CENTRE FOR RESEARCH INTO
ENERGY DEMAND SOLUTIONS

New times, new policies? Policies to change energy use in the context of zero carbon

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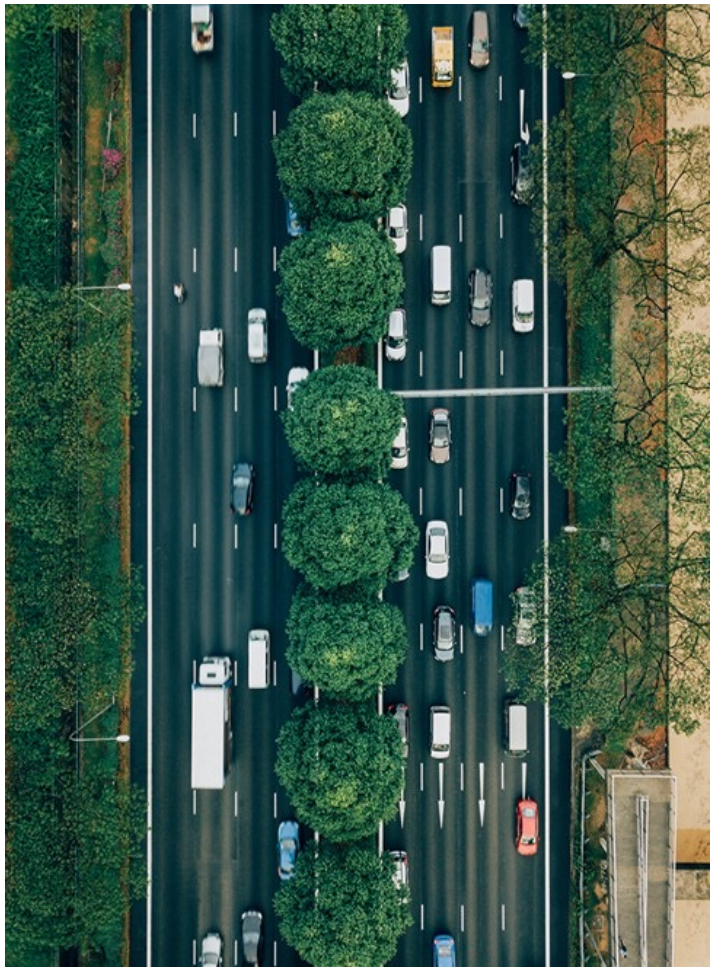
Which policies have worked historically?

The key policy instruments to improve efficiency have been:

- regulation – via product, vehicle and building standards ;
- incentives – via energy taxes and support for efficient energy using products;
- information, advice and education; and
- support for R&D and early stage deployment.

…general agreement on the importance of policy packages.



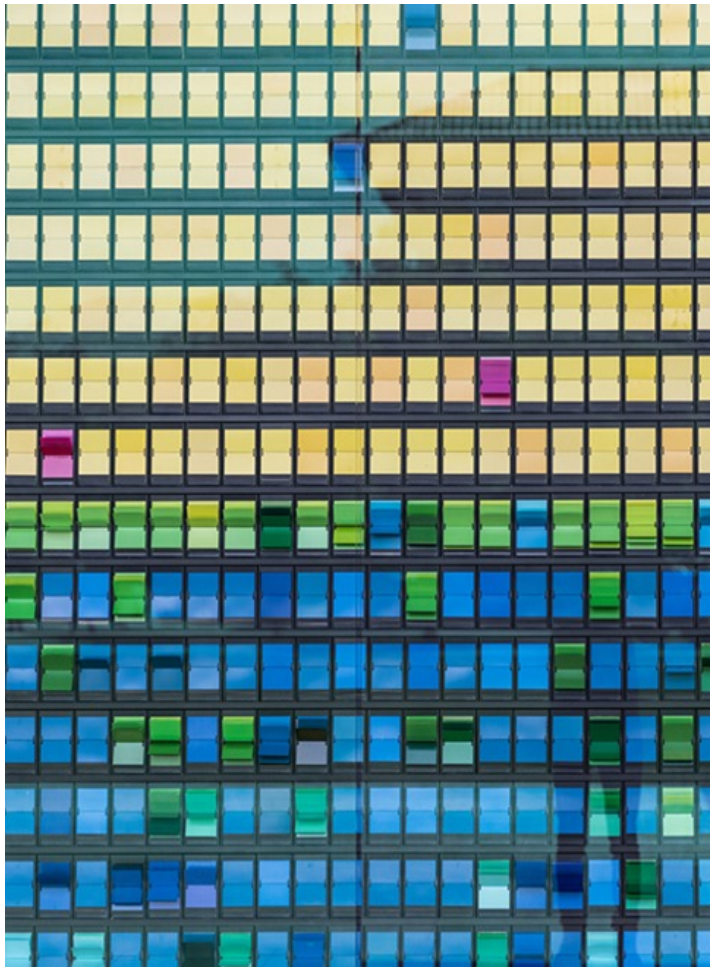
What has changed?

