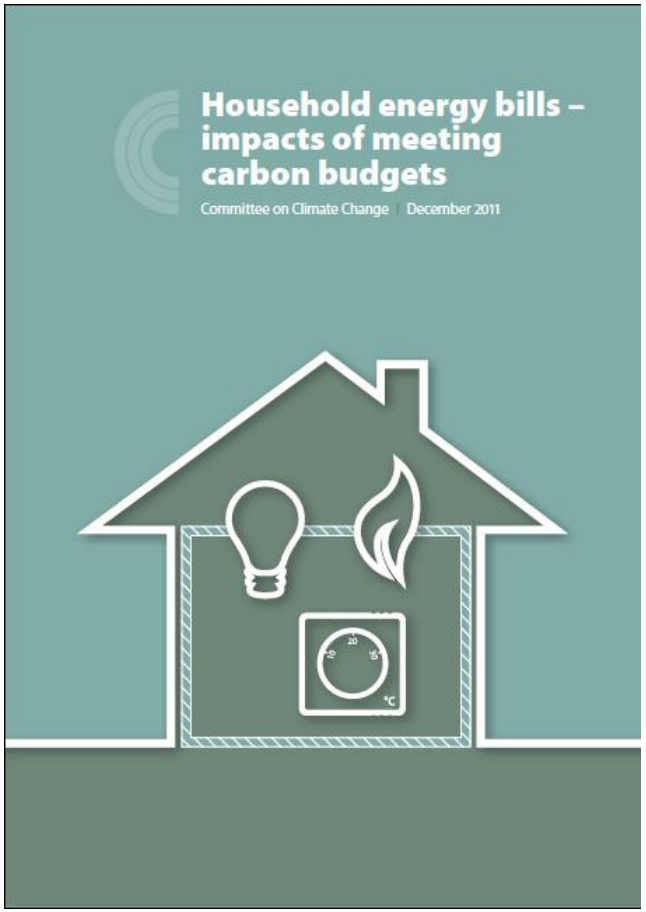
Committee on Climate Change

Household energy bills – impacts of meeting carbon budgets

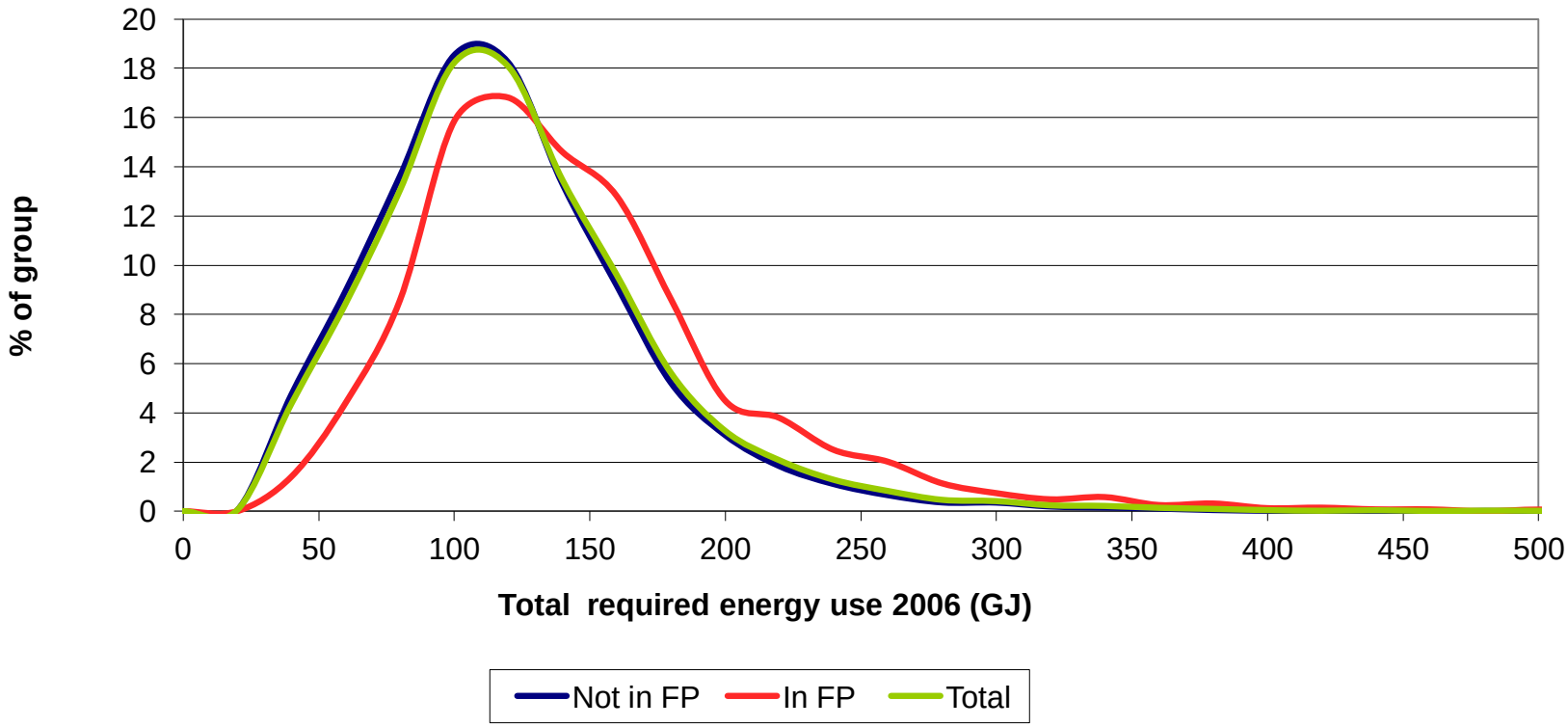
Mike Thompson
BIEE
15th March 2012



Contents

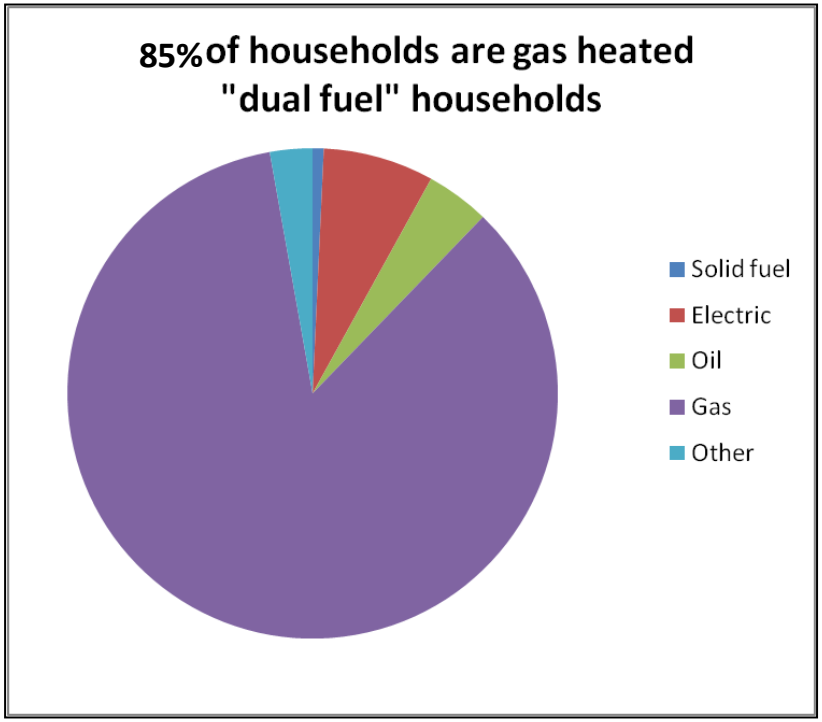
Context – Climate Change Act requires Committee to consider impact of carbon budgets on energy supplies and fuel poverty

- Number of households in fuel poverty is rising (2 million in 2004, over 5 million in 2010), predominantly due to rising energy prices
- Fuel poor tend to have energy use at least as high as the non fuel poor:



Source: BRE modelling for the CCC (2009) based on English House Condition Survey Data 2006

Some principles of CCC approach



- Focus on dual-fuel households:

(don't conflate with electric heated homes)

