Department of Energy & Climate Change

# Estimated impacts of energy and climate change policies on energy prices and bills

March 2013

# Contents

# List of acronyms

| | |
|---|---|
| BBL | Balgzand Bacton Line |
| CCA | Climate Change Agreement |
| CCL | Climate Change Levy |
| CCS | Carbon Capture and Storage |
| CERT | Carbon Emissions Reduction Target |
| CESP | Community Energy Saving Programme |
| CfD | Contract for Difference |
| CHP | Combined Heat and Power |
| CLG | Communities and Local Government |
| CPF | Carbon Price Floor |
| CRC | Carbon Reduction Commitment |
| CSE | Centre for Sustainable Energy |
| DECC | Department of Energy and Climate Change |
| Defra | Department for the Environment, Food and Rural Affairs |
| DIMPSA | Distributional Impacts Model for Strategic and Policy Analysis |
| DPCR | Distribution Price Control Review |
| DUKES | Digest of UK Energy Statistics |
| DUoS | Distribution Use of System |
| ECO | Energy Company Obligation |
| EEC | Energy Efficiency Commitment |
| EMR | Electricity Market Reform |
| EUA | EU Allowance |
| EU ETS | EU Emissions Trading System |
| FIT | Feed-in-Tariff |
| GVA | Gross Value Added |
| HRE | Heat Replacement Effect |
| IA | Impact Assessment |
| IEA | International Energy Agency |
| IUK | Interconnector UK |
| LCF | Levy Control Framework / Living Costs and Food Survey |
| LED | Light-Emitting Diode |
| LNG | Liquefied Natural Gas |
| LPG | Liquefied Petroleum Gas |
| NBP | National Balancing Point |
| NEED | National Energy Efficiency Data-framework |
| OECD | Organisation for Economic Co-operation and Development |
| Ofgem | Office of Gas and Electricity Markets |
| PV | Photovoltaic |
| RdSAP | Reduced data standard assessment procedure |
| RHI | Renewable Heat Incentive |
| RIIO | Revenue = Incentives + Innovation + Outputs |
| RO | Renewables Obligation |
| ROC | Renewables Obligation Certificate |
| SEDBUK | Seasonal Efficiency of Domestic Boilers in the UK |
| SMETS | Smart Metering Equipment Technical Specifications |
| TNUoS | Transmission Network Use of System |
| UEP | Updated Energy and Emissions Projections |
| WHD | Warm Home Discount |

# Ministerial Foreword by the Secretary of State

Energy is fundamental to our way of life – powering our appliances, heating our homes and running heavy industry. It is essential to our society and our economy that we maintain secure and affordable energy supplies while making sure we tackle pollution and reduce emissions that harm the planet.

This document reflects our commitment to being open and transparent about the impacts of our policies on the cost of energy for consumers and updates analysis published in November 2011.

The bad news is that global energy prices are expected to keep rising, putting upward pressure on our energy bills. This is the biggest driver in higher bills. We operate in a global energy market and, while the Government is doing everything we can to reduce the impacts of these rising costs, we cannot control international fossil fuel prices.

But the good news is that, taken together, the Government's policies mean that household bills will be on average 11%, or £166, lower in 2020 than if we just sat on our hands and did nothing.

This includes helping people cut their bills and use less energy to keep warm by upgrading their houses through the Green Deal. And it includes the long-term low-carbon reform of the electricity market to protect people from volatile fossil fuel prices in the future.

UK households are currently paying the lowest retail gas prices in the EU 15 and among the lowest retail electricity prices. Our policies are designed to help bring forward the investment needed to replace ageing power stations, move towards more climate friendly energy generation like renewables, nuclear and carbon capture and storage and improve the energy efficiency of our homes and businesses. This currently accounts for only 9% of the household energy bill and it is essential we do this work if we are to both power the country in the future and protect the planet while maintaining affordability. In addition, these policies will place the British economy at the leading edge of a new booming global green energy market worth around £3.3 trillion and growing larger every year.

Of course the impact of what we are doing to keep bills low will vary on individual households. So we are doing everything we can to encourage people to take advantage of all the energy saving opportunities available and we are targeting support for those most in need – for example, through the Warm Home Discount and the new Energy Company Obligation. We also want it to be easier for people to get the best deal on their bills. That is why the energy suppliers have agreed to give people more information on the tariffs they offer. And the Government will act to ensure people are able to get on the lowest tariffs, through legislation if we have to.

Businesses currently face higher energy costs as a result of policies. While energy costs represent less than 3% of total costs for the manufacturing sector, there is a small section of energy intensive industries facing strong international competition. Nothing would be gained from forcing these industries, jobs, and emissions abroad. That is why we are taking action to reduce the transitional impact of government policy on the cost of electricity for these users, with measures worth around £250 million over the Spending Review period and further support continuing into 2015/16. Government is also seeking to exempt energy intensive industries from the costs of Contracts for Difference. This potential reduction in costs is not reflected in the analysis because the exact details of any support have still to be decided. However, as an illustration, on the basis of an energy intensive firm receiving compensation for 75% of these costs it is estimated that this could lower the impact of policies on their total energy costs in 2020 by over half.

In addition energy intensive industries already receive help through Climate Change Agreements covering 51 sectors enabling firms to receive up to a 90% discount on the Climate Change Levy. Further, the Government has announced it will introduce exemptions from the Climate Change Levy for energy used in metallurgical and mineralogical processes from 1 April 2014.

As this report demonstrates, we are acting, through the market, through the benefits system, through investing in new technology to keep bills down in the long-term in the face of rising global prices.

# Estimated impacts of energy and climate change policies on energy prices and bills

## Executive Summary

1. The Government is committed to being open and transparent about the impacts of energy and climate change policies on households and businesses. This document assesses their impact on gas and electricity prices and bills and updates analysis published in November 2011.[1] The key conclusions are consistent with this previous analysis.

**Current household energy prices and bills**

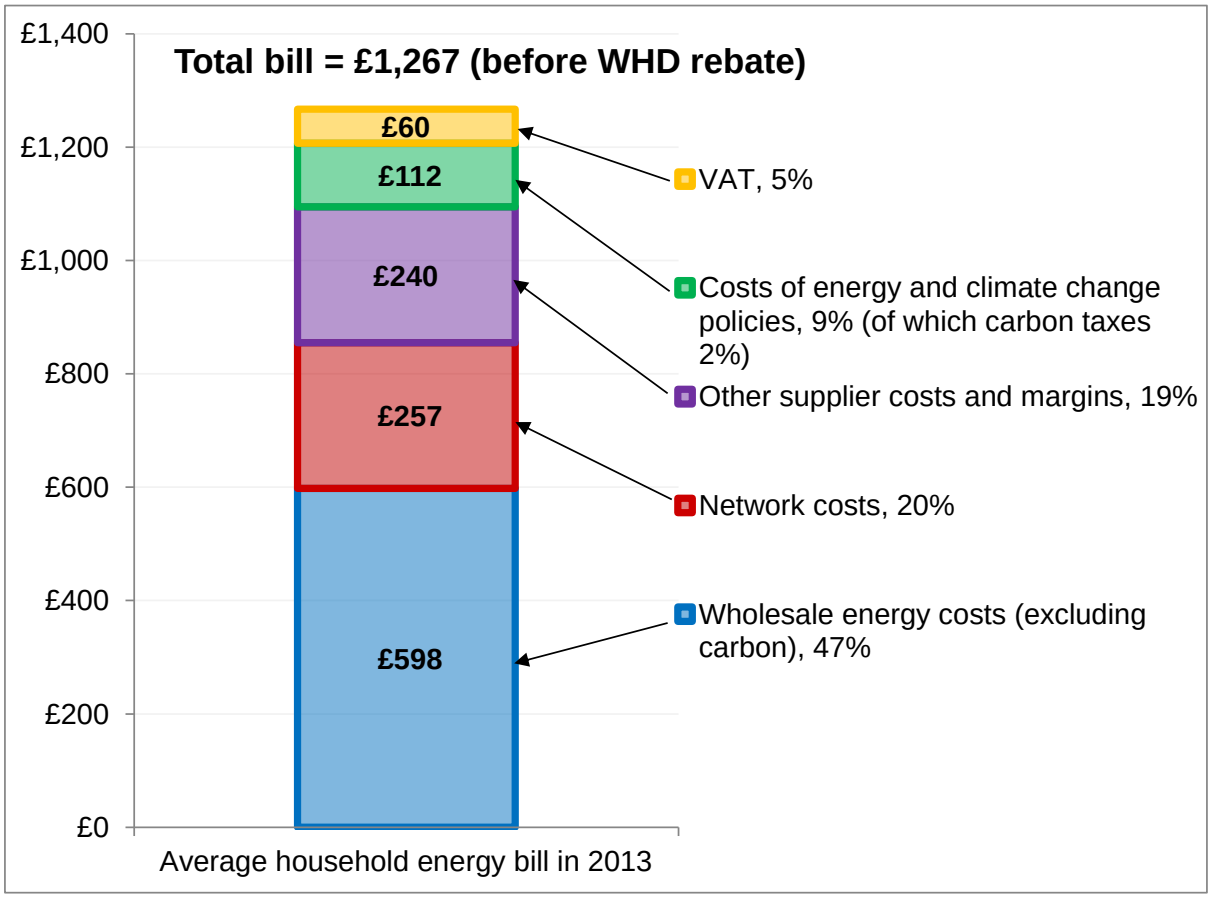
2. UK household dual fuel (electricity and gas) energy bills in 2013 are estimated to be **around £1,267** (before the Warm Home Discount (WHD) rebate[2] ) based on average levels of energy consumption. However, energy bills will vary across households, for example according to the size and efficiency of the housing stock, size of the household and primary heating fuel.

3. UK households are currently paying the **lowest retail gas prices and among the lowest retail electricity prices in the EU 15**.

4. Wholesale gas and electricity costs currently make up the largest proportion of an average household energy bill – **around 47%** in 2013. Transmission, distribution and metering costs account for 20%, other supplier costs and margins account for 19% and VAT 5%. By contrast, the **costs** of energy and climate change policies are estimated to represent **around 9% (or around £112)** of the same bill (see Chart 1). This breakdown is consistent with those published by Ofgem and the major energy suppliers.

[1] Available online at: https://www.gov.uk/government/publications/assessment-of-the-impact-of-energy-and-climate-change-policies-on-prices-and-bills.
[2] The Warm Home Discount rebate is only available to eligible households. However, when the rebate is averaged over all households this reduces the bill to £1,255.

**Chart 1: Estimated breakdown of average household dual fuel bill in 2013**




Source: DECC 2013

## Recent trends in household energy bills

5. The average prices of gas and electricity paid by UK households have risen by around 18% and 9% (in real terms), respectively, since 2010 and by around 41% and 20% (in real terms), respectively, since 2007 (see Chart 2).

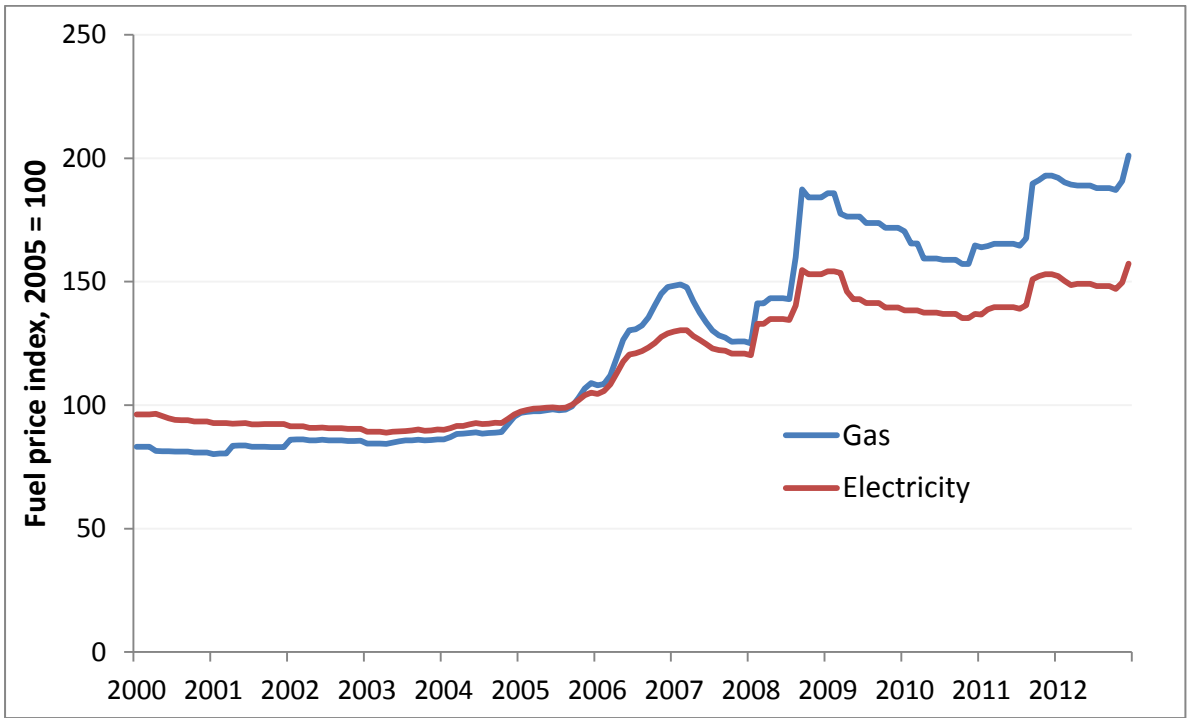
6. Accounting for changes in consumption, average household dual fuel bills are estimated to have increased by around 13% in real terms between 2010 and 2012. The main drivers of this increase are:

   - **Wholesale energy costs,** estimated to have contributed at least 60% of the increase in household energy bills over this period;

   - **Network costs, supplier operating costs and margins,** estimated to have contributed around 25% of the increase;

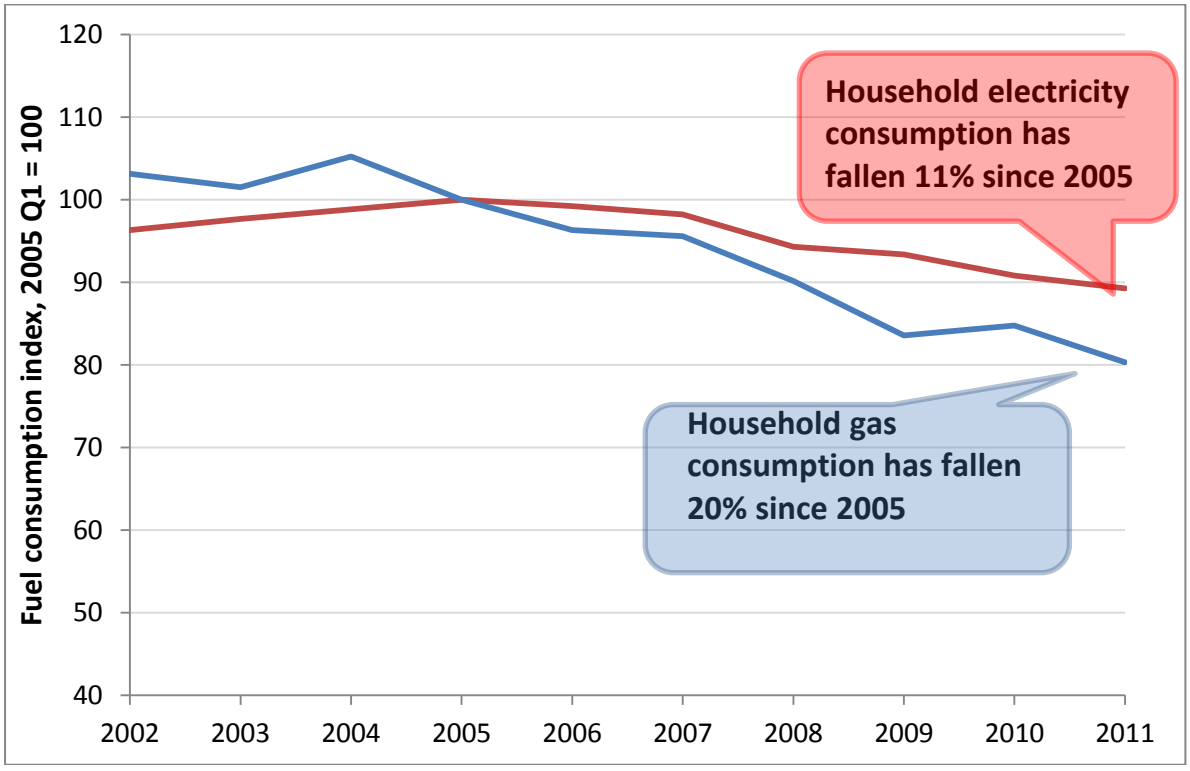
   - **The costs of energy and climate change policies,** estimated to have contributed around 15% of the increase. This accounts for the cost of the Warm Home Discount, but not the rebates it delivers to eligible consumers. This also does not take account of the energy bills savings from energy efficiency policies.

**Chart 2: Domestic gas and electricity price indices relative to the GDP deflator**




Source: ONS data published in DECC's *Quarterly Energy Prices*.

**Chart 3: Total final UK domestic sector gas and electricity consumption**




Notes: Consumption is temperature adjusted. Final 2012 data not yet available.
Source: DECC's *Energy Trend Statistics*.

7. Total final annual domestic sector consumption of gas and electricity (temperature adjusted) has been on a declining trend since 2005, in part due to the impact of energy efficiency policies (see Chart 3).

## The estimated impact of policies on household energy bills

8. **This year's analysis includes the estimated impacts of Building Regulations** which have set minimum standards of efficiency for gas condensing boilers since 2002. This was not captured in previous analysis due to the absence of robust savings estimates. The analysis of household impacts throughout the report also includes estimates excluding the impact of Building Regulations to enable comparison with the previous analysis. Excluding these savings, the conclusions of the household analysis are consistent with DECC's previous published report.

9. **Evidence shows that energy efficiency policies deliver savings.** For example, a total of 2.4 million wall cavities, 4.9 million lofts and 88,000 solid walls have been insulated through Government schemes since April 2008 and evidence shows that these measures can deliver significant savings – from £25 to £270 or more per installation per year.

10. Accounting for these savings, **the average[3] impact of policies is estimated to be a net saving of around 5%** (including the impact of Building Regulations) in 2013 compared to what bills would have been if these policies had never been introduced.[4]

## Projected future trends and policy impacts for household energy bills

11. Going forward, **energy bills are likely to continue on an upward trend, with or without policies**, as a result of rising wholesale energy and network costs.

12. Although the costs of policies will also increase going forward in order to support increasing low carbon investment, **policies will also continue to deliver increasing energy efficiency savings**:

    - By 2022, around **half the UK household population is expected to have at least one major insulation measure** (loft, cavity wall or solid wall insulation) delivered through supplier obligations since 2002, which could save households from £25 to £270 or more off their annual heating bill;

    - Further households could also benefit from efficiency improvements if they choose to take up a **Green Deal**;

    - Tighter efficiency standards for household energy appliances as a result of **Products Policy** are expected to deliver an average annual saving of around £158 per household in 2020 (including around £25 per household through more efficient TVs and set-top boxes, £25 through more efficient consumer electronics and around £20 through more efficient lighting);

    - Around 12 million gas condensing boilers will be replaced between now and 2020, with the large majority of these being newer, more efficient versions

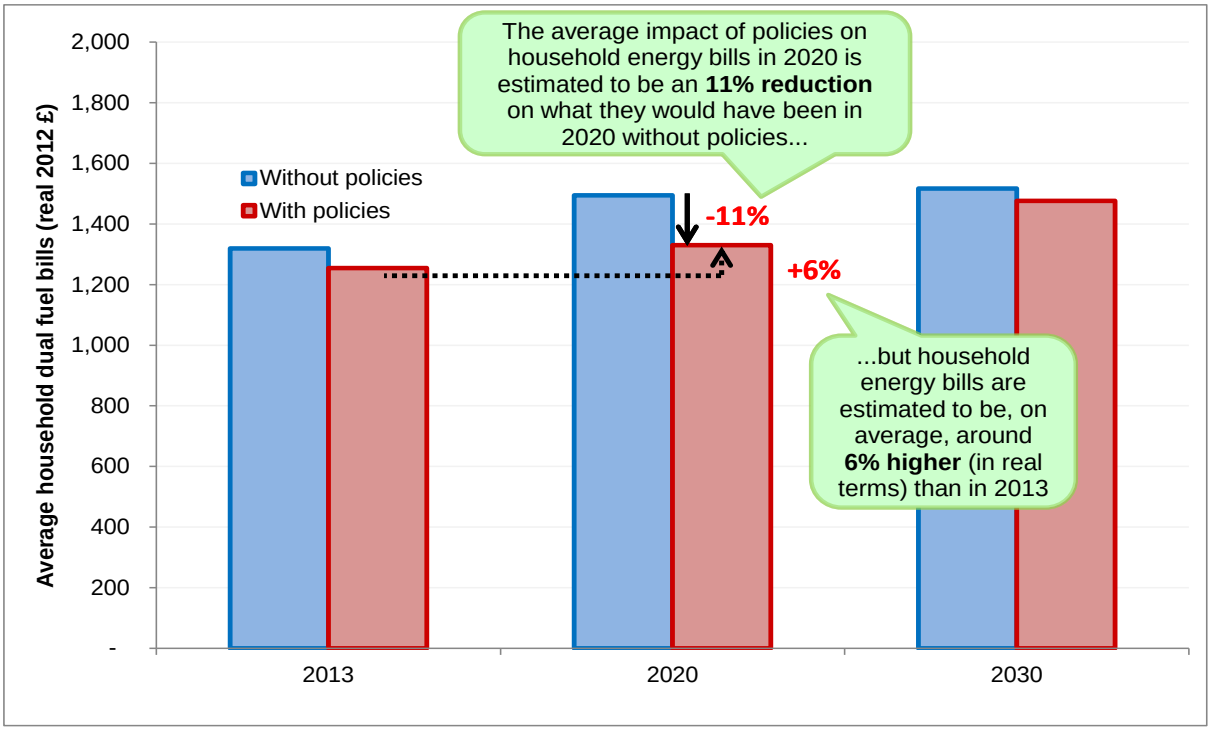
[3] Relates to arithmetic mean impact.
[4] For a full list of policies considered, see Annex B.

