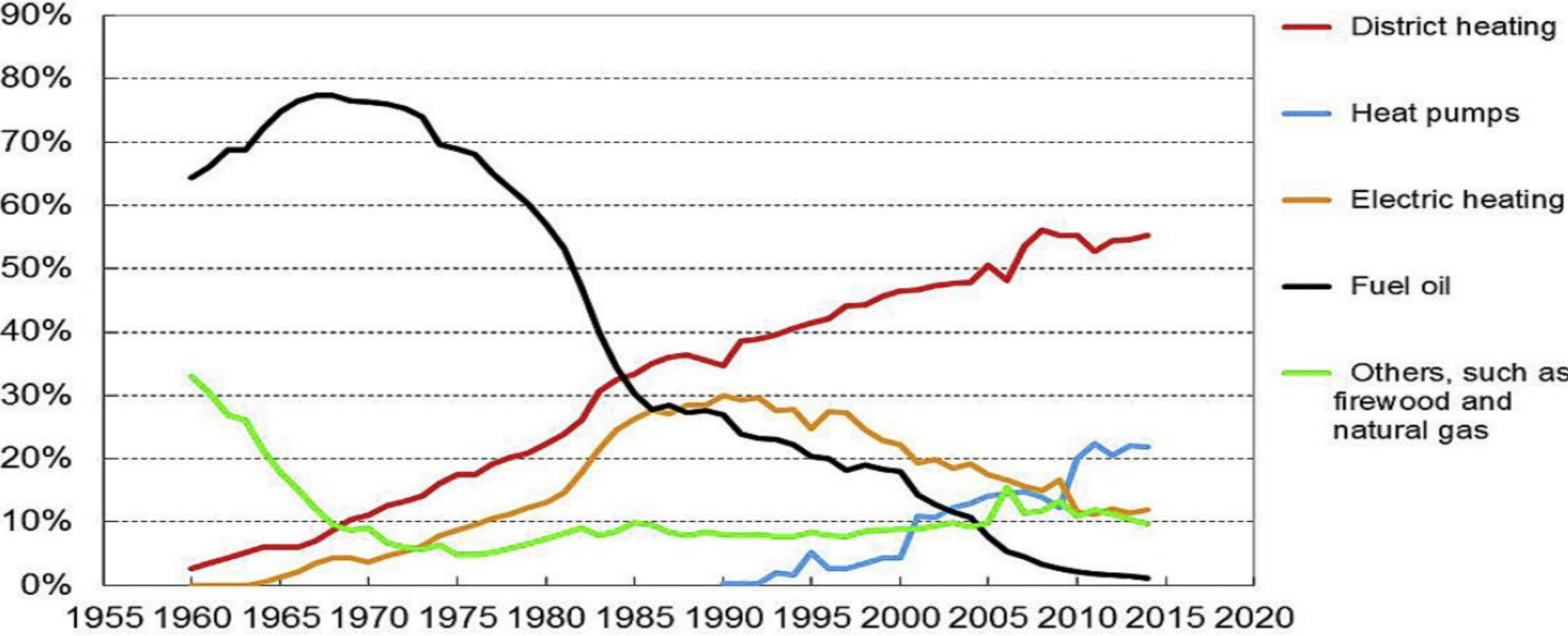


Figure 2: All-Island Fuel Mix for 2019 as Percentage of Demand

- **Greater flexibility** crucial to make electrification feasible and affordable, notably through increased storage and behavioural changes.
 - Both could be **supported by technology** – roll-out of EVs and smart heating.
 - But **policy changes also needed**, e.g. to support long-duration storage.
- Costs of electrification may be prohibitive without major **improvements in energy efficiency**
- **Many households will need support** to make the required investments in combined efficiency and heat pumps.

SOME EUROPEAN COUNTRIES SHOW TRANSFORMATION IS FEASIBLE – BUT SLOW

Market shares for heat supply to residential and service sector buildings in Sweden



UK POLITICAL WILL HAS BEEN LIMITED

- Statements so far have **typically been vague** (unlike with EVs):
 - Hydrogen: in 2025, will set out plans for a **possible pilot** hydrogen town before the end of the decade
 - Heat pumps: **setting an ambition** of 600,000 heat pumps installations per year by 2028
 - CCUS: **aim for** four industrial CCUS clusters by 2030. ... Our £1 billion CCUS Infrastructure Fund will provide industry with the certainty required
- And **progress has been unsurprisingly slow**:
 - £16.5 million for Electrification of Heat Demonstration Project 2019-22
 - **Only installed 26,000 in 2019**, compared to CCC indicator of 30,000+
 - **Inconsistent treatment of policy costs** between gas and electricity is holding back electrification.
- Not helped by **indecision** between different routes, and **political centralisation**.
 - “ambition still **leaves open the choice** as to whether we ultimately pursue hydrogen heating, an electrified heating system, or a mixture of both, whilst we continue to pilot the options.”
 - Areas where one approach is clearly superior have had little ability to pursue it – e.g. south-west England.

CONCLUSION

- **Opportunities and technology are there** to decarbonise heating rapidly and effectively.
 - Potential to be more attractive to consumers (as with EVs), with ability to provide cooling in summer and smarter heating options
 - EV roll-out means significant increase in battery capacity.
- But **will has been lacking** to date.
- Need for **sustained political commitment** to tackle the many barriers involved, and a much clearer direction of travel.
- Fingers crossed for the White Paper...