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Energy solutions
for a changing world

Why EEOs are better than a CO₂ tax & Do EEOs work?

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- Why EEOs are more effective in saving CO₂/energy than a CO₂/energy tax for non-energy intensive end users
- Is there any evidence that energy efficiency including EEOs can help turn down energy demand – top down evidence?
- Is there any evidence that energy efficiency including EEOs can help turn down energy demand – bottom up evidence?

Importance of EEOs to Energy Affordability

- As we decarbonise energy supply costs will rise – energy affordability in a low carbon world is a concern
- Already an issue & will grow politically e.g. the French EEO from January 2011 has ring fenced savings for low income households
- EU ETS increases cost of energy and sends strong price signals to the supply side but the signals to the demand side are much weaker
- For example in UK for a 10% increase in electricity prices, demand reduction is -2%; a one off electricity price rise of 3% will therefore reduce electricity demand by 0.6%

EEOs & Energy Affordability -1

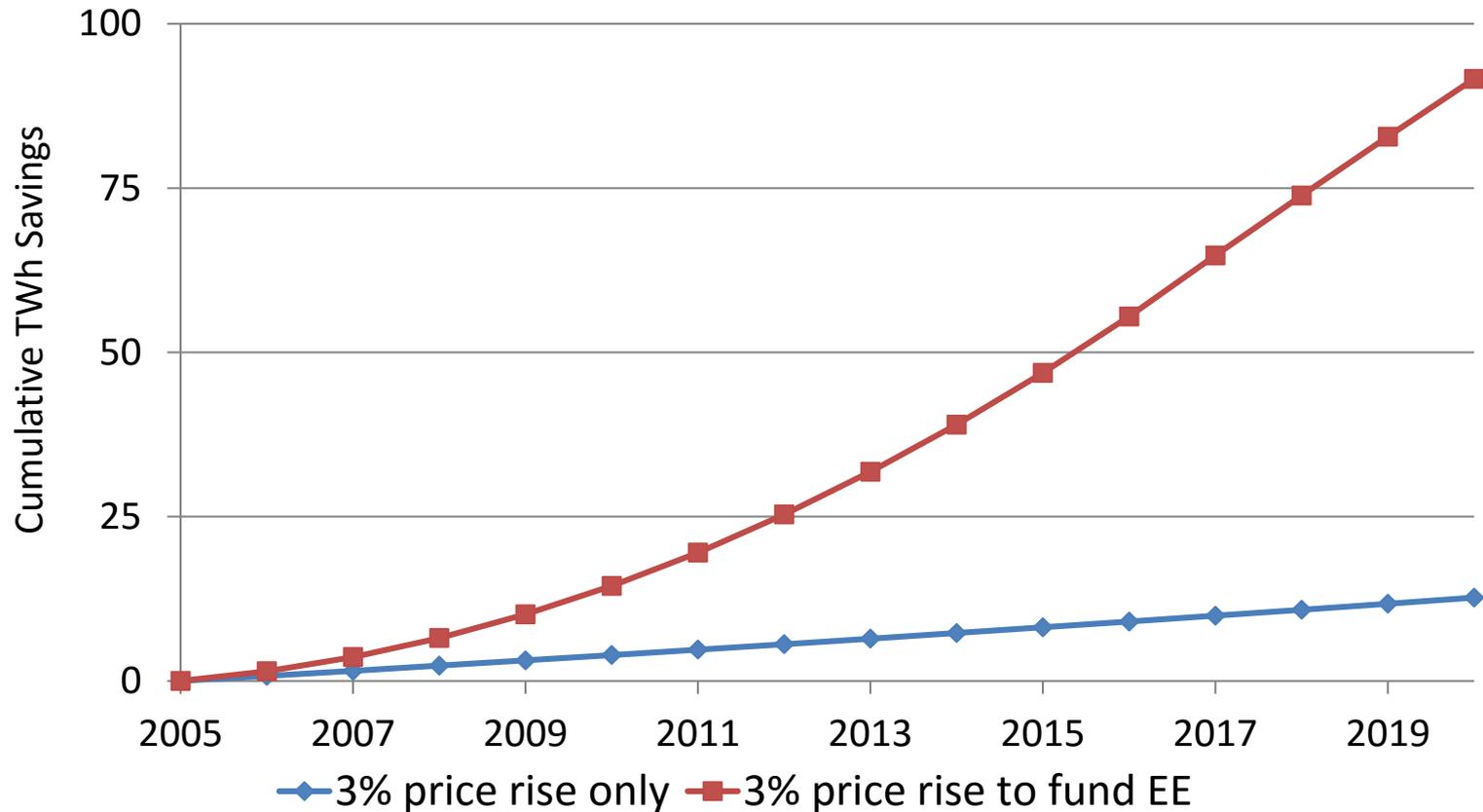
- But what if that one-off 3% price rise was to be reinvested each year in energy efficiency measures in households?
- Used data on the levelised cost (€2 cents/kWh) to electricity suppliers in the British EEO for the period 2005-8; Used the actual electricity savings obtained by energy suppliers in the period 2005-8; savings are primarily insulation (36%), lighting (34%) and appliances & ITC (29%)
- The calculation allows for the fall off over time of electricity savings from the shorter lived measures; it also corrects for comfort (increased amenity) – important for insulation measures

EEOs & Energy Affordability - 2

- The calculation assumes that the levelised cost of saving a unit of electricity remains the same in real terms after the end of 2008 till 2020; that the real price of electricity remains constant in the same period;
- Using data derived from the British EEO for the period 2005-8 illustrates this more clearly – 7 times more effective in saving energy than a one off price rise by 2020

Investing a price rise in EE saves 7 times more electricity than that from a price rise.

