

Energy Efficiency and Economic Expansion?

Insights from EPSRC-funded research (Impact Accelerator)

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Presentation to the Scottish Government, 5th September, 2017

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Why energy efficiency?

- To reduce energy use? To reduce fuel poverty?
- To deliver economic expansion?
- And/or to achieve energy and social policy goals in a way that is economically sustainable?
- September 2016 – First Minister's announcement: inclusion of public spending on energy efficiency in **post-Brexit economic stimulus package**
- Relatively small spend (£20million) but what was meant and what could be realised in terms of inclusion in economic stimulus package?



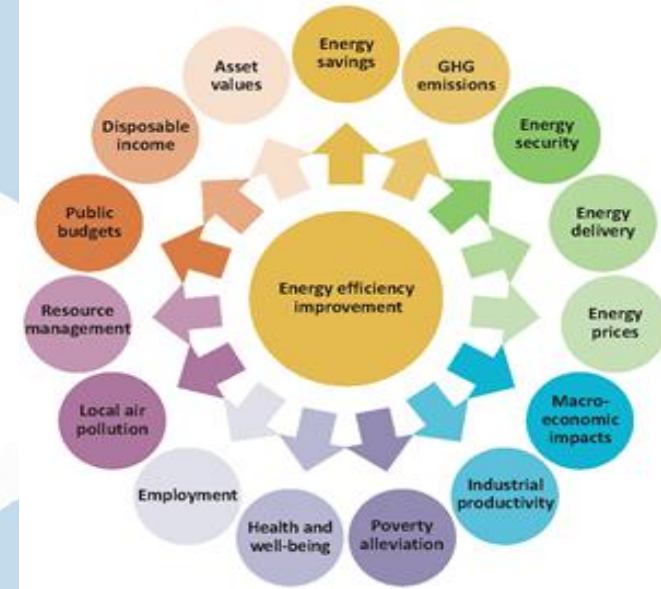
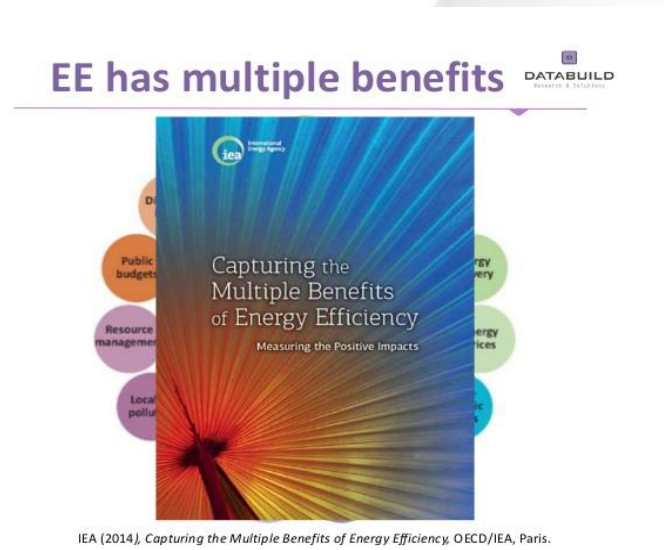
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Taking a wider view

- International Energy Agency (2014) – Capturing the Multiple Benefits of Energy Efficiency



- India's Bureau of Energy Efficiency – increased wider policy support when energy efficiency became 'more than an energy policy'



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Our EPSRC project

- EPSRC EUED (CIED Sussex, Impact theme) – ‘Energy Saving Innovations and Economy-Wide Rebound Effects’ (2015-2017)



- KT/CEP involvement in IEA MB project
- Shift of focus in project to the economic expansionary effects of increased energy efficiency that drive economy-wide rebound effects



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The language of 'multiple benefits'

- Link back to 'double dividend' language
- Conveying message that there is more to be gained from actions to increase energy efficiency than reduced energy use
- But must be careful in implying 'win-win' or no trade-offs involved
- For example, IEA MB: two sources of economic expansion
 1. The retrofitting/investment stage
 2. Realising energy efficiency improvements
- The first is questionable – e.g. BEIS experience with HMT