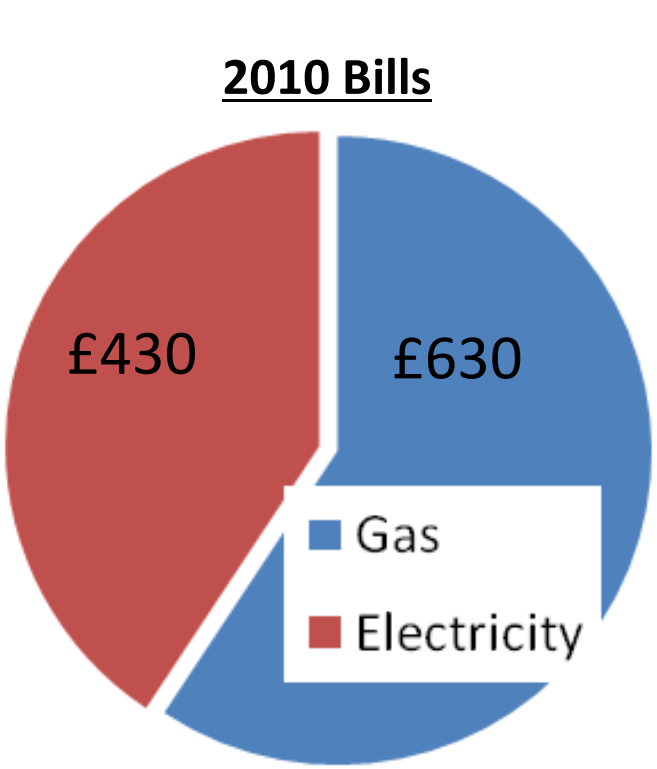
- Separate:
  - Electricity / Gas
  - Price / Energy consumption
  - Supporting low-carbon investment / Supporting energy efficiency
- Bills not the only thing that matters!
  - E.g. total cost of carbon budgets, fiscal impact, competitiveness, technology development (see other CCC reports)