Cumulative Energy Saving from a one off 3% price rise compared to investing that on-going rise in EEOs



Is there any evidence that EEOs work ?

Top Down Analysis - 1

- Use Government data on residential energy consumption as GB has the longest running and largest EEO (and only residential);
- Prior to 2005 residential gas demand increasing in range 1 to 2% per year
- In GB natural gas is main (non transport) fuel in residential sector >70% of household final energy demand; gas provides >80% of all heating & hot water demand
- But in 2005, **3 important developments which would reduce demand**: EE obligation doubled (72% delivered energy savings in EEO come from insulation measures in gas households); new regulations on boiler replacement meant condensing boilers quickly moved from 36% of the replacement market to >97%; gas price rises for residential customers reduced demand

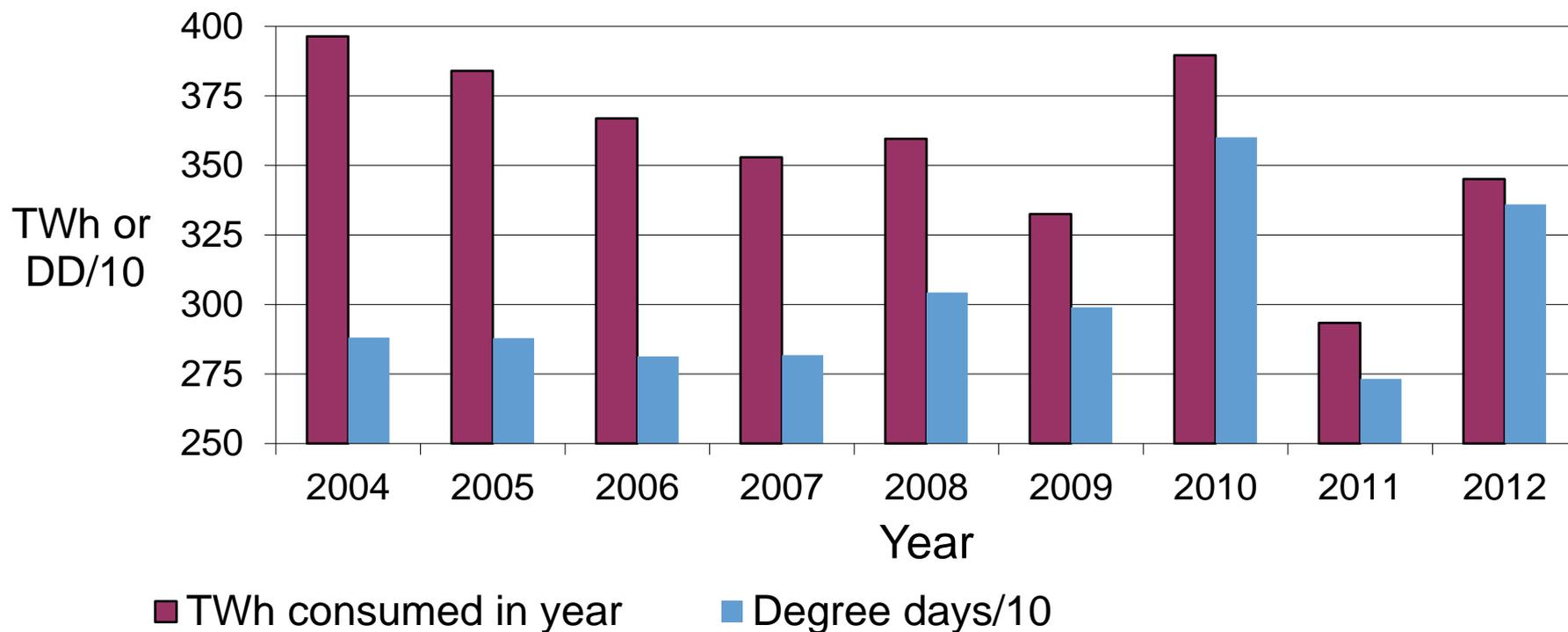
Is there any evidence that EEOs work ?

Top Down Analysis - 2

- Factors increasing demand were:
- Between 2004 to 2012, gas customers increased by 2.23 million (10.1%);
- Factors affecting variable demand
- Residential gas demand correlates strongly with winter temperatures (Degree Days) but 2004 was a relatively warm winter as shown in the next slide

Annual Residential Gas Demand 2004-12 (despite 10.2 % increase in customer numbers)

GB Residential gas demand uncorrected for temperature



Is there any evidence that EEOs work ?

