Domestic energy bills and costs of implementing environmental measures

The Sustainable Development Commission has analysed household electricity and gas bills to show the contribution of the additional costs of implementing environmental measures to recent price rises.

The first section of this document presents the analysis for household electricity costs. The second section presents the analysis for household gas costs.

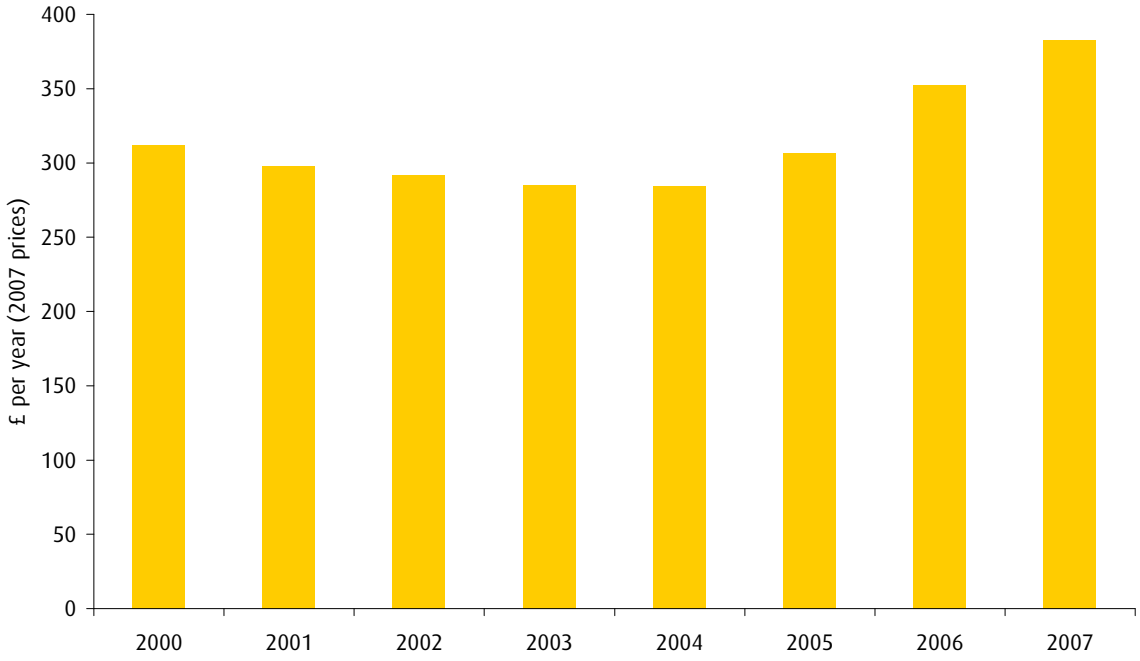
Section 1: Analysis of domestic electricity costs

Domestic electricity bills

The cost of the average annual domestic electricity bill for the UK between 2000 and 2007 was taken from the Quarterly Energy Prices publication by the Department for Business, Enterprise and Regulatory Reform (BERR)[1] and is presented in Figure 1.

The prices, for consumption between Q4 of the previous year and Q3 of the named year, assume standard credit payment of a standard tariff (i.e. not economy 7) and are uplifted to 2007 prices based on the RPI. Prices are an average for the UK taking into account the proportion of domestic customers using 'home' and 'non-home' suppliers and assuming an average household consumption of 3,300 kWh per year[1].

Figure 1 Average household electricity bill (2000-2007)



[1] BERR, Energy Table 2.2.1 Average annual domestic electricity bills (http://www.berr.gov.uk/energy/statistics/publications/prices/)