Net zero by 2050 implies substantial changes:

- Complete decarbonisation, i.e. **not** efficient use of fossil fuels;
- Consider a greater scope of actions, e.g. demand reduction not just energy efficiency;
- Need for faster progress.

So the new question is:

- "What national policy interventions will be needed to deliver the major changes in energy use implied by the goals of the Paris Agreement?"

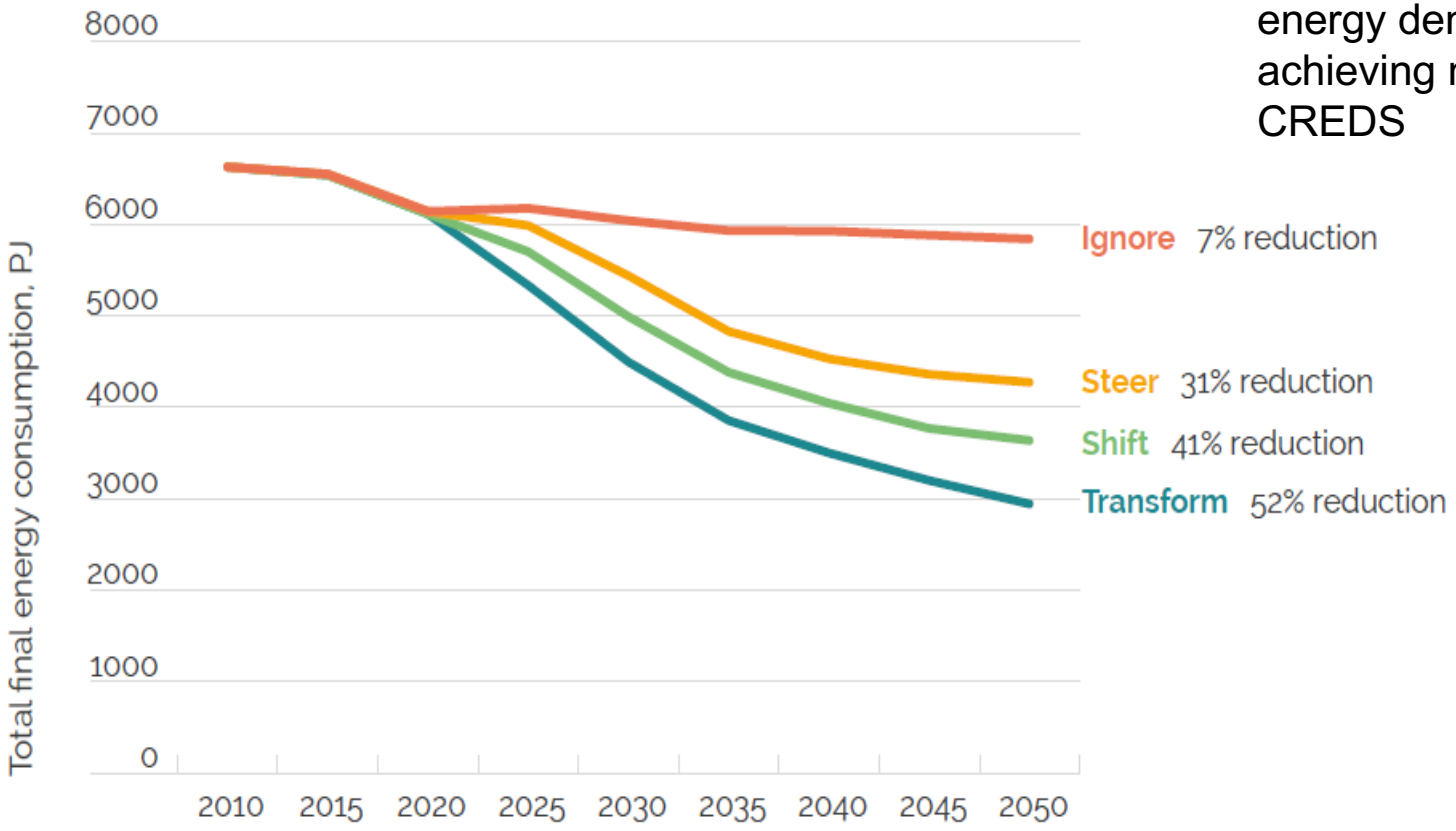


Methodology and Analysis

- Based around an existing study of demand side potentials to reach net zero in the UK (Barrett et al 2021).
- For each identified change in technology or user practice, we reviewed policy options, with a focus on delivering quickly.
- The main policy options are identified in a series of large tables.
- For the details, please read the paper!
- In this presentation, we focus on key findings.

