

***“Energy Efficiency Obligations –
the UK Practical Experience on Validating &
Evaluating Energy Savings”***

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Key topics to be addressed

- Brief history of UK energy efficiency obligations
- Key elements of measurement philosophy
- Need for continuous assessment of energy savings & impact of recent research
- Verification in Practice
- Final energy and carbon savings from first phase of UK Energy Efficiency Commitment (EEC)

What are Energy Efficiency Obligations?

- A legal obligation on energy suppliers/retailers or distributors to save energy in their customers' premises
- Can be applied to any end use sector e.g. residential, small business, all sectors
- Energy saving targets are set by Government/Regulator and individual energy targets for supplier/retailer or distributor are proportional to their customer numbers
- Work in monopoly or liberalised market

Key Principles for UK design

- Focus on desired outcome i.e. energy saving in the customer's household
- Ex ante savings - proven energy efficiency measures only (if not energy suppliers pay for measurement costs)
- To give a representative value of the energy savings for any EE measure, use average lifetime of the measure but discount over life of measure (initially 8%, then 6% will be 3.5%)
- Ring fence low income – 50% of the benefit to come from low income households

Other Principles for UK design

- Minimise Free Riders – those that would have installed that EE measure anyway e.g. high profile campaigns in local area; keep moving the standard on white goods e.g. initially A to C, then A&B only, now A only, from 2005 A+ & A++ only
- Additionality – to disallow EE initiatives which are legally required anyway e.g. Building Regulations
- Quality and Customer Satisfaction – sample surveys of customer satisfaction undertaken; quality CFL list
- Incentives for energy suppliers to attract funds from other players e.g. local authorities, manufacturers, customers

UK History of Energy Efficiency Obligations

Phase	Duration	Fuel Obligated	Annual Supplier (€M)	€/year/fuel for customer
EESOP 1	1994-98	Electricity	35	1.5
EESOP 2	1998-00	Electricity	35	1.5
EESOP 3	2000-02	Electricity & gas	~70	~1.8
EEC 1	2002-05	Electricity & gas	~200	~4.5
EEC 2	2005-08	Electricity & gas	~560	~13

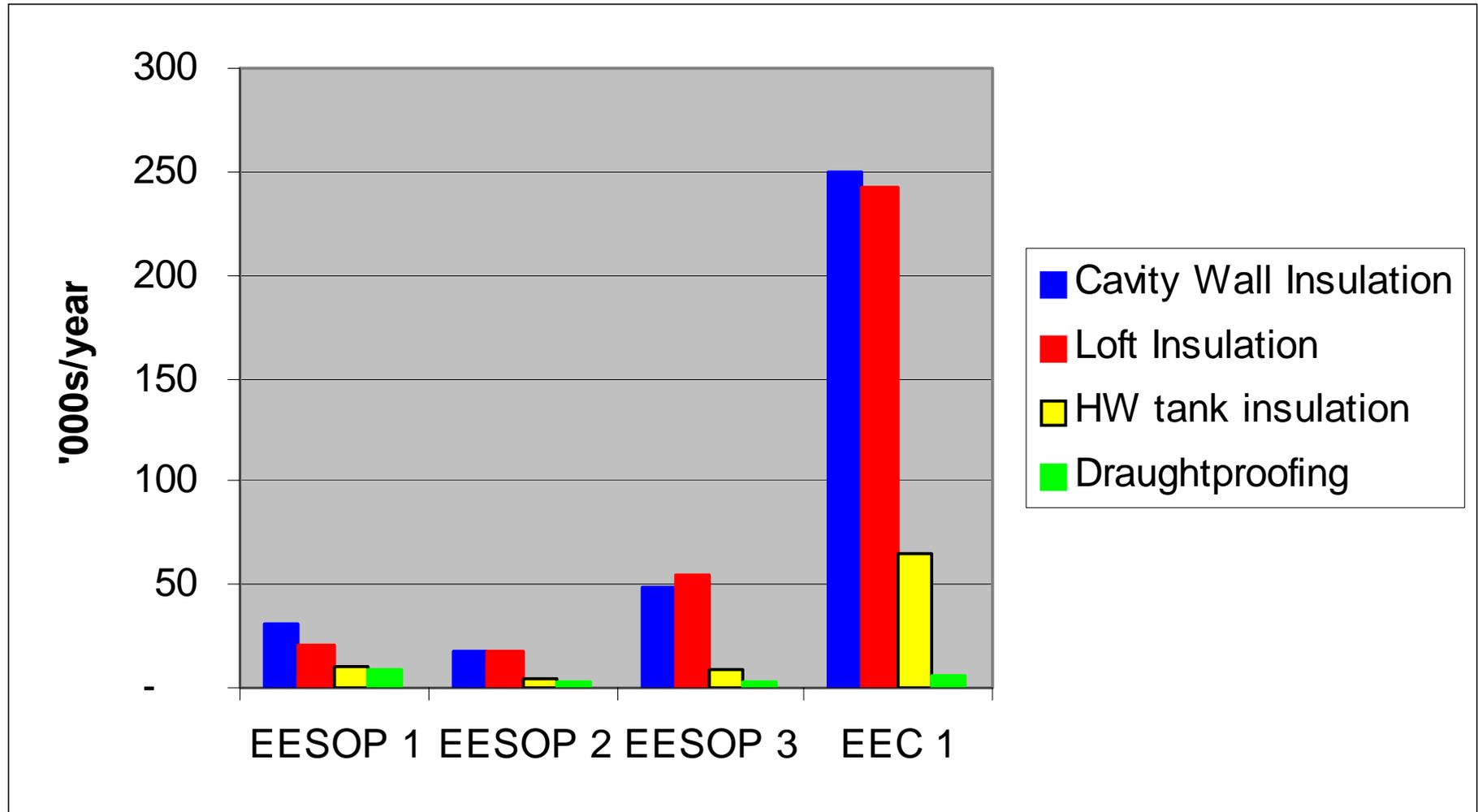
What is EEC?