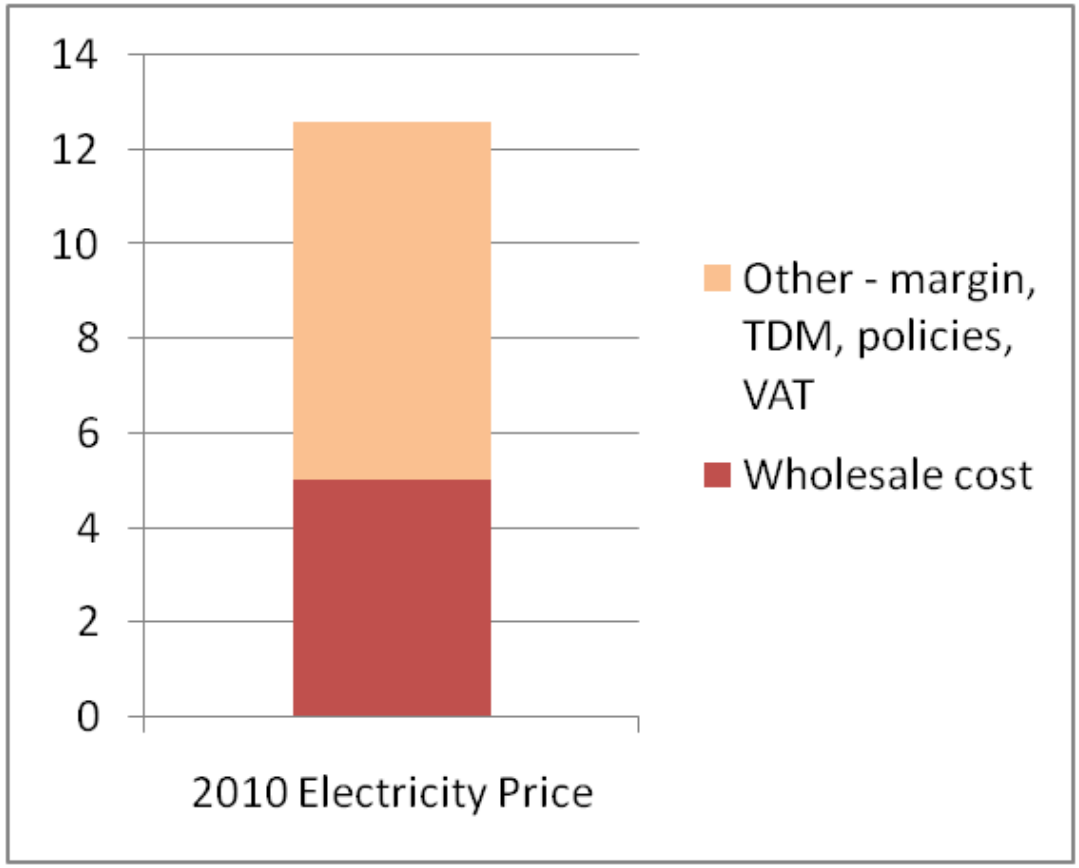
Contents

For the typical household, electricity generation costs are around 15% of their bill (i.e. currently around £170)

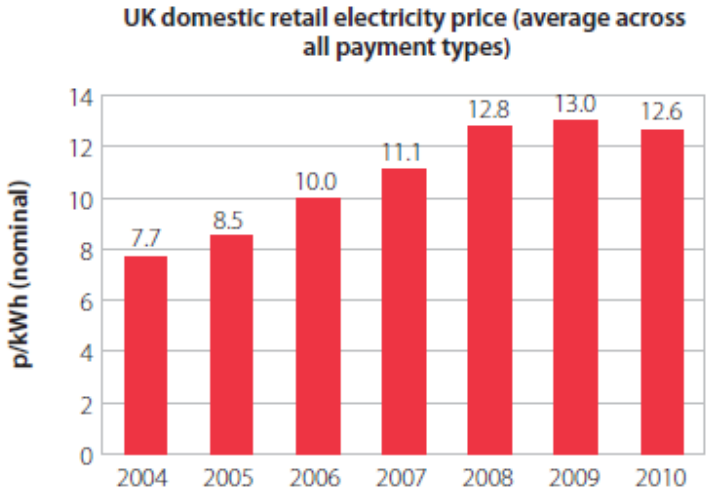
Around 40% of the average bill is from electricity...

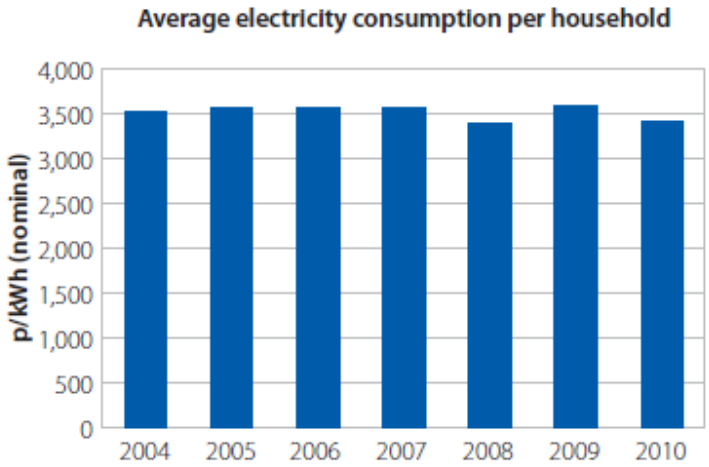
...and around 40% of the electricity price is from wholesale costs