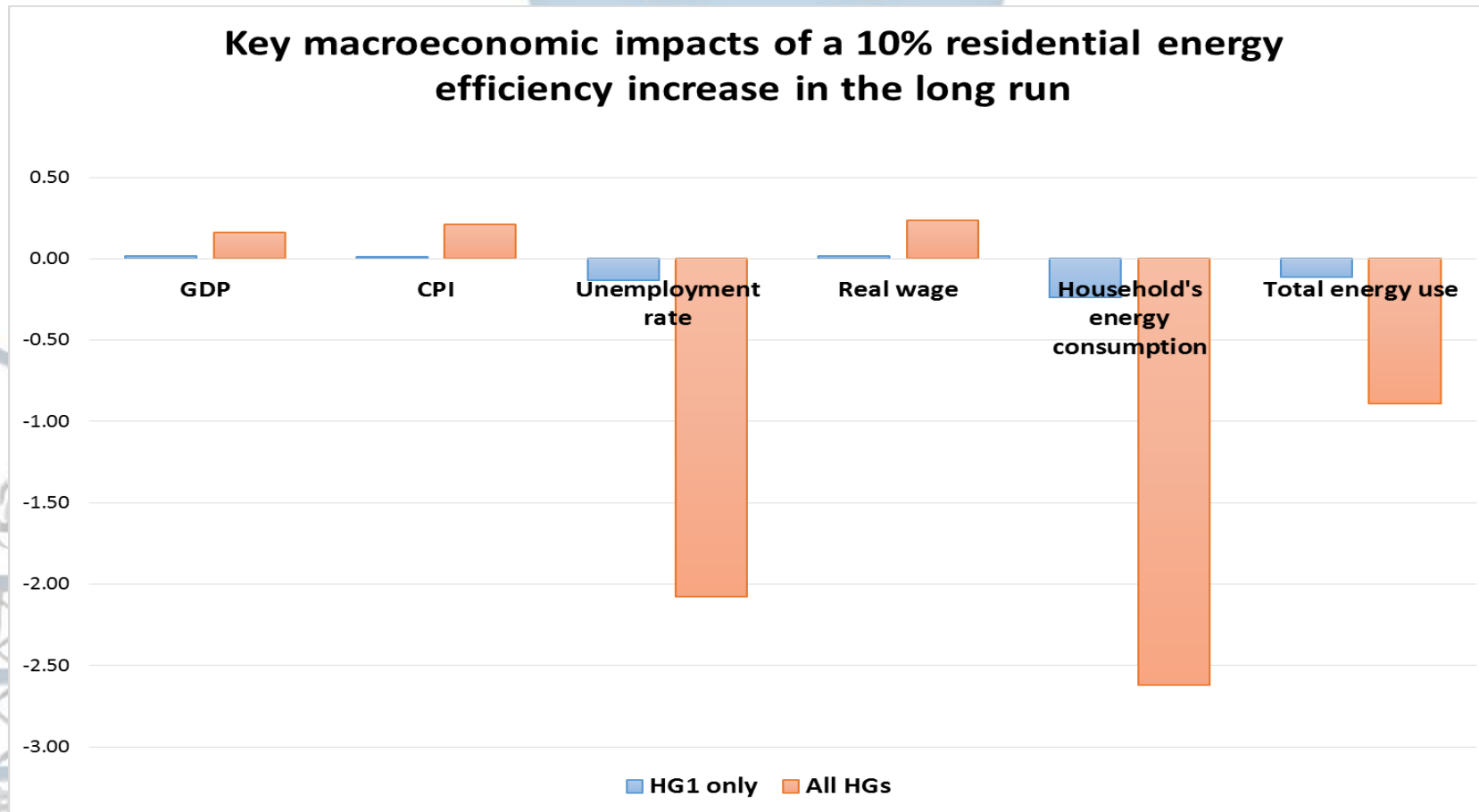


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Improving UK household residential energy efficiency