- EEC is an obligation on energy suppliers/retailers (electricity and gas) to save energy in their customers' households
- Only now on residential sector customers
- Energy saving targets are set by Government and individual supplier/retailer targets are proportional to their customer numbers
- Administration and verification carried out by Energy Regulator (Ofgem) – cost <1% of energy supplier expenditure in EEC1

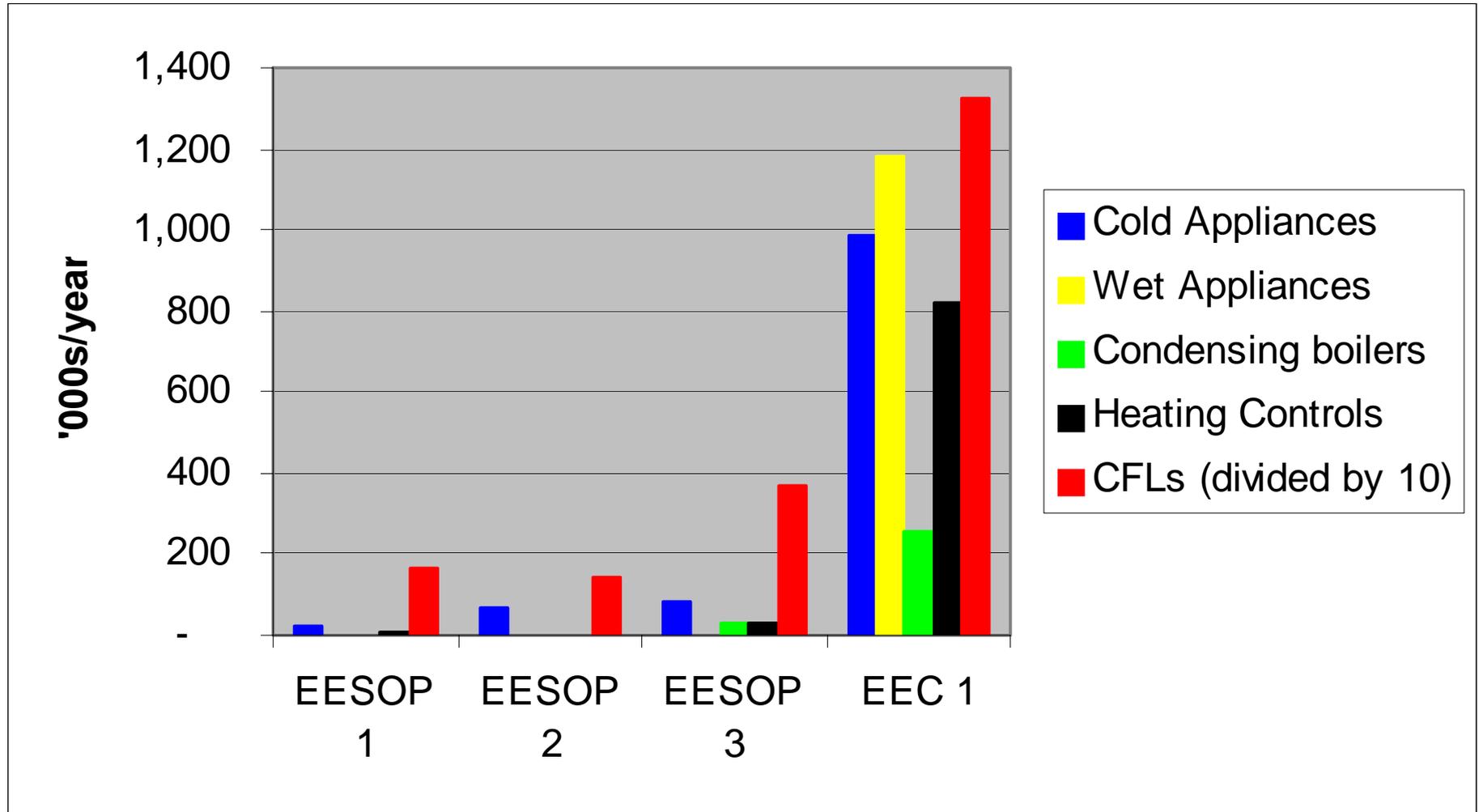
What is EEC? - continued

- Cost of EEC is a “ cost of doing business” – no explicit levy but EEC1 estimated at ~ €4.5 /customer per fuel per year; EEC2 ~ €13
- Now over 11 years experience of energy supplier/retailer obligations – evolved in light of energy market liberalisation
- However, continuous improvements necessary e.g. new EE measures, savings change, short term incentives to transform markets etc.
- Dramatic increase in scale of activity from SOP

Average insulation installations/year in EESOP and EEC



Average installations/year in EESOP & EEC



Key elements of Measurement Philosophy - 1

- Ex-ante or “deemed “ energy savings from wide range of proven EE measures from traditional (insulation, gas boilers, CFLs etc) to emerging (ground sourced heat pumps, set top boxes, solar water heaters)
- Lots of detail in practice e.g. house type, size, fuel saved etc.
- Ofgem approve broad plans of energy suppliers
- Subsequently suppliers report actual measures implemented with monitoring forms specific to EE measure implemented e.g. customer satisfaction, technical quality, low income customers, % financial contribution, customer acceptance, additionality etc.

Key elements of Measurement Philosophy - 2

- “Bottom-up” is simple, manageable and verifiable & works well for widely used, similar EE measures
- Does not necessarily capture all energy efficiency activity - do by monitoring total market sales of energy efficiency measures