(as a result of **Building Regulations**), saving each household from around £20 to £120 or more per year;

- **Smart Meters** will be rolled out to all households by the end of 2019, helping households make more informed energy decisions.

13. As a result, household dual fuel bills are estimated to rise by less than in the absence of policies – **in 2020 households are estimated on average to save around 11% (or £166)** on their energy bills compared to what they would have paid in that year in the absence of policies (See Chart 4). This is because the total monetary savings from policies which help households save energy are expected to more than offset the necessary cost of investing in new capacity and efficiency.[5] Excluding Building Regulations, the average saving is around 6%, comparable to the 7% saving estimated in November 2011. This is consistent with analysis published by the Committee on Climate Change, which concluded that successful implementation of energy efficiency policies can more than offset the cost of policies on household energy bills on average by 2020.

**Chart 4: Estimated average impact of energy and climate change policies on household energy bills compared with bills in the absence of policies**




Source: DECC 2013

14. Table 1 summarises the estimated average impact of energy and climate change policies on energy (gas plus electricity) bills for households in 2013, 2020 and 2030 compared with what these bills would be in each year in the absence of policies.

[5] For a list of policies under consideration, please see Annex B.

15. The reduction in net savings between 2020 and 2030 reflects that the analysis does not include any new policies (e.g. energy efficiency) that may be required in order to meet the 4th Carbon Budget, and that there is assumed to be no new policy to take the place of ECO after it is scheduled to end in 2022.

**Table 1: Estimated average impact of energy and climate change policies on household energy (gas & electricity) bills compared with bills in the absence of policies**

| Real 2012 prices | 2013 | 2020 | 2030 |
|---|---|---|---|
| Bill without policies | £1,319 | £1,496 | £1,516 |
| Bill with policies (including rebates and loan repayments) | £1,255 | £1,331 | £1,476 |
| Impact of policies (including Building Regulations) | -£65 (-5%) | -£166 (-11%) | -£41 (-3%) |
| Impact of policies (excluding Building Regulations) | -£16 (-1%) | -£87 (-6%) | £8 (1%) |

Source: DECC 2013

### Impacts across the household distribution

16. The large majority of households are expected to achieve savings through Products Policy, Building Regulations and Smart Meters, meaning **even those households that do not benefit from any insulation measures or rebates could still save around 1% (or £15)**, on average, on their energy bills in 2020.

17. **Poorer households are typically hit hardest by rises in energy prices**. However, policies can help offset this impact for eligible households on the lowest incomes enabling more of the most vulnerable to heat their homes more affordably and to a more adequate level. The poorest 30% of households are expected, on average, to spend between 1.0% and 2.4% less of their total household expenditure on energy in 2020 compared to in the absence of energy and climate change policies.

18. **Electrically heated households are expected to experience higher bills**, on average, as a result of policies. In order to address this, there are a number of measures in place to support these households. For example, the Warm Home Discount is available to low income households both on and off the gas grid and many electrically heated households could potentially benefit from energy efficiency measures through the Green Deal. In addition, there are other measures in place such as extensions to gas distribution networks to fuel-poor households as well as targeted assistance to electrically heated homes in the form of parts of the Renewable Heat Premium Payment.

### Current business energy prices and bills

19. **Business energy costs depend on a wide range of factors**, including size, fuel mix, whether electricity is sourced from the grid or generated on-site and

whether they are covered by the CRC energy efficiency scheme or Climate Change Agreements.

20. UK businesses (of all sizes) currently pay the lowest gas prices in the EU 15. Small and medium-sized industrial users currently pay electricity prices around the median for the region and larger energy users currently pay electricity prices above the median.

**The impact of policies on future business energy costs and competitiveness**

21. The costs of energy and climate change policies generally represent a larger proportion of total energy costs for businesses compared with the household sector because other components of energy prices, such as network costs and supplier costs and margins, are typically lower per unit of energy for businesses due to economies of scale. As such, energy and climate change policies are expected to lead to higher business bills than otherwise.

22. The most effective way to reduce energy bills for business is to improve energy efficiency. The Green Deal enables businesses as well as households to reduce their energy bills through improving the heating efficiency of their buildings. The Government has consulted on ways in which businesses can be incentivised to reduce their demand for electricity, including the possibility of measures to be included in the Energy Bill currently going through Parliament. The Government will shortly be publishing its proposals on how it intends to promote electricity demand reduction amongst businesses.

23. Businesses that are **medium-sized users of energy** currently face energy (gas plus electricity) costs that are on average **between 15 and 21% higher** as a result of policies. By 2020 the impact is estimated to be **between 23 and 26%**.

24. For most businesses **energy costs are a small proportion of total business costs** – less than 3% on average for the UK manufacturing sector. By contrast, employment costs represented around 18% of the total. This implies that energy and climate change policies are currently adding less than 1% to total business costs in this sector.

25. Businesses that are **large energy intensive users** face varying impacts depending on, among other things, their mixture of gas and electricity use and the extent to which they consume on-site generated electricity (exempt from a number of policy costs affecting retail energy suppliers). Policies are estimated to be **adding between 1 and 14%** to energy bills for these users in 2013 and **between 6 and 37%** in 2020 (the lower end of the range reflects users who generate electricity on-site).Up to half of the impact in 2020 is accounted for by taxes on carbon (EU ETS and CPF), providing revenues to the government.

26. These impacts do not include measures the Government is currently considering to reduce the transitional impact of the EU ETS, Carbon Price Floor and Contracts for Difference on the costs of electricity for the most electro-intensive industries where these could have a significant impact on their competitiveness. Together these policies make up the majority of future policy costs for energy intensive users, adding up to 23% to their total energy costs by 2020. Any

potential reduction in the costs due to these measures is not reflected in the analysis because the exact details of any support have still to be decided. However, as an illustration, on the basis of a firm receiving compensation for 75% of these costs it is estimated that this would lower the impact of policies on their total energy costs in 2020 by over half, reducing them from 30% to 13%.

27. This is in addition to the help that energy intensive industries already receive through Climate Change Agreements covering 51 sectors enabling firms to receive up to 90% discount on the Climate Change Levy. Further, the Government has announced it will introduce exemptions from the Climate Change Levy for energy used in metallurgical and mineralogical processes from 1 April 2014.

28. Moreover, an analysis of energy costs does not in itself tell us how international business competitiveness will be affected. A number of other important factors need to be considered, including exposure to international competition, the wider business environment and wider tax and benefit system.

29. Table 2 summarises the estimated average impact of energy and climate change policies on energy (gas plus electricity) bills for businesses that are medium-sized users of energy and large energy intensive industrial users in 2013, 2020 and 2030 compared with what these bills would be in each year in the absence of policies.

**Table 2: Estimated average impact of energy and climate change policies on business energy (gas & electricity) bills compared with bills in the absence of policies[6] (excludes measures government is considering to reduce impacts of EU ETS, CPF and CfDs on large energy intensive users)**

| Real 2012 prices | 2013 | 2020 | 2030 |
|---|---|---|---|
| **Medium-sized business users** | | | |
| Bill without policies | £1.39m | £1.51m | £1.52m |
| Bill with policies (non-CRC) | £1.59m | £1.90m | £2.13m |
| Impact of policies (non-CRC) | £200,000 (15%) | £390,000 (26%) | £600,000 (40%) |
| Bill with policies (CRC)[7] | £1.68m | £1.85m | £2.11m |
| Impact of policies (CRC) | £300,000 (21%) | £330,000 (22%) | £590,000 (39%) |
| **Large energy intensive industrial users** | | | |
| Bill without policies | £7.1 to 12.5m | £7.6 to 13.8m | £7.7 to 13.6m |
| Bill with policies | £7.1 to 14.2m | £8.1 to 18.8m | £8.7 to 21.7m |
| Impact of policies | £0.1 to 1.8m (1 to 14%) | £0.5 to 5.0m (6 to 36%) | £1.0 to 8.1m (13 to 60%) |

Source: DECC 2013

[6] See Annex A for a definition of each user.
[7] A business which is part of the CRC energy efficiency scheme. In this analysis, we have included the cost of the CRC allowances within the price and bill figures. In reality, these are charged separately from bills and are expected to change behaviour amongst CRC participants as a liability managed separately from energy bills.

## Fossil fuel price sensitivities

30. The main analysis is based on DECC's central fossil fuel price scenario consistent with wholesale gas prices rising to 72p/therm (in real 2012 prices) by 2020. If fossil fuel prices rise faster and further than DECC's central projection, the impact of policies on businesses will be reduced and the benefits for households increased as Government policies help to shield energy consumers from rising fossil fuel prices. However, if fossil fuel prices fall, then the benefits of policies would be less and the costs greater.

# 1. Introduction

31. The Government is committed to maintaining secure, affordable supplies of energy at all times, and to do so while meeting our legally binding emission targets. If the UK were to do nothing, our energy supplies would become much more dependent on imports, more vulnerable to volatility in global fossil fuel prices and there would be a significantly greater chance of costly blackouts. The UK would also miss its emission targets.

32. Policies which will help deliver against these goals will impact on households and businesses and can potentially have significantly different impacts across different households and businesses, particularly concerning the most vulnerable households and the most energy intensive businesses.

33. This is why the Government is committed to being open and transparent about the impacts of policies which will help meet these goals on the costs of heat and power for households and businesses now and into the future. This document focuses on the impact of policies on energy (electricity and gas) prices and bills. It updates analysis published in November 2011[8] for the latest technical assumptions and information on policies.

**Contents and structure of the document**

34. The structure of this document is as follows:

- Section 2 “Approach” describes the methodology used;
- Section 3 “Trends and drivers” sets the context by presenting recent trends in wholesale and retail energy prices;
- Section 4 “Household energy prices and bills” focuses on the household sector, including analysis across the household distribution;
- Section 5 “Business energy prices and bills” looks at energy bills for medium-sized business users and large energy intensive industrial users;
- Section 6 “Sensitivity analysis” considers the implications of different assumptions for fossil fuel prices;
- Annexes A-H present further detail on the methodology, policies covered, scope and more detailed results.

[8] Available online at: https://www.gov.uk/government/publications/assessment-of-the-impact-of-energy-and-climate-change-policies-on-prices-and-bills.

## 2. Approach

**Methodology (See Annex A for more detail)**

35. There are three main routes through which policies can impact (either positively or negatively) the amount households and businesses spend on energy, with some policies impacting via more than one route:

    - **Wholesale energy costs,** by changing the costs of producing energy: for example, the primary effect of the EU Emissions Trading System (EU ETS) and Carbon Price Floor (CPF) is to increase wholesale electricity prices by increasing the cost of generating electricity from fossil fuels, whereas by supporting investment in technologies with low generating (operating) costs (but typically higher capital costs), Government policies may also put downward pressure on wholesale electricity prices;

    - **Retail energy costs,** by changing the costs of supplying energy to final customers: for example, the Renewables Obligation (RO) imposes costs on retail electricity suppliers, reflecting the amount required to support investment in renewable technologies, whereas Smart Meters are expected to reduce supply costs for retail energy suppliers in the longer-term by reducing the costs of metering, managing debt and the customer switching process, among other things; and

    - **Energy use,** by changing the amount of energy needed to provide a particular energy service (heating, power, etc) or by changing behaviour: for example, EU minimum standards (Products Policy) improve the energy efficiency of appliances used by households (TVs, fridges, etc) and businesses (electric motors, lighting, etc), while Smart Meters are expected to encourage more energy efficient behaviour.

36. Projecting what impact energy and climate change policies will have on future energy prices and consumption levels is difficult. Future energy bills are inherently uncertain and the uncertainties increase the further out we wish to project. There are a number of factors which will affect what we pay for energy in the future, many of which cannot be predicted or controlled. Wholesale energy costs are the largest single component of energy bills and are largely determined by international fossil fuel prices. While this report presents results to 2030, the projections are especially uncertain out to this period. For this reason, our summary impacts and distributional analysis focus on 2020.

37. Wholesale energy costs will also influence the support costs needed to deliver investment in energy efficiency and low-carbon technologies. While the exact costs to energy suppliers of meeting carbon-based obligations such as the Energy Company Obligation (ECO) are not yet known, they will tend to be lower if energy prices are higher and vice-versa. The cost of low carbon technologies delivered through EMR will also vary inversely with wholesale energy costs.

38. Other factors will also drive changes in energy bills (through consumption decisions), in particular annual changes in weather or consumer tastes. For the

purpose of this analysis, the impacts of these other factors have not been captured in our energy bill estimates in order to focus on how energy and climate change policies will impact energy bills.[9]

39. An analysis of electricity and gas bills does not in itself tell us whether energy users, particularly businesses, are financially better or worse off as a result of energy and climate change policies or how international business competitiveness will be affected. A number of other important factors need to be taken into account, including exposure to international competition, the wider business environment, the free allocation of EU ETS allowances to some sectors, and the wider tax and benefit system. More details on this are set out in Annex C.

40. Given these uncertainties, the figures presented in this report use central assumptions as set out and evidenced in individual policy Impact Assessments. Sensitivity analysis surrounding fossil fuel price assumptions is also presented.

41. The impact of policies on energy prices and bills are presented as the difference between the average price or bill in a given year compared with what that price or bill would have been in the same year if the (old and new) policies under assessment had never been in place (the no policy "baseline"). This is different to a baseline scenario where policies were stopped from today – even if policies were stopped today, some costs and savings would continue from technologies already built and installed.

42. The impacts in this document (including the Annexes) for individual policies will differ from those presented in individual policy Impact Assessments which look at the marginal impact of individual policies (i.e. against a baseline that includes other policies). This differs from the cumulative impact of all policies considered in this report (which is assessed against a baseline without any policies past or present). Further detail on this and the modelling methodology can be found in Annex A.

43. Annex A also details methodological changes to the analysis since the November 2011 report. The most significant changes to the analysis have been:

    - **The inclusion of the estimated impact of minimum efficiency standards for new and replacement gas condensing boilers set by Building Regulations:**[10] Estimates of these savings were previously not available but have now been included in the analysis. This is not a new policy – the savings reflect the impact of regulations introduced since 2002. Further detail on the policies and sources to background information is available in Annex B. The effect is that net savings in the household sector are estimated to be larger than estimated in November 2011 due to efficiency savings on gas which were not previously quantified. The remainder of this report also

[9] I.e. weather effects and consumer tastes have been held constant. As such, baseline (before policies) energy consumption for all illustrative users in this document remains flat over time and is unchanged from the analysis in the November 2011 report.

[10] They also set minimum standards for the installation of new and replacement boilers that use other fuels e.g. oil and LPG boilers now also have to be high efficiency condensing ones. However, the impact of these standards is not captured in this analysis.

presents the impacts excluding these savings in order to allow comparison with the November 2011 analysis;

- **A reduction in unit network costs (and hence energy prices) for business and industrial users:** There is significant evidence to suggest that network costs per unit of energy are lower for larger energy users than previously assumed. The effect is that energy prices for business and industrial users are now estimated to be lower. Therefore, any given absolute increase in the cost of energy as a result of policies now represents a larger percentage increase on energy prices and bills for these users;

- **Splitting the medium-sized business user impacts by CRC and non-CRC participants:** The non-domestic sector is split into three distinct groups based on policy coverage:

  i. **The CCA sector:** An energy intensive sector covered by Climate Change Agreements (CCAs) which allow eligible businesses to receive a discount on the Climate Change Levy (CCL) in return for meeting energy efficiency or carbon saving targets. As per the previous report, analysis of the impact of policies for such users is captured in Section 5.3;

  ii. **The CRC sector:** Businesses which belong to large public and private sector organisations which participate in the mandatory CRC Energy Efficiency Scheme which incentivises the uptake of cost-effective energy efficiency opportunities through the application of additional financial and reputational drivers (see Section 5.2);

  iii. **The "unconstrained" sector:** Typically smaller businesses which are not covered by either the CRC or a CCA (see Section 5.2).

**Policies covered**

44. The results presented in this report are based on analysis of policies and proposals put forward by both the present and previous Governments. Only those policies already in place or that have been planned to a sufficient degree of detail (i.e. with quantified estimates of costs and benefits) have been included in the modelling. Annex B describes the policies assessed in this document and details any changes made to the policies since the last published analysis in November 2011.

45. Apart from the increased discount on the CCL on electricity for users signed up to CCAs, this analysis does not take account of the remaining package of measures to eligible electro-intensive industries also announced in the 2011 Autumn Statement which amount to £250 million over the period 2013 to the end of the Spending Review. The exact design of the package, including the extent of support for eligible parties and the criteria for eligibility, has yet to be agreed. The proposed exemption for electro-intensive industries from the costs of EMR Contracts for Difference is also not covered.

## 3. Trends and drivers

46. The average prices of gas and electricity paid by UK households have risen by around 18% and 9% (in real terms), respectively, since 2010 and by around 41% and 20% (in real terms), respectively, since 2007.[11] Taking changes in consumption over time into account, the average household dual fuel bill is estimated to have increased by around 13%, in real terms, since 2010.[12]

47. Wholesale energy costs, which make up around half of a household energy bill (and more for industrial energy users) are estimated to have contributed to at least 60% of the increase in household energy bills between 2010 and 2012 as the wholesale price of gas has risen by over 35% over the past two years.[13] The remainder of the increase was driven by other factors: increases in network costs, supplier operating costs and margins are estimated to have accounted for around 25% of the increase and the *costs* of energy and climate change policies around 15% of the increase – this figure accounts for the cost of the Warm Home Discount but not the rebates it delivers to eligible consumers. It also does not include expected energy bill savings from energy efficiency policies.[14]

48. Total UK consumption of gas and electricity in the domestic sector has fallen steadily since 2005, in part due to the impact of energy efficiency policies. In 2011 gas consumption was around 20% lower than in 2005 and electricity consumption 10% lower (after adjusting for temperature).[15]

[11] Source: DECC *Quarterly Energy Prices*, Table 2.1.1. Available online at: https://www.gov.uk/government/statistical-data-sets/monthly-domestic-energy-price-stastics.
[12] Source: DECC *Quarterly Energy Prices*, Tables 2.2.1 and 2.3.1. Available online at: https://www.gov.uk/government/statistical-data-sets/annual-domestic-energy-price-statistics.
[13] Real terms increases. Source: Heren and Marex Spectron. Based on final 12 month average traded price of the Winter 10/11 and Winter 12/13 contracts.
[14] DECC estimates based on standard Ofgem consumption assumptions of 16.5MWh gas and 3.3MWh electricity per year. Rounded to the nearest 5 percentage points. The estimated contribution of the costs of energy and climate change policies to the increase in energy bills between 2010 and 2012 should not be confused with the share of energy bills in 2012 which these costs represent – which is estimated to be around 9%.
[15] Source: DECC's *Energy Trend Statistics.*

49. Chart 5 compares "April Annual"[16] wholesale electricity prices with the variable costs of gas generation (excluding carbon costs; based on the NBP[17] price for delivery in the forward financial year). In general, electricity prices have moved with gas prices. This is because, currently in the GB wholesale electricity market, the marginal (price-setting) plant is usually a gas generator, which can pass through changes in gas or carbon prices to the wholesale electricity price.

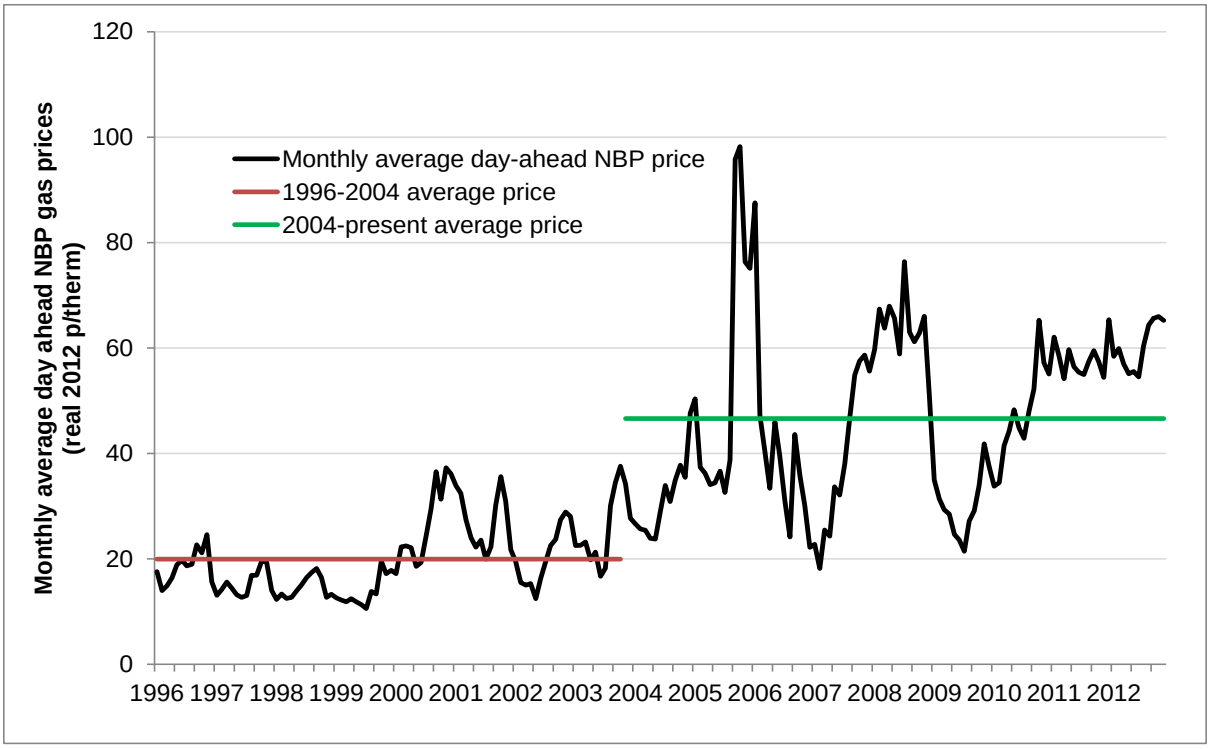
**Chart 5: Forward (April annual) baseload electricity prices and gas costs of generation (monthly averages)**


Source: Marex Spectron, ICIS Heren. Note: Costs of generation based on 49.13% efficient gas plant.

[16] Price in a given period for electricity to be delivered in the forward financial year.
[17] National Balancing Point – the UK's virtual natural gas trading hub.