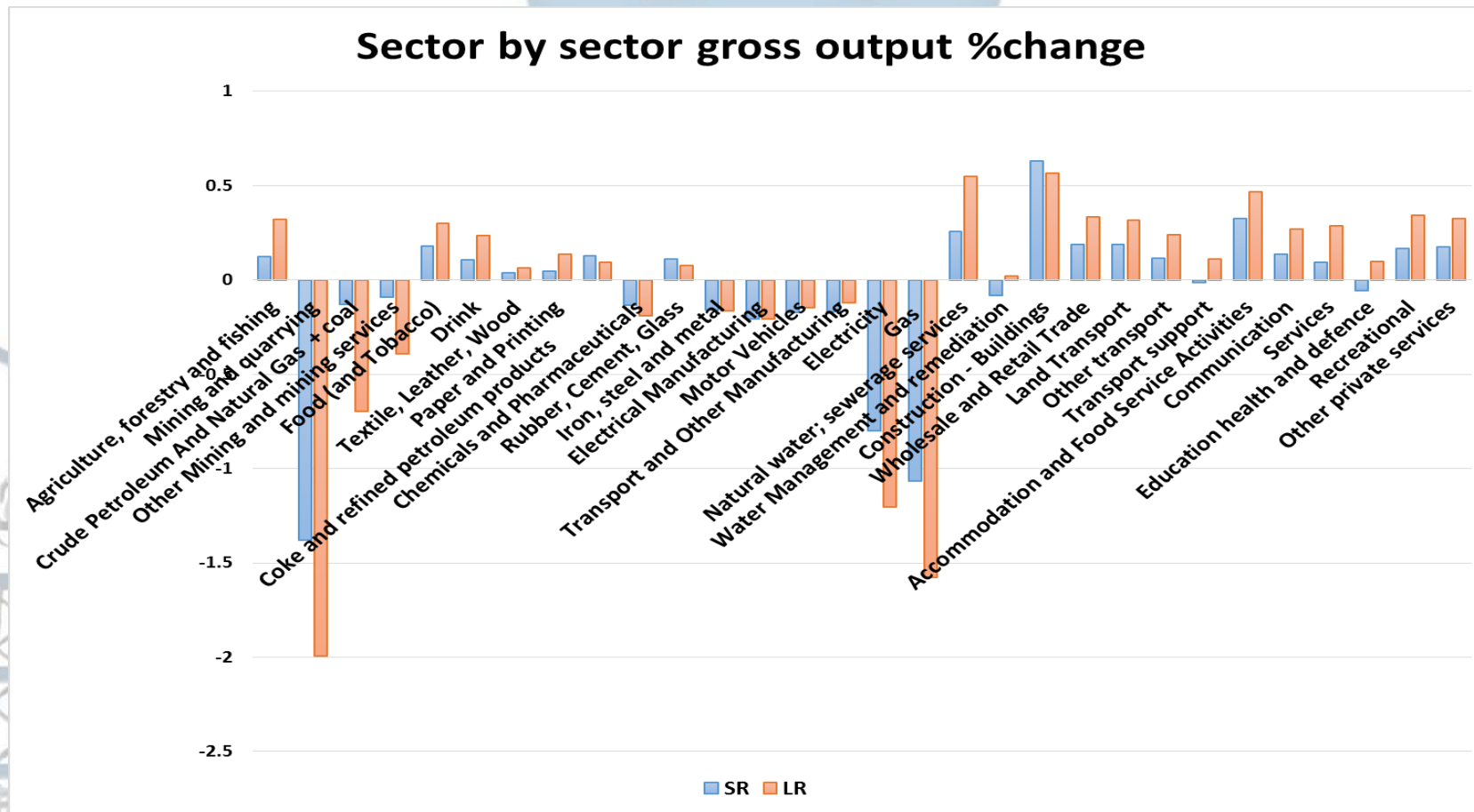


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Winners and losers?