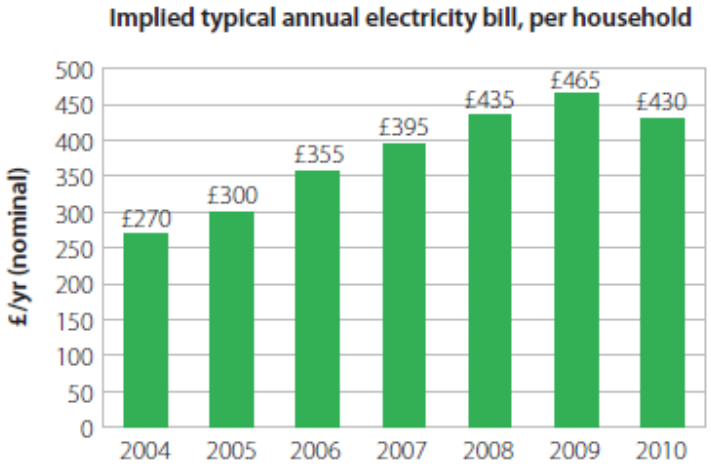




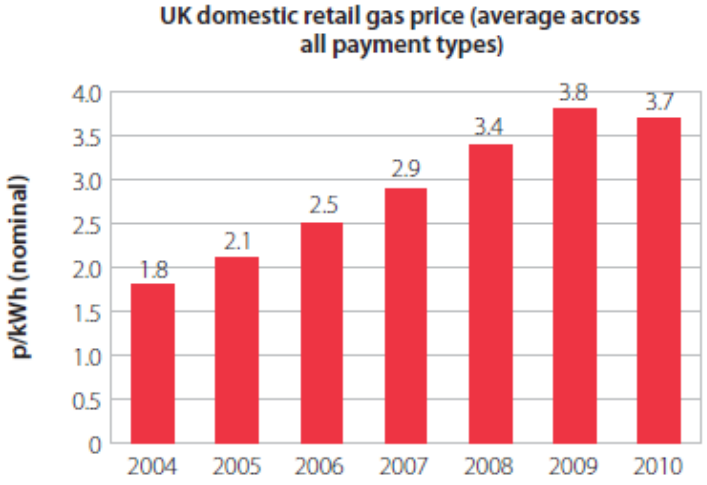
Electricity bill has increased in line with price (+65% 2004-2010)

