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**CENTRE FOR ENERGY POLICY**

# Multiple benefits of energy storage? The need to take a wider policy perspective

Presentation to ETP-SHFCA meeting on 'Energy Storage in a  
Changing World'

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**(DRAWING ON LESSONS LEARNED - EPSRC GRANT REF: EP/M00760X/1)**



## A wider policy perspective?

- Energy storage and the flexibility, responsiveness and security of the energy system
- *Electricity* storage in particular?
- A game changer?
- Nonetheless, life isn't just about energy supply.....
- ....and what are our perceptions on the demand-side?
  
- In terms of 'changing the game', understanding of wider public policy and politicians perhaps the crucial challenge
  
- A new way of thinking.....multiple benefits?
- Not that new? Not just recognising policy trade offs anymore....

## Energy efficiency has lasting stimulatory effects

- September 16 - Scottish Government inclusion of investment in energy efficiency in **post-Brexit economic stimulus package**
- Initial policy focus? – impacts on fuel poverty, public budgets.....output and job creation triggered by building activity to make homes and public buildings more energy efficient.... but how much **additional sustained activity?**

## Energy efficiency has lasting stimulatory effects

- Further, and lasting, economic stimulus generated by what happens once increased efficiency takes effect
  - Increased disposable household income
  - Savings from lower energy bills redirected to spending on other things
  - Depending on how economy responds, some winners and losers
  - But likely net lasting gains at economy-wide/macroeconomic level
- Even clearer story in efficiency improves in industrial energy use, particularly in energy and/or export intensive, or key upstream supply chain



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**Source:** Lecca, P.,  
McGregor, P. G., Swales, J.  
K., & Turner, K. (2014).  
The added value from a  
general equilibrium  
analysis of increased  
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energy use. *Ecological  
Economics*. 100, 51-62.  
Doi:10.1016/j.ecolecon.20  
14.01.008.



European  
Commission

# Science for Environment Policy

## Household energy efficiency could help boost the economy

**Improving the energy efficiency of homes** could have positive economy-wide impacts, recent UK research suggests. It would allow householders to spend the money they save on energy on other products and services. Although this additional demand and the associated production in non-energy sectors would partly offset the energy saved in the home, this 'rebound effect' does not completely outweigh the household energy savings.

**This study explored the links between increased energy efficiency of UK households** and the wider UK economy using 'general equilibrium' modelling. In particular, researchers investigated a potential 5% improvement in [energy](#) efficiency, which they assumed would occur as a result of technological improvements (e.g. more efficient appliances) that allow a household to continue operating at the same capacity, but using less energy.

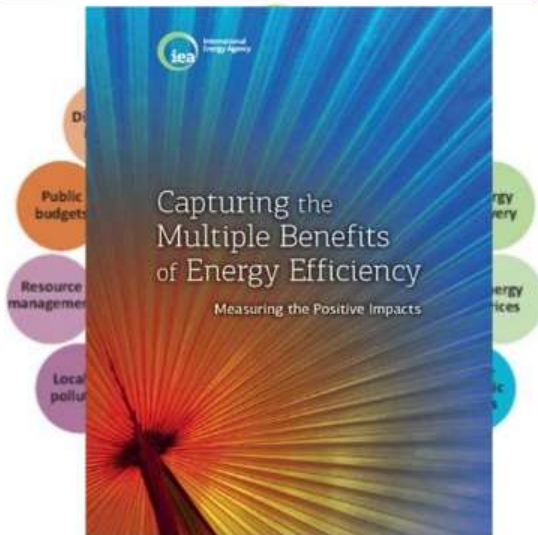
Financial savings from this lower energy use will probably mean that householders use their appliances more than before, creating 'direct rebound effects'. This study also considered 'indirect rebound effects'. These occur because the cost savings allow householders to spend more money on goods and services other than energy. The energy used by other sectors that provide these goods and services can reduce the overall benefits of the initial improvement in household efficiency. To understand these rebound effects, the researchers assessed the energy usage of 21 economic sectors. These included four energy sectors (1. coal; 2. refined oil (and also nuclear fuel that goes to the electricity generation sector - analysed together with oil, as these two sectors were integrated in the study's source of data); 3. gas; 4. electricity) and 17 other sectors, including food, textiles/clothing and finance.

The model's results suggest that the 5% improvement would have positive effects on the national economy, because increased real income and spending on non-energy sectors has a greater economic impact than the same amount of spending on energy. The effects would



# Multiple Benefits of Energy Efficiency (IEA, 2014)

EE has multiple benefits 



IEA (2014), *Capturing the Multiple Benefits of Energy Efficiency*, OECD/IEA, Paris.



# Multiple benefits thinking not limited to energy efficiency



## The pillars

### Harnessing the industrial opportunities from new energy technologies

In nuclear, the decision to proceed with the first new nuclear power station in a generation at Hinkley Point is accompanied by a commitment to develop a strong UK supply chain to support the sector, with EDF expecting over 60 per cent of the project's construction value to be placed with UK companies. In turn investment in nuclear skills – at college and university level – is upgrading both the domestic capacity to provide the labour required and the level of skills and income in the local workforce.

7. **Delivering affordable energy and clean growth** – we need to keep costs down for businesses, and secure the economic benefits of the transition to a low-carbon economy.



# Not just about the potential for benefits



## The challenge

There are three major challenges for energy policy that our industrial strategy will address.

First, to ensure that the shift to a low carbon economy is done in a way that minimises the cost to UK businesses, taxpayers and consumers.





## Example: CCS Commercialisation Competition



### The Role of Economical-Technical System Modelling in Considering the Value of CCS



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“HM Treasury raised concerns about the merits of the carbon capture and storage competition given fiscal constraints”

‘Briefing for the House of Commons Environmental Audit Committee’ by the National Audit Office, July 2016 (page 7)

#### Analysis:

It is considered that this decision was reached because there were key omissions in the information provided to Treasury:

- The wider economic and fiscal case not made
- The near-term benefits were not argued *e.g.* employment in developing infrastructure
- The longer term benefits of establishing an economic service activity not considered

#### How can we do this:

- Need to consider case for CCS via *social* cost benefit analysis
- Need to include carbon capture, transport and storage as economic service activities
- Need to inform wider economy models with techno-economic data of the CCS system



## What would the narrative around energy (electricity?) storage be in this context?

- House of Lords (Feb.17) – prioritise **low energy bills and security** over low carbon
- What can storage offer in terms of the **multiple benefits**?
- At **local area level** (persuading public)?
- And wider Scotland/UK (persuading Scottish/UK govt.)?
- **Making the fiscal case**?
- Does it share same type of upfront costs/investment hurdle as CCS?
- **Communication** using HMT Green Book ‘language’
- And considering in context of economy-wide modelling? (UK Parliament Enquiry on ‘HMT and Sustainability’)