50. Since wholesale energy costs represent the largest proportion of retail gas and electricity prices for energy consumers in the UK, sustained movements in international prices for fossil fuels will be a key factor influencing future energy prices. Chart 6 presents monthly wholesale gas prices, in real 2012 prices, from 1996 to present and demonstrates both the volatility of wholesale gas prices and the rising trend.

**Chart 6: Wholesale gas prices, 1996 to present**




Source: Heren (converted by DECC to real terms using the UK GDP deflator)

51. A key factor to explain the increase in UK gas prices, since competition was introduced in 1996, is the significant rise in oil prices. The physical interconnection provided by the IUK[18] and BBL[19] pipelines links the UK with continental gas markets where gas contracts are priced against the price of oil products. This means that gas prices in the UK are also heavily influenced by oil prices. The UK market's exposure to oil-indexed pricing has intensified as UK Continental Shelf gas production has declined over time, and imports have grown as a share of total supplies.

52. Chart 5 illustrates the changing trend towards higher and more volatile prices after 2004, when the UK became a net importer of gas. This change was primarily driven by global energy market developments. Policies which help decarbonise the UK's energy supplies (such as the RO and EMR) will result in a more diversified electricity supply, reducing the vulnerability of UK energy prices to movements in fossil fuel prices but will add costs to retail prices in the short- to medium-term.

[18] Interconnector UK gas pipeline linking the Bacton gas terminal in England with the Zeebrugge terminal in Belgium.
[19] Gas pipeline linking the Bacton terminal in England to the Balgzand terminal in the Netherlands.

53. More recently, there has been a weakening of the oil-gas price link. This was driven by factors such as the expansion of global markets in Liquefied Natural Gas (LNG), the rapid increase in US production of unconventional gas and the reduction in global gas demand that followed the global recession. In combination, these factors led the International Energy Agency (IEA) to state in its 2010 World Energy Outlook that a "sizeable glut of global gas-supply capacity has developed". This glut has subsequently been eroded by increased demand, particularly in Asia where a combination of factors including the economic recovery, increased gas consumption by China and the Fukushima disaster in Japan resulted in an increased need for LNG cargos for power generation.

54. Future wholesale gas prices in the UK are likely to be influenced by global oil prices which are expected to rise, rate of investment in supply-side infrastructure, demand and supply fundamentals, and prospect of liberalisation in neighbouring European markets. DECC has published a range of scenarios reflecting the inherent uncertainties in projecting long-term price movements.[20] DECC's central gas price scenario assumes a re-linking of gas to oil-indexed prices in the short-term as the 'gas glut' erodes. However, with liberalisation, and the bringing forward of further gas supply projects, it is assumed that from 2017 the oil-linkage begins to weaken significantly and that the gas price plateaus at around 72p/therm (real 2012 prices) – higher than the 2012 average price of 60p/therm.[21]

55. Whilst wholesale gas prices are not at levels similar to their annual peak in 2008,[22] retail prices are higher today. This is because other components of retail prices have increased since then. The cost of transporting electricity to consumers has increased due to assets installed in the 1950s and 60s having to be replaced as they reach the end of their economic lives and new generation capacity being connected – as a result, electricity network costs have increased by around 20% in real terms since 2008.[23]

[20] Available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/fossil-fuel-price-projections.
[21] Source: Heren. Average 2012 NBP day-ahead price.
[22] Real terms annual average. While Chart 2 shows prices reached their monthly peak in 2006, there was a longer duration of relatively high prices in 2008.
[23] Based on data provided by Ofgem.

# 4. Household energy prices and bills

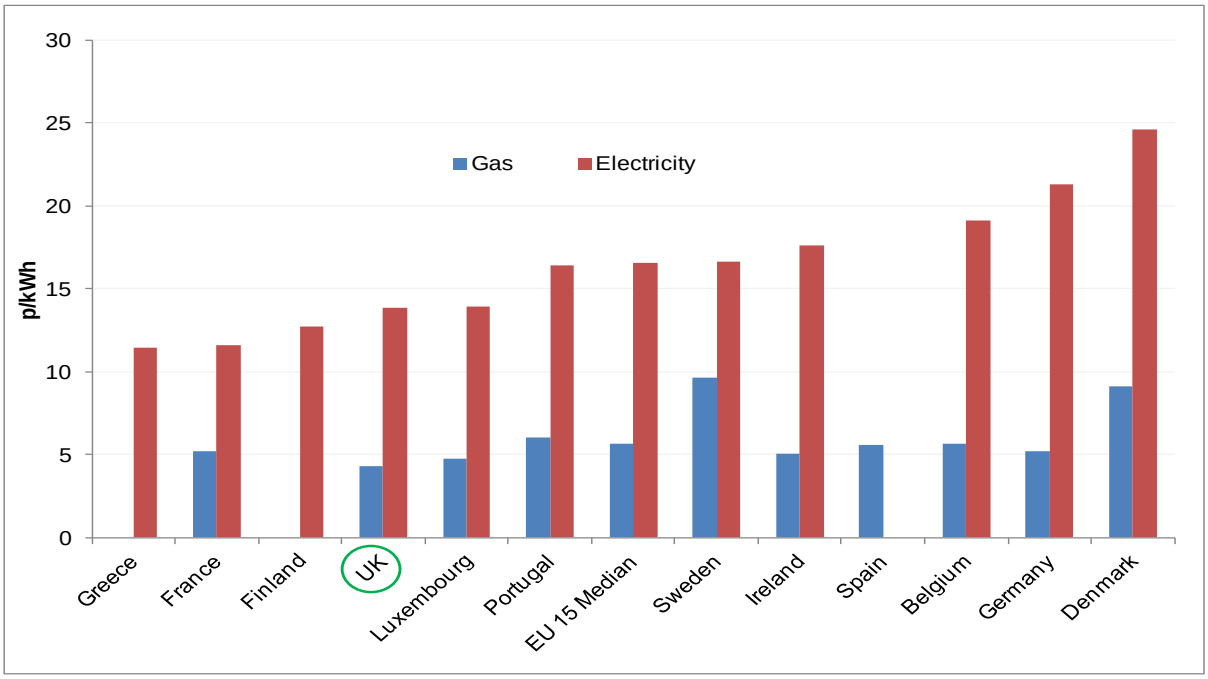
## 4.1. International comparisons

56. Charts 7 and 8 show how the UK's household gas and electricity prices compare to the rest of the EU 15 and G7. The UK ranks well internationally for household energy prices. When compared to the EU 15, UK households have faced the lowest gas prices since 2008. Households in Canada and the US face lower gas prices on average than in the UK due to the exploitation of low cost unconventional gas reserves. This has not had any direct effect on the price of gas outside of North America.[24] This is because the North American gas market is relatively isolated with a lack of export infrastructure and tight regulation of exports (particularly in the US).

57. The UK has had the third or fourth lowest household electricity prices in the EU 15 for the past four years. Comparatively low levels of energy and climate change policy support costs and VAT in the UK contribute significantly to this positive ranking. The UK currently has the lowest rate of VAT on residential energy prices of all the EU 15 and the total amount paid towards VAT and the cost of energy and climate change policies per unit of residential electricity is currently the third lowest of the EU 15.[25] Lower wholesale energy costs drive lower costs in other countries, particularly in France and the Nordic area.

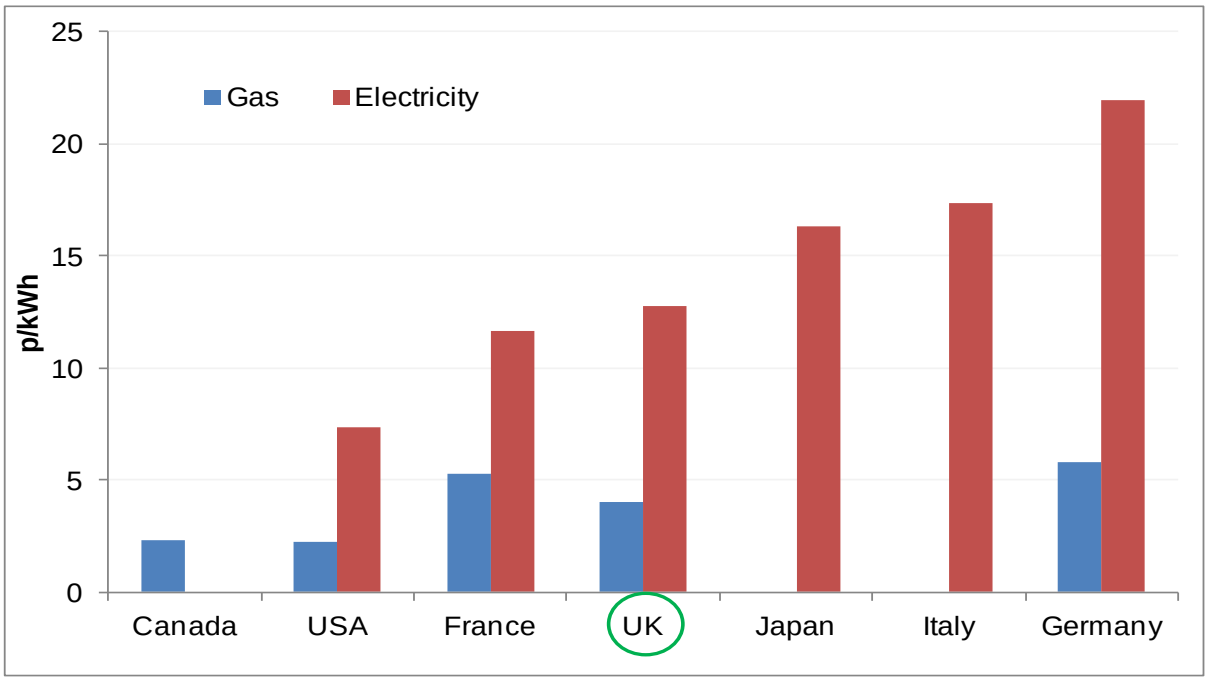
[24] The UK has benefitted indirectly from the increases in unconventional gas production in North America through the increased availability of LNG that was expected to be needed in the US, though much of this has been offset by increases in gas demand in Asia in recent years.
[25] Source: *Household Energy Price Index for Europe, January 2013*. Available online at: http://www.energypriceindex.com/wp-content/uploads/2011/08/HEPI_Press_Release_January20131.pdf.

## Chart 7: Average energy prices for medium-sized domestic customers in the EU15, January-June 2012




Source: Eurostat data, published in DECC's *Quarterly Energy Prices.* Gas data for Greece and Finland was unavailable for this period. Electricity data for Spain was unavailable and both gas and electricity data for Austria, Netherlands and Italy was unavailable but DECC estimates that their prices are likely to be above the relevant median. Data sorted by electricity prices.

## Chart 8: Average energy prices for domestic consumers in the G7, 2011

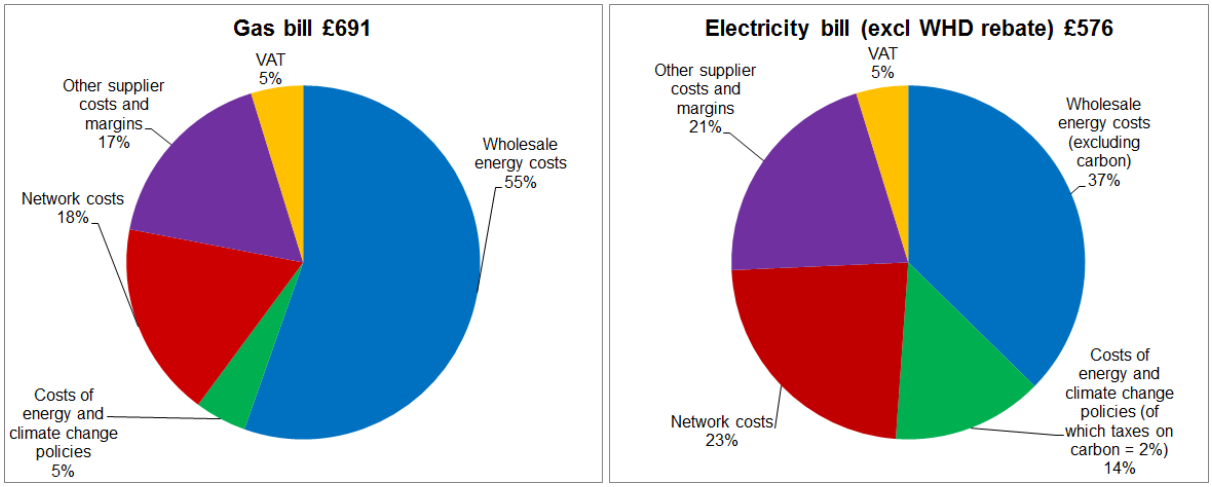



Source: IEA data, published in DECC's *Quarterly Energy Prices, September 2012.* Gas data for Japan and Italy was unavailable for this period but DECC estimates that the price is likely to exceed the relevant median for both countries. Electricity data for Canada was unavailable for this period but DECC estimates that the price is likely to be below the relevant median. Data sorted by electricity prices.

## 4.2. A breakdown of current household energy bills

58. DECC's estimated breakdown of an average UK household gas and electricity bill in 2013 is presented in Chart 9 (more detail is given in Annex D). Average household gas and electricity bills in 2013 are estimated to be £691 and £576, respectively (in real 2012 prices), before rebates.[26] Wholesale energy costs are estimated to currently make up around 55% of an average household gas bill and 37% of an average household electricity bill (excluding the cost of carbon).

**Chart 9: Estimated breakdown of average household gas and electricity bills in 2013[27]**




Source: DECC 2013. Figures in real 2012 prices. Percentages may not sum to 100% due to rounding.

59. In 2013, energy and climate change policies are estimated to represent 5% of an average household gas bill, 14% (of which 2% reflects taxes on carbon through the EU ETS and the CPF) of an average household electricity bill and 9% of an average household dual fuel (gas plus electricity) bill. Transmission, distribution and metering costs (20%), other supplier costs and margins (19%) and VAT (5%) are the other main components of the average household energy bill.

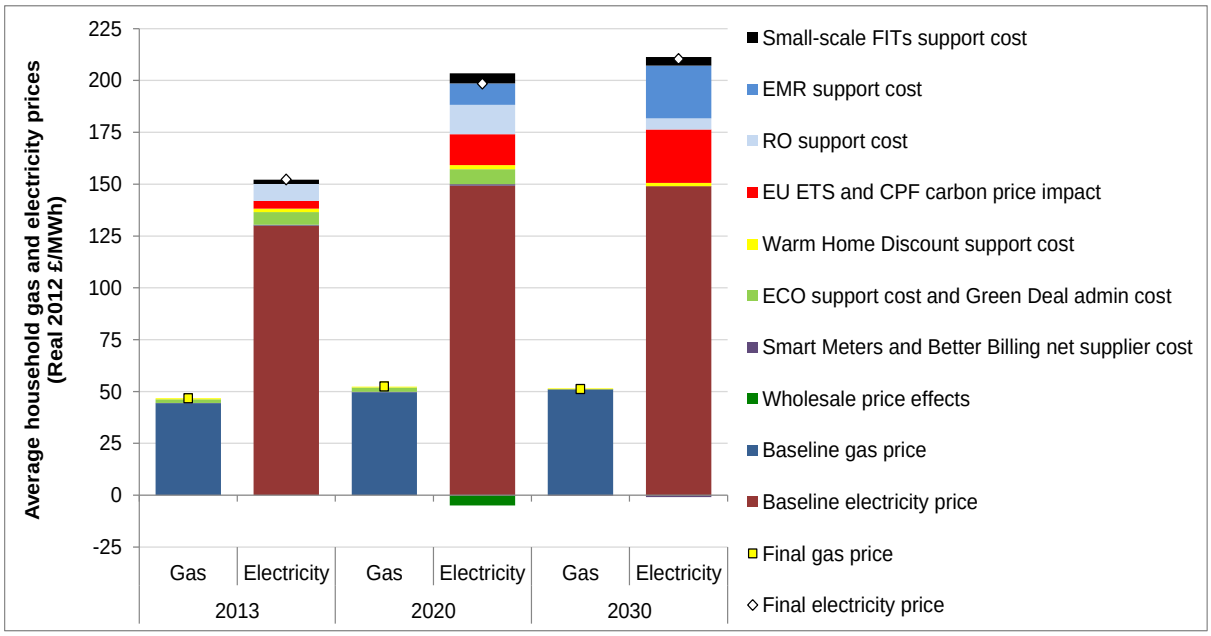
60. However, the proportions above include the cost of the Warm Home Discount, but do not show the impact of the rebates delivered through the policy to eligible consumers. They also do not show the savings from energy efficiency policies (such as Products Policy, Building Regulations, the Green Deal and ECO and its predecessors[28]) reducing energy consumption. Combined, these are estimated to deliver an average saving of £203 on household energy bills in 2013. Accounting for this and any impacts policies may be having on wholesale energy costs, energy and climate change policies are estimated, on average, to be delivering lower household energy bills. Energy and climate change policies are estimated, on average, to save around £65 or 5% in 2013, compared to what bills would have been in the absence of policies. However, the impact on individual households will differ depending on whether they take up particular policy measures. Further consideration of how the estimated impacts might differ across the household distribution is presented in later sections.

[26] Based on 14.8MWh of gas consumption and 3.8MWh of electricity consumption (after policies).
[27] For detail on how the 2013 "with policy" bills compare with Ofgem's recent assessments, please see Annex D.
[28] The Carbon Emissions Reduction Target (CERT), Community Energy Savings Programme (CESP) and Energy Efficiency Commitments (EEC).

## 4.3. Estimated average impact of energy and climate change policies on household energy bills to 2030

61. Chart 10 and Table 3 show the estimated impact on average UK household gas and electricity prices as a result of energy and climate change policies in 2013, 2020 and 2030. The results are based on DECC's central fossil fuel price scenario consistent with a wholesale gas price of 69p/therm in 2013 and 72p/therm in both 2020 and 2030 (in real 2012 prices).

**Chart 10: Estimated impact of energy and climate change policies on average retail gas and electricity prices paid by UK households (including VAT)[29]**




Source: DECC 2013

[29] For further detail on each policy including "Wholesale price effects", please see Annex C.

**Table 3: Estimated average impact of energy and climate change policies on household gas and electricity prices and bills (inc. VAT)[30]**

| | 2013 | 2020 | 2030 |
|---|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | | |
| Average **gas price** without policies | 44 | 50 | 51 |
| Average **gas price** with policies | 47 | 52 | 51 |
| Impact of policies on average **gas price** | 2 (5%) | 3 (5%) | 0 (0%) |
| Average **electricity price** without policies | 130 | 150 | 149 |
| Average **electricity price** with policies | 152 | 198 | 210 |
| Impact of policies on average **electricity price** | 22 (17%) | 49 (33%) | 61 (41%) |
| **Bill impacts (real 2012 £ and % change)** | | | |
| Average **gas bill** without policies | £738 | £826 | £849 |
| Average **gas bill** with policies | £691 | £733 | £742 |
| Impact of policies on average **gas bill** | -£46 (-6%) | -£94 (-11%) | -£107 (-13%) |
| Average **electricity bill** without policies | £582 | £670 | £667 |
| Average **electricity bill** with policies | £563 | £598 | £734 |
| Impact of policies on average **electricity bill** | -£18 (-3%) | -£72 (-11%) | £67 (10%) |
| Average **energy bill** without policies | £1,319 | £1,496 | £1,516 |
| Average **energy bill** with policies | £1,255 | £1,331 | £1,476 |
| Impact of policies on average **energy (gas plus electricity) bill** | -£65 (-5%) | -£166 (-11%) | -£41 (-3%) |
| *Impact of policies on average **energy bill – Excluding building regulations*** | *-£16 (-1%)* | *-£87 (-6%)* | *£8 (1%)* |

Source: DECC 2013. Numbers may not add up due to rounding.
The average bills are based on annual consumption of 16.6MWh of gas and 4.5MWh of electricity in each year to 2030 *before* efficiency savings are made from policies. *After* policies consumption will be lower and vary in each year depending on the estimated level of policy driven efficiency savings.
The electricity and energy bill *with policies* are net of the Warm Home Discount rebate.
For details of each policy's contribution to the total price and bill impacts, see Annexes E and F.

62. Energy prices are expected to continue on an upward trend over time, with or without policies, as a result of rising wholesale energy and network costs. In real terms, household gas and electricity prices are estimated to rise by around 12%

[30] The percentages for 2013 in this table differ to those in Chart 5 because Table 2 represents the *impact of policies* on top of an energy bill *in the absence of policies* (and so captures policy impacts on wholesale energy costs and energy consumption), whereas Chart 5 presents the *share of policy costs* for an energy bill *in the presence of policies*.

and 30% (in real terms), respectively, between 2013 and 2020 and by around 10% and 38% between 2013 and 2030.

63. Energy and climate change policies are estimated to currently be adding around 5% to the average gas price paid by UK households. This largely reflects the cost of ECO, which we estimate will cost energy companies around the same as delivering the Carbon Emissions Reduction Target (CERT) and Community Energy Saving Programme (CESP) in the previous year. The estimated impact of policies on household gas prices is expected to remain broadly unchanged to 2020. The ECO is assumed to end in 2022 for the purpose of this analysis. As such, the estimated impact of policies on the average gas price paid by UK households is estimated to fall to close to zero by 2030.

64. Policies are estimated to currently be adding around 17% to the average electricity price paid by UK households. In addition to the cost of the ECO and Warm Home Discount, this also reflects the cost of the RO and small-scale Feed-in-Tariffs (FITs) obligation on retail prices and the carbon cost of the EU ETS and CPF on wholesale electricity costs. Going forward, this impact is estimated to increase to 33% in 2020 and 41% in 2030, reflecting the rising trajectory of the CPF and EMR (and to a lesser extent RO) support costs as more low-carbon generation technologies are expected to be deployed.

65. Compared with the November 2011 analysis, DECC's revised estimates of the impact of policies on electricity prices in 2020 and 2030 are higher owing to several technical updates. They include an increase in the total cost of small-scale FITs following a surge in uptake of small-scale renewable electricity measures over the past year, an increase in the total cost of the RO reflecting an expected higher level of renewable generation annually as a result of new bandings to be introduced in 2013/14[31] and increased EMR support costs post 2020 assuming the introduction of the Capacity Market.