Cost of environmental measures

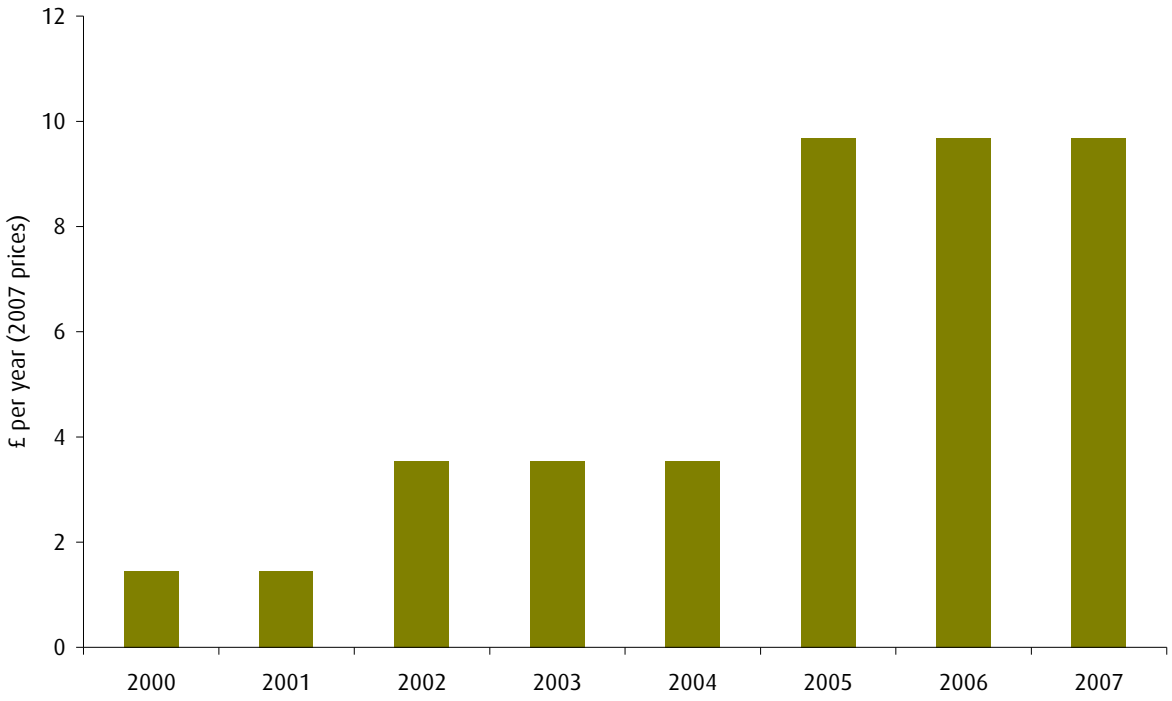
EESOP, EEC and CERT

Since 1994, requirements have been placed upon energy supply companies to install energy efficiency measures in customers' homes under the Energy Efficiency Standards of Performance (EESOP; 1994-2002), Energy Efficiency Commitment phase 1 (EEC1; 2002-2004) and EEC phase 2 (2005-2008). The costs of installing these measures are borne by the supply companies and passed on as an additional cost on household energy bills. However, those households benefiting from the schemes may see a reduction in their bills due to improved energy efficiency.

For information on the **EEC and CERT obligations** on energy suppliers to achieve targets for promoting reductions in carbon emissions in the household sector, please visit: http://www.defra.gov.uk/environment/climatechange/uk/household/supplier/index.htm

The annual cost per bill for each scheme was £1.20 (EESOP), £3.20 (EEC1) and £9 (EEC2) excluding VAT.[2] The cost per household electricity bill uplifted to 2007 prices is shown in Figure 2.

Figure 2 Cost of energy efficiency measures per household electricity bill (2000-2007)



Renewables Obligation

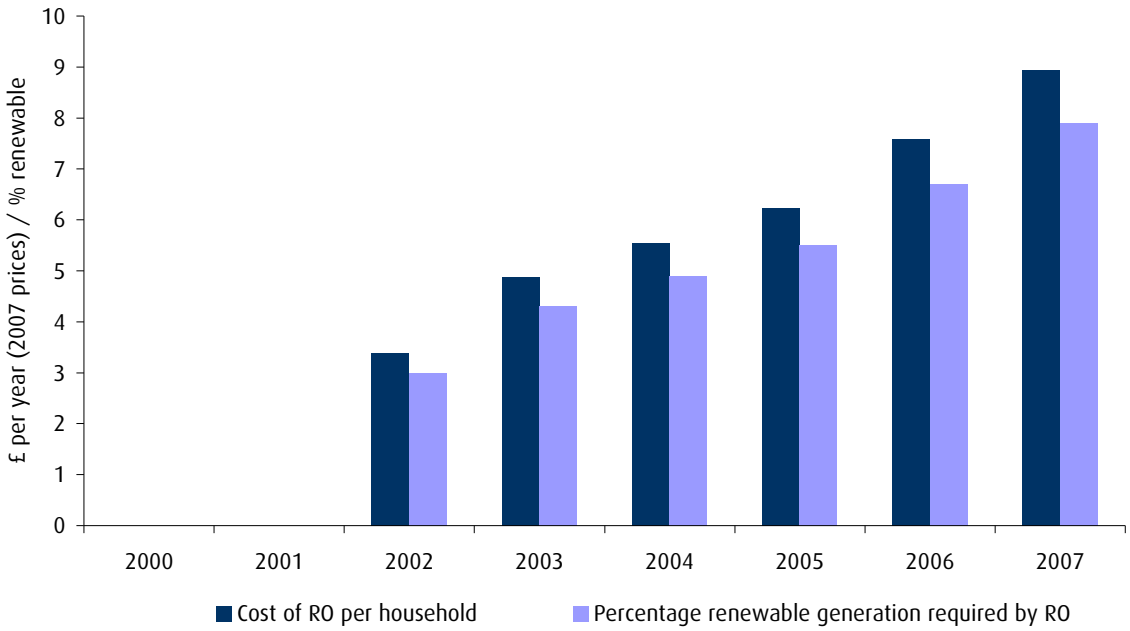
Since 2002, energy supply companies have been required to source an increasing percentage of their electricity from certified renewable generators to meet the Renewables Obligation (RO). Alternatively, the supply company can pay the 'buy-out' price of £34.30 (2007 price) per MWh for the portion of their obligation which has not been met.

