Valuation and Demand

GC620 Evaluating the effectiveness of domestic energy efficiency policy

Phil Birch, Sweett Group
Objectives

- Evaluate existing / previous domestic policy initiatives
- Normalise the data into recognisable metrics (e.g. cost / carbon)
- Provide recommendations as to the elements that work well / should be avoided
Method

1. Identify relevant policies
2. Develop evaluation matrix
3. Gather and synthesise data
4. Develop principles for future policy
5. Test and refine principles
6. Develop policy guidance tool for stakeholder use

Stakeholder engagement
## Policies reviewed

<table>
<thead>
<tr>
<th>Supplier obligations</th>
<th>Grants</th>
<th>Market mechanisms and financial incentives</th>
<th>Pilot demonstrations</th>
<th>Standards and codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEC1</td>
<td>Boiler scrappage</td>
<td>FITs</td>
<td>Major PV programme</td>
<td>CfSH</td>
</tr>
<tr>
<td>EEC2</td>
<td>HECAction</td>
<td>Reduced VAT</td>
<td>LCBP</td>
<td>Part L</td>
</tr>
<tr>
<td>EESoP</td>
<td>HEES</td>
<td>RHI / RHPP</td>
<td>DECC LA competition</td>
<td>Decent Homes</td>
</tr>
<tr>
<td>CERT</td>
<td>Warm front</td>
<td>Green Deal</td>
<td>PAYS audits</td>
<td>PRSMS</td>
</tr>
<tr>
<td>CESP</td>
<td></td>
<td></td>
<td>Retrofit for the future</td>
<td></td>
</tr>
<tr>
<td>ECO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Grants: Boiler scrappage, HECAction, HEES, Warm front*

*Mechanisms and financial incentives: FITs, Reduced VAT, RHI / RHPP, Green Deal*

*Pilot demonstrations: Major PV programme, LCBP, DECC LA competition, PAYS audits, Retrofit for the future*

*Standards and codes: CfSH, Part L, Decent Homes, PRSMS*
The Green Construction Board

**Evaluation matrix**

<table>
<thead>
<tr>
<th>Policy / programme name</th>
<th>Changes to scheme over time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief description</td>
<td>Marketing/engagement</td>
</tr>
<tr>
<td>Current status</td>
<td>Audience differentiation / segmentation</td>
</tr>
<tr>
<td>Time scale / years active</td>
<td>Costs to public purse / cost to bill payer</td>
</tr>
<tr>
<td>Sources of info</td>
<td>Other costs and investments</td>
</tr>
<tr>
<td>Geographic coverage</td>
<td>Total investment mobilised</td>
</tr>
<tr>
<td>Type of scheme</td>
<td>Take-up</td>
</tr>
<tr>
<td>Source and structure of funding if applicable</td>
<td>Carbon savings (predicted)</td>
</tr>
<tr>
<td>Target audiences</td>
<td>Carbon savings (actual)</td>
</tr>
<tr>
<td>Building types</td>
<td>Cost per tCO₂ saved</td>
</tr>
<tr>
<td>Measures supported</td>
<td>Energy savings (predicted)</td>
</tr>
<tr>
<td>Basic offer or mechanism</td>
<td>Energy savings (actual)</td>
</tr>
<tr>
<td>Supporting policies / programmes</td>
<td>Key successes and barriers overcome</td>
</tr>
<tr>
<td>Monitoring and evaluation mechanisms</td>
<td>Key failures and barriers not overcome</td>
</tr>
<tr>
<td>Institutional framework</td>
<td>Key learnings</td>
</tr>
<tr>
<td>Key stakeholders for delivery (broken down by role)</td>
<td>Key stakeholder contacts</td>
</tr>
<tr>
<td>Barriers addressed</td>
<td>Overall non-carbon benefits</td>
</tr>
<tr>
<td>Stated objectives</td>
<td></td>
</tr>
<tr>
<td>Any non-stated objectives?</td>
<td></td>
</tr>
</tbody>
</table>
## Success and failure factors

### Success

- Low delivery costs
- Joined up strategy - short, medium and long term
- Achieve 2050 Target
- Robust baseline and measurement
- The ‘right stuff’ to the ‘right people’
- Mass market uptake
- Cost effective delivery
- Equitable - fair distribution of benefits
- Householder satisfaction
- Behaviour change
- Happy, successful supply chain
- Consumer protection
- Understand link between energy and reducing CO₂
- Minimise unintended consequences
- Real savings (not calculated)