66. However, energy bills are a combination of prices and energy usage. By 2020, the impact of policies on energy prices is, on average, expected to be more than offset by the impact of policies which improve energy efficiency by helping households (and also businesses) reduce energy consumption (see Table 3).

67. Efficiency measures delivered as part of CERT (and EEC 1 and 2) and CESP, as well as existing EU and UK minimum efficiency standards (Products Policy and Building Regulations) mean that many households are now consuming less energy than they would have done without these policies (see Box 1).

[31] Although the total cost of the RO per unit of electricity generated through large-scale renewables is estimated to be lower than under the current bandings.

**Box 1: Evidence of the impact of household energy efficiency policies**

Evidence shows that energy efficiency policies are already having a significant impact on household energy bills across the UK.

The actual impact of energy efficiency policies on household energy consumption and energy bills will depend on (1) the performance of different energy efficiency measures and (2) the uptake of measures.

The National Energy Efficiency Data-framework (NEED)[32] contains evidence on actual consumption in homes before and after receiving cavity or loft insulation. It shows that the installation of energy efficiency measures enables considerable energy savings for real households. For example, a typical saving of 10% of annual gas consumption for cavity wall insulation and 3% for loft insulation. Alternatively, a household with Solid Wall Insulation saves around 4.7MWh[33] per year. This means that installing insulation could save consumers from £25 to £270 or more off their annual heating bill.

In terms of the uptake of measures, there is clear evidence that households are installing energy efficiency measures. For example, the latest published statistics show that retro-fit cavity wall insulation has been installed in around 596,000 homes over the past 12 months and that a cumulative total of 2.4 million cavities, 4.9 million lofts and 88,000 solid walls have been insulated through Government schemes since April 2008, the start of CERT.[34]

68. Going forward, energy efficiency savings are expected to increase. In addition to continued savings from measures installed during CERT (and EEC 1 and 2) and CESP until the end of their technological life-span,[35] further savings will be delivered by:

    - the roll-out of Smart Meters across the household sector encouraging more energy efficient behaviour;

    - the increased take-up of insulation and heating measures through the ECO and Green Deal;

[32] For further detail, see: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/national-energy-efficiency-data-need-framework.
[33] Figures based on 2013 estimated gas price. Accounting for inaccessibility and in-use factor and comfort taking (where measures installed reduce the cost of heating to a certain temperature level, households may choose to use some of this saving to increase warmth levels in their home). Consistent with assumptions used for the Green Deal IA.
[34] Further detail is available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/49403/7154-stat-release-est-home-ins-oct-2012.pdf.
[35] For example, the assumed lifetime of Loft and Cavity Wall Insulation is 42 years and for Solid Wall insulation is 36 years. Consistent with the Green Deal Impact Assessment, available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42984/5533-final-stage-impact-assessment-for-the-green-deal-a.pdf.

- the gradual replacement of energy using products (such as fridges and TVs) with more efficient products that meet minimum EU standards (Products Policy); and

- the gradual replacement of boilers with more efficient boilers meeting the minimum standards set out in Building Regulations.

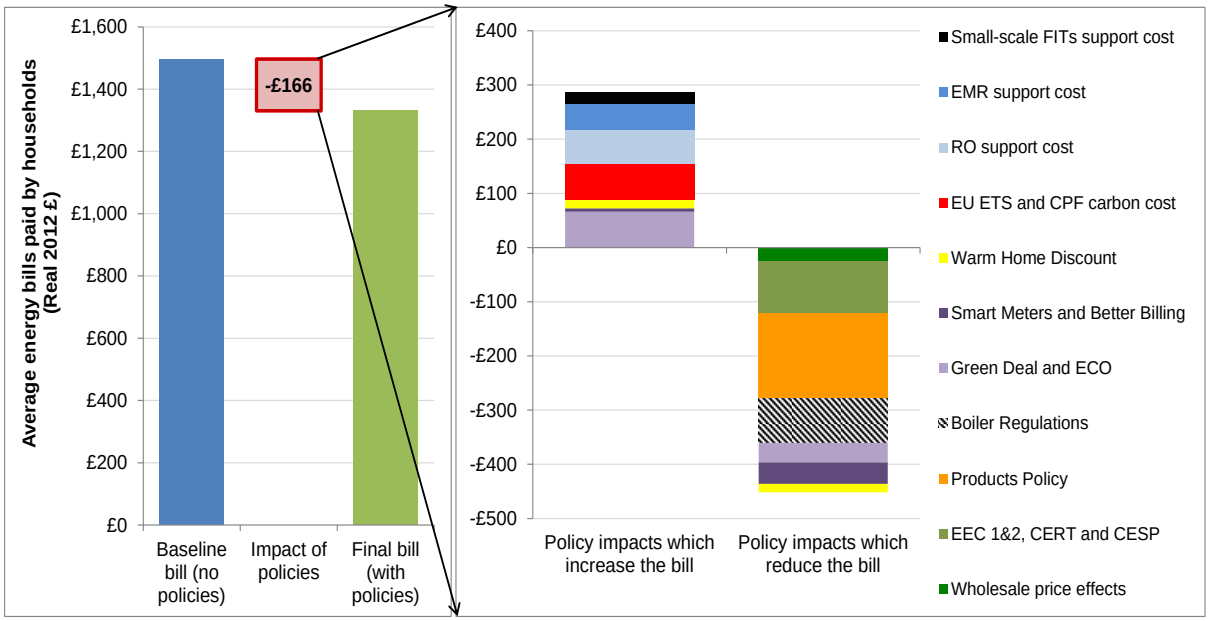
69. Accounting for these savings and averaging the total Warm Home Discount rebate received by eligible households over all households, energy and climate change policies are estimated to, on average, result in lower household energy bills (by 11% in 2020 and 3% in 2030) compared to what bills would have been in these years without policies.[36] The reduction in net savings between 2020 and 2030 reflects that there is assumed to be no policy to replace ECO after it is scheduled to end in 2022, and that, as previously stated, this analysis does not include any new policies that may be required in order to meet the 4th Carbon Budget.

70. Consequently, household energy bills are estimated to rise on average over time by less than energy prices – by around 6% (in real terms) between now and 2020, less than the estimated 13% increase that would happen in the absence of policies.

71. Chart 11 illustrates the counteracting effects of the policy price impacts, which increase household energy bills, and the efficiency savings and rebates which reduce household energy bills in 2020. Annexes E and F provide the total policy impact on gas and electricity prices and bills broken down by the individual policy contributions.

[36] These impacts already account for some level of comfort taking and evidence on the performance of measures on the ground. See Annex C for further details.

## Chart 11: Estimated average impact of energy and climate change policies on household energy bills in 2020 (including VAT)[37]




Source: DECC 2013. Figures in real 2012 prices.

### Box 2: The impact on households that do not take-up insulation measures and are not eligible for a Warm Home Discount rebate

The analysis so far focuses on the **average impact** of policies across all households – i.e. those who do and do not take up insulation measures and who are and aren't eligible for a Warm Home Discount.

While this is a useful indicator, it is also important to consider how these impacts vary across households depending on whether they take up certain measures – the impacts of policies on energy prices are likely to be borne by all consumers, but not all households are expected to take up major insulation measures or be eligible for a Warm Home Discount.

Certain policies, however, are likely to penetrate the majority of households or require little to no behavioural change to achieve bill savings:

- Every household in the UK will have a Smart Meter by the end of 2019 which could deliver savings through more efficient energy use and lower prices if energy suppliers pass on resulting supply cost savings to customers;
- All households stand to benefit from Products Policy through more efficient

[37] There have been some minor changes to the groupings of policies in this chart compared with the November 2011 report for simplicity and to aide understanding: The impact of EU ETS and CPF have been grouped together into a single carbon cost. The heat replacement effect of Products Policy has been netted off the respective policy savings rather than presented separately as this cost is only incurred in conjunction with the savings. The Green Deal loan repayment has been subtracted from the total savings from Green Deal and ECO as this is only borne by households taking out Green Deals.

TVs and set-top boxes (saving around £25 per household), more efficient consumer electronics (a further £25 per household) and more efficient lighting (a further £20 per household) among many other products and appliances; and

- By 2020, the majority of households in England and Wales are likely to have replaced their gas boiler since the minimum efficiency standards were introduced in 2002 through Building Regulations, saving each household from around £20 to £120 on their annual heating bill.

As a result, for those households that do not take up an insulation measure and also aren't eligible for a Warm Home Discount the impact of policies is estimated to be an average saving of around £15 (or 1%) in 2020 compared to what their energy bills would have been if energy and climate change policies had never been introduced.

This impact will also vary across the housing stock, depending on, for example, the number of energy using products in a house, the household's ability to raise the finances for a replacement boiler and the household's primary heating fuel. Some of these factors, among others, are considered in the following section.

## 4.4. Impacts of energy and climate change policies on energy bills in 2020 across the household distribution

72. Looking at the average impact of policies can mask significant distributional impacts across households, because policies can lead to transfers between households, as well as between different sections of the population. To examine this, a model has been developed by the Centre for Sustainable Energy (CSE), supported by DECC, which simulates how the impacts on energy bills are likely to vary across different households (see Annex A for model details).

73. This section looks at how impacts on households vary according to: levels of total household expenditure; household composition; and type of heating fuel. Further analysis by type of household tenure, as well as rurality is presented in Annex G.

74. Overall, the distributional analysis shows that the average impact of policies is a reduction on energy bills across all expenditure deciles and for each different household composition. Those receiving policy measures in lower expenditure groups are expected to see the largest reductions in their bills as a proportion of expenditure, although households that do not take up measures and are not eligible for a Warm Home Discount will benefit less as a result of policies.

75. Electrically heated households are expected to experience higher bills, on average, as a result of policies. In order to address this, there are a number of measures in place to support these households. See section 4.4.4 below.

### 4.4.1. Distributional modelling

76. There are key differences between the analysis in this section using this distributional model and the analysis in previous sections which will mean the results between the two will not exactly match (although the overall conclusions are consistent). These differences are:

    - The distributional model database is populated by actual survey data up to 2009[38]. As such, only policy measures received from 2010 onwards can be modelled (whereas the average bill impacts analysis also captures savings from measures delivered before 2010 through CERT and EEC 1 and 2). To estimate the number of households expected to benefit from at least one major policy measure from the start of supplier obligation-based energy efficiency policies (i.e. pre-2010) a separate analysis has been carried out (see Box 3).

    - Unlike the average bill impacts analysis, the distributional model can capture the effects of fuel switching, electricity bill savings from households generating their own electricity through small-scale FITs measures and income streams received for generating and exporting electricity through small-scale FITs and through generating heat through the Renewable Heat Incentive scheme (RHI).

77. Policies that drive energy efficiency will lead to transfers of benefits from those who do not take up measures but contribute to the costs of these policies through their energy bills to those who do take up measures.

78. Households that take up measures will therefore generally have lower energy bills as a result of a particular policy as the savings arising from the measure will typically be larger than the cost to the household of the policy (as the total policy cost is assumed to be spread over all households).[39]

79. As outlined above, the costs of energy policies are generally anticipated to be passed on to consumers by retail energy suppliers. This could either be on a per household basis (through, for example, increasing the standing charge in the energy bill) or a per unit basis through an increase in the unit price of energy. The precise method of cost pass through will vary between energy suppliers depending on their own tariff structure and approach to cost mark-up.

80. It is reasonable to assume some of the costs will be passed on by increasing the unit price of energy, meaning households with higher levels of energy consumption can be expected to face a larger absolute increase in their bill for the same increase in price. As people on higher incomes generally consume more energy – living in larger houses (which require more heating) and having more electrical appliances – they will typically experience a larger absolute

[38] Data comes from the 2004-2009 Living Costs and Food surveys (LCF), and the 2007/2008 English Housing Survey (EHS)

[39] In the case of ECO and the Warm Home Discount, the costs of the policies are assumed to only be spread across household users and not businesses. For policies such as small-scale FITs, EMR and RO, the policy costs are assumed to be spread across all users, including businesses.

increase in their bill relative to lower income families as a result of price increases.

81. However, when taken as a proportion of total expenditure (or income), the impact on lower income households of energy price increases becomes greater, as the energy bill makes up a larger share of total expenditure for low income households – in 2011, expenditure on energy represented, on average, 7% of total household expenditure for the 30% lowest income households compared to 4% for the 30% highest income households.[40] It is the affordability of energy and climate change policies that is important when assessing distributional impacts, so the results below are presented as a proportion of total household expenditure. For comparison with the analysis from the November 2011 report, charts also present results excluding the impact of building regulations.

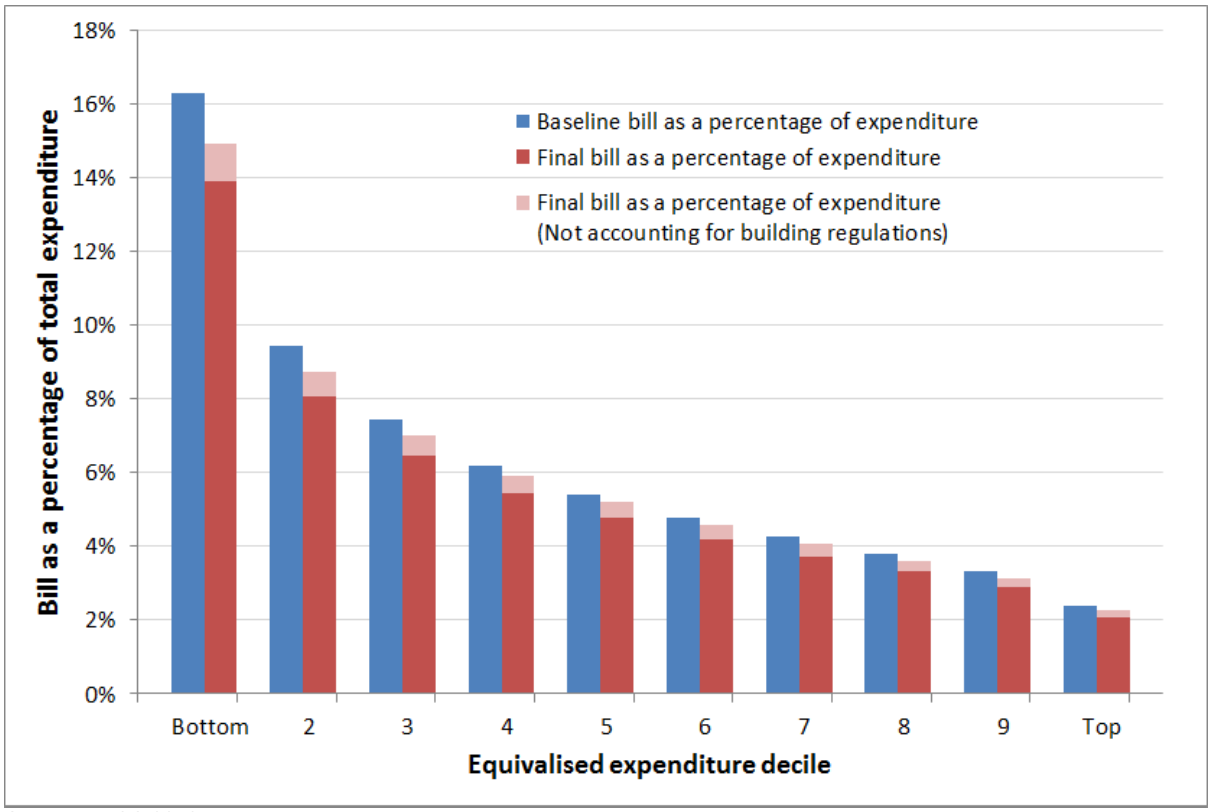
### 4.4.2. Impact by expenditure decile

82. Chart 12 shows the impact of policies on the average energy bills for each (equivalised) expenditure decile as a percentage of their total (un-equivalised) expenditure in 2020.[41] While the cost of energy represents the largest share of expenditure for the bottom three expenditure deciles (bottom 30%), these households are also expected to see the greatest proportional reduction in energy bills, on average, as a result of policies. For this group, energy bills in 2020 are estimated to be, on average, between 1.0% and 2.4% lower as a proportion of total expenditure as a result of policies – for example, excluding policies, energy represents, on average, 16.3% of expenditure in 2020 for the bottom decile, but this falls to an average of 13.9% after the impact of policies. This compares to the remaining deciles where there is, on average, between a 0.3% and 0.8% reduction in bills as a share of expenditure resulting from policies.

[40] ONS, Family Spending, 2012 Edition, Table A6. Available online at: http://www.ons.gov.uk/ons/rel/family-spending/family-spending/family-spending-2012-edition/index.html. This share is likely to have increased slightly as energy prices have increased over the same period.

[41] Equivalised expenditure is a measure of household expenditure that takes account of the differences in a household's size and composition, and thus is equivalised or made equivalent for all household sizes and compositions. DECC uses the OECD equivalisation scale for this analysis.

**Chart 12: Energy bill as a percentage of expenditure in 2020, with and without energy and climate change policies across expenditure deciles**




Source: DECC 2013.

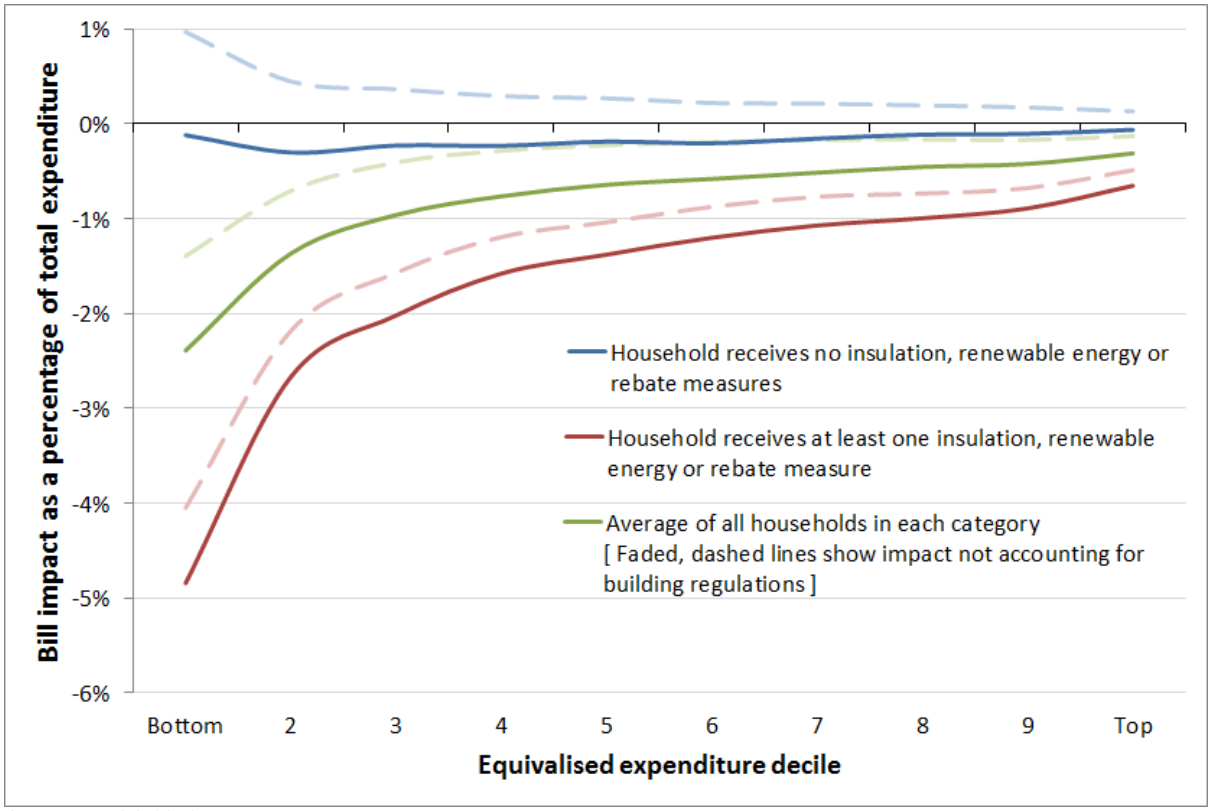
83. However, this does not tell the full story as the impact on households will depend upon whether they receive or take up policy measures. Chart 13 differentiates the average bill impact for each decile into those households that do and do not benefit from measures in 2020.

84. For the purposes of this analysis, a policy measure includes any insulation, heat and renewable energy measures taken out by households since 2010 as a result of the following policies: CERT, CERT Extension, CESP, Green Deal, ECO, RHI and small-scale FITs.[42] Additionally, households that receive a rebate on their energy bill as a result of the Warm Home Discount are also considered to have received a measure.

85. Smart Meters and the purchase of more energy efficient products as a result of Products Policy and more efficient boilers as a result of Building Regulations are assumed to impact on the final bill of all households. As all households are expected to stand to benefit from these policies, they are not used to differentiate between those who do or do not receive policy measures (more detail is given in Annex A).

[42] Any tariff payments from FITs are deducted from the electricity bill rather than added to income/expenditure.

**Chart 13: The effect of receiving a measure on the impact of policies on household energy bills as a percentage of expenditure in 2020 – across expenditure deciles**




Source: DECC 2013.

86. Around 3.4 million (or 45%) of households in the bottom three expenditure deciles are expected to be benefiting in 2020 from policy measures delivered since 2010. These households could see their energy bills fall by, on average, between 2.0% and 4.2% of total expenditure. This compares to an average savings of between 0.1% and 0.3% of total expenditure for households in the same deciles that do not receive any policy measures.

87. While a number of households are not expected to take up measures or receive an energy bill rebate to 2020, many of these will have benefited from policy measures delivered pre-2010 which are not captured in Chart 12 (see Box 3).[43]

[43] This is because pre-2010 measures will generally have lowered their energy consumption, meaning that in the absence of these policies their bills would otherwise have been higher.

### Box 3: An assessment of the numbers of households expected to receive policy measures and rebates since April 2002

The analysis in this section looks at the estimated impact of measures delivered since 2010. However, there has already been significant improvement in energy efficiency in the household sector since before this period.

Analysis by DECC[44] based on evidence published by Ofgem as well as Impact Assessments for the ECO suggests that, at the start of April 2012, around 9.7 million properties are estimated to have received at least one major insulation measure under EEC, CERT and CESP. By the end of 2022, around 14.5 million properties (around half of all UK households) are estimated to have received at least one type of major insulation measure through energy supplier obligations including EEC, CERT, CESP and ECO. Four million of these properties are estimated to have benefitted from both wall and loft insulation over this period.