For more information on the **Renewables Obligation**, please visit: http://www.berr.gov.uk/energy/sources/renewables/policy/renewables-obligation/page15630.html

[2] Sources: Royal Commission on Environmental Pollution, *Energy – The Changing Climate*, 2000; Department for Environment, Food and Rural Affairs, *Assessment of EEC 2002-05 Carbon, Energy and Cost Savings*, 2006; Energy Saving Trust, *Briefing Note, EEC 2005 – 2008*.

The RO scheme imposes a cost on energy suppliers and this cost is passed on to the customer in their electricity bill. The cost of the RO scheme per household was calculated by multiplying the average annual household electricity consumption (3,300 kWh)[1] by the percentage renewable target for each year and the buy-out price.[3] The cost per household electricity bill is presented in Figure 3 as well as the percentage renewable generation required by the RO scheme.

Figure 3 Cost of the Renewables Obligation per household electricity bill (2000-2007)



European Union Emissions Trading Scheme

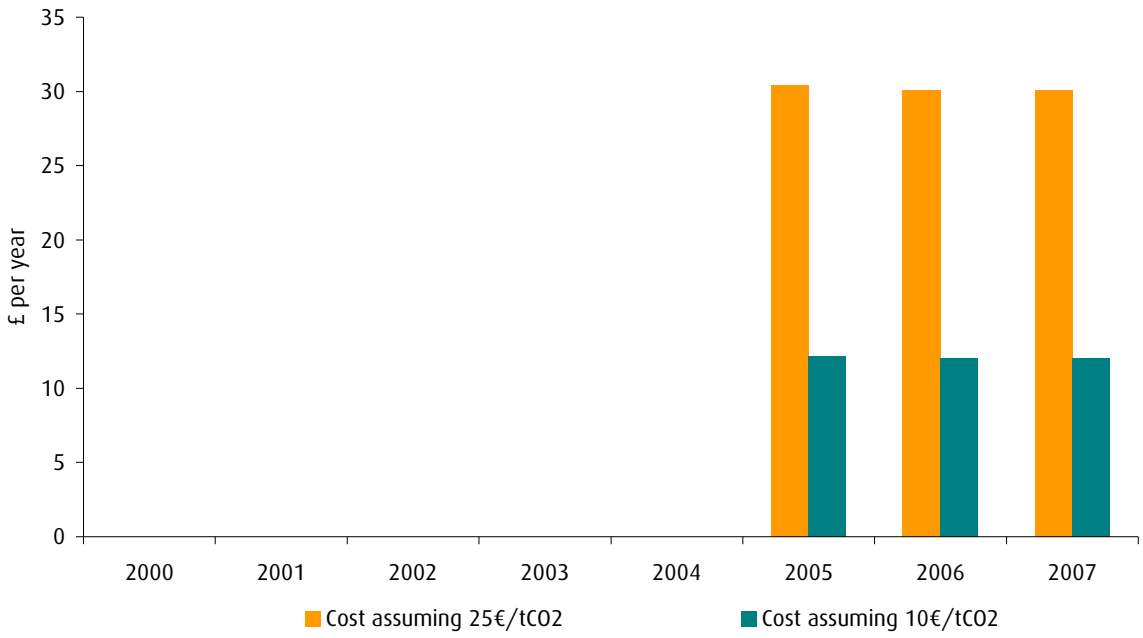
Since 2005, companies generating electricity from the combustion of fossil fuels have been required to participate in the European Union Emissions Trading Scheme (EU ETS). This scheme creates a market in emission allowances (EUAs) with each allowance being equivalent to one tonne of carbon dioxide. At the end of each year, companies must comply with the scheme, by surrendering to the environmental regulator allowances equal to their emissions of carbon dioxide or pay a fine. The cost of allowances is passed on to electricity customers in their bills.