- Philosophy has been adopted by UK Government in its “Energy Efficiency Plan for Action” as its basis of determining progress in residential sector towards Carbon saving

Meeting the EEC Target

- Target is energy savings but individual fuel savings are weighted by C content
- Any fuel can be saved but mainly gas and electricity
- Energy supplier/retailer schemes must be “additional”, e.g. beyond Building Regulations or better than market average for appliances
- 50% of savings/benefit to come from low income households
- Save energy from any residential customer

Lessons for EEC2 from Continuous Assessment -1

- Need to change “scoring system” for CFLs – focus on 100W equiv “sticks” – not the consumer preference for lower wattages and “look alike”/decorative CFLs (shorter lives)
- Research hours of use and wattage → in EEC2, every CFL has a energy credit of 33.5 kWh/a irrespective of wattage replaced and average 14 year life
- Means all lighting points can now be addressed
- No discernable rebound effect from lighting

Lessons for EEC2 from Continuous Assessment - 2

- Research shows comfort factor (rebound effect) following insulation measures being installed is identical for high and low income at 30%
- Energy savings from cavity wall insulation are 10% lower than expected
- Need to allow for higher heating efficiencies in the future as average gas boiler efficiency will increase (Building Regulations) thus lowering the insulation savings
- Ongoing research into effectiveness of existing loft insulation

Verification in Practice

- Energy supplier submit final report on an energy efficiency initiative with claimed savings to Ofgem
- Ofgem audits a random sample of each supplier scheme to check eligibility, measures in place, savings estimates realistic etc.
- Ofgem also requires energy suppliers to undertake some technical quality monitoring (e.g. insulation) – typically 2-5% of installations
- Suppliers must submit quality surveys of individual scheme activities