Additional households are expected to take up insulation measures through Green Deals and other renewable measures eligible for payments through the small-scale FIT schemes and RHI while eligible low income and vulnerable households will be in receipt of Warm Home Discounts.

Moreover, with 30 million new energy efficient appliances being subsidised through EEC (not counting the millions of energy efficient light bulbs), it is likely that nearly every property in Great Britain has received something through the supplier obligations, however small.

Meanwhile, minimum boiler efficiency standards first introduced with the 2002 Building Regulations are likely to have benefited a large number of households – evidence suggests that around 1.5 million homes per year replace their boilers[45] which would imply a significant proportion of the population of England and Wales will likely have benefitted from the increased efficiency standards imposed on the manufacture of these products between 2002 and 2020.

88. Households in the remaining deciles benefiting from policy measures could also see their energy bills fall on average relative to a no policy scenario but by between 0.7% and 1.6% of their total expenditure. If households in these deciles do not receive a policy measure, they are still expected to experience energy bill savings from policies, on average.

89. The reason those in lower expenditure households that receive policy measures see larger bill reductions as a proportion of expenditure than those in higher expenditure deciles is a result of policies such as the Warm Home Discount[46]

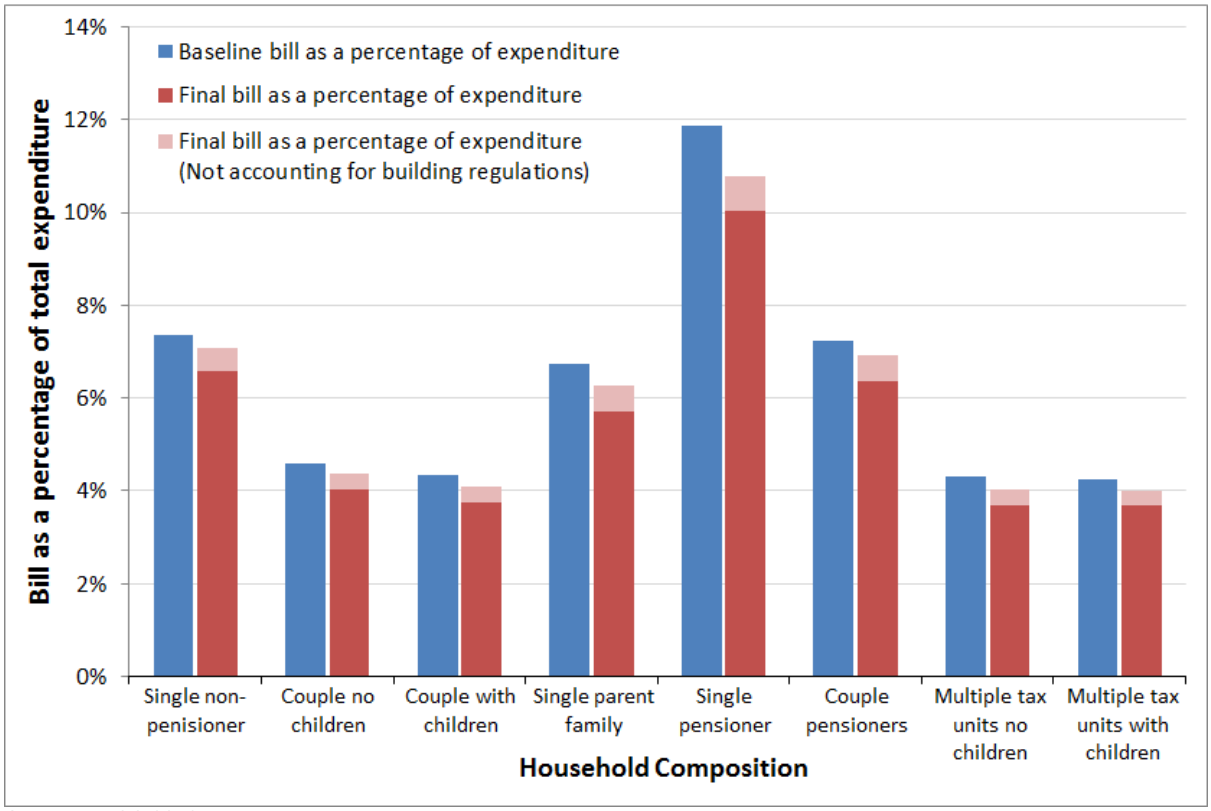
[44] *DECC Energy Trends, September 2012*. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/65907/6479-energy-trends-sep-2012.pdf. Note this analysis excludes any take up of Green Deals.
[45] Based on evidence from the Heating and Hot Water Industry Council. Available online at: http://www.centralheating.co.uk/news/category/market-reports.
[46] The Warm Home Discount offers rebates to some households funded through energy bills, see Annex B.

and elements of CERT and the ECO being targeted at low-income and vulnerable households (which typically fall in the bottom three expenditure deciles) – meaning they are more likely than other households to receive a measure or rebate, as well as more likely to receive more than one measure/rebate. In addition, for any given level of bill saving, the savings as a proportion of expenditure will be higher for lower deciles, given their correspondingly lower levels of expenditure.

### 4.4.3. Impacts by household type/composition

90. Chart 14 shows the average impact of policies on the energy bills of different household types/compositions as a percentage of their total expenditure in 2020. It shows that there is an average net saving for all household types as a result of energy and climate change policies. The largest average savings as a proportion of expenditure go to single pensioner households, who could expect a bill saving equivalent to around 1.9% of their expenditure.

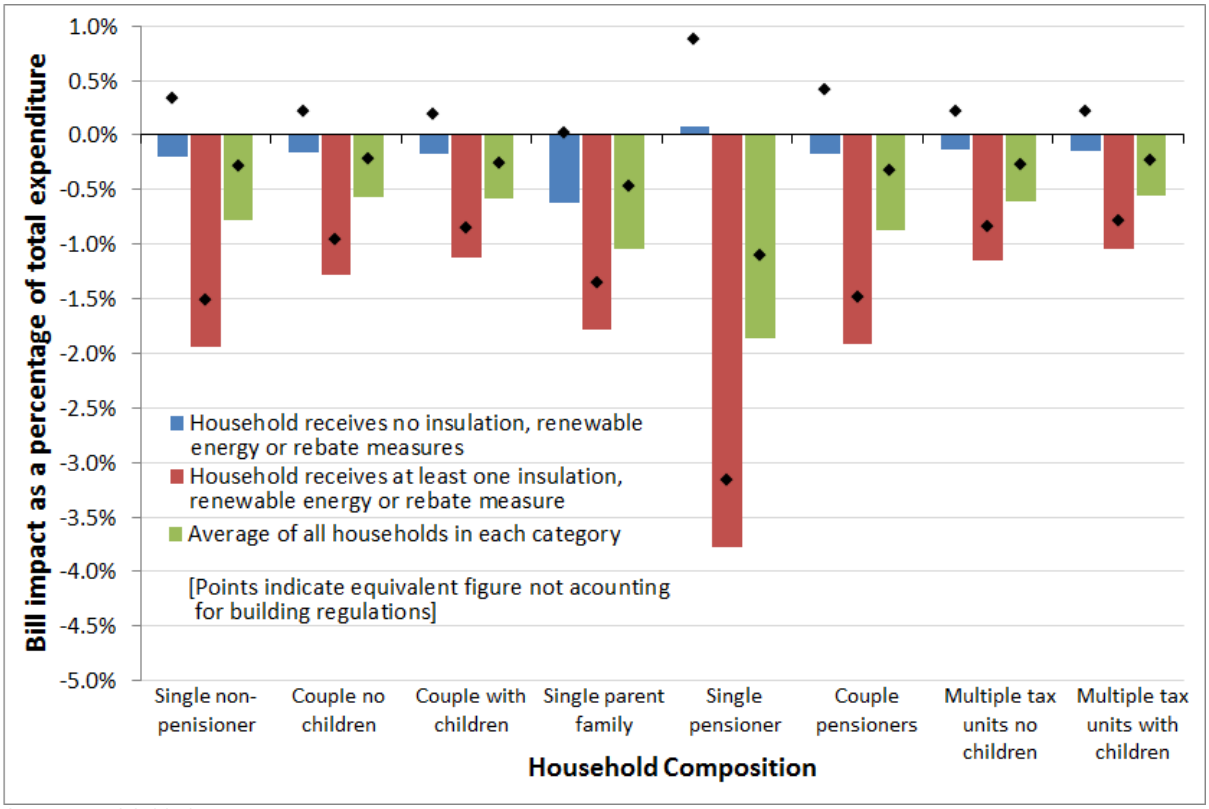
**Chart 14: Energy bill as a percentage of expenditure in 2020, with and without energy and climate change policies across household types**




Source: DECC 2013.

91. Chart 15 breaks these averages down further, looking at the impact on bills of households receiving policy measures compared with those who do not. As explained above, for the purpose of this analysis a policy measure includes insulation and renewable energy measures or receipt of a Warm Home Discount rebate on energy bills.

**Chart 15: The effect of receiving a measure on the impact of policies on household energy bills as a percentage of expenditure in 2020 – across household types**




Source: DECC 2013.

92. It is noticeable that, for households taking up policy measures, the largest average bill saving as a percentage of expenditure (of around 3.8% or £282), falls to single pensioner households – almost half of whom are estimated to have received at least one measure or rebate by 2020. This is likely a reflection of the fact that policies such as the Warm Home Discount and elements of CERT and the ECO are targeted at vulnerable households, including single pensioners.

### 4.4.4. Impacts by type of heating fuel

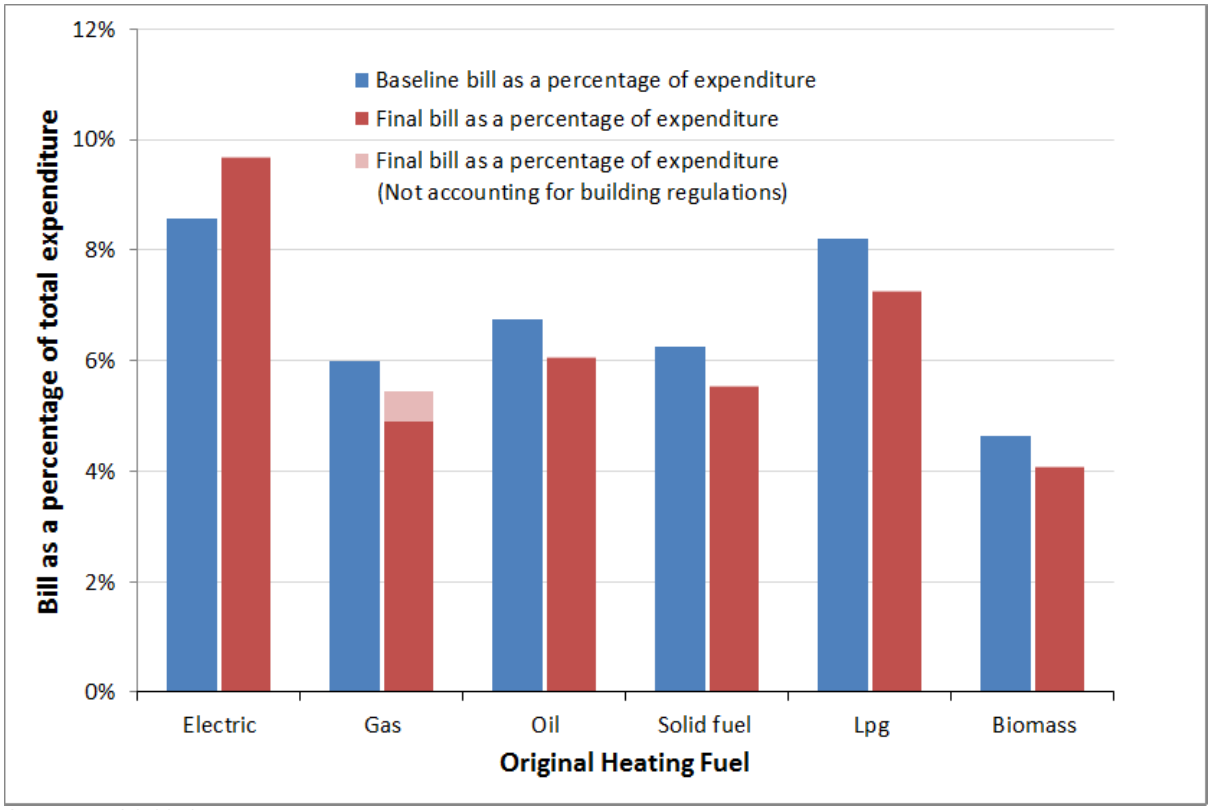
93. Chart 16 shows how impacts differ according to the main heating fuel used by households. Those households who use electrical heating – around 9% of the population at present[47] – are expected to, on average, see an increase in their energy bills of around 1.1% of total expenditure in 2020. This compares with estimated decreases of between 0.6% and 1.1% of expenditure for households using other fuel types. The main driver behind the increase in bills for electrically heated homes is that price impacts of policies are greater per unit of electricity than per unit of gas, while some of the policies to reduce electricity consumption, such as Products Policy, will generally only lower non-heat related electricity demand.

[47] Source: 2010 English Housing Survey

94. The Warm Home Discount is available to low income households both on and off the gas grid and many electrically heated households could potentially benefit from energy efficiency measures through the Green Deal. In addition, there are other measures in place to help electrically heated households, such as Ofgem's current work to encourage the extension of the gas distribution networks to fuel poor households and homes within the CERT priority group – in total, up to 20,000 households could be connected under this scheme over the current price control period (2008-2013) – and the Renewable Heat Premium Payment, a one-off grant scheme which helps householders with up-front costs of installing renewable heating equipment.[48]

95. Many low income households that are off the gas grid are likely to have high energy costs and are, therefore, more likely to be in fuel poverty. The Government launched a consultation in late 2012 setting out proposals for adopting an alternative fuel poverty definition – the Low Income High Costs approach – which was in response to the recommendations of the independent Hills Review. Later this year, the Government will publish a new fuel poverty strategy based on our new understanding of the problem. The new strategy will set out the principles for addressing the fuel poverty problem and shaping future policy design.

**Chart 16: Energy bill as a percentage of expenditure in 2020, with and without energy and climate change policies, by heating fuel**




Source: DECC 2013.

[48] The scheme provides support for solar thermal, biomass, air-to-water source heat pumps and ground source heat pumps. Whilst all households can receive support for solar thermal installations, the grants for the other three technologies are available to off gas-grid householders only.

# 5. Business energy prices and bills

96. Business energy costs depend on a wide range of factors, including size, fuel mix, whether they generate electricity on-site, and whether they are covered by the CRC energy efficiency scheme or Climate Change Agreements.

97. The costs of energy and climate change policies generally represent a larger proportion of total energy costs compared with the household sector because other components of energy prices, such as network costs and supplier costs and margins, are typically lower per unit of energy for businesses due to economies of scale.

98. The most effective way to reduce energy bills for business is to improve energy efficiency. The Green Deal enables businesses as well as households to reduce their energy bills through improving heating efficiency of their buildings. The Government has consulted on ways in which businesses can be incentivised to reduce their demand for electricity, including the possibility of measures to be included in the Energy Bill currently going through Parliament. The Government will shortly be publishing its proposals on how it intends to promote electricity demand reduction amongst businesses.

99. For most businesses energy costs are a small proportion of total business costs – less than 3% on average for the UK manufacturing sector. By contrast, employment costs represented around 18% of the total. This implies that energy and climate change policies are currently adding less than 1% to total business costs in this sector.

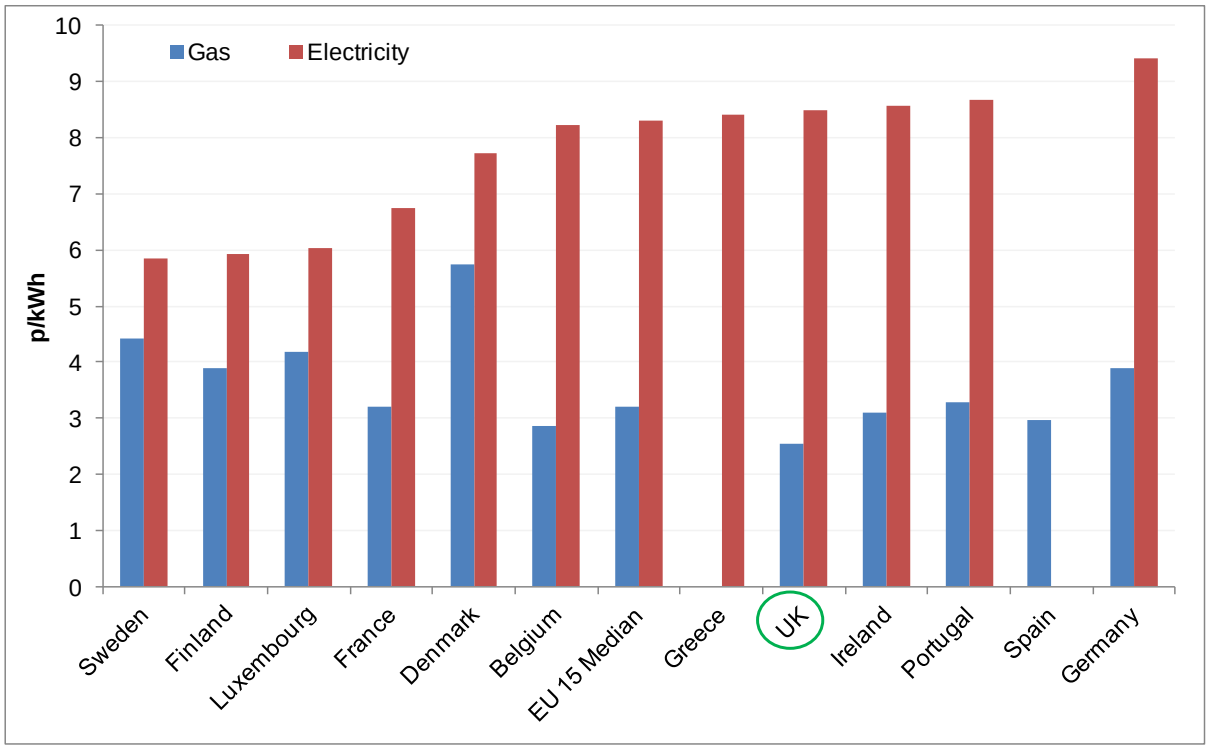
100. In order to simplify presentation of the effect of policies, following a more detailed look at the international comparisons, the impacts of energy and climate change policies are split by businesses that are medium-sized users of energy, or large energy-intensive users. Ranges are presented and discussed in the relevant sections.

## 5.1. International comparisons

101. Charts 17, 18 and 19 show how UK average industrial energy prices compare with other EU 15 and G7 countries. As with household prices, the UK ranks well internationally for industrial gas prices with the lowest gas price in the EU 15 for all consumption bands since mid-2009.

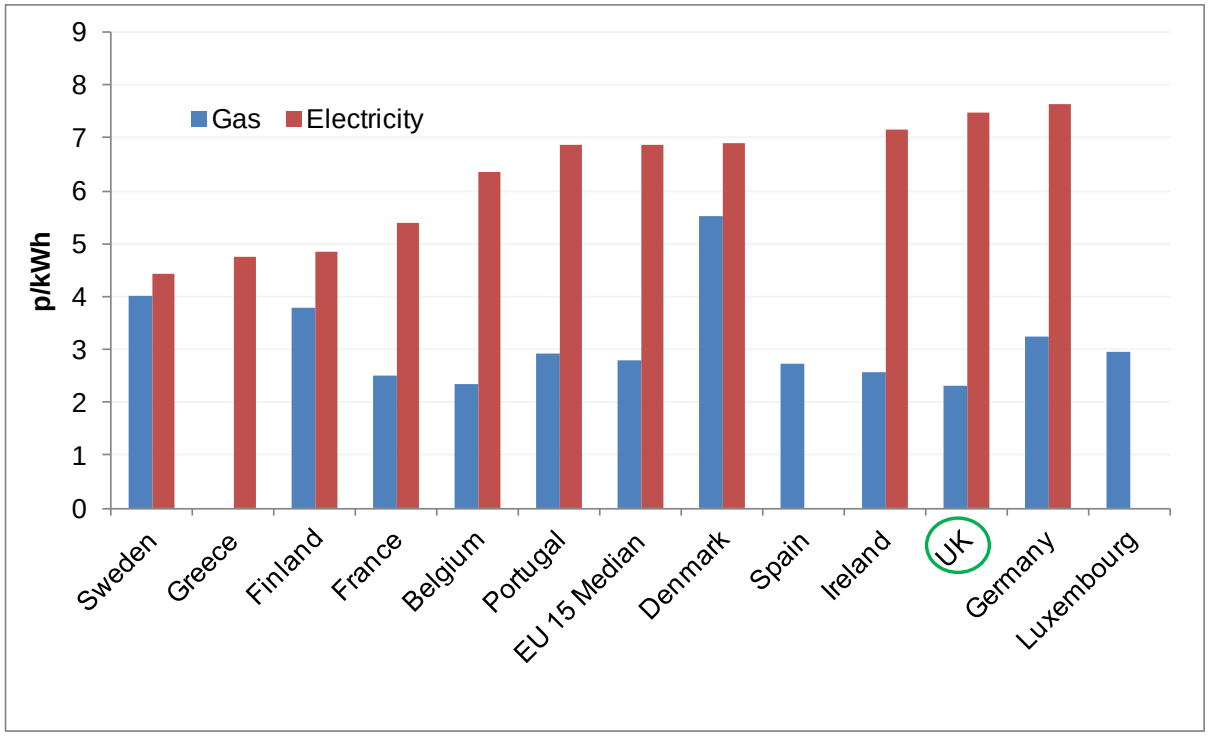
102. The UK ranks less well internationally for industrial electricity prices with prices similar to the EU 15 median for small and medium industrial consumers, but higher than the EU 15 median for large and extra-large industrial customers. Countries in the Nordic area and France outperform the UK due to lower wholesale electricity costs. In addition, very large users in countries like Germany, Denmark and Italy currently receive significant reimbursements on energy taxes and low carbon energy support.