For information on the **EUETS**, please visit:
http://www.defra.gov.uk/environment/climatechange/trading/eu/index.htm

The cost of the EU ETS per household electricity bill was calculated by multiplying the average annual household electricity consumption (3,300 kWh)[1] by the grid average emissions factor each year[4] and the price of allowances. The market price for allowances was very volatile during the first phase of the EU ETS (2005-2008) so the cost per household has been based on estimated prices of €10/tCO_2 and €25/tCO_2 to illustrate the likely range of the impact of the scheme on bills. This is shown in Figure 4.

[3] All values for the Renewable Obligation from Ofgem publications (http://www.ofgem.gov.uk)
[4] Greenhouse gas emissions conversion factors published by Defra (individual annual value used for 2005 and average of values for 2000-2005 used for the years 2006 and 2007):
(http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf)

Figure 4 Cost of the EUETS per household electricity bill (2000-2007)



Comparison of contribution to household electricity bills

The contribution of the cost of implementing each of the different environmental measures to household electricity bills is shown in Figure 5.

Figure 6 shows the percentage of the total electricity bill contributed by the combined cost of environmental measures (a range is shown to account for the variable price of carbon on the EU ETS market).

2000 to 2004

The average household electricity bill fell from £312 in 2000 to £284 in 2004. During this period, there was an increase in the total cost of environmental measures per household electricity bill from £2 to £10 per year. It is therefore apparent that the cost of environmental measures was not the driver of price changes during this period.

2004 to 2005

The average household electricity bill increased from £284 in 2004 to £307 in 2005. During this period, there was an increase in the total cost of environmental measures (from £10 to up to around £46, based on our higher estimate of EU ETS allowance prices) which will have contributed to the increase in household bills.

2005 to 2007

The average household electricity bill increased significantly from £307 in 2005 to £383 in 2007. During this period, the total cost of environmental measures only increased very slightly from around £46 to £49 (again based on the higher estimate of EU ETS allowances) suggesting that this was not the major driver of rising bills.

Looking forward

In April 2008, the Energy Efficiency Commitment was replaced by the Carbon Emission Reduction Target (CERT; 2008-2011). The illustrative mix of measures in the impact assessment for the CERT scheme predicts that the cost per household will increase to around £17.50 per bill.[5] This equates to an increase in the cost of energy efficiency measures from £10 per household electricity bill during 2007 (under the EEC 2 scheme) to £17.50 in 2008, an increase equivalent to around 2% of a typical electricity bill. At the same time, the increasing percentage of renewable electricity generation required under the renewable obligation will raise the cost of this measure from £9 to £10 per household electricity bill. The impact of the second phase of the EU-ETS is not yet known but the conservative value of carbon allocations (€25/tCO_2) used to estimate the contribution to electricity bills during the first phase (2005-2007) means that this cost is unlikely to increase significantly.

The change from the EEC scheme (phase 2) to the CERT scheme and the increasing targets in the RO will mean an increase in the total cost of environmental measures of £9 per household electricity bill between 2007 and 2008. The above analysis however suggests that other factors (e.g. wholesale electricity prices) are likely to be the major driver of any overall increase in bills.

[5] Consultation proposals for the CERT scheme (http://www.defra.gov.uk/corporate/consult/cert2008-11/consultation.pdf)

Figure 5 Cost contributions to the average household electricity bill (2000-2007)

