Energy Efficiency Obligations: the UK experience

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Regulatory Assistance Project (RAP)

Non-profit organization providing technical and policy assistance to government officials on energy and environmental issues

Principals and senior associates are all former regulators or energy officials with deep experience in energy efficiency and other clean energy alternatives

Funded by several foundations, US DOE & EPA and international agencies & philanthropic organisations

RAP has advised governments in over 18 nations and 40 US states; European office in Brussels.
Contents

Energy efficiency obligations/ White Certificates

GB experience of Energy Efficiency Obligations (EEOs)

Recent developments in EU-27

Do EEOs work i.e. do they actually turn down demand?
EEOs & Openly Tradable WCs

All such activities in EU whether called EEOs or WCs operate the same principle – obligation requires energy provider to prove their activities have resulted in energy efficiency improvements by eligible end use customers - awarded a White Certificate accrediting the extent of the energy savings achieved.

Openly tradable WCs are when parties other than the obligated energy providers can earn WCs in their own right and trade them in the market place – really only in Italy, with limited trading in France.
GB & Energy Efficiency Obligations

Been on electricity retailers since 1994, gas since 2000
Been steadily growing in terms of energy retailer spend and activity – now only residential sector
EEC2 results (April 2005-March 2008) very positive
From April 2008 called CERT with a lifetime CO2 saving target (undiscounted); financial savings discounted at 3.5%; 40% savings target for low income households
My current estimate of expenditure in CERT by energy retailers is ~€1.4 billion/year or per fuel bill increase per year ~€34 equivalent to ~4% of average GB residential dual fuel bill.
GB EE Obligations - History

Number of measures installed thousands/year

Source – Ofgem 2011
Over 120 million measures actually installed in 3 years; appliances & lighting dominate in numbers but insulation dominates the energy savings (75%)

Target met 23% cheaper than Government estimate; free-riders ~ 20%; suppliers spent ~ €360M/year

NPV/tCO2 net of deadweight = €54

Cost of saving a unit of electricity is 2.2p/kWh; for gas 0.6 p/kWh; cf ex VAT residential price 9.6 & 2.5 p/kWh

2 out of 3 low income households benefited (mainly CFLs); also 1.1million low income homes insulated
EEC2 (2005-8) Headlines – 2

Cost on fuel bills – for all consumers ~€8.3 per fuel per year (); for low income ~€6 per fuel per year

Every €1 raised from low income households, their group has long term benefits of €18 incl. comfort

All households consumer benefits €4.4 billion; consumer benefit per €1 supplier spend = €8

National cost effectiveness (including comfort, excluding deadweight) = £2.8 billion

Impacts on fuel poverty comparable with WarmFront (the Government’s fuel poverty programme)
Carbon Emissions Reduction Target (CERT)

The original 3 year target of 154 MtCO2 lifetime savings was increased by 20% by Government to 185 MtCO2 lifetime savings & then extended the same CO2 saving rate 21 months till end 2012 – now 293 MtCO2

At end of first 4 year period, energy retailers had met 83% of the increased 293 MtCO2 lifetime savings

CFLs “give away” banned in April 2010 and completely since April 2011; extension target has 68% “ring fenced” for professionally installed insulation

Expected energy retailer spend now ~€1.4 billion/year

Measures installed in first 3 years of CERT in approx. order of individual contribution to CO2 savings – next slide:
## CERT installations – the top 10 in 4 years

<table>
<thead>
<tr>
<th>Energy Efficiency Measure</th>
<th>Total number of measures installed</th>
<th>% of total CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavity wall insulation</td>
<td>2,103,150</td>
<td>26.4%</td>
</tr>
<tr>
<td>Professional Loft Insulation</td>
<td>2,915,389</td>
<td>22.4%</td>
</tr>
<tr>
<td>CFLs</td>
<td>303,555,479</td>
<td>21.4%</td>
</tr>
<tr>
<td>DIY Loft Insulation</td>
<td>524,651</td>
<td>10.3%</td>
</tr>
<tr>
<td>Shower regulators</td>
<td>5,171,654</td>
<td>4.3%</td>
</tr>
<tr>
<td>Communal heating - number of heating systems</td>
<td>397</td>
<td>2.7%</td>
</tr>
<tr>
<td>Fuel switching</td>
<td>90,476</td>
<td>2.5%</td>
</tr>
<tr>
<td>Window glazing over Building Regulations</td>
<td>1,506,930</td>
<td>1.9%</td>
</tr>
<tr>
<td>TVs</td>
<td>30,324,293</td>
<td>1.9%</td>
</tr>
<tr>
<td>Standby savers</td>
<td>5,442,049</td>
<td>1.8%</td>
</tr>
</tbody>
</table>
CERT CO2 Savings by End March 2012

CERT CO2 savings by end use

- Insulation: 62%
- Lighting: 21%
- Heating: 11%
- Appliances: 5%
- Behavioural: 1%

Source – Ofgem 2012
## EEOs in the EU (2011)