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Questions for the 'multiple benefits' framework

- Economic expansion – where in the economy, how much and for how long?
- HMT particularly questioned the notion of sustained economic expansion from investment/retrofitting stage
- Our Scottish EPSRC 'Impact Accelerator' project
- What are the impacts of the £20m spend, most likely in the Scottish construction sector?



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Gains to the Scottish economy resulting from the total **£20m spending boost alone** are largest in the year that the spending and retrofitting take place and must be set against the impact on the government budget of making the expenditure (partly offset by gains from the expansion).

Assuming spending and retrofit in 2017....

2017 GDP +£3.9m, jobs +121,

public budget -£18.2m

2020 GDP +£1.76m, Jobs
+31, public budget
+£0.42m

2027 GDP +£0.72m,
Jobs +12, public
budget +£0.2m



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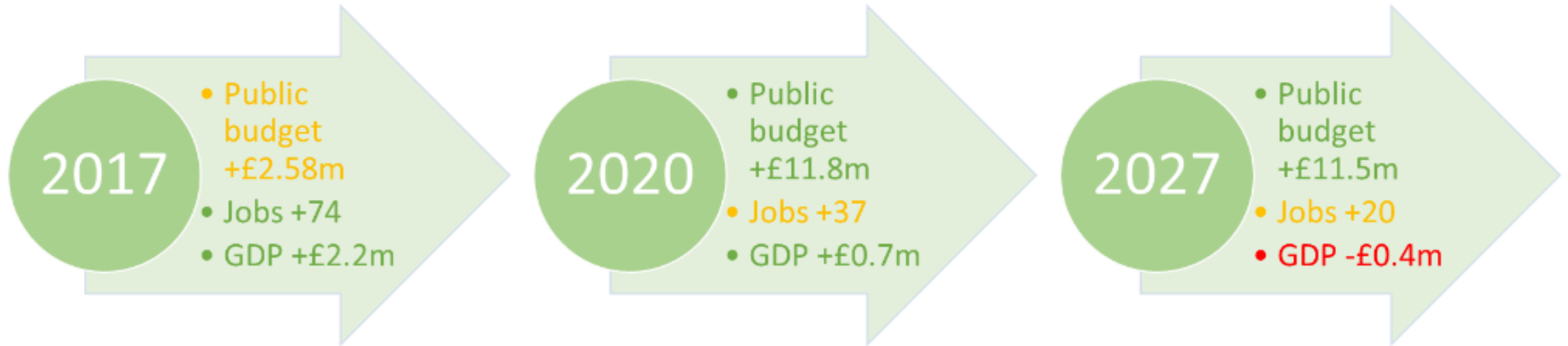
Energy efficiency on the production side of the economy?

- Industrial energy efficiency: lowers marginal cost of energy services
- Decreased cost of production: may reduce output price, boosting economic productivity and competitiveness
- Both in sector where efficiency improves and downstream
- Process of ***productivity-led or cost-push economic expansion***
- *However*, depends on targeted sector, its energy intensity (how much the price of output may be affected), its export intensity (impact of boosted competitiveness) and/or downstream linkages (indirect competitiveness boost/spill-over effects)



In the case of the £10m spent on increasing energy efficiency in public buildings, a sustained return to the public purse may be secured as a result of reduced costs of delivering public services. However, depending on the response of energy supplier, this may come at the cost of reduced Scottish GDP, though employment may fare slightly better.

If even just a 2.5% reduction in physical energy requirements is achieved in the public sector...