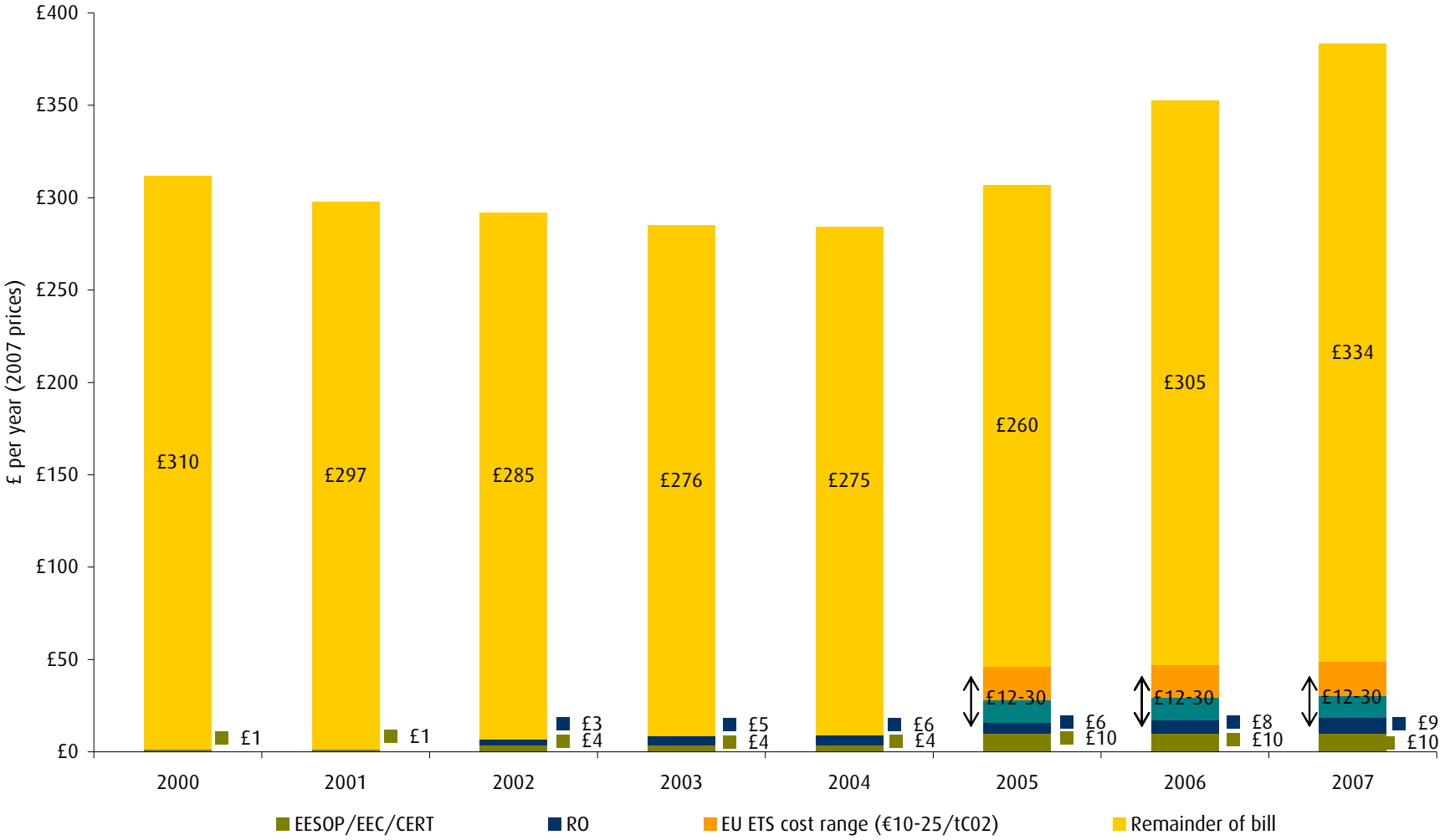
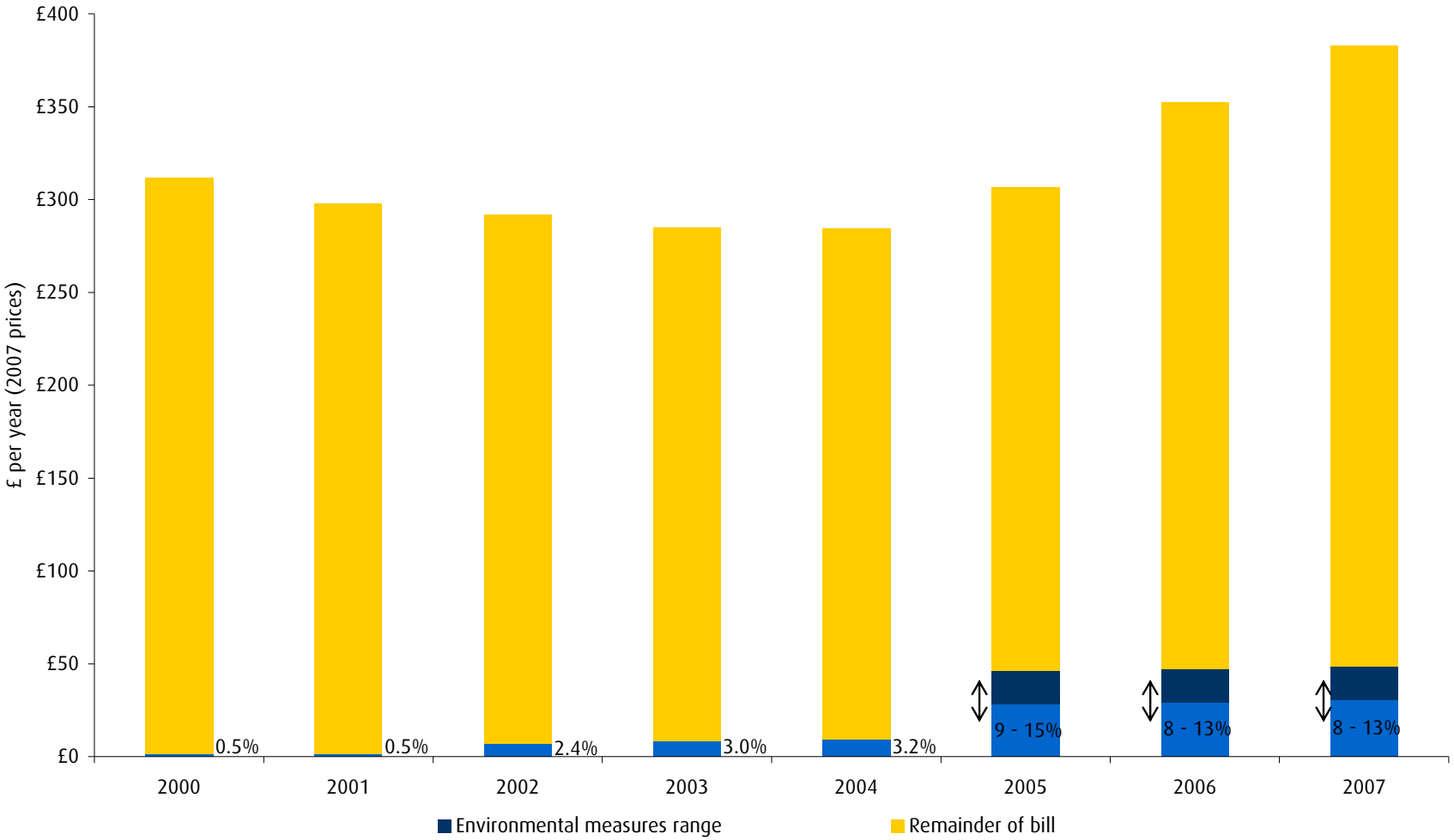