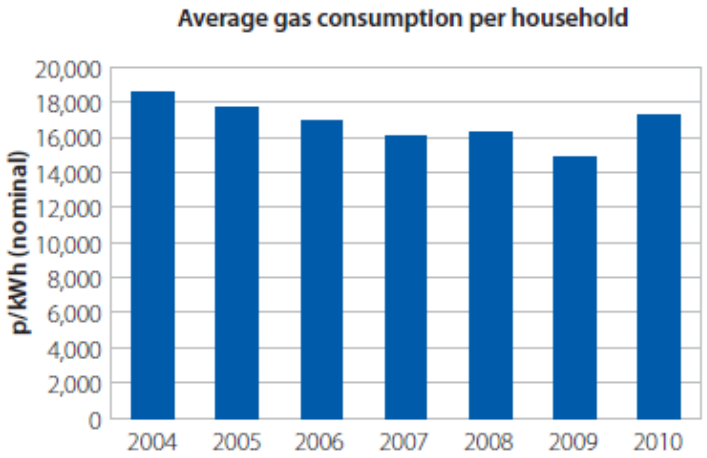


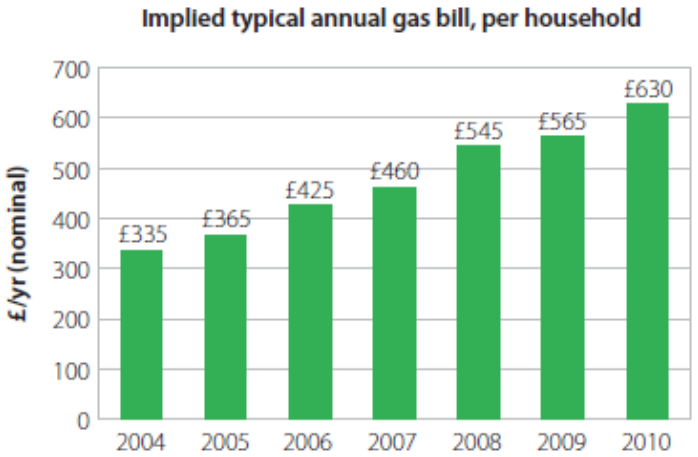




Gas bill has increased further (90%), despite consumption fall







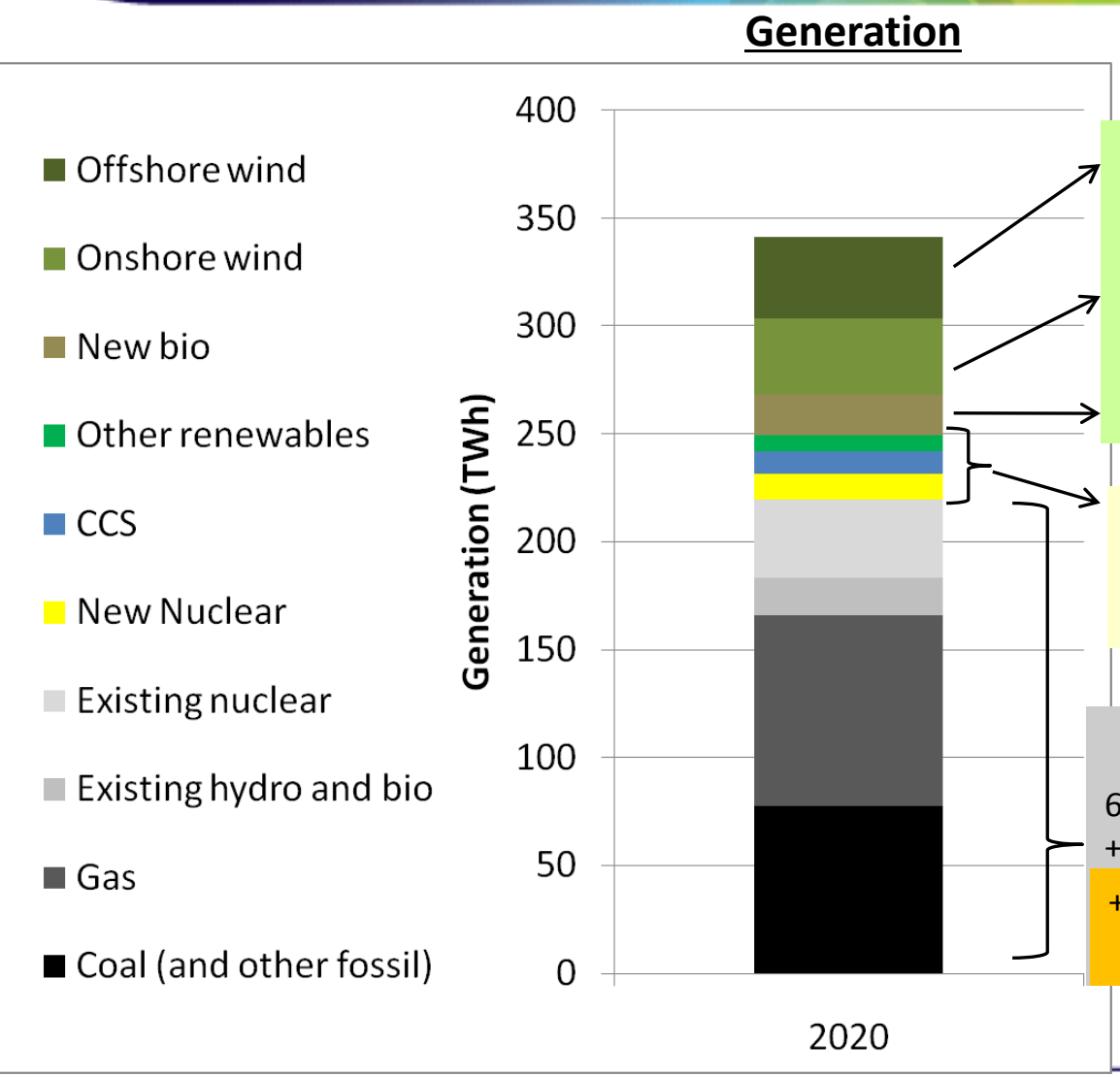
Factors in energy bill rises from 2004 to 2010