Outcome EEC1 April 2002- March 2005

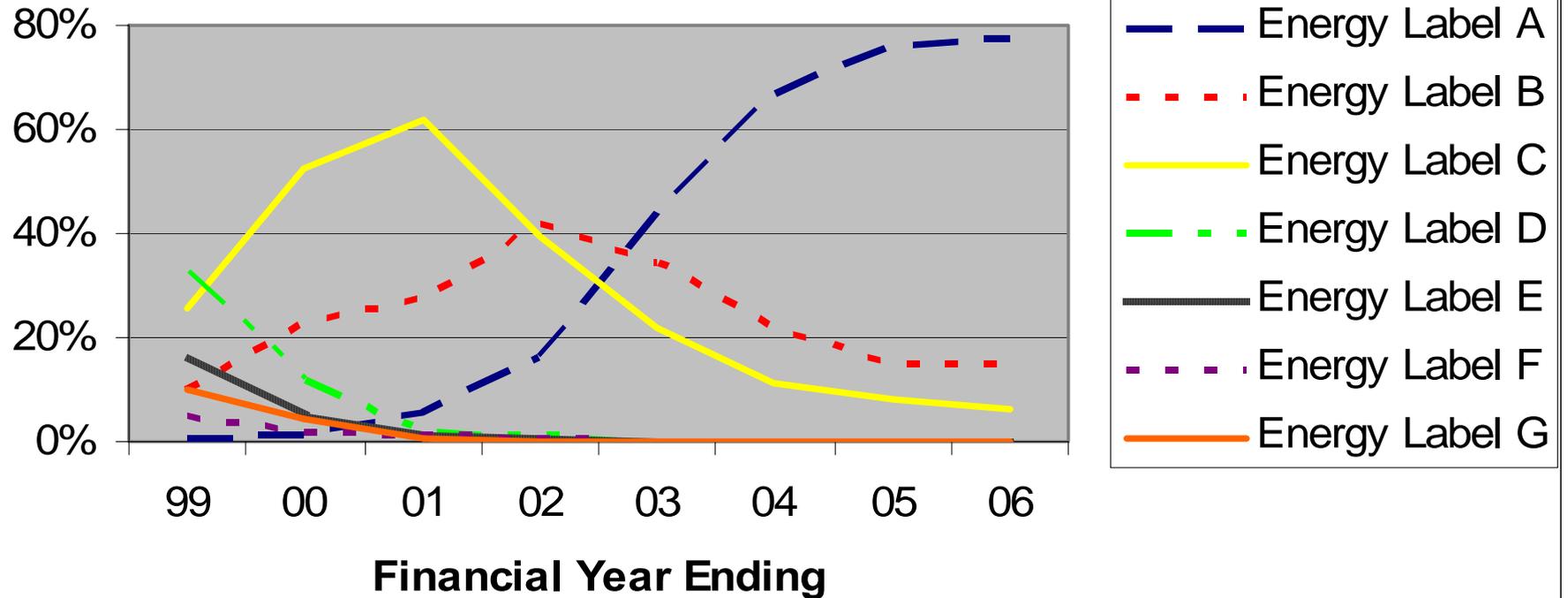
- All major energy suppliers easily met their targets; insulation savings carried forward to EEC2 equivalent of 24% of EEC2 target
- Energy suppliers have again delivered 20% more cost effectively than the target anticipated
- 38% of savings came from insulation; 12% from heating; 16% from appliances and 34% from lighting
- Lighting is the most common measure nearly 40 million CFLs; 6.5 million A-rated appliances

Are EE Obligations good for “UK plc”?

- Annual saving of 0.4MtC at cost -€430/tC (Defra)
- The cost to the nation of saving a unit of electricity is €2 cents/kWh c.f. household cost in 2004 of €10 cents/kWh
- The cost to the nation of saving a unit of gas is €0.7 cents/kWh c.f. household cost in 2004 of €2.5 cents/kWh
- At least 2 out of 5 households in UK will have directly benefited from EEC1 (mainly CFLs and appliances)
- Most low income households will have directly benefited from EEC1 (mainly CFLs)
- Market for cold appliances (over 60% A-rated) and wet appliances (80%) underwent a “tipping point”

Fridge Freezers under EESOP3 and EEC1

Fridge Freezers Market Shares - based on GFK data



Energy Efficiency Costs have Reduced over Time