### Failure

- Customer dissatisfaction
- Lack of institutional memory
- Major technical failure
- Uncertainty
- Fragmented landscape - wasted effort, time and resources
- Absence of leadership
- Lobbying of politics trumps the economic case
- Lack of data
- Consultations repeated
- Lack of right measurement tools
- Performance gap
- Research gap
Outputs

Excel toolkit with extensive information about each investigated programme

Four outputs help toolkit users learn about and evaluate each programme

A: Overall review of scheme impacts
B: Individual scheme review
C: COMPASS toolkit for policy development
D: Scheme details

‘COMPASS’ is a mnemonic designed to help the user understand the key requirements for developing effective policy
Consistency and longevity should be assured through a realistic timetable.

Objectives should be coherent and clearly communicated.

Market needs should be assessed and guide scheme design.

Performance gaps should be recognised and real savings ensured.

Awareness-raising and consumer engagement should be built in.

Simple policy designs are most effective.

Scrutinise, monitor and evaluate progress, with reference to baseline data.
Overview of toolkit

Section A - Review of total contribution of energy efficiency policy to reducing carbon emissions in domestic sector

Figure 2: Total contribution of programmes to overall domestic CO₂ emissions reduction
This graph shows the total contribution of all the programmes to overall domestic CO₂ emissions reduction between 1990 and 2012. Blue shading represents total emissions, and the red area shows the savings achieved by the policies, measured in mT CO₂.

Figure 3: mCO₂ saved versus overall SAP score
This graph shows the CO₂ saved by all the programmes (red bars) alongside the overall SAP score of the domestic building stock (blue line), based on the SAP 2005 process. CO₂ is measured in millions of tonnes per year.

Figure 4: Total contribution of programmes to domestic CO₂ emission reduction (per property)
This graph shows the total contribution of all the programmes to domestic CO₂ emissions reduction per property since 1990. Green represents the total emissions per property, while red represents the savings achieved by the programmes, measured in TCO₂/yr.
Overview of toolkit

**Section B - Evaluation of specific programmes** (hover over each programme to see results below)

<table>
<thead>
<tr>
<th>Supplier obligations</th>
<th>EEC 1</th>
<th>EEC 2</th>
<th>EESOp</th>
<th>CERT</th>
<th>CESP</th>
<th>Energy Company Obligation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilots and demonstrations</td>
<td>Large scale PV demo</td>
<td>LCBP</td>
<td>DECC LA competition</td>
<td>PAYS pilots</td>
<td>Retrofit for the Future</td>
<td></td>
</tr>
<tr>
<td>Standards and codes</td>
<td>Code for Sustainable Homes</td>
<td>Decent Homes</td>
<td>Part L of Building Regulations</td>
<td>Private-rented sector minimum standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grants</td>
<td>Boiler scrappage</td>
<td>HECAction</td>
<td>HEES</td>
<td>Warm front</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market mechanisms and financial incentive structures</td>
<td>Feed-in Tariffs</td>
<td>Reduced rate of VAT</td>
<td>Renewable Heat Incentive Payment</td>
<td>Green Deal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5** - Performance of programme versus principles (explanation below)

**Figure 6** - Performance of programme at reducing carbon (explanation below)

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**Figure 5** shows the performance of each programme against each best practice principle for policy development. Section C provides further information about each principle. The data informing the graph can be viewed via the button below.

**Figure 6** shows the amount of carbon (in millions of tonnes of CO₂) each programme has saved (for those schemes where data is available).

Click the button to view the scoring behind Figure 5
Overview of toolkit

Section C - COMPASS guide for developing best practice energy efficiency policy

Principles for effective policy

**Principle**

- Market needs should be assessed and guide scheme design

**Explanation**

Policy design should consider the state of the market, and respond to the needs of business, industry and consumers. For example, there may be a need for certainty in regulation, or for a particular market failure to be addressed. However, as well as responding to the market, schemes can aim to change market conditions, providing this is done carefully, with extensive stakeholder engagement.

**Example of good practice**

ECC1, ECC2: Evaluations suggest that these schemes addressed a market failure and provided a clear, long-term structure within which market actors could make plans.