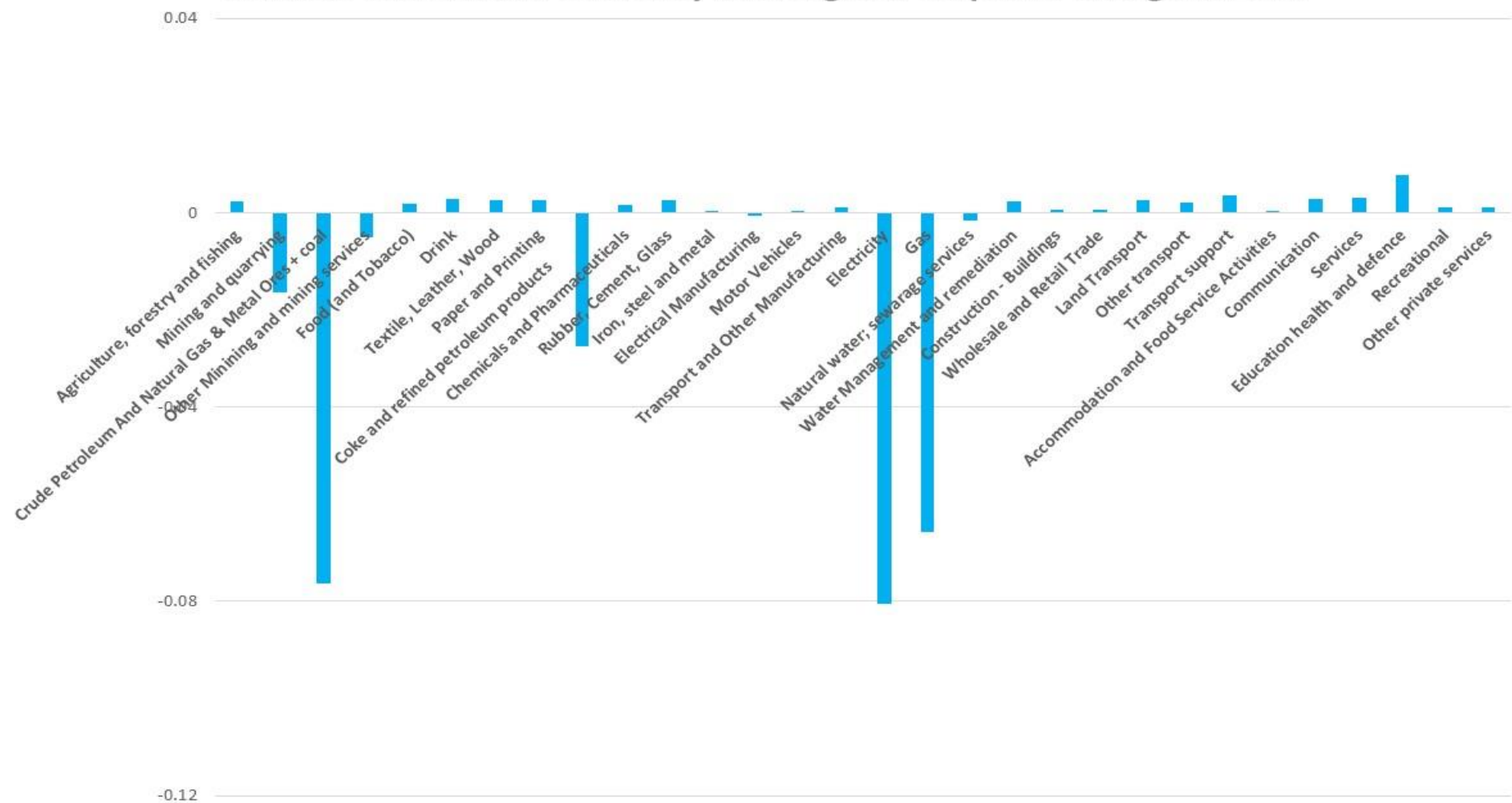


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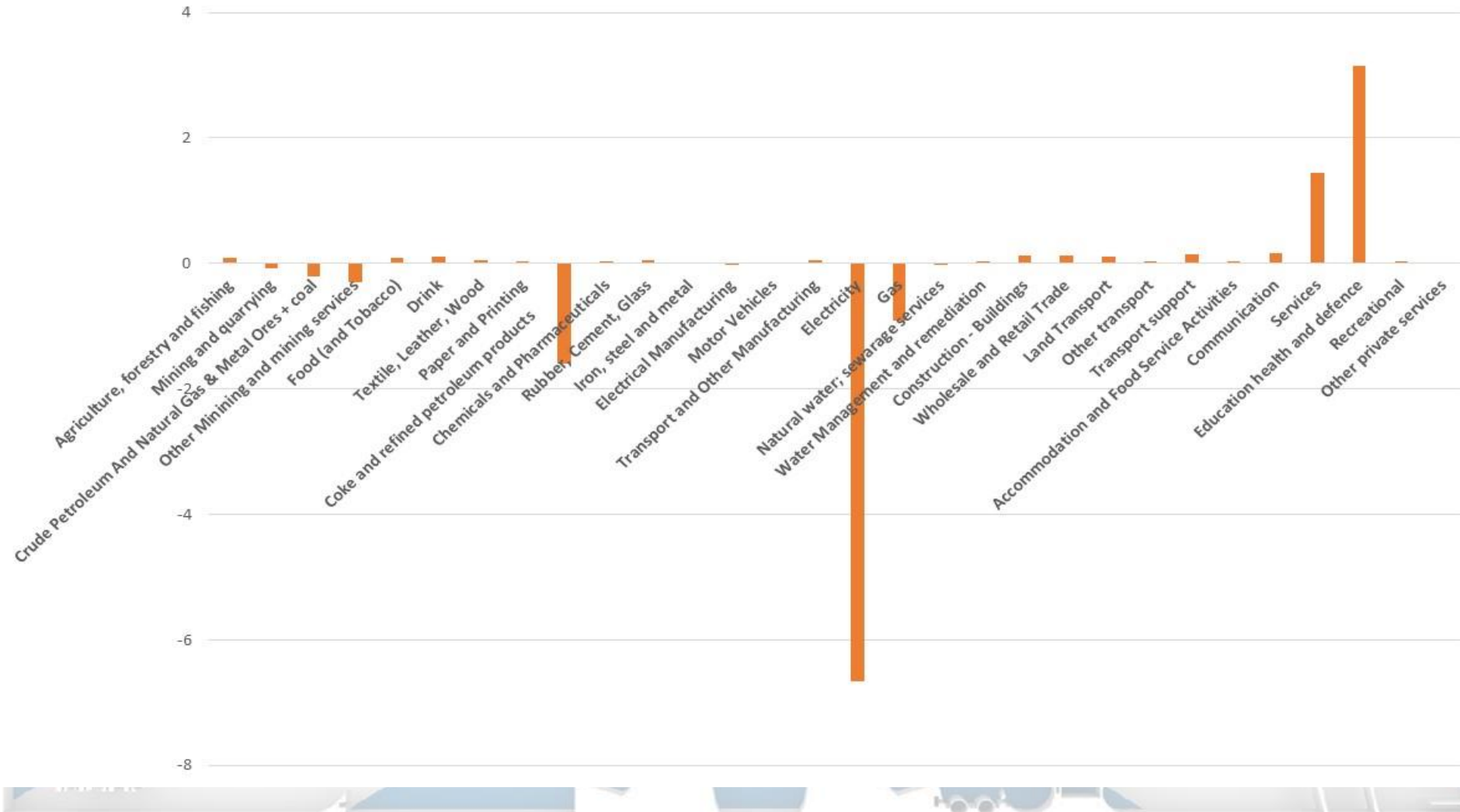
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Winners and Losers? Sector by sector gross output % change in 2027



In value terms? Sector by sector gross output change in £m



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Energy efficiency on the consumption side of the economy?

