UNIVERSITY of STRATHCLYDE
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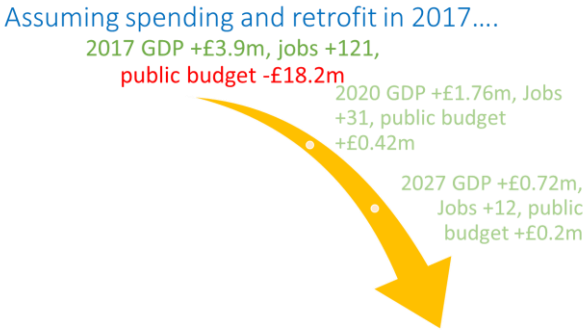
Potential economic impacts of the Scottish Government's £20million 'post-Brexit' energy efficiency spending stimulus

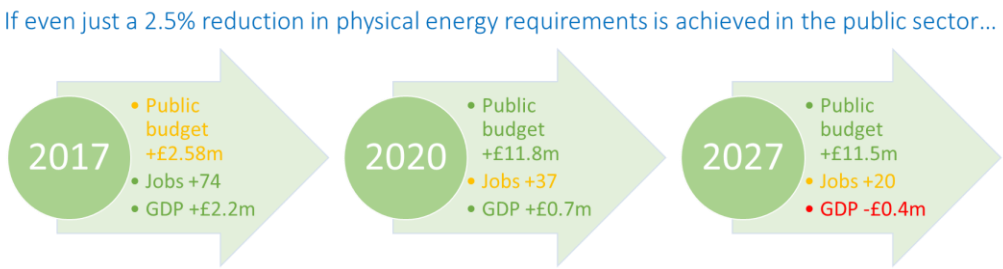
In September 2016, Scotland's First Minister announced the allocation of £20 million to be spent on energy efficiency measures, split between £10 million in social housing and £10 million in public buildings. The spending was announced as part of an economic stimulus package. Here we consider the potential impacts on several key performance indicators of the spending injection itself and of the intended boost to energy efficiency in the two targeted sectors.

Headline impacts estimated:

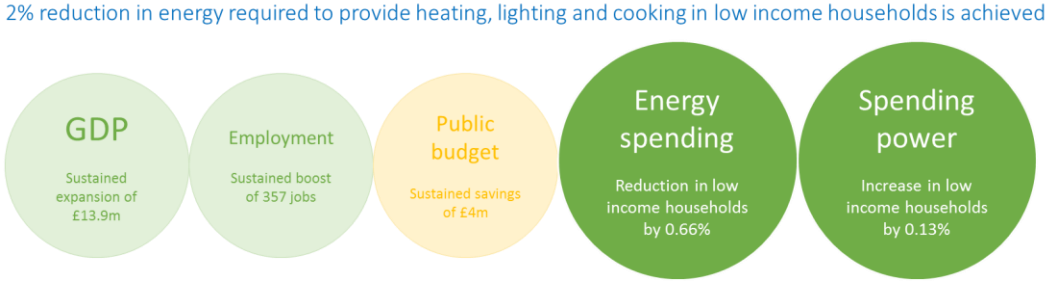
1. Gains to the Scottish economy resulting from the total **£20m spending boost alone** are largest in the year that the spending and retrofitting take place and must be set against the impact on the government budget of making the expenditure (partly offset by gains from the expansion).



2. 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 suppliers, this may come at the cost of reduced Scottish GDP, though employment may fare slightly better.



3. 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 on energy by low income households fall, the purchasing power of low household real incomes will rise in a sustained way.



How are economic impacts delivered in each case?

1. What gains are delivered by the £20million additional spending alone?

This will involve spending on public building and housing stock 'capital' delivered by the Scottish Construction sector. However, the positive macroeconomic impacts are greatest in the year (2017) that the spending and retrofitting are made to enable efficiency improvements. Our most optimistic estimate is a boost to Scottish GDP of around £3.9million, which will only lead to a very small (less than £1.8m) offset to the £20m requirement on the public budget, supporting around 121 FTE (full-time equivalent) jobs in 2017. Within a year GDP expansion falls to less than £2.7million, supporting less than 85 Scottish jobs, (33 of which will be direct jobs in the construction sector), and continues to erode over time (e.g. by 2027 GDP expansion is only £0.72m with 12 jobs supported).