## Chart 17: Average gas and electricity prices for medium-sized industrial consumers in the EU 15, January-June 2012




Source: Eurostat data published in DECC's *Quarterly Energy Prices.* Gas and electricity data for Austria and gas data for Greece was unavailable. Gas and electricity data for Netherlands and gas data for Italy was unavailable, although DECC estimates that these prices are likely to be below the relevant median. Electricity data for Spain and Italy was unavailable although DECC estimates that these prices are likely to be above the relevant median. Data sorted by electricity prices.

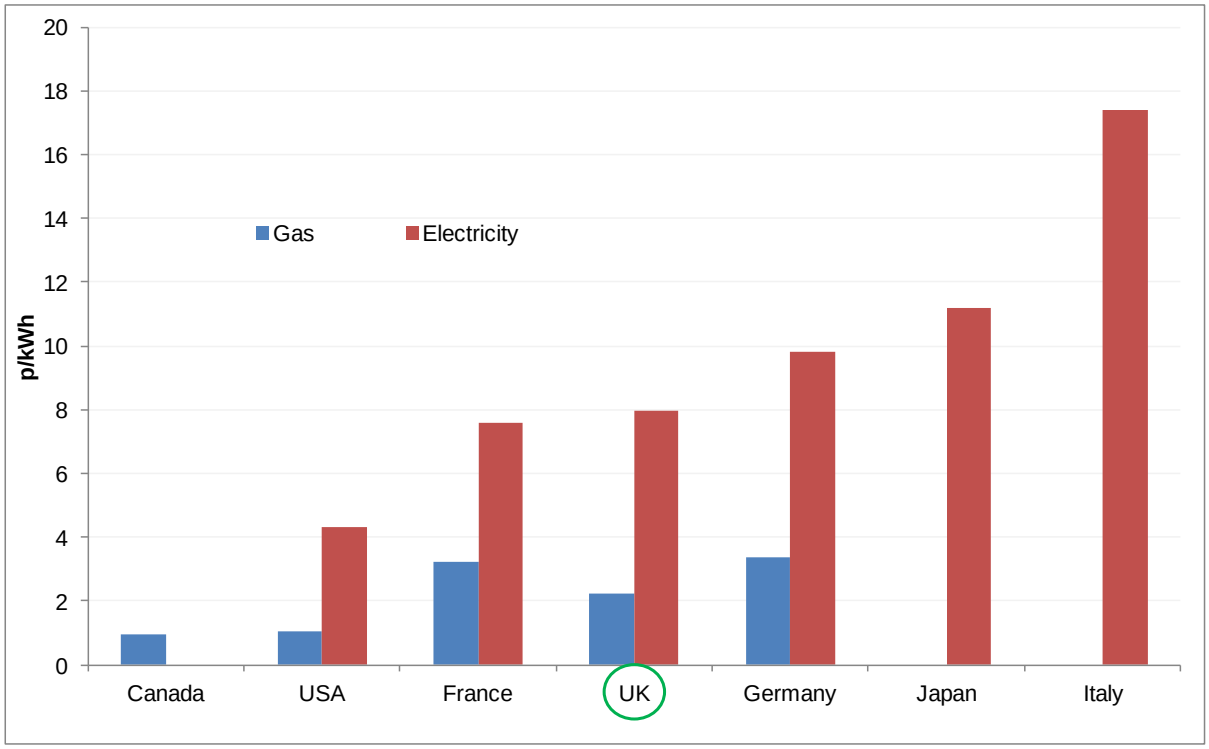
## Chart 18: Average gas and electricity prices for large industrial gas consumers and extra-large industrial electricity consumers in the EU 15, January-June 2012[49]




Source: Eurostat data published in DECC's *Quarterly Energy Price.* Gas data for Greece, electricity data for Luxembourg and both gas and electricity data for Austria was unavailable. Gas and electricity data for Netherlands was unavailable but DECC estimates that these prices are likely to be below the relevant median. Electricity data for Spain and Italy was unavailable but DECC estimate that these prices are likely to be above the relevant median. Gas data for Italy was unavailable but DECC estimates that these prices are likely to be similar to the median. Data sorted by electricity prices.

[49] The Eurostat size band for large industrial gas users is annual consumption of between 27,778MWh and 277,777MWh and for extra-large electricity users is annual consumption of between 70,000MWh and 150,000MWh. Many energy intensive users in the UK are above this threshold (particularly for electricity). Data for users that consume more than 150,000MWh a year of electricity is available on the Eurostat website (http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database) but only for a limited number of countries. It is therefore unclear whether the same comparison which applies to users below the 150,000MWh threshold will apply to larger users.

**Chart 19: Average industrial gas and electricity prices in the G7, 2011**




Source: IEA data published in DECC's *Quarterly Energy Prices, September 2012.* Gas data for Canada was unavailable but DECC estimates the price to be lower than the relevant median. Electricity data for Japan and Italy was unavailable but DECC estimates these prices to be above the relevant median. Data ranked by electricity prices.

103. This data allows us to estimate the current competitive position of UK energy prices but does not tell us about the future competitiveness of UK firms, which is dependent on a number of other factors as well as the future relative costs of energy. Going forward energy prices are expected to increase in most countries due to rising international prices for fossil fuels. France and Germany are also likely to face significant additional costs as a result of electricity market reorganisation and nuclear phase out respectively.

104. All EU countries are subject to Europe-wide targets for renewable energy and carbon emissions. While there has been further research in this area suggesting that policy costs on electricity prices for large industrial users are likely to remain higher in EU countries (and particularly in the UK) than in other competitor economies, [50] there is significant uncertainty as to what this will mean for prices in individual countries.

## 5.2. Impacts of energy and climate change policies on energy bills to 2030 for businesses that are medium-sized energy users

105. Different policies apply to business sectors of the economy compared with the household sector. The analysis below has been carried out for businesses that are medium-sized users of gas and electricity based on the midpoints of Eurostat

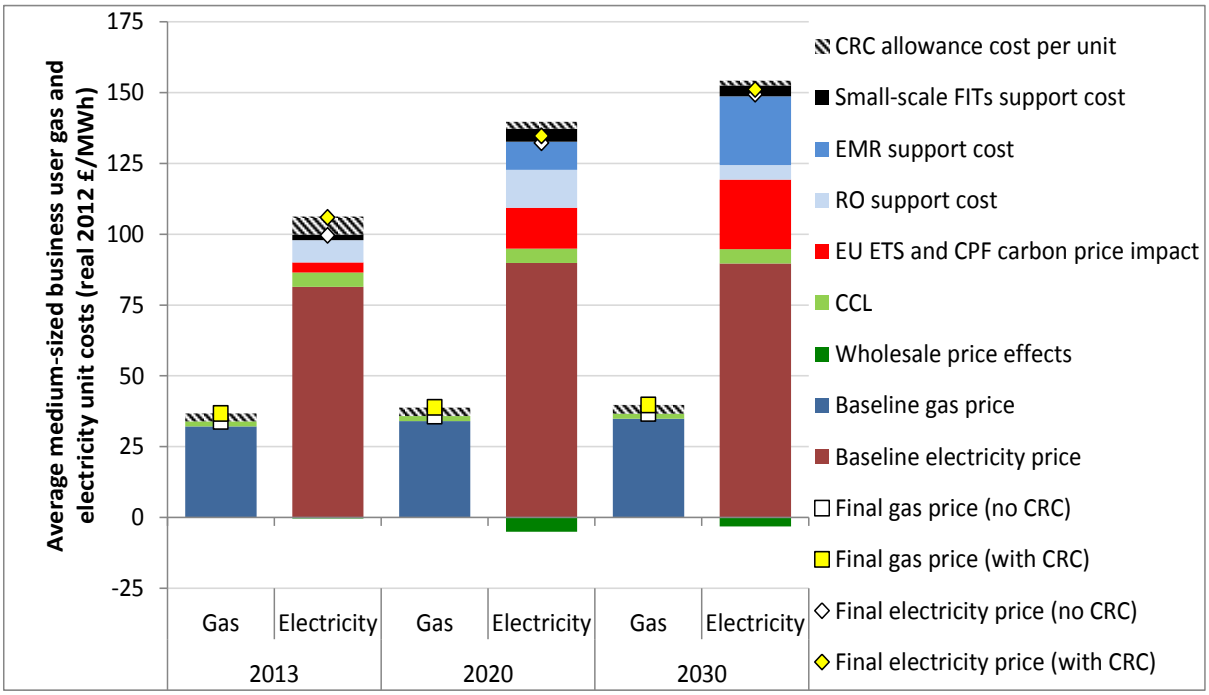
[50] For example, an analysis by ICF International available online at: https://www.gov.uk/government/publications/international-comparison-of-energy-and-climate-change-policies-impacting-energy-intensive-industries-in-selected-countries.

size-bands for medium-sized gas and electricity consumers in industry. [51] Impacts are presented for two types of user – those who are not participants of the CRC Energy Efficiency Scheme and those who are (neither user is assumed to be part of a CCA). This is because a significant proportion of the non-domestic sector falls outside of the CRC (and CCAs) and the policy costs and energy efficiency incentives affecting them can differ.

106. Businesses that are CRC participants are expected to make energy efficiency improvements through a range of reputational, behavioural and financial drivers which will have the effect of lowering their energy bills. These users will also incur costs of purchasing CRC allowances. These costs are not direct costs on their energy bill and not directly reflected in the energy prices they pay, but they have been accounted for in this analysis for illustrative purposes as they will incur these costs for each unit of gas or electricity they consume.

107. Chart 20 and Tables 4a and 4b illustrate the estimated average increase in business sector gas and electricity unit costs for medium-sized users due to energy and climate change policies in 2013, 2020 and 2030. As with household energy prices, the increases in unit costs excluding policies are driven by expected increases in wholesale energy prices (based on DECC's central fossil fuel price assumptions) and increases in transmission and distribution costs (see Annex A for further details).

**Chart 20: Estimated impact of energy and climate change policies on average gas and electricity prices (with and without cost per unit of CRC) for UK medium-sized business users**




Source: DECC 2013.

[51] Medium-sized business users are defined by annual consumption between 2,778 and 27,777MWh of gas and between 2,000 and 19,999MWh of electricity. The midpoints of these ranges have been used for this analysis.

## Table 4a: Estimated average impact of energy and climate change policies on gas and electricity unit costs and total costs for medium-sized business users – non-CRC participant[52]

| | 2013 | 2020 | 2030 |
|---|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | | |
| Average **gas cost** without policies | 32 | 34 | 35 |
| Average **gas cost** with policies | 34 | 36 | 37 |
| Impact of policies on average **gas cost** | 2 (5%) | 2 (5%) | 2 (5%) |
| Average **electricity cost** without policies | 81 | 90 | 90 |
| Average **electricity cost** with policies | 100 | 132 | 149 |
| Impact of policies on average **electricity cost** | 18 (22%) | 42 (46%) | 60 (66%) |
| **Total cost/Bill impacts (real 2012 £s and % change)** | | | |
| Average **gas bill** without policies | £490,000 | £520,000 | £530,000 |
| Average **gas bill** with policies | £520,000 | £540,000 | £560,000 |
| Impact of policies on average **gas bill** | £30,000 (6%) | £20,000 (4%) | £30,000 (5%) |
| Average **electricity bill** without policies | £900,000 | £1.00m | £990,000 |
| Average **electricity bill** with policies | £1.07m | £1.36m | £1.57m |
| Impact of policies on average **electricity bill** | £180,000 (20%) | £370,000 (37%) | £580,000 (59%) |
| Average **energy bill** without policies | £1.39m | £1.51m | £1.52m |
| Average **energy bill** with policies | £1.59m | £1.90m | £2.13m |
| Impact of policies on average **energy (gas plus electricity) bill** | £200,000 (15%) | £390,000 (26%) | £600,000 (40%) |

Source: DECC 2013. Numbers may not add up due to rounding. Figures rounded to the nearest £10,000.
The average medium-sized business user is assumed to be consuming 15,278MWh of gas and 11,000MWh of electricity in each year to 2030 *before* efficiency savings (based on midpoints of Eurostat size bands).
For details of each policy's contribution to the total price and bill impacts, see Annexes E and F.

[52] It should be noted that these figures do not include the bills savings resulting from the Smart Meters rollout in the non-domestic sector (defined as those within electricity profile classes 3 and 4 and those with gas consumption below 732 MWh per annum) as these users are smaller than a medium-sized business user. These figures also do not include impacts on bills from advanced metering in larger electrical sites (defined as those within profile classes 5-8) and larger gas sites (defined as those with consumption above 732MWh per annum), whose energy suppliers are required to provide such metering by April 2014. Figures also exclude the very largest electricity sites (where maximum demand exceeds 100 KW) and gas sites (consumption exceeding 58,600MWh per annum), where half hourly metering has been mandatory since 1998.

**Table 4b: Estimated average impact of energy and climate change policies on gas and electricity unit costs and total costs for medium-sized business users – CRC participant[53]**

| | 2013 | 2020 | 2030 |
|---|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | | |
| Average **gas cost** without policies | 32 | 34 | 35 |
| Average **gas cost** with policies | 37 | 39 | 40 |
| Impact of policies on average **gas cost** | 5 (14%) | 5 (14%) | 5 (14%) |
| Average **electricity cost** without policies | 81 | 90 | 90 |
| Average **electricity cost** with policies | 106 | 135 | 151 |
| Impact of policies on average **electricity cost** | 25 (30%) | 44 (49%) | 61 (68%) |
| **Total cost/Bill impacts (real 2012 £s and % change)** | | | |
| Average **gas bill** without policies | £490,000 | £520,000 | £530,000 |
| Average **gas bill** with policies | £550,000 | £480,000 | £530,000 |
| Impact of policies on average **gas bill** | £50,000 (11%) | -£40,000 (-8%) | -£1,000 (0%) |
| Average **electricity bill** without policies | £900,000 | £1.00m | £990,000 |
| Average **electricity bill** with policies | £1.14m | £1.37m | £1.58m |
| Impact of policies on average **electricity bill** | £240,000 (27%) | £380,000 (38%) | £590,000 (60%) |
| Average **energy bill** without policies | £1.39m | £1.51m | £1.52m |
| Average **energy bill** with policies | £1.68m | £1.85m | £2.11m |
| Impact of policies on average **energy (gas plus electricity) bill** | £300,000 (21%) | £330,000 (22%) | £590,000 (39%) |

Source: DECC 2013. Numbers may not add up due to rounding. Figures rounded to the nearest £10,000. See also footnotes for Table 4a.

108. Energy and climate change policies are currently estimated to be adding around 5 and 14% to the average unit cost of gas for non-CRC and CRC participants respectively in the UK in 2013. This reflects the impact of the CCL and, for CRC users, the cost of purchasing a CRC allowance to cover the emissions from each unit of gas they consume. The impact of policies on unit gas costs for both users is estimated to remain broadly constant to 2030.

109. Policies are estimated to be adding around 22 and 30% to the average unit cost of electricity faced by non-CRC and CRC participants respectively in the UK in 2013. As with the unit cost of gas for these users, this impact reflects the CCL and CRC allowance cost per unit of electricity consumed (for CRC users). It also

[53] See footnote 52.

reflects the cost of the RO and small-scale FITs on retail prices and the cost of the EU ETS and CPF on wholesale electricity costs.

110. Looking forward, the impact of policies on unit electricity costs for business users is expected to rise to around 46 and 49% for non-CRC and CRC users respectively by 2020 with the rising CPF trajectory and the increased deployment of renewables and other low-carbon generation funded by the RO, small-scale FITs and EMR. This increase is partly mitigated by the dampening effect on wholesale electricity prices as a result of increasing low marginal cost generating capacity entering the system as a result of policies like the CPF, RO and EMR.

111. Towards 2030, the impact of policies on business unit electricity costs is expected to rise to around 66 and 68% for non-CRC and CRC users respectively reflecting the rising cost of carbon to electricity generators (which are assumed to be passed onto retail prices through wholesale electricity costs) and assuming the introduction of the Capacity Market as part of EMR post-2020.

112. The impact of policies on unit energy costs to business users is higher than estimated in November 2011. As with the estimates for the domestic sector, this reflects, among other technical updates, an increase in the total cost of small-scale FITs following a surge in uptake of small-scale renewable electricity measures over the past year, an increase in the total cost of the RO reflecting an expected higher level of renewable generation annually as a result of new bandings to be introduced in 2013/14[54] and increased EMR support costs post 2020 assuming the introduction of the Capacity Market.

113. In addition, there has been a downward revision in baseline (before policy) costs. Baseline energy prices now better reflect evidence around per unit energy network costs among larger (business) energy users. As a result, final (with policy) gas and electricity prices for these users are estimated to be around 6% and 12% lower respectively in 2020 than was estimated in the previous report.

114. As with households, the impact of policies on the average energy bill paid by medium-sized business users is expected to be lower than the impact on energy prices. Efficiency savings achieved through actions to cut emissions covered by the CRC energy efficiency scheme and existing EU minimum efficiency standards for products (Products Policy) mean the average business user is currently expected to be consuming less energy than it would have done without these policies. As such, policies are currently estimated to be adding around 15% and 21% to the average energy bill of a medium-sized non-CRC and CRC participant respectively compared to what the bill would have been in the absence of policies.

115. Going forward, there are expected to be further increases in efficiency savings made by the business sector as less efficient energy using products are increasingly removed from the market and replaced by new products which must meet the more stringent efficiency standards. Businesses are also expected to

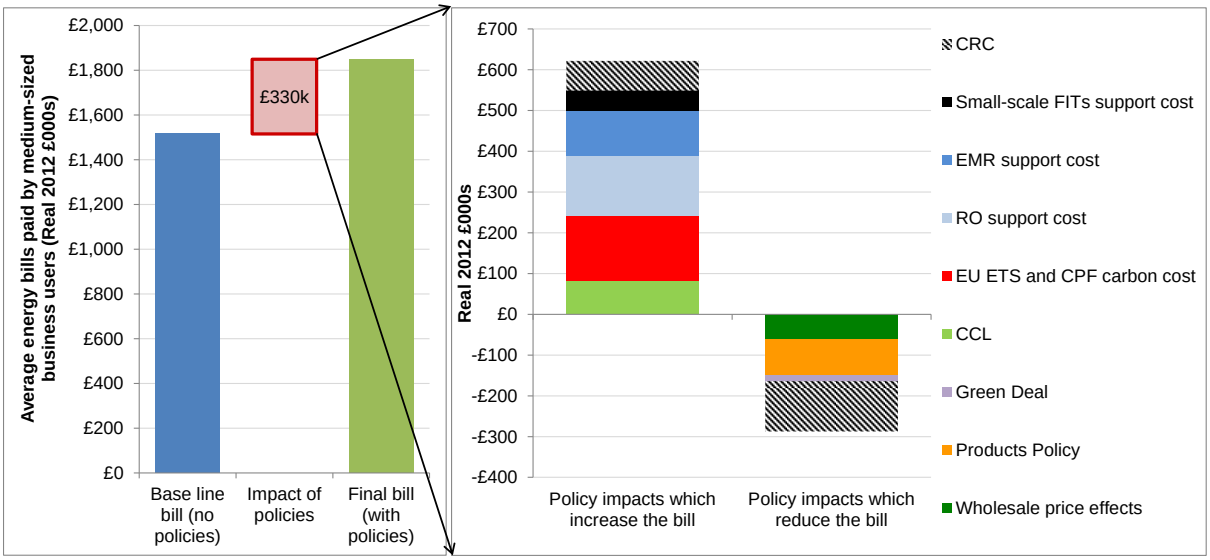
[54] Although the total cost of the RO per unit of electricity generated through large-scale renewables is estimated to be lower than under the current bandings.

take up measures as part of the Green Deal. Accounting for these savings, energy and climate change policies are estimated to add around 26 and 22% to the average energy (and CRC carbon permit) bill of a medium-sized non-CRC and CRC participant respectively in 2020, rising to around 40 and 39% respectively in 2030 (compared to what the bill would have been in these years in the absence of policies).

116. For both non-CRC and CRC users a significant portion of the impact of policies on electricity prices is made up of taxes on carbon (EU ETS and CPF). Taxes on carbon represent over 30% of the impact of policies on electricity prices in 2020, and around 40% in 2030. This translates to over 40% of the total energy bill impact of policies in these years, for non-CRC and CRC users, being made up of taxes on carbon.

117. Chart 21 shows the counteracting effects of the policy price impacts (for a CRC user) which increase energy bills, and the efficiency savings which reduce the energy bills, for medium-sized business users in 2020. Annexes E and F provide the total policy impact on gas and electricity prices and bills broken down by individual policy contributions.

**Chart 21: Estimated average impact of energy and climate change policies on a medium-sized business user's energy bill in 2020 – CRC participant[55]**




Source: DECC 2013. Figures in real 2012 prices.

118. For most businesses, direct energy costs are a relatively small proportion of total costs. For example, the cost of energy and water represented less than 3% of the total costs for the UK manufacturing sector as a whole. This implies that, if the average energy bill in the sector were 21% higher in 2013 as a result of energy and climate change policies, then the direct impact of energy and climate change policies on total costs in that sector is less than 1%.

[55] As with the equivalent domestic sector chart, there have been some minor changes to the groupings of policies in this chart compared with the November 2011 report for simplicity and to aid understanding: The impact of EU ETS and CPF have been grouped together into a single carbon cost. The heat replacement effect of products policy has been netted off its respective policy savings rather than presented separately as this cost is only incurred in conjunction with the savings and the Green Deal loan repayment has been subtracted from the total savings from Green Deal and ECO as this is only borne by businesses taking out Green Deals.

## 5.3. Impacts of energy and climate change policies on large energy-intensive users' energy bills to 2030 (excluding impact of measures Government is considering to reduce impact of EU ETS, CPF and CfDs)

119. For a small but important section of business, known as energy-intensive industries, [56] energy costs constitute a significant proportion of their total costs. In 2010, these industries directly accounted for around 4% of total gross value added in the UK and around 2% of the workforce[57] – they also create indirect value and employment down the product supply chain.

120. The Government has a range of measures both announced and under consideration which will help to reduce the impact of government policy on costs for these users. The analysis does not reflect the impacts of measures the Government is considering to reduce the impacts on large energy intensive users of the EU ETS, CPF and CfDs on electricity costs.

121. An analysis of electricity and gas bills does not in itself tell us whether energy intensive industries are financially better or worse off as a result of energy and climate change policies or how their international competitiveness will be affected. A number of other important factors need to be taken into account. These wider factors are detailed in Annex C, which also indicates if and how any of these factors fall within the scope of this analysis.