- Household energy efficiency: lowers marginal cost of energy services
- Frees up income to spend on other things
- Shift in pattern of, and increase in level of demand
- Process of ***demand-driven economic expansion***
- Diagram for HMT/BEIS (above) – winners and losers ('crowding out')
- Impacts in practice? Depends on energy intensity, spending power and sources of income in targeted households (and what happens to prices)
- In Scotland, may not expect UK-style crowding out – less constrained economy (flow migration of labour)



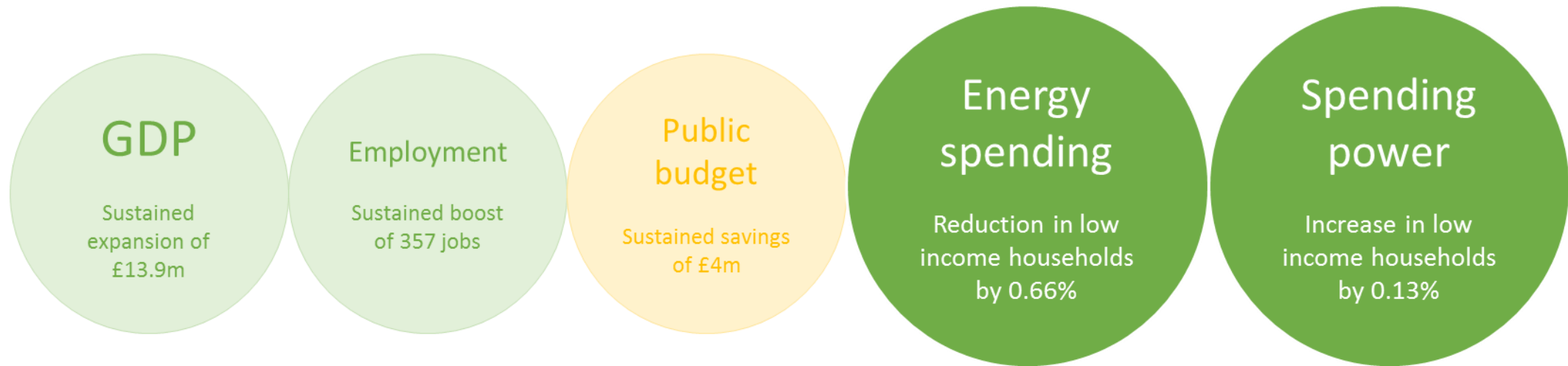
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The greatest all round socio-economic return may be realised as a result of increasing energy efficiency in low income households. This is in terms of a sustained boost to Scottish GDP, employment and public finances (recovering a significant part of the £10m spend). The key impact in terms of fuel poverty is that not only will spending by low income households on energy fall, the purchasing power of low household real incomes will rise in a sustained way.

If a 2% reduction in energy required to provide heating, lighting and cooking in low income households is achieved...