Moreover, it is important to note that the positive impacts estimated depend crucially on how the construction industry view the £20m government spending. Specifically, if firms view this as a one-off investment only, they may not allocate their resources in such a way as to facilitate the type of boost reported here.

2. Might a more sustained boost to Scottish GDP, jobs and/or public finances be delivered by the £10m spent on increasing energy efficiency in public buildings?

Improved macroeconomic performance may be anticipated as a result of any efficiency improvement on the production side of the economy due to the knock-on effects of reduced costs and increased competitiveness. However, where the public sector activity in question does not have important UK downstream supply and/or export market connections, the main positive impacts of reduced energy costs in public buildings would be expected in the state of the public budget. Our analysis suggests that if the £10m spending on making public buildings more energy efficient in 2017 can result in even a 2.5% reduction in physical energy requirements to deliver the Scottish public service requirement (i.e. public administration, defence, education and health), the gross savings in government spending will exceed £11m in 2017 and be sustained over time. Combined with the £10m spend and its positive effects, the net impact on the Scottish public budget is £2.58m. That is, in 2017 (or whenever the efficiency gain is realised), the £10m investment would (more than) pay for itself in terms of the public purse, and continue to deliver in subsequent years (when only operational / maintenance spending would be required to continue to maintain efficiency gains).

However, the positive impact on the public budget will be slightly eroded over time by limited economy-wide expansion. Initially (in the year that efficiency improves) we estimate that a very small positive boost to GDP (only around £290k) and Scottish employment (only 14 jobs) may be realised if prices faced by government, households and firms (directly or indirectly) using public services are reduced. This will add to the short-term boost from the £10m share of the additional spend itself, leading to a total net GDP boost of just over £2.2m and around 75 jobs supported by the boost in 2017.

Nonetheless, over time the boost to GDP and jobs will quickly be offset, particularly by contracting activity in Scottish energy supply sectors as demand for their output falls, so that by 2024 the positive GDP effect is entirely wiped out and by around 2037 around £1m of Scottish GDP is sacrificed. This will be reflected in public finances, though we estimate that £11m in savings per annum may still be achieved if an energy efficiency improvement of at least 2.5% continues to be realised in the public sector. Moreover, a net positive impact on Scottish employment may be maintained, though at a very low level (only around 10 jobs attributable to the policy action are sustained over time).

3. Would increasing energy efficiency in social housing generate a larger and more sustained expansion in the Scottish economy?

A sustained stimulus to the economy may be triggered by improving the energy efficiency of people's homes. This is because both the spending power of households and the share of disposable income available to them to spend on other things (as well as energy – the rebound effect) increases as a result of the lower cost of heating and lighting enabled by increased efficiency. However, whenever the economy is stimulated by increased demand, there are likely to be trade-offs as a result of pressure on prices throughout the economy.

Our analysis suggests that if the £10m investment in making the social housing stock more energy efficient in 2017 can result in even a 2% average decrease in energy required to maintain the status quo in heating, lighting and cooking across the lowest household band in the Scottish economy, a wider societal economic return in the form of a cumulative increase in GDP of more than £10m (£12.6m) by 2019, accompanied by the creation of 212 full-time equivalent jobs, may be associated with the efficiency improvement alone. Combined with the impacts of the £10m spend on retrofitting, a cumulative £9.5m boost is delivered by 2018, growing to £16.8m by 2019. Moreover, this efficiency-driven element is sustained and grows over time such that the combined impact of the spending and the resulting energy efficiency boost grows until a net per annum boost of around £13.9m is achieved by 2041. This is accompanied by a sustained increase in Scottish employment of 356 jobs. Initially, there is some upward pressure on prices across the Scottish economy, which will negatively affect both real household incomes and the public budget by increasing required nominal spending to maintain real expenditure levels, as well as potentially dampening export demand.