Figure 6 Percentage contributions to the average household electricity bill (2000-2007)



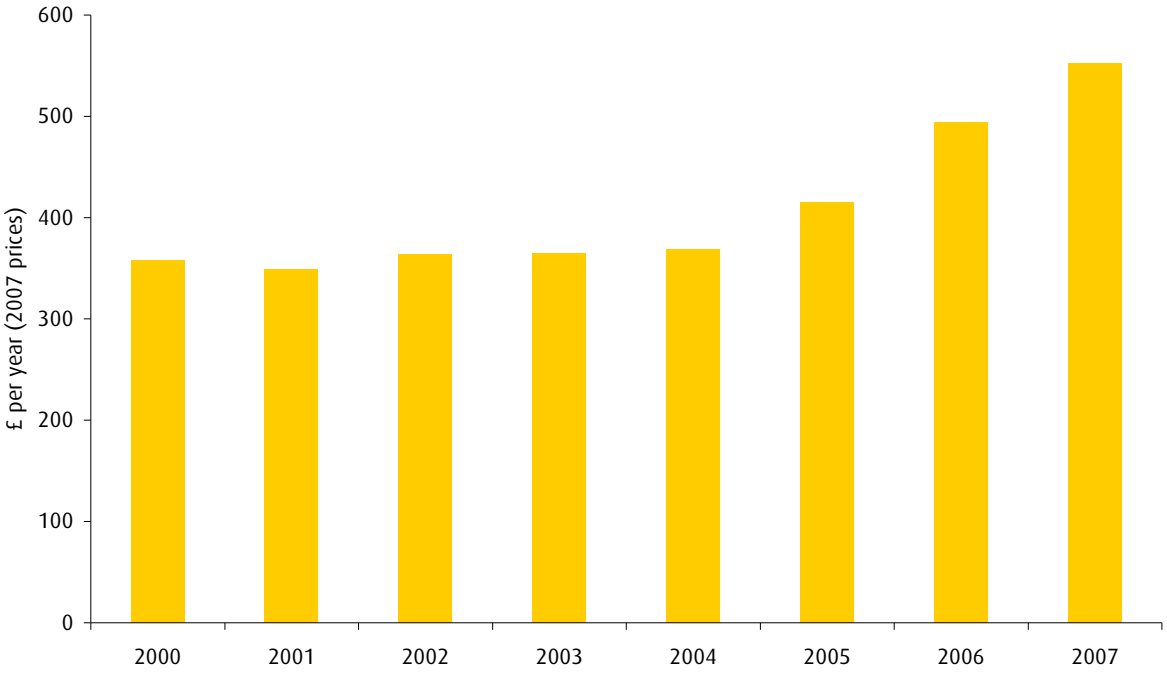
Section 2: Analysis of domestic gas costs

Domestic gas bills

The cost of the average annual domestic gas bill for the UK between 2000 and 2007 was taken from the Quarterly Energy Prices publication by the Department for Business, Enterprise and Regulatory Reform (BERR)[6] and is presented in Figure 7.