122. The methodology and policies assessed in the analysis of large energy intensive industries differ to those for the analysis of medium-sized business users presented in the previous section for the following key reasons:

- The **policy assumptions** in the modelling for energy intensive users are different – large energy intensive users receive a discount on the CCL for participating in CCAs[58] through which they agree to undertake efficiency improvements. They are outside the CRC Energy Efficiency Scheme. The analysis assumes all electricity and gas used by the illustrative user faces a discounted rate of CCL;

- There is not assumed to be any **Green Deal take up** for very large industrial users as it is unlikely to be available for large process installations;

- **Baseline prices** (i.e. excluding policies) are lower for large energy intensive users in line with historic trends as a result of economies of scale in supplying such users, lower per unit network costs and potentially stronger bargaining power which could result in lower supplier margins.

[56] Energy intensive industries include a number of extraction, manufacturing, processing and finishing industries across a range of sectors, for example, iron & steel, aluminium, refineries, chemicals, plastics, food and drink, glass, paper, cement and lime, ceramics and textiles.
[57] BIS estimates based on the criterion that energy costs are at least 10% of GVA.
[58] The analysis does not account for any electricity consumption which is completely exempt from the CCL. For such users, the estimated impacts of energy and climate change policies should be considered an overestimate.

123. These impacts account for the increased rate of relief from the CCL on electricity of 90% from April 2013 benefitting participants of the 51 sectors which have made commitments under the CCA scheme. However, the analysis does not include the impact of other measures the Government is currently considering to reduce the transitional impact of policies on the costs of electricity for eligible electricity-intensive industries, beginning in 2013.

124. The package of measures is worth around £250 million over the Spending Review period with further support continuing into 2015/16 and aims to offset the indirect costs of the EU ETS and the CPF from April 2013, subject to EU State Aid rules. In November 2012, the Government also announced that it was exploring options for reducing the impact of electricity costs on electricity-intensive industries as a result of Contracts for Difference (CfDs) where these have a significant impact on their competitiveness, subject to value-for-money and State Aid approval.

125. The EU ETS, CPF and CfDs make up the majority of future policy costs for energy intensive users, adding up to 23% to their total energy costs by 2020. Any potential reduction in the costs due to these measures is not reflected in the analysis because the exact details of any support have still to be decided. However, as an illustration, on the basis of a firm receiving compensation for 75% of these costs it is estimated that this would lower the impact of policies on their total energy costs in 2020 by more than half, reducing them from 30% to 13%.[59]

126. In addition, the Government has also announced it will introduce exemptions from the Climate Change Levy for energy used in metallurgical and mineralogical processes from 1 April 2014.

127. The impact of policies on energy intensive users' energy bills is complex to analyse. This is because of the diversity of energy usage (including a large use of non-metered fuels) and energy prices faced by users and the different levels of cost effective energy efficiency opportunities both within and across different industrial sectors. Due to the range of different production processes within the sector, each requiring a different fuel mix, it has not been possible to arrive at a single representative energy intensive user. Instead, analysis has been carried out based on three different illustrative users: an "electro-intensive user", a "balanced user" and a "gas intensive user" defined by the relative share of electricity and gas consumption.[60]

128. Table 5 and Charts 22 and 23 present the results of this analysis. The lower end of the ranges shown in the table reflects the fact that a significant share of electricity consumed by large energy intensive industries may be generated on-site and will therefore not be affected by a number of the policy costs, in particular those which are obligations on retail energy suppliers (such as the RO,

[59] This is based on a "balanced" user consuming an equal amount of gas and electricity before policies.
[60] The three illustrative users are: "gas intensive user" 20% electricity, 80% gas, "balanced user" 50% electricity, 50% gas and "electro-intensive user" 80% electricity, 20% gas informed by actual consumption data for companies in 2008 collected by AEA.

small-scale FITs and EMR) – the analysis assumes these users will still pay the cost of EU ETS and the CPF on any electricity generated on site.

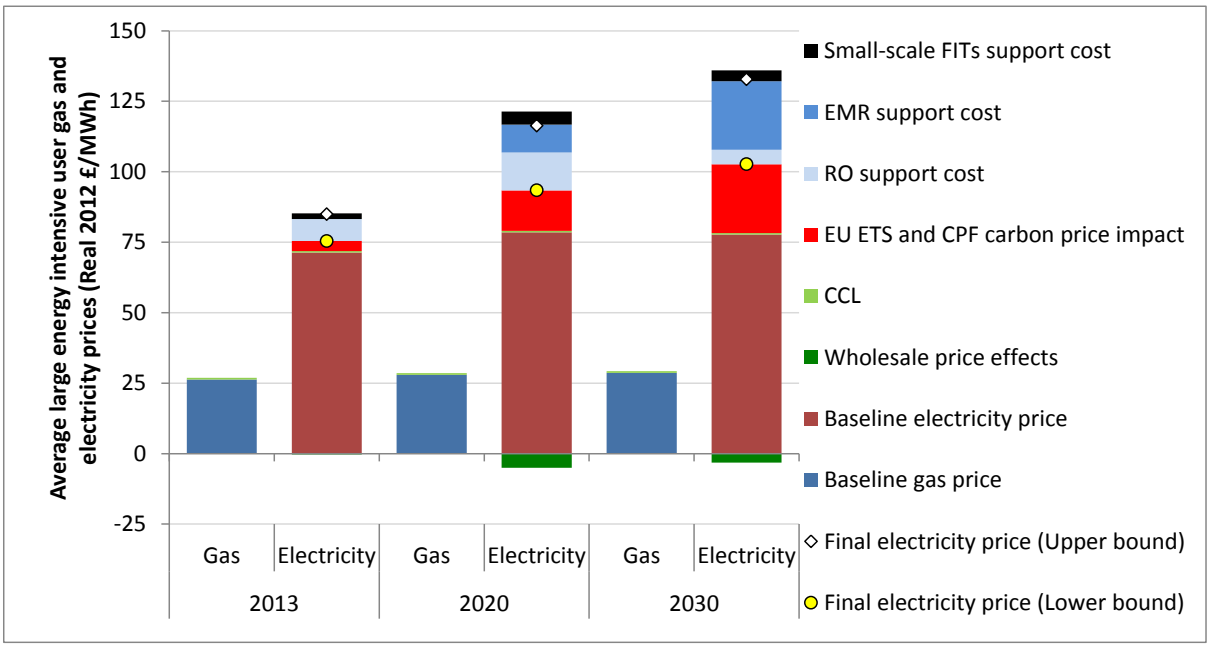
**Table 5: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by large energy intensive users compared with prices and bills in the absence of policies[61] (excludes measures government is considering on EU ETS, CPF and CfDs)**

| | 2013 | 2020 | 2030 |
|---|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | | |
| Average **gas price** without policies | 26 | 28 | 29 |
| Average **gas price** with policies | 27 | 29 | 29 |
| Impact of policies on average **gas price** | 1 (2%) | 1 (2%) | 1 (2%) |
| Average **electricity price** without policies | 71 | 79 | 78 |
| Average **electricity price** with policies | 75 to 85 | 94 to 116 | 103 to 133 |
| Impact of policies on average **electricity price** | 4 to 14 (6 to 19%) | 15 to 37 (19 to 47%) | 25 to 55 (32 to 71%) |
| **Bill impacts (real 2012 £s and % change) – illustrative 100GWh p.a. users** | | | |
| Average **gas bill** without policies | £2.6m | £2.8m | £2.9m |
| Average **gas bill** with policies | £2.6m | £2.8m | £2.9m |
| Impact of policies on average **gas bill** | -£0.008m (0%) | £0.1m (2%) | £0.1m (2%) |
| Average **electricity bill** without policies | £7.1m | £7.9m | £7.8m |
| Average **electricity bill** with policies | £7.3 to 8.2m | £8.9 to 11.0m | £9.9 to 12.9m |
| Impact of policies on average **electricity bill** | £0.2 to 1.1m (2 to 15%) | £1.0 to 3.1m (13 to 39%) | £2.2 to 5.1m (28 to 65%) |
| **Illustrative energy (gas and electricity) bill impacts[62]** | | | |
| Electro-intensive user | 2 to 14% | 12 to 36% | 26 to 60% |
| Balanced user | 2 to 11% | 10 to 30% | 21 to 48% |
| Gas intensive user | 1 to 6% | 6 to 17% | 13 to 28% |

Source: DECC 2013. Figures presented to the nearest £0.1m, where figures would round to zero one significant figure is shown. Numbers may not sum due to rounding.
For details of each policy's contribution to the total price and bill impacts, see Annexes E and F.

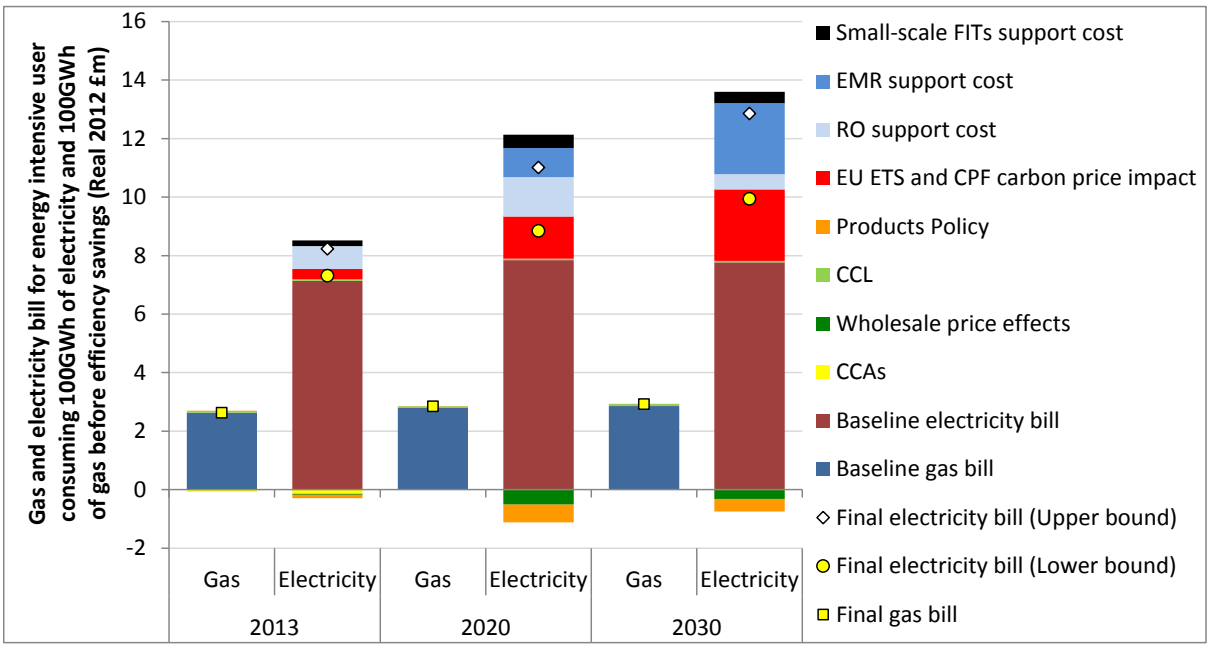
[61] The results in Table 4 focus on the % impacts rather than absolute impacts because, in reality, the scale of consumption in the sector varies significantly. As the results are scalable, the % impacts would remain unchanged across different scales of consumption.
[62] The illustrative users have been selected based on data on existing consumption mixes by CCA users.

**Chart 22: Estimated average impact of energy and climate change policies on retail gas and electricity prices faced by large energy intensive users (excludes measures government is considering on EU ETS, CPF and CfDs)**




Source: DECC 2013.

**Chart 23: Estimated average impact of energy and climate change policies on retail gas and electricity bills faced by large energy intensive users who consume 100,000MWh of gas and 100,000MWh of electricity before policies (excludes measures government is considering on EU ETS, CPF and CfDs)**




Source: DECC 2013.

129. Policies are estimated to be adding between 1 and 14% to energy bills for these users in 2013 and between 6 and 36% in 2020. The higher end of the range is more reflective of relatively electro-intensive users who buy all their electricity through an energy supplier rather than produce it on site and the lower end of the range more reflective of relatively gas intensive users who meet their electricity needs through on-site generation.

130. As with the results for the medium-sized business users, while the policy impact on retail energy prices is estimated to be higher than was estimated in the previous report, in part due to increases in the estimated costs of small-scale FITs, RO and EMR, the biggest driver for the increase in policy impacts *in percentage terms* is the downward revision in baseline (before policy) prices. This reflects better evidence around per unit energy network costs among larger energy users. Estimates of network costs have been reduced by 32% for electricity and have almost halved for gas in 2020. As a result, the overall level of gas and electricity prices for these users are projected to be lower than estimated previously – around 19% lower for gas prices and 14% lower for electricity prices in 2020.

# 6. Sensitivity analysis

131. Assessing the future impact of energy and climate change policies on prices and bills depends on assumptions made about what prices would be in the absence of those policies ('the baseline counterfactual'). It is possible to envisage a large number of plausible counterfactuals by making different assumptions on key factors including future fossil fuel prices.

132. Changes in fossil fuel prices (gas, coal and oil) are the primary drivers of wholesale energy costs. Fossil fuel prices also affect the cost of energy and climate change policies. With higher fossil fuel prices, the total costs of energy and climate change policies are generally reduced. Higher fossil fuel prices lower the cost of policies such as EMR since less additional support is required to bring forward low-carbon investment. If fossil fuel prices are lower, more support would be required to bring forward the same amount of low-carbon investment. Higher fossil fuel prices also lead to higher energy prices more generally and thereby increase the value of any energy savings from energy efficiency policies. Similarly, lower energy prices reduce the direct monetary value of energy efficiency savings.

133. The analysis in the previous sections is based on DECC's "Central" fossil fuel price scenario consistent with a wholesale gas price of 72p/therm in 2020, a coal price of $120/tonne in 2020 and an oil price of $124/bbl in 2020 (all in real 2012 prices). However, this is only one possible state of the world.

134. Table 6 shows the estimated average cumulative impact of energy and climate change policies on the energy (gas plus electricity) bills paid by the illustrative energy users in 2020 and 2030, compared with what they would have been in each of these years in the absence of policies, based on three possible scenarios for fossil fuel prices:

- **"Low" –** Consistent with wholesale gas prices falling to 41p/therm by 2020. Oil prices are assumed to be $93/bbl and coal prices $76/tonne in 2020 (all real 2012 prices);
- **"Central" –** Consistent with wholesale gas prices plateauing at 72p/therm from 2018 onward. Oil prices are assumed to be $124/bbl and coal prices $120/tonne in 2020;
- **"High" –** Consistent with wholesale gas prices rising to 102p/therm by 2020. Oil prices are assumed to be $151/bbl and coal prices $164/tonne in 2020.

135. More detail on these fossil fuel price scenarios are available online[63] and detailed results for the fossil fuel price sensitivities are presented in Annex H.

136. While the costs of policies such as the RO and EMR are re-estimated to reflect the different fossil fuel price scenarios, the costs and savings from the energy efficiency policies are assumed to be the same in MWh terms across the three scenarios. In reality, we may observe higher take up of measures under the Green Deal, for example, when fossil fuel prices are high, and it may cost

[63] Available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/fossil-fuel-price-projections.

energy suppliers less to incentivise households to take up efficiency measures in order to meet their carbon obligations or for measures to meet the Green Deal Golden Rule. The opposite is likely to be true if fossil fuel prices were lower.

**Table 6: Estimated average impact of energy and climate change policies on energy (gas plus electricity) bills compared with bills in the absence of policies under different fossil fuel price scenarios (excludes measures government is considering to reduce impacts of EU ETS, CPF and CfDs on large energy intensive users)**

| | 2020 | 2030 |
|---|---|---|
| **Household** | | |
| Low | -6% | 4% |
| Central | -11% | -3% |
| High | -14% | -7% |
| **Medium-sized business user – non-CRC** | | |
| Low | 45% | 68% |
| Central | 26% | 40% |
| High | 16% | 25% |
| **Medium-sized business user – CRC** | | |
| Low | 43% | 68% |
| Central | 22% | 39% |
| High | 12% | 23% |
| **Large energy intensive industrial user**[64] | | |
| Low | 10 to 65% | 20 to 104% |
| Central | 6 to 36% | 13 to 60% |
| High | 5 to 23% | 9 to 37% |

Source: DECC 2013.
The ranges presented for large energy intensive users capture the range of results for the three illustrative user mixes. The results for each illustrative large energy intensive user are presented separately in Annex H.

137. Under lower fossil fuel prices, policies are expected to add more to energy bills (and save less, on average, on household bills) compared with the other scenarios. However, energy bills for all users would be lower overall than they would be under the “Central” and “High” fossil fuel price scenarios.

138. Under the “High” fossil fuel price scenario, the opposite is true: energy bills for all users would be higher in all years than under the “Central” and “Low” scenarios, but the impact of policies would be lower (the savings from policies on the average household energy bill would be greater). Under high fossil fuel prices, the average impact of policies in 2020 is estimated to be, on average, lower household energy bills by around 14% compared to what bills would have been on average in 2020 without policies.

[64] These ranges also capture the range of impacts across the three illustrative users. i.e. The lower bounds are consistent with the lower bound impacts for the gas-intensive user and the upper bounds are consistent with the upper bound of the electro-intensive user results.

# Annex A: An introduction to DECC's modelling methodology and assumptions

## Average price and bills model

The average energy prices and bills model produces estimates of the impact of energy and climate change policies on household and business energy users. Average in this case means that any price or consumption impact is spread evenly, on a per MWh basis, across all consumers affected by the policy, either domestic, non-domestic or both.

Consumption

Results for the household sector are based on a representative average demand level for households, derived from historical total domestic consumption as published in DECC's Digest of UK Energy Statistics (DUKES) divided by Communities and Local Government (CLG) estimates of the number of households in the UK. The baseline (before the impact of policies) gas and electricity consumption for the average household user are 16.6MWh of gas and 4.5MWh of electricity.

Results for the business sector are based on the consumption of a medium-sized fuel user in industry (as defined by Eurostat).[65] Energy intensive users are defined as those in sectors covered by Climate Change Agreements. The energy bills for these users are based on a range of three different mixes of gas and electricity consumption (before the impact of policies): 160,000MWh gas and 40,000MWh electricity ("gas intensive user"), 100,000MWh each of gas and electricity ("balanced user") and 40,000MWh gas and 160,000MWh of electricity ("electro intensive user").

The baseline level of energy consumption (before the impact of policies) for households and business users is assumed to remain constant over the period 2013 to 2030 – price elasticity impacts are not therefore taken into account. This facilitates analysis of the impact of policies relative to a baseline. However, the total level of consumption used to spread policy costs is taken from the latest DECC Updated Energy Projections (UEP).[66] For policies such as the RO, FITs and EMR, which are obligations related to the supply of electricity, costs are spread evenly over total electricity sales. Electricity sales will reflect the estimated total supply of energy through the public distribution system and sold via retail electricity suppliers. It excludes any electricity consumption supplied from other generators and energy industry own use.

[65] A medium-sized gas user is defined by an annual consumption of between 2,778 and 27,777MWh of gas. A medium-sized electricity user is defined by an annual consumption of between 2,000 and 19,999MWh of electricity. The midpoints of these ranges have been used for this analysis.

[66] The latest projections are available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/energy-and-emissions-projections.

## Prices

The estimated price without policies is calculated by summing assumptions of the future wholesale cost, balancing, transmission, distribution and metering costs, an assumed energy supplier cost and margin for each year and any residual difference resulting from comparing a 10 year back cast of the methodology with historic data on retail prices.[67]

### *Wholesale costs*

The wholesale gas price is based on DECC's latest fossil fuel price scenarios.[68] The wholesale electricity price before and after policies is estimated using DECC's Dynamic Dispatch Model.[69] For business and industrial users, a projected annual average baseload price is used. For household users, an annual average volume weighted price is used.

In addition, to proxy the effect of energy suppliers' hedging strategies on the wholesale costs of supplying energy, a one-year lag is applied to the wholesale price for households and an uplift is estimated based on the 5 year average historic difference between actual lagged wholesale prices and wholesale cost estimates consistent with those published by Ofgem as part of their Supply Market Indicators analysis.[70] This uplift will account for distribution losses, seasonal consumption profiling[71] and shaping costs.[72]

### *Balancing costs*

Balancing charges for electricity make up less than 1% of the final energy price. Baseline balancing charges are based on historic National Grid Data.[73] The historic 5 year average is projected forward.

### *Transmission, distribution and metering costs*

Electricity transmission charges are based on allowed revenue sourced from Ofgem's RIIO T1 price control initial proposals.[74] The domestic £/MWh forecasts

[67] Based on price data published in DECC's *Quarterly Energy Prices* publication, available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/quarterly-energy-prices.
[68] Available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/fossil-fuel-price-projections.
[69] Background information on this model is available online at: https://www.gov.uk/government/publications/dynamic-dispatch-model-ddm.
[70] Available online at: http://www.ofgem.gov.uk/Markets/RetMkts/rmr/smr/Pages/indicators.aspx.
[71] For example, households tend to consume more gas in winter when it is colder and the wholesale price of gas tends to be higher.
[72] For example, households tend to consume relatively more energy at peak times of the day when the wholesale price tends to be higher.
[73] Available online at: http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/PG/.
[74] Available online at: http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/RIIO%20T1%20Initial%20Proposals%20for%20NGGT%20and%20NGET%20Overview%202707212.pdf, and http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/SPT_SHETL_IP.pdf, – note, these may differ from the final settlement and will be updated appropriately next year. Offshore transmission costs are outside of Ofgem's price controls. DECC has

are calculated by trending on the current £/MWh TNUoS (as estimated from Ofgem's household energy bills explained factsheet), using the growth rate in allowed revenue and normalised by growth in UEP demand. Electricity distribution charges are based on an extrapolation of Ofgem's latest allowed revenue projections for 2010/11 to 2014/15 (DPCR5 final proposals).[75] The domestic £/MWh forecasts are calculated by trending on the current £/MWh DUoS (as estimated from Ofgem's household energy bills explained factsheet), using the growth rate in allowed revenue and normalised by growth in UEP demand. Based on the Common Distribution Charging Methodology, the domestic forecast is scaled downwards to estimate non-domestic charges.

