

Can we decouple economic expansion and rebound effects?

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Centre on Innovation and Energy Demand





Energy efficiency and multiple benefits

- Energy efficiency is good for the economy
- Industrial energy efficiency: improves competitiveness and triggers productivity-led or cost-push economic expansion
- Household energy efficiency: frees up and increases real income for expenditure on other things, triggering demand-driven expansion
- However, economic expansion will involve increases in energy use in sector across the economy that will (partly) erode energy savings delivered by efficiency improvements
- Does this make mean we need to live with erosion of energy savings as the economy expands?





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The problem for energy efficiency policy

- People may not respond to energy efficiency initiatives, particularly where costly up-front investment required
- Problem: energy efficiency not a desirable 'commodity'?
- Issue of private vs. public social costs and benefits
- One option: accept need additional effort from other policy instrument
- For example, tool to adjust relative prices of different means of delivering service required







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Taxes, subsidies ('green taxation')....or efficiency/factor productivity improvements?

- Focus on delivery of economic co-benefits?
- Focus on what we actually use energy for
 - E.g. heating and lighting, mobility
 - low carbon electricity over gas, public over private transport
- Can we use factor productivity measures (not just energy efficiency)....
- To make low carbon options more competitive and appealing?
- Combined with exploiting (and improving?) substitution possibilities between different means of delivering service?







E.g. Increased efficiency in production and transmission of (low carbon) electricity in the UK

- Electricity as a substitute for gas in providing heating services
- Simulate a simple 5% boost to efficiency in use of capital, labour, energy and other material inputs (total factor productivity)
- Produce same kWh using reduced input requirements
- Or 5% more with same inputs
- Key cost reduction translates to reduced price per kWh













What if we increase responsiveness of households to change in relative prices of electricity and gas?







A positive direction for research?

- Focus on what people will actually respond to, rather than what technical and economic models predict
- Combined with political realities of different 'carrot and stick' options
- Need to focus on identifying *executable* plans

Key in research analysis here: outcomes depend on:

- 1. how prices faced by users are actually affected by policy action
- how different users perceive and respond to changes in relative prices for different means of delivering the energy services they actually demand

Bring focus back to energy efficiency and what the social return may imply \rightarrow the second option....