Bottom Up Analysis - 1

- British Gas individual annual gas consumption data for 4 million customers (~40% of their customer base) 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 ?

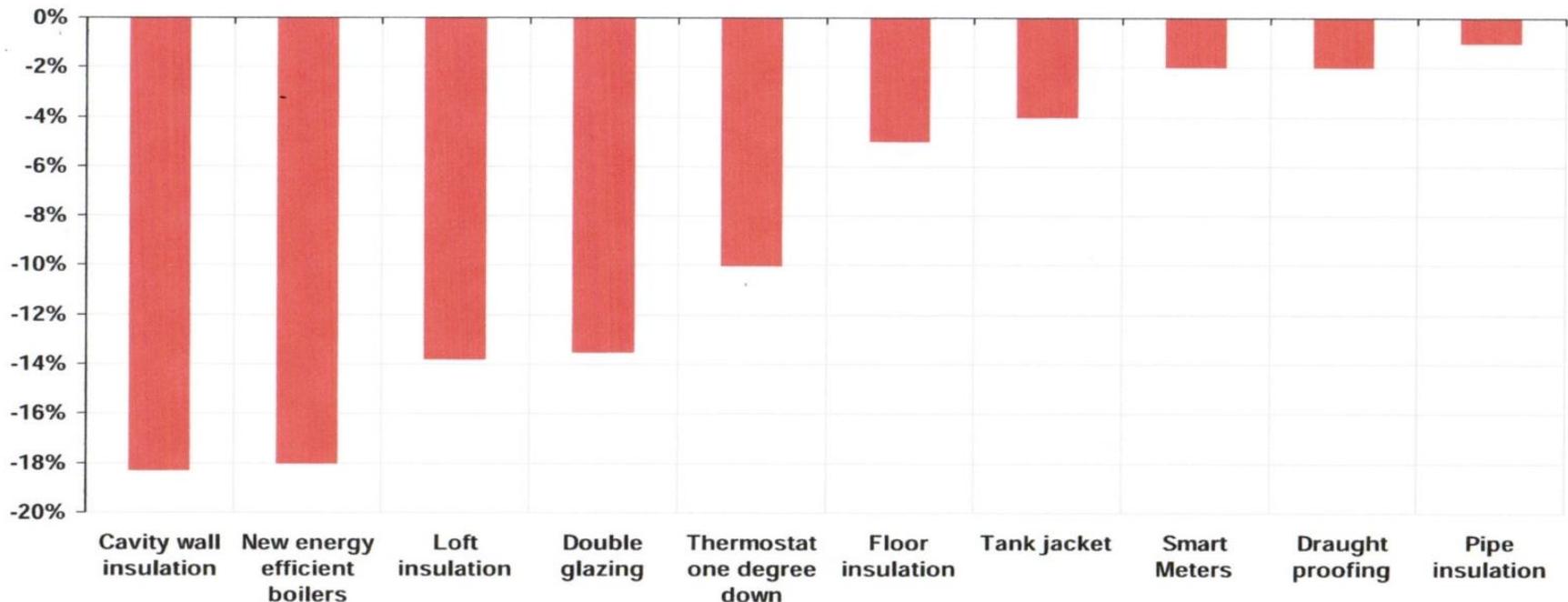
Bottom Up Analysis - 2

- For this 5 year period, conclusions were:
 - Average household consumption **fell by 22% over the period!**
 - Annual fall was 4.9%/year 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)

Reduction in Residential Customers' Gas Demand by EE Measure

Key findings 2006 to 2010

Figure 2: Energy efficiency measures household natural gas consumption impacts amongst British Gas customers, annual percentage fall, 2006 to 2009



Conclusions on EU EEOs

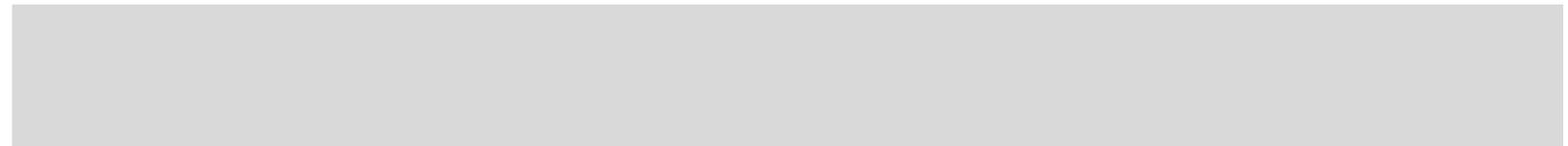
- Despite wide variation in the implementation of EEOs & energy market liberalisation status, they have been successful policy tools
- MSs with EEOs have evaluated their programmes and expanded them in recent times; EU EED encourages the use of EEOs
- In the largest EEO, over the 5 years since 2005, 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

About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power sector. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

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