The prices, for consumption between Q4 of the previous year and Q3 of the named year, assume standard credit payment and are uplifted to 2007 prices based on the RPI. Prices are an average for the UK taking into account the proportion of domestic customers using 'home' and 'non-home' suppliers and assuming an average household consumption of 18,000 kWh per year.[5]

Figure 7 Average household gas bill (2000-2007)



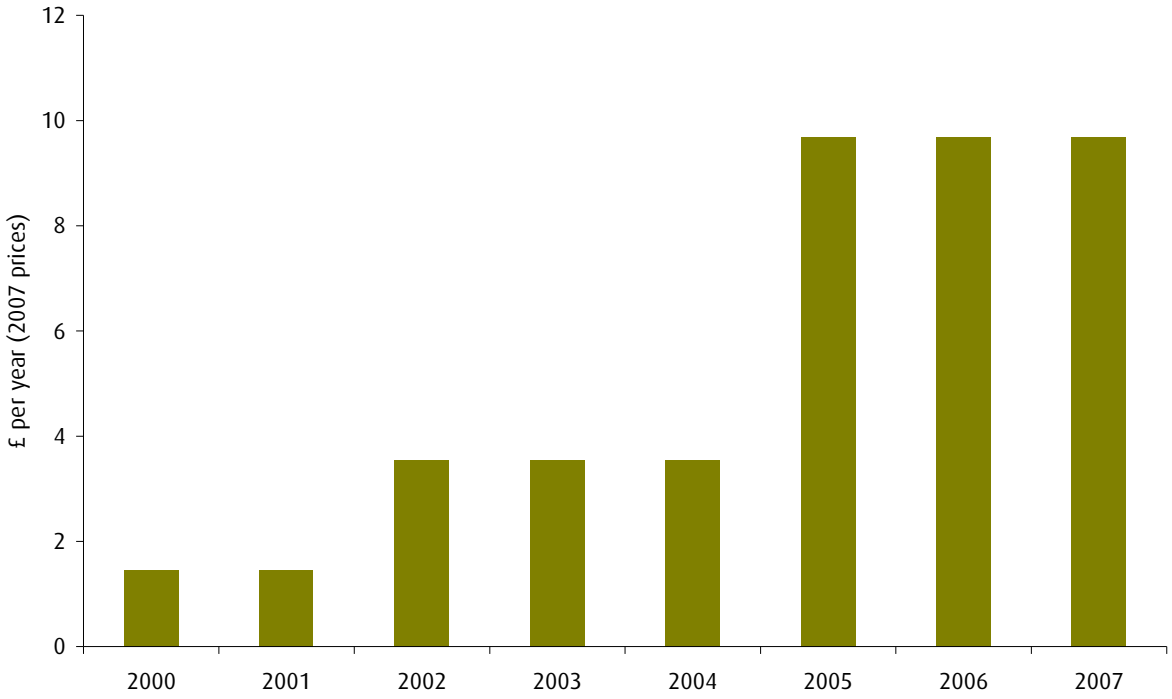
Cost of environmental measures

EESOP, EEC and CERT

As discussed in section 2.2 above, requirements have been placed upon energy supply companies to install energy efficiency measures in customers' homes under the EESOP (1994-2002), EEC phase 1 (2002-2004) and EEC phase 2 (2005-2008). The cost per household gas bill, in 2007 prices, is presented in **Figure 8**. The RO and EU ETS do not have an impact on household gas bills.

[6] BERR, Energy Table 2.3.1 Average annual domestic gas bills (http://www.berr.gov.uk/energy/statistics/publications/prices/)

Figure 8 Cost of energy efficiency measures per household gas bill (2000-2007)



Comparison of contribution to household gas bills

The contribution of the cost of implementing environmental measures to domestic gas bills is shown in Figure 9.

Figure 10 shows the percentage of the total gas bill contributed by the cost of environmental measures.

The average household gas bill increased steadily from £358 in 2000 to £552 in 2007. During this period, the cost of implementing environmental measures increased in two steps from approximately £2 to £10 per household. This is equivalent to no more than 2.4% of the total household bill. In addition, the average household gas bill continues to rise in years when the costs of environmental measures remain constant, demonstrating that environmental measures are not a significant driver of increases in household gas bills.