Scenario Change	Primary Policy Area(s)
Improved efficiency of building components and appliances	
Building fabric improvements	Financial support programmes; national building regulations
Installation of heat pumps	Building regulations; financial support programmes
Switch to hydrogen or syngas in hybrid systems	Building regulations
Phasing out gas boilers in existing buildings	Building regulations; financial support programmes
No gas boilers in new buildings	Building regulations
Gas hobs and ovens are phased out by 2035	Product standards; financial support programmes
10% efficiency savings in electric hobs and ovens by 2030	Product standards
Incandescent sales are phased out by 2025 (out of use by 2027)	Product standards; existing trend
Fluorescent sales are phased out by 2030 (out of use by 2035)	Product standards; existing trend
5% efficiency improvements in LED technology by 2025	Product standards
Adoption of more energy efficiency appliances	Product standards
Continuous installation of on-site renewable energy generation	Financial support programmes
Embodied carbon emissions are considered in retrofit	Building regulations
Additional measures in non-residential buildings	
New build dwelling construction is replaced by repurposing non-domestic energy space	Energy retrofit taxation; repurposing building use legislation
Increase practice of homeworking	Existing trend, employment legislation
Switch to a 4-day working practice	Employment legislation
Smart systems ensure that buildings are heated only as needed	Investment incentives
Reduce office space	User incentives; public investment
Smart meter rollout	Regulation; public investment
More regular maintenance of air-conditioning units	Information campaigns
Automation of building management controls	Regulation; public investment
Reduction of total number of appliances	Public investment

CREDS Positive Low Energy Futures



Barrett et al (2021) The role of energy demand reduction in achieving net-zero in the UK. CREDS

Where do savings come from?

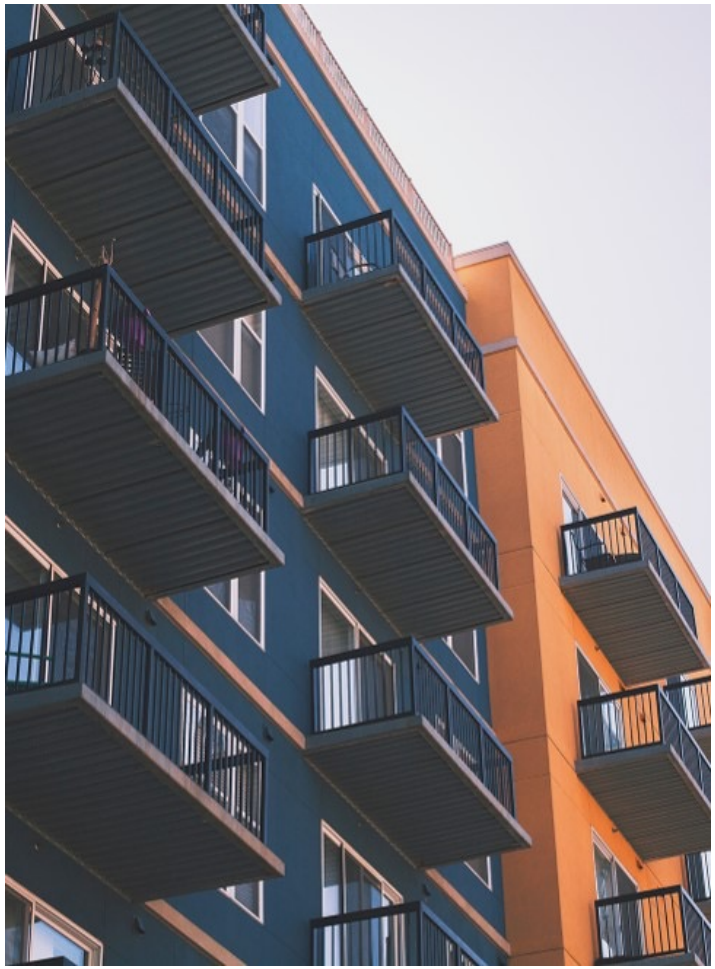
All energy-using sectors.

Four broad categories change:

- "Component efficiency" – insulation, products, processes etc;
- Efficiencies from energy system change – notably electrification of vehicles and heating;
- Systemic change in other sectors, notably to:
  - public and active transport,
  - circular economy for energy-intensive materials,
  - low meat food systems.
- Reduced consumption, especially by high consumers.

Implications for policy

- Policy needs to focus on delivering energy efficiency improvement **and** shifts to less energy-intensive practices.
- It's a systems transformation problem and therefore
  - The conventional "static, linear economics" wisdom about the efficiency of a uniform carbon price is not correct.
  - Focus on 'future fuels', notably the new uses of electricity.
- There is no 'silver bullet' policy – packages remain key.
  - New technology roll-out
  - Standards critical for products, buildings and vehicles;
  - Financial incentives will play an important role;
  - "Information instruments", but low-carbon community development may be a better way to think about it.



Thinking about system transformation

Policies will need to:

- change whole systems, towards electrification of energy, public transport, low-energy materials;
- incentivise the new and disincentive the old;
- drive investment in sustainable infrastructure;
- support skills for new jobs and working practices;
- now include policies to reduce consumption

Energy policy will include what have been seen as economic, land use, agricultural, transport, housing, industrial and employment policies.

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Thank you

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