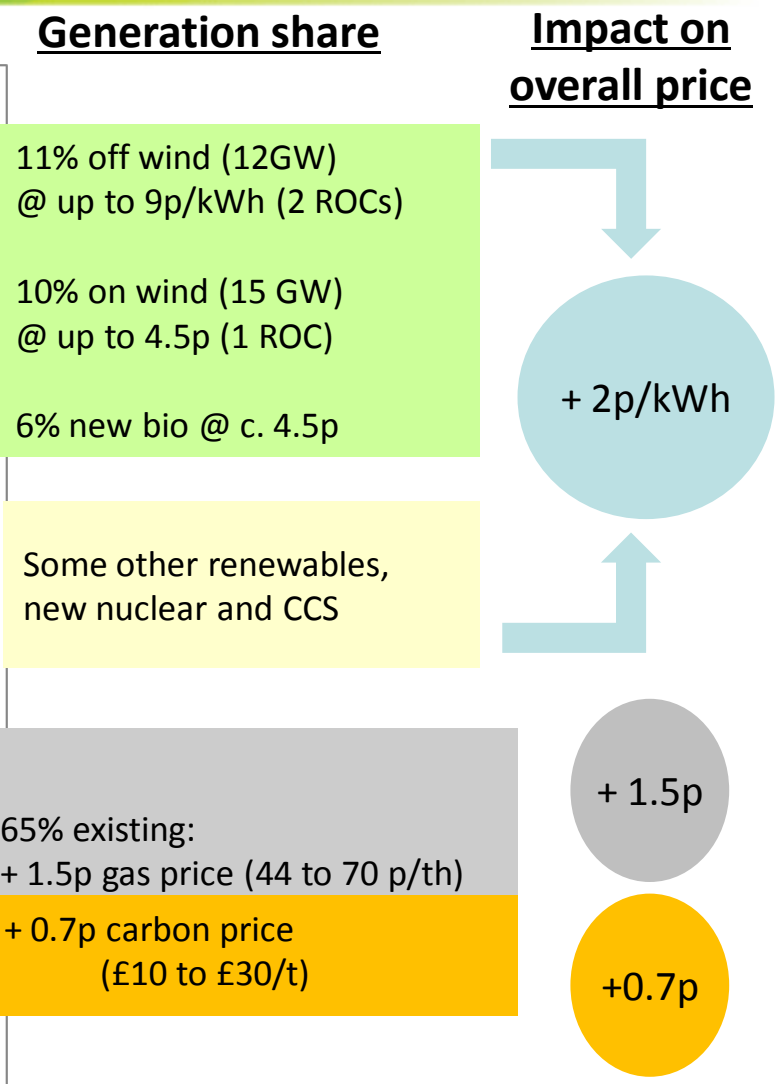
Factor	Impact
Wholesale gas price – gas	+ £190
Wholesale costs – electricity	+ £100
TDM	+ £70
Energy efficiency funding	+ £45
Support for low-carbon (i.e. Carbon price and RO)	+ £30
VAT	+ £20
TOTAL	**£455**

Contents

Drivers of electricity wholesale price

Extra costs from gas & carbon prices, renewables





Note: 1p/kWh = c. £35 on the average bill

Other factors driving cost increases

Low-carbon Factors	Impact
ENSG transmission upgrades	+ 0.1 p/kWh
Smart meters	+ 0.2 p/kWh
Energy efficiency funding	-

- £5 billion investment (latest estimate £9bn)
- 5% return over 40 years
- Spread over all demand

Current funding of £50 per household could fund e.g. 2 million solid wall insulations by 2020

Other Factors	Impact
Supplier cost and margin	-
Other TDM	+ 0.5 p/kWh
VAT	+ 0.3 p/kWh

Gas price in heating
+20% gas costs (£125)

Scope for energy reductions

Factors not requiring policy

Weather – 2010 gas consumption around 15% higher because of cold weather
Boiler replacement – end-of-life replacement would give 6% reduction