Looking forward

In April 2008, the EEC will be replaced by the CERT (2008-2011) and this is expected to mean an increase in the cost per household gas bill from £10 in 2007 to £17.50 in 2008. However, this increase will remain a small proportion of the overall gas bill at around 1.5% of a typical gas bill, and is likely to be small in comparison with increases in the wholesale gas price.

Figure 9 Cost contributions to the average household gas bill (2000-2007)

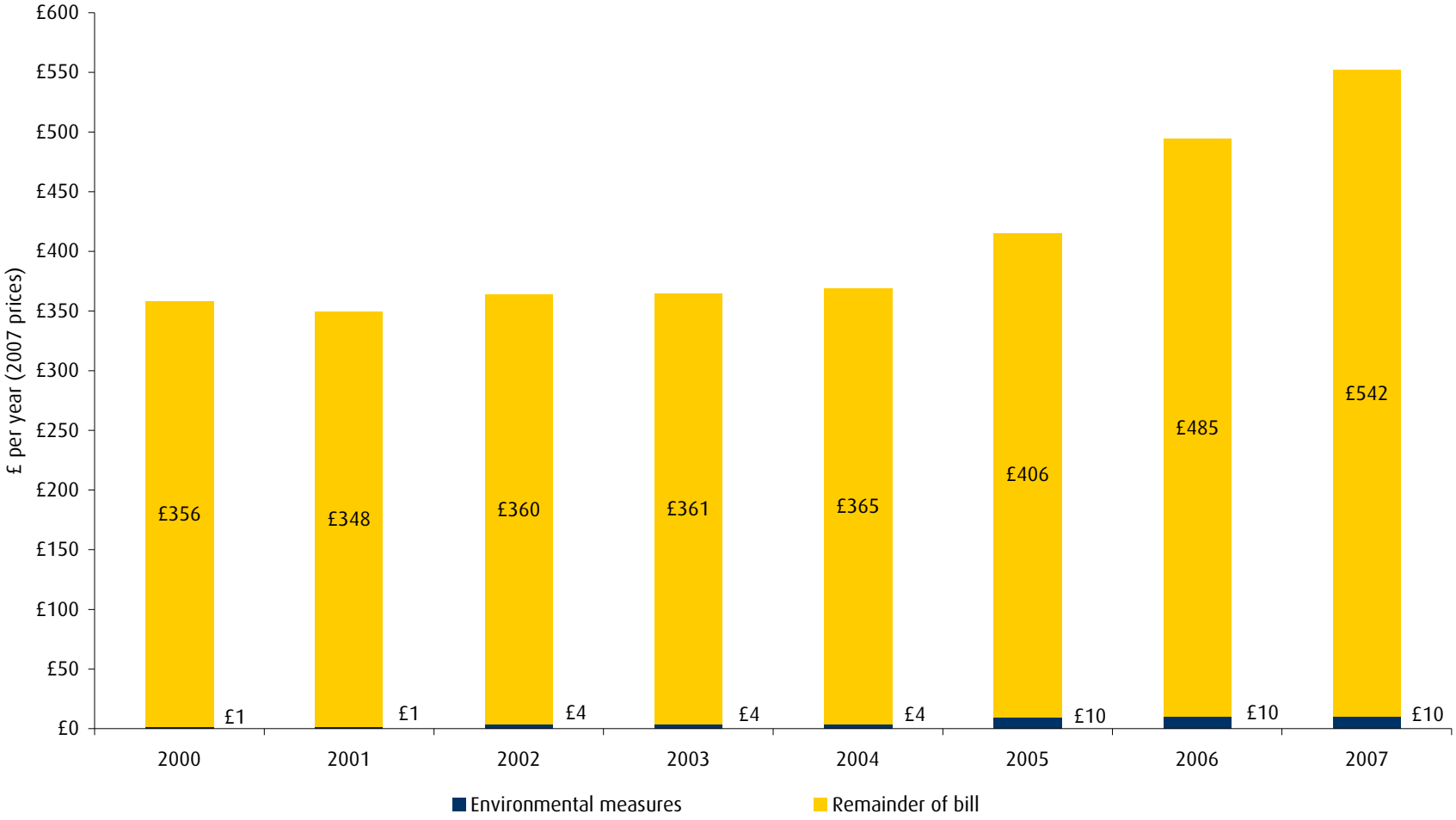


Figure 10 Percentage contributions to the average household gas bill (2000-2007)