CERT: Stakeholders suggest that CERT has created employment by supporting the expansion of the insulation industry, with jobs for assessors, surveyors, installers, and in the production of double glazing, mineral wool and other insulation materials.

**Example of bad practice**

Green Deal: Businesses have expressed concerns, including that the Cashback rules prevent most SMEs and sole traders from participating in the scheme, meaning 85% of cashback has been through one large Green Deal provider (ACE, 2013).

RHI: There have been criticisms concerning the creation of perverse incentives and the over-promotion of less efficient technologies e.g. air source heat pumps (ECC Committee oral evidence, 20.3.2013)

Both Government and industry can play their part in addressing the examples of bad practice and replicating the examples of good practice. A good starting point is to consider the questions set out below:

**Questions for Government**

- Have you considered the state of the market, and responded to the needs of business, industry and consumers?
- If the scheme is aiming to change market conditions, have you undertaken extensive stakeholder engagement?

**Questions for industry**

- Do you provide realistic and constructive input on market needs into scheme design, sharing data where possible?
## Section D - Overview of different programmes / initiatives

<table>
<thead>
<tr>
<th>Policy / programme name:</th>
<th>Warm Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief description:</td>
<td>State funded grant scheme aimed at addressing fuel poverty.</td>
</tr>
<tr>
<td>Timescale:</td>
<td>June 2000 - 2012</td>
</tr>
<tr>
<td>Sources of information:</td>
<td>&quot;Warm Front: helping to combat fuel poverty&quot; (2003) by the NAO. &quot;The Warm Front Scheme&quot; (2009) by the NAO. &quot;Warm Front, better health&quot; (2008) by Geoff Green and Jan Gilbertson</td>
</tr>
<tr>
<td>Carbon saved:</td>
<td>7.2 mt</td>
</tr>
<tr>
<td>Notes:</td>
<td>Savings from 2001 to 2008 inclusive are from Jack Hulme paper for DECC (<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48189/3148-co2-emissions-savings-warm-front.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48189/3148-co2-emissions-savings-warm-front.pdf</a>, p. 6). From there on, the 2012 UEP projections form the basis of Warm Front CO2 savings. However, the latter include other fuel poverty programmes (unspecific and show emissions increases overall from 2008). We have assumed that the Warm Homes Discount accounts for these emissions increases, and, for the years 2011 to 2014 inclusive, have identified these increases in the Final Stage IA of the Warm Homes Discount (<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42595/1308-warm-home-disc-impact-assessment.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42595/1308-warm-home-disc-impact-assessment.pdf</a>; p. 27, Table 10, Policy option 2), which have then been subtracted from the UEP 2012 emissions from these years. This brings things broadly into line with Jack Hulme’s paper. Across 2009 and 2010 (between the end of Jack Hulme’s estimate and the start of the WhID), we have reduced 2008’s savings linearly to bring them into line with 2011. The UEP emissions data begins to tail off from 2027. We assume this to be the continued impact of the longer-lived measures delivered by Warm Front (insulation), as the heating systems installed (with an assumed lifetime of 15 years) should no longer have persistent carbon savings beyond this date. As a result, we bring down the savings in 2014 through to 2027 down linearly, reflecting the gradual expiry of mainly heating system CO2 savings. 2027 to 2030 is unchanged UEP data.</td>
</tr>
<tr>
<td>Cost per tonne of CO2:</td>
<td>£ 384.69</td>
</tr>
<tr>
<td>Confidence level:</td>
<td>medium</td>
</tr>
<tr>
<td>Programme cost (£m):</td>
<td>2775.00</td>
</tr>
<tr>
<td>Confidence in data:</td>
<td>medium</td>
</tr>
</tbody>
</table>
Recommendations

- Disseminate COMPASS toolkit - audiences include policy makers and influencers.

- Situate toolkit in a prominent, central location so it can be easily accessed.

- Identify appropriate host to manage and maintain toolkit.

- Investigate potential to expand coverage to non-domestic sectors.

- Evaluate merits of a web based application to encourage dissemination and use.
Next steps / wider links

- COMPASS toolkit used to inform other pieces of work around policy research in line with 2025 construction strategy.

- COMPASS approach can provide a useful foundation for future policy evaluation / design.