Additional measures

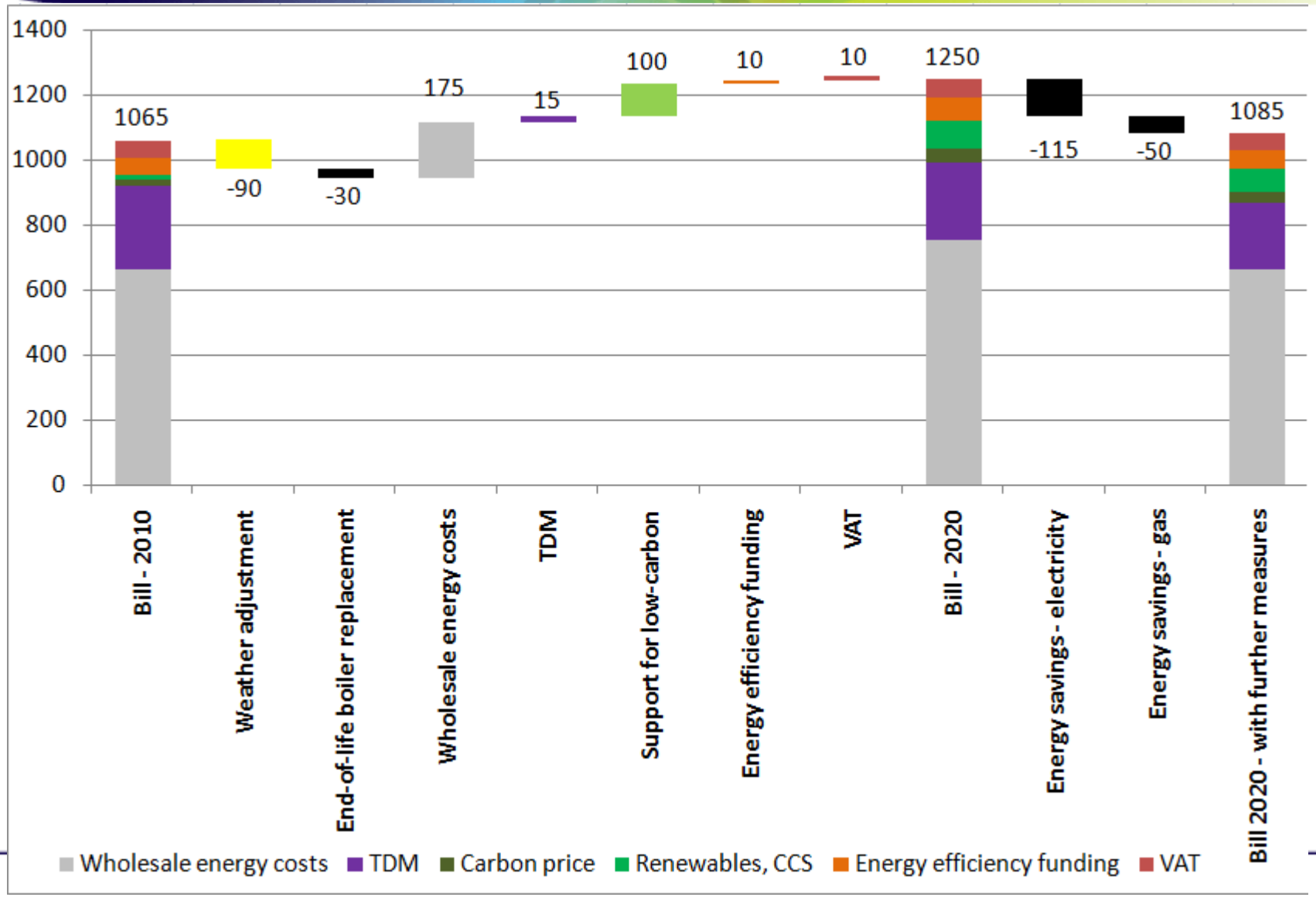
Heating – potential 8% reduction
Lofts and cavities – 5%
Other physical measures – 1%
Use of heating controls – 4%

Electricity – potential 19% reduction
Lighting – 4%
Appliances – 14%
Behaviour change – 1%

Effective policies required to unlock savings

Contents

Prospects for future energy bills



A word on non-typical households

- 7% with oil, LPG and solid fuels likely to see similar impacts to gas-heated homes
  - Particular opportunity from RHI (e.g. we model 60% of measures in these households)

- 9% with electric heating potentially worse off
  - Note that data is poorer here
  - Tariff arrangements less straightforward
  - Electricity use probably 3-4 times higher
  - Next steps: Improve understanding, targeting for EE and RHI, consider preferential tariffs?

CCC conclusions in December 2011 paper on bills

- **Recent increases** in bills from 2004 to 2010 (£455) were primarily due to factors unrelated to climate policy (which contributed £75)

- We expect **carbon policies** to add around £110 to the average dual-fuel bill by 2020, mainly due to support for investments in low-carbon power generation

- We identify significant potential for **energy efficiency** to reduce bills
  - However, these are currently uncertain and require effective policies.
  - If unlocked they would offset carbon policy costs

- Households with **electric heating** could be disproportionately affected by low-carbon costs