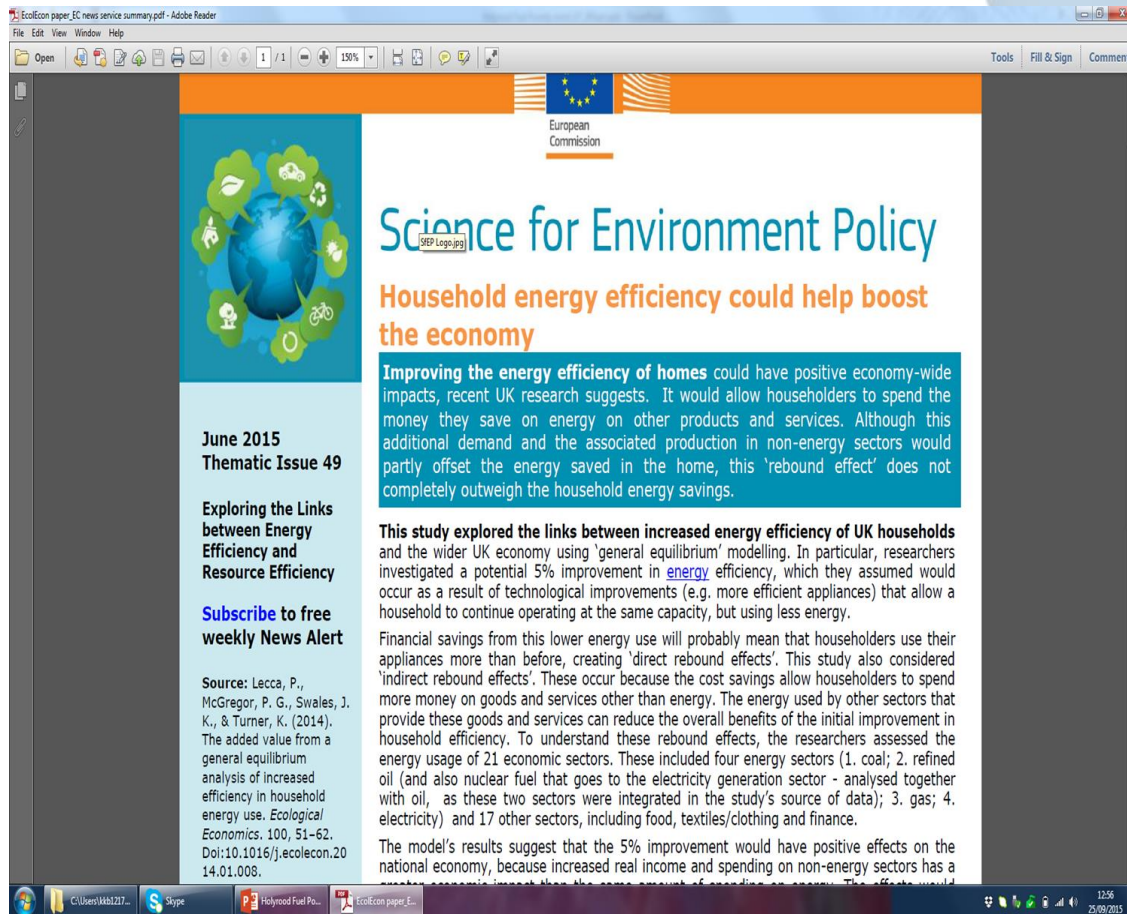


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A bigger economic boost is possible...



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 change over time; in the long-run, industry and householders adjust their behaviour and capacity in response to changes in energy consumption triggered by the efficiency savings; for example, although energy companies will drop their prices in response to reduced demand, they may increase them in the long run in order to restore company revenues.

In the long term, the national GDP could increase by 0.10% in response to the household expenditure changes. Total household consumption of goods and services would increase by 0.25% in value and national investment by 0.10%, results suggest. There could also be a corresponding 0.40% fall in unemployment rates and average wage increases of 0.07%.



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General lessons?

- Multiple benefits? HMT correct to question particularly the retrofit stage
- True that energy efficiency generally has potential to boost the economy
- *But*, it really does depend on what sectors of the economy, what type of households are targeted and how
- **Question – what type of policy action is energy efficiency considered/aimed to be?**
- Expansionary policy? Energy policy? Social policy? Cost reduction policy?
- What are the key performance indicators? Type/focus of policy determines this
- Key point, if the £20m spend announced Sept 16 was indeed an economic stimulus/expansionary policy, it didn't quite do the job



But economy-wide impact *are* important in any case

ENERGY STRATEGY – SCOTLAND'S ENERGY EFFICIENCY PROGRAMME (SEEP)

NATIONAL INFRASTRUCTURE PRIORITY FOR ENERGY EFFICIENCY



Achieving these targets will mean that to be fit for the future Scotland's homes, commercial properties and the public sector estate will need to be near zero carbon by the middle of this century. Delivering this will be very challenging and must be done in a way that is both socially and economically sustainable. Improving the energy efficiency of Scotland's buildings, decarbonising their heat supply and tackling fuel poverty will have many positive benefits including supporting jobs nationwide, enhancing businesses' competitiveness, as well as improving health and early years outcomes.



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CEP web-site:

<https://www.strath.ac.uk/research/internationalpublicpolicyinstitute/centreforeenergypolicy>

EPSRC project web-site:

<http://www.cied.ac.uk/project/energy-saving-innovations-and-economy-wide-rebound-effects>

Please read our Centre for Energy Policy blog and policy briefs at:

<https://www.strath.ac.uk/research/internationalpublicpolicyinstitute/ourblog/energy/>

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