However, so long as Scottish labour and capital markets are able to fully respond to the demand stimulus, any pressure on prices will be relaxed over time. Moreover, the macroeconomic impacts, both positive and negative, in any time frame of boosting the spending of the lowest income households to the extent considered here are not that great: the maximum impacts on the CPI and GDP in percentage terms are only 0.01% (for both indicators) in 2017 and 2047 respectively. Other energy actions – whether involving more spend to deliver more efficiency, or targeting households with greater spending power – could potentially deliver greater economic expansion. [See other policy brief on the final page of this briefing for other relevant work in our project.]

However, the key performance indicators by which the type of economic expansion delivered by increased energy efficiency in low income households may be judged by are likely to be (i) realising *sufficient* return via GDP, employment and/or the public budget to justify the spending; and (ii) on the impacts on the determinants of fuel poverty. In terms of (i), and in contrast to the public sector case above, the budgetary benefits are indirect, being delivered through the wider economic expansion (with any impact on the cost of delivering public services being a slightly negative one due to upward pressure on prices). Nonetheless by 2038 a sustained improvement of £4m in the public budget, equating to 40% of the initial £10m spend is achieved. The greater societal return is achieved through the boost to GDP, which by 2022, reaches a sustained level of £10million higher (in real terms) per annum as a combined result of the additional spending and the efficiency boost.

In terms of how key determinants of fuel poverty are impacted, the key thing to note is that in the absence of the economic expansion, the level of real income will be unchanged by increased energy efficiency on its own. Rather fuel poverty will be expected to reduce (and may be offset by rebound effects) through reduced spending on energy alone. However, when the economy expands, the real income of low income households increases (here by 0.006% in 2017, when the £10m spend is made, with a sustained increase of 0.003% from 2018 onwards). This will also act to reduce fuel poverty. However, any real income gains will be eroded in time frames where the CPI increases. The positive impact on any fuel poverty indicator will also be affected by further rebound effects (increasing energy use due to real increase in income). However, this may not reflect a loss in economic well-being per se (e.g. where historically homes have been under-heated and rebound reflects 'comfort-taking').

On the other hand, another important point to note, and which may not be fully or explicitly reflected in any fuel poverty indicator, is that low income households gain from increased efficiency in terms of the spending power of their real income. This is a direct result of the increase in energy efficiency. In the case reported here, this proves more important than the boost to the underlying real income itself, which is limited in low income households where the wage and capital incomes generated in the growing economy are a less important source of income. The impact of the combined spending and energy efficiency improvement is to boost the spending power of the real income of the lowest household income group by 0.134% in 2017 and by 0.132% from 2021 onwards. This is set against a 0.64% drop in spending on residential energy use by the lowest income households in 2017, and a sustained drop of 0.66% from 2022. While these are relatively small impacts on spending power and energy uses, they are the result of a relatively small spend on and boost to energy efficiency. As the Scottish Government's fuller investment to support energy efficiency rolls out over time, positive outcomes such as these would be expected to grow.

A NOTE ON OUR APPROACH

The key performance indicator impacts reported here are estimated using a version of the AMOS computable general equilibrium (CGE) model initially developed by the Fraser of Allander Institute (FAI) and extended to consider energy policy issues by FAI and the Centre for Energy Policy (CEP) at the University of Strathclyde (UoS). We note that the AMOS model used here is calibrated on 2010 data for Scotland and that results reported in monetary units should be considered in that context. Moreover, given a current lack of data on Scottish household energy use and potential energy efficiency gains in the type of format required for economy-wide modelling, the numerical findings should be viewed as indicative in terms of the magnitude and direction rather than providing point estimates of expected impacts.

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OTHER RELEVANT IPPI CENTRE FOR ENERGY POLICY BRIEFS

‘How Improving Household Efficiency Could Boost the Scottish Economy’

‘Increased Household Energy Efficiency: Can it Boost the UK Economy?’

‘So what if there were a larger and more sustained energy efficiency effort across the economy, what would be the impact?’

‘So which households can benefit from energy efficiency and is there an argument to fund from the public purse?’

European Commission Science for Environmental Policy news piece: ‘Household energy efficiency could help boost the economy’
(http://ec.europa.eu/environment/integration/research/newsalert/pdf/household_energy_efficiency_could_help_boost_economy_49si7_en.pdf)

Find these and more on our website: http://www.strath.ac.uk/research/internationalpublicpolicyinstitute