<table>
<thead>
<tr>
<th>Country</th>
<th>Obligated Company</th>
<th>Eligible Customers</th>
<th>Administrator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium - Flanders</td>
<td>electricity distributors</td>
<td>residential and non energy intensive industry and service</td>
<td>Flemish Government</td>
</tr>
<tr>
<td>France</td>
<td>retailers of non-transport energy + importers of road transport fuel</td>
<td>All (including transport) except EU ETS</td>
<td>Government</td>
</tr>
<tr>
<td>Italy</td>
<td>electricity &amp; gas distributors</td>
<td>All including transport</td>
<td>Regulator (AEEG)</td>
</tr>
<tr>
<td>GB</td>
<td>electricity &amp; gas retailers</td>
<td>Residential only</td>
<td>Regulator (Ofgem)</td>
</tr>
<tr>
<td>Denmark</td>
<td>electricity, gas, fuel oil &amp; heat distributors</td>
<td>All except transport</td>
<td>Danish Energy Authority</td>
</tr>
<tr>
<td>Country</td>
<td>Nature of saving target</td>
<td>Current size of target</td>
<td>Estimated annual spend by companies €M {€/person}</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------</td>
<td>------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Belgium – Flanders</td>
<td>1st year primary energy</td>
<td>0.6 TWh annual</td>
<td>60 {14}</td>
</tr>
<tr>
<td>France</td>
<td>lifetime delivered energy</td>
<td>345 cumac TWh over 3 years to end 2013</td>
<td>340 {5}</td>
</tr>
<tr>
<td>Italy</td>
<td>cumulative 5 year primary energy</td>
<td>5.3 Mtoe in 2011</td>
<td>530 {9}</td>
</tr>
<tr>
<td>GB</td>
<td>lifetime CO2</td>
<td>293 MtCO2 in 4.75 years to end 2012</td>
<td>1440 {24}</td>
</tr>
<tr>
<td>Denmark</td>
<td>1st year delivered energy</td>
<td>6.1 PJ annual</td>
<td>100 {18}</td>
</tr>
</tbody>
</table>
### Most EEO Activity is in Residential Sector

<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>% energy savings from residential sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium - Flanders</td>
<td>2010</td>
<td>58% (mandated)</td>
</tr>
<tr>
<td>Denmark</td>
<td>2008</td>
<td>42%</td>
</tr>
<tr>
<td>France</td>
<td>2006-9</td>
<td>87%</td>
</tr>
<tr>
<td>Italy</td>
<td>2009</td>
<td>81%</td>
</tr>
<tr>
<td>GB</td>
<td>2008-12</td>
<td>100% (mandated)</td>
</tr>
</tbody>
</table>
EU EEOs – Where do the savings come from?

Residential Energy Savings by End-use

- Ita 2005-7
- Fra 2006-9
- Dk 2008
- GB 2008-11

Legend:
- Insulation
- Lighting
- Heating
- Appliances
- Other
Recent Trends in EEOs in the EU

Recognition that only counting first year energy savings towards the target undervalues energy savings from those measures with longer lifetimes; Denmark introduced in 2011 weighting factors dependent on the life of the EE measure; Italy looking at similar options to value longer lived measures such as insulation & industrial projects

France pioneering EEO on oil importers involved with road transport fuels;

Ireland introduced “voluntary” EEO this year on energy suppliers and oil importers of road transport fuel;
Observations on EEOs in the EU

Core element in all: EEO (backed by penalties if target missed);

Relatively few schemes in place (7 + 1 imminent) – they vary quite a lot but all judged to deliver successfully

Different targets, different end use sectors, different obliged actors - reflect local status of energy market, the EE history of the utilities, climate, energy saving opportunities, culture etc.;
Perhaps more importantly, different rules for measuring “savings” and for dealing with deadweight/free riders

Initial goals set low and achieved at costs below policy makers’ expectations; expanded & energy providers now spending ~€3.2 billion/year; in ~50 operational years of EU EEOs, no energy provider missed it’s overall energy saving target
Annual residential gas demand
(7% more customers between 2004-11)
British Gas individual annual gas consumption data for 4 million customers for the period 2006-10

Looked at factors affecting demand:
> Households, income & tenure of property
> External and internal temperatures
> Energy efficiency measures installed
> Changes in behaviour, lifestyles, increased climate change awareness, energy efficiency advice etc.
Is there any evidence that EEOs work? - 2

For this 5 year period, conclusions were:

Average household consumption fell by 22% over the period!!
Annual fall was 4.9% compound
Behaviour & lifestyle changes etc. reduced by ~ 2.7%/year
Reduction in gas customer demand was 3.3%/year as a direct result of energy efficiency measures (mainly insulation and heating)
Conclusions on EU EEOs

- Despite wide variation in the implementation of EEOs & energy market liberalisation status, they have been successful policy tools.
- MSs with EEOs have evaluated their programmes and expanded them in recent times.
- In the largest EEO, over the last 5 years they are contributing to a significant reduction in residential gas demand (22% reduction).
- EEOs avoid MS Government having to use public expenditure to stimulate EE – relevant to the current financial problems facing MSs.