Gas transmission and distribution costs are more simply estimated. They are based on historic data of transmission and distribution charges on household gas bills supplied by Ofgem and extrapolated forward using the average trend over the last 10 years' worth of data. Charges to business and industrial customers are scaled down using factors consistent with the electricity network charging methodology.

Metering costs are based on historic estimates provided by Ofgem. These figures are small and assumed to stay flat over the projection period.

*Supplier cost and margin*

Household sector supplier operating costs are assumed to stay fixed over time and consistent with Ofgem data published in their Supply Market Indicators.

Household sector net margins are assumed to be a constant percentage of wholesale costs consistent with the average of the last 5 years' worth of Ofgem data published in their Supply Market Indicators.

The business user supplier margins are based on data published by the six largest energy suppliers. Each supplier is obligated by Ofgem to produce a breakdown of their UK revenue and costs from supply of gas and electricity to non-domestic accounts. From this information we have calculated an estimate of fixed unit operating costs and percentage margin.

The energy intensive user operating costs per unit are scaled down from the business user estimates according to the scale of their baseline consumption. Margins per unit are assumed to be zero per unit of energy for simplicity.

Bills

The bill without policies is calculated using the estimated energy price without policies, including VAT, and multiplying by baseline energy consumption.

factored them into the analysis by using internal analysis based on a calculating Offshore transmission costs as proportion of projected future offshore generation capex costs, as advised by Ofgem.

[75] Ofgem's DPCR5 final proposals and its financial model are available online at: http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=371&refer=Networks/ElecDist/PriceCntrls/DPCR5.

Estimated impacts of policies

In the absence of any firm evidence of differential pass-through to domestic and non-domestic customers, this analysis is based on the assumption that policy costs are spread evenly across total energy sales in the UK.[76]

The aggregate efficiency savings estimates and Warm Home Discount rebates received by eligible households are also spread evenly across all relevant[77] consumers.

The results from the average price and bills model are useful indicators of the overall impact of policies on a particular sector (e.g. the household sector or the business sector). In reality, the heterogeneity among users within the same sector means that the impacts will differ across different households and businesses.

For the business sector, impacts will differ depending on the coverage of policies and the scale and mix of energy consumed among other factors. For this reason, the analysis was extended to include three illustrative large energy intensive industrial users. However, these results remain indicative for this particular subsector rather than an individual company or site.

In the household sector, the impact of policies will differ based on whether or not a household takes up a particular energy efficiency or renewable measure, whether they are eligible for a Warm Home Discount rebate, the type of house, the composition of the household, what the main heating fuel is, etc. For this reason, a separate model was developed to assess the impact of policies across different sets of household users.

**Distributional Impacts Model for Policy and Strategic Analysis (DIMPSA)**

The Centre for Sustainable Energy (CSE) worked with DECC to analyse the distributional impacts of energy and climate change policies on the energy bills of UK households. DIMPSA is based on the Living Costs and Food (LCF) survey, from which household energy consumption is derived. The LCF does not include detailed information on physical household characteristics, beyond built form, which are important in modelling the impact of energy policies. Data from the English Housing Survey (EHS) was therefore used to generate a predictive model to identify wall type, loft insulation levels and heating system age/communal heating in the LCF dataset.

The model identifies records in the LCF that may be suitable for sustainable energy technologies. The user can apply a number of criteria to the dataset to constrain the application of measures - variables used include; tenure, built form, central heating type, number of rooms, occupants, age of household representative, rurality (derived) and wall type

[76] We assume that 100% of the costs of the policies borne by the energy suppliers are passed on to consumers.
[77] Relevant in the sense that aggregate efficiency savings are estimated separately for each relevant sector (e.g. households) and those savings are then spread evenly across that specific sector.

Policy costs (consistent with the price impacts estimated from the Average Price and Bills model) and measures are input into the model to produce an estimated final bill for each household. The counterfactual bill is then subtracted to give a bill impact figure. Policy measures are targeted at specific groups consistent with policy design and randomly distributed between eligible households.

The level of savings associated with different measures are estimated based on the year and household characteristics and are adjusted for comfort taking (the direct rebound effect whereby the reduced cost of running appliances means they will be run more often). For any heat consumption reduction measure or renewable heat pump or insulation measure the savings are adjusted by 15% to allow for comfort taking.

Smart Meters average savings are applied as a proportion of the level of energy consumed, and consistent with the roll-out profile in the Smart Meters Impact Assessment.

Products Policy savings are distributed across households based on the number of electricity using products[78] in the house – households which own a large number of energy using products (typically richer households) are therefore assumed to achieve higher savings through Products Policy than households which own a small number of energy using products (typically poorer households).

Boiler efficiency savings are assumed to be incurred only by those households who have a gas condensing boiler at a cumulative rate of 1.5 million households per year. The savings are estimated as a proportion of original gas consumption (which is typically lower for poorer households).

The installation of measures such as FIT and RHI will include some level of tariff payment – which reflects the way the policies function – and tariff payments received are netted off the final bill. (Note: In the November 2011 report, the domestic RHI was not included in the analysis).

For the presentation of results, expenditure is used rather than income as it may be a better indicator of the impact on households. This is because analysis of the income distribution can be potentially misleading. Some households – typically those containing students, self-employed and unemployed individuals – could be experiencing temporary periods of low income and funding their expenditure from savings or borrowings (anticipating a higher income stream in future). Because such households may be smoothing their lifetime consumption, expenditure may be a better indicator of their standard of living.

**Differences in the coverage of the two models**

Because the DIMPSA baseline dataset is based on actual household characteristics and modelled housing stock data to 2009, it already captures any major insulation and heat measures taken up (whether through policy or voluntarily) up to that period. As such, the model cannot determine the impact of any policy measures

[78] Distinguished by brown or white goods.

distributed pre-2010. The estimated savings used for the Average Price and Bills analysis captures savings accrued over the period 2012-2030 from measures delivered pre-2010 up to the start of EEC.

The DIMPSA dataset also captures the mix of heating fuels which are currently used across the country, including non-metered fuels and biomass. As such, DIMPSA can capture any effects of fuel switching as a result of households taking up particular heat measures. The Average Price and Bills analysis can only capture the extent to which there may be switching from electricity to gas as a result of energy efficiency policies. No fuel switching as a result of policies such as the RHI are captured nor any electricity cost savings as a result of own-generation through domestic small-scale FITs measures.

The Average Price and Bills model also does not capture any tariff or income payments through small-scale FITs and the RHI which DIMPSA can.

While these differences exist, the high level results of the two models, in terms of direction and order of magnitude remain broadly consistent.

**The difference between marginal impacts and the combined impact of all policies on bills**

It is important to be aware that the individual policy contributions presented in Annex F of this document differ from the estimated *marginal* impact of policies set out in individual policy Impact Assessments (IAs).

To assess the impact of an entire policy package, we need to consider the impact of this policy package against a “no policy” counterfactual scenario (baseline) which excludes all policies in the package. In contrast, individual policy IAs analyse policies against a baseline which includes other policies in order to identify the marginal impact of their introduction.

Summing across the marginal impacts of all individual policies results in double counting of the value of energy efficiency savings because of policy interactions (e.g. a policy that increases retail energy prices also increases the value of efficiency savings from all other policies). In order to avoid any double counting, a more uniform approach is taken to attribute the contribution of individual policies to the total policy package impact: energy efficiency savings are valued at final (after all policies) energy prices and the cost impact of policies is estimated using baseline (before all policies) energy consumption.

As a result, the contribution from an individual policy presented in Annex F will generally be larger than the policy’s marginal bill impact (presented in the policy IA) all other things being equal. The individual impacts of policies which lead to net increases in bills will tend to be larger in this overarching analysis compared with those policies’ marginal impacts and the impacts of policies which lead to net reductions in bills will tend to be smaller in this analysis compared with those policies’ marginal impacts. The figures presented in this document fulfil a different

analytical purpose from the numbers presented in the IAs and do not override the impacts presented in IAs.

**Analysing EMR**

Analysis presented in the EMR IA showed the marginal impact of the EMR compared to a basecase counterfactual, without the EMR package. The basecase counterfactual meets a similar decarbonisation level to that achieved under EMR, however using existing policy instruments. In the latest IA, EMR was also assessed under different decarbonisation scenarios. Under all scenarios, the net marginal impact of EMR is to reduce electricity bills over the period 2016 to 2030, relative to a basecase which achieves the same decarbonisation level using existing policy instruments. The marginal impact of the EMR on electricity prices and bills has three main components:

- **EMR support costs:** The large-scale FIT payments and capacity payments which are assumed to be funded through electricity bills (this will increase electricity bills);

- **Lower RO support costs:** From 2016, new renewable generation will be supported by large-scale FIT payments rather than the RO. This lowers the future RO costs compared to a scenario where EMR is not introduced and large-scale renewables continue to be supported by the RO (the impact will be to decrease electricity bills);

- **Wholesale price effect:** Resulting changes in the generation mix and capacity margins affect the wholesale electricity price (this tends to decrease electricity bills).

The analysis published in the EMR IA showed that the combined impact of the second two effects was expected to outweigh the first effect over much of the period analysed. As such, the net marginal impact of EMR is expected to be a *reduction* in electricity prices and bills over the period 2016 to 2030 compared to what they would have been, over the same period, if decarbonisation ambitions were achieved through existing policy instruments.

The RO support cost impacts presented in Annexes E and F are net of the effect of introducing EMR, and therefore lower than they would be in the absence of EMR. The impact of EMR on the electricity wholesale price is captured by the “Wholesale price effects” component, which also captures the effect of the RO and other policies on wholesale electricity prices. EMR support costs are listed separately and should not be confused with the net marginal impact of EMR on electricity prices and bills as they only reflect one of the components of the impact.

## Annex B: Policies assessed in this analysis

The results presented in this document are based on analysis of proposals and policies put forward by both the previous and the present Government. Only those policies which are already in place or planned to a sufficient degree of detail have been included in the modelling (i.e. with quantified estimates of costs and benefits).

The table below sets out the policies analysed and where there have been significant changes in policy design since the analysis of price and bill impacts published in November 2011.

| Policy | Notes |
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| Better Billing | Suppliers are required to include on bills or statements comparisons between the energy used in the period covered by the bill or statement and that from the same period in the previous year. This requirement, which was part of the UK's implementation of the Energy Services Directive, was designed to help customers be more aware of their energy usage, and consequently use energy more efficiently. The savings estimates are consistent with the published Impact Assessment.[79] |
| Building/boiler Regulations | Building Regulations set minimum standards of efficiency for the installation of new and replacement gas condensing boilers, estimated savings for which have now been included in the analysis.<br><br>Building Regulations also set minimum energy efficiency standards whenever building work is carried out on new and existing buildings, including windows, building fabric insulation, energy efficiency of fixed heating, domestic hot water systems, mechanical ventilation, air conditioning and lighting which can deliver further gas and electricity savings to domestic and non-domestic buildings in England and Wales.[80] These savings have not been quantified and are therefore not included in the present analysis but there will be further work with CLG over the next year with a view to arrive at robust estimates which may be incorporated in the next report.<br><br>Building regulations do not directly affect energy prices but minimum efficiency standards for boilers may mean rising costs of replacement which are not reflected in the energy bill. These costs have not been included as they fall outside the scope of this analysis but have been assessed in relevant Impact Assessments.<br><br>The relevant regulations are:<br><br>**Building Regulations (2002, 2005/6)** – (England and Wales only) Introduced a minimum efficiency standard for installation of gas |

[79] The consultation document and accompanying Impact Assessment are available online at: http://webarchive.nationalarchives.gov.uk/20120109090353/http://www.decc.gov.uk/assets/decc/what%20we%20do/supporting%20consumers/smart%20energy%20meters/file40456.pdf.

[80] Building Regulations are devolved to Scotland, Northern Ireland and now Wales but all now have minimum standards calling for high efficiency condensing boilers.

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| | condensing boilers to B rating from April 2005 (and thus affecting all subsequent boiler replacement).[81]<br><br>**Building Regulations (2010)** – Raised minimum efficiency standards for installation of gas condensing boilers (from B to A).[82]<br><br>The savings reflect the impact of regulations introduced since 2002.<br><br>1.5 million boilers per annum are assumed to be replaced based on detailed industry sales figures from the Heating and Hot Water Council.[83] Based on analysis for CLG's previous IAs, it is assumed that a SEDBUK E to D saves 805 kWh pa, D to B saves 1,386 kWh pa and B to A saves 379 kWh pa. Based on industry data for the proportion of new boilers which are not condensing boilers, it is assumed that 90% of new boilers are condensing for the 2002 and 2005 steps. Industry data has shown that a large proportion of condensing boilers were built to 'A' standard prior to the 2010 step and so it is assumed that only 14% of new boilers were shifted from A to B as a direct result of the 2010 step. A taper is also applied to the estimated savings to reflect baseline market technological improvements, energy price increases, consumer expectations, etc. |
| Carbon Emissions Reduction Target (CERT) | This required energy suppliers to make savings in the amount of $CO_2$ emitted by householders. Suppliers met this target by promoting (for example, through subsidies) the uptake of energy efficiency measures; predominantly loft insulation, cavity wall insulation and historically low energy lighting. This policy was introduced in April 2008 and extended to December 2012 (see below). The estimated savings delivered by CERT's predecessors, Energy Efficiency commitments 1 & 2 (EEC1&2) which were in place between April 2002 and March 2008, are also included in this policy's bill impact estimates.<br><br>The estimated efficiency savings from CERT allow for a comfort factor of 15% for insulation measures. They also reflect some degree of underperformance and under use of measures distributed based on available evidence.<br><br>Bill impacts for CERT and the CERT extension arise from the cost to suppliers of meeting their targets and the reduced energy demand resulting from households receiving measures.[84] |
| CERT Extension | The CERT Extension is a 108Mt extension to CERT, ran between 2011 and 2012. It included a super-priority group target of 15%; a 68% professional insulation target; and Compact Fluorescent Lights were no longer eligible measures. Analysis allows for a comfort factor of 40% for insulation measures in the super priority group (15% in all other groups) |

[81] The Impact Assessment on the revisions to part L of the building regulations from 2006 is available online at: http://webarchive.nationalarchives.gov.uk/20120919132719/www.communities.gov.uk/publications/planningandbuilding/regulatoryimpactassessment7.

[82] The Impact Assessment for the revisions to Part L and F of the Building Regulations from 2010 is available online at: http://webarchive.nationalarchives.gov.uk/20120919132719/www.communities.gov.uk/publications/planningandbuilding/partlf2010ia.

[83] Information on HHIC is available online at: http://www.centralheating.co.uk/news/category/market-reports.

[84] For further information, the Impact Assessment is available online at: http://webarchive.nationalarchives.gov.uk/20120109090353/http://www.decc.gov.uk/assets/decc/Consultations/carbon%20emissions%20reduction%20target/1_20090630122512_e_@@_CERTImpactAssessment.pdf.

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| | and 25% for heating measures in the super priority group (0% for all other groups).[85] The savings from installed measures are expected to accrue in the years following. |
| Climate Change Agreements (CCA) | CCAs allow eligible energy intensive businesses to receive a discount on the CCL (see next box) in return for meeting energy efficiency or carbon saving targets.<br>CCAs and the CCL are estimated to have no additional savings beyond business as usual projections from DECC's Energy Model.[86] The next round of CCA targets were set in 2012 using an evidence gathering process that combines DECC analysis and submissions by industry.[87] |
| Climate Change Levy (CCL) | The CCL was introduced in April 2001. It is a tax on the use of energy in industry, commerce and the public sector. The Government announced the full rates from 1 April 2013 would be £5.24/MWh for electricity and £1.82/MWh for gas. We assume these rates remain constant in real terms to 2030. The analysis assumes a CCA discount is received on this for all delivered electricity and gas consumption by energy intensive users. The discount is assumed to be 65% for both gas and electricity for the year 2012, rising to 90% for electricity from 2013 in line with the Government's 2011 Autumn Statement. |
| Community Energy Saving Programme (CESP) | CESP targets households in Great Britain, in areas of low income, to improve energy efficiency standards. It is funded by an obligation on energy suppliers and electricity generators and is expected to deliver up to £365 million of efficiency measures between October 2009 and December 2012.[88] |
| CRC Energy Efficiency Scheme (CRC) | The CRC is a mandatory UK-wide scheme introduced in April 2010 which targets unregulated emissions from large public and private sector organisations. It is designed to incentivise the uptake of cost-effective energy efficiency opportunities through the application of additional financial and reputational drivers.<br>In the Autumn Statement 2012, the Government announced a wide range of measures to simplify the CRC.[89] |
| Electricity Market Reform (EMR) | The Government first set out a package of measures to reform the electricity market to deliver secure, affordable, low carbon electricity in its EMR White Paper in July 2011.[90] The lead policy option to deliver low-carbon investment was identified as a Feed-in-Tariff Contract for |

[85] For further information, the Impact Assessment is available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48491/121-iacertextension.pdf.
[86] The latest projections are available online at: https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/energy-and-emissions-projections.
[87] For further information, see policy page at: http://www.decc.gov.uk/en/content/cms/emissions/ccas/ccas_policy/ccas_policy.aspx.
[88] For further information, see: http://webarchive.nationalarchives.gov.uk/20120109090353/http://www.decc.gov.uk/en/content/cms/funding/funding_ops/cesp/cesp.aspx.
[89] For further information, the Impact Assessment is available online at: https://www.gov.uk/government/consultations/simplifying-our-energy-efficiency-scheme-crc https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42583/901-ia-crc-en-efficiency-scheme-amend.pdf.
[90] Available online at: https://www.gov.uk/government/publications/planning-our-electric-future-a-white-paper-for-secure-affordable-and-low-carbon-energy.

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| | Difference (FIT CfD) compared to alternatives, including a premium Feed-in-Tariff. In the Technical Update published in December 2011,[91] a Capacity Market was identified as the preferred instrument to mitigate security of supply risks compared to alternatives, including a Strategic Reserve, a Capacity Payments model, and doing nothing. In the analysis published alongside the draft Energy Bill in May 2012,[92] an Administrative Capacity Market was chosen as the preferred model, compared with a reliability option.<br><br>Provisions to enable implementation of these aspects of EMR are included in the Energy Bill 2012, which was introduced to Parliament in November 2012.<br><br>This analysis includes updated assumptions, which are consistent with those used for the latest EMR analysis supporting the Energy Bill. In particular the analysis has been revised to incorporate the latest DECC assumptions on fossil fuel prices, technology costs and electricity demand.<br><br>Modelling for EMR was undertaken using an illustrative level of decarbonisation in the power sector by 2030 (an emission intensity of 100gCO2/kWh), which is consistent with previously published EMR analysis. |
| EU Emissions Trading System (EU ETS) and Carbon Price Floor (CPF) | The EU ETS was introduced in 2005 and the CPF will be introduced in April 2013. The estimated price and bill impacts of the EU ETS and CPF are based on analysis of the impact of the carbon price on wholesale electricity prices. The results presented assume full cost pass through of the EUA (carbon) price faced by the marginal generator to end use consumers regardless of whether allowances are allocated free of charge to generators or are purchased from auctions or the secondary carbon market. Electricity generation investment and dispatch decisions are held constant as the impact of policies on them is separately attributed to the "Wholesale electricity price impacts (merit order effects)" element (described below).<br><br>This analysis is based on a linear trajectory for the CPF between 2013 and 2020 and between 2020 and 2030, starting at £16/$tCO_2$ in 2013, targeting £30/$tCO_2$ in 2020 and £70/ $tCO_2$ in 2030 (in real 2009 prices).<br><br>The CPF is designed to top up the carbon price to a target level and therefore the projected impact of the policy on bills depends on the underlying assumption for the EUA price, except for in the year's for which the CPF levy has already been announced. DECC's carbon price assumptions in this analysis are based on current market prices of end-year EUA futures contracts.[93] This carbon value is used to estimate the lower-bound impact of the EU ETS with a corresponding impact of the CPF balance in 2030. However, it is important to note that if Government is successful in its push for tougher EU and global action to limit emissions, the general trend will be for increasing future carbon prices. |

[91] Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48253/3884-planning-electric-future-technical-update.pdf.
[92] Available online at: http://www.official-documents.gov.uk/document/cm83/8362/8362.pdf.
[93] Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48185/3138-carbon-values-decc-energy-modelling.pdf.

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| | The Government is committed to continuing to push for global action to limit the increase in temperature to 2°C and the carbon value consistent with this goal is £70/tCO2 in 2030 (in real 2009 prices).[94] Under this scenario the impact of the CPF would be reduced to zero in 2030. This carbon value is used to estimate the upper-bound impact of the EU ETS with no corresponding CPF impact in 2030.<br><br>The impact on wholesale electricity prices of increased low carbon generation capacity (as a result of the RO and CPF) has also been accounted for and presented separately (see description of "wholesale electricity price impacts" below).<br><br>This analysis has not considered the direct costs of the EU ETS (i.e. the cost to businesses covered by the system of purchasing carbon allowances). |
| Small-scale Feed-in-Tariffs (FITs) | Introduced in April 2010, small-scale FITs are designed to incentivise small-scale, low-carbon electricity generation by households, communities and businesses. A small-scale FITs generator may use electricity generated onsite, thus avoiding having to purchase that electricity from their supplier, may export their generation directly to the grid, or (in many cases) some combination of the two. Small-scale FITs consist of two elements of payment to FITs generators: a generation tariff paid for every unit of electricity generated and metered, and an export tariff for any electricity generated and exported to the grid. Generators are free to opt out of the export tariff and negotiate a price for their electricity exports directly with a supplier. In estimating the impact on bills, only generation tariff costs are included- the export tariff is not considered a net subsidy as it reflects the value of embedded electricity.<br><br>Since November 2011, there have been 3 completed consultations as part of the FITs Comprehensive Review, which have led to significant changes to the scheme:<br><br>• Phase 1 consultation (published February 2012)[95] on small-scale (below 250KW) solar PV tariffs. This introduced new, lower tariffs from 1 April for all installations with an eligibility date from 3 March 2012 onwards. It also linked solar PV tariffs from 1 April 2012 to a new energy efficiency eligibility requirement, and introduced new multi-installation tariff rates for aggregated installations.<br><br>• Phase 2A consultation (published May 2012)[96] on solar PV cost control. This set tariffs for new solar PV installations from 1 August 2012 onwards. It also introduced a degression mechanism, whereby from 1 October 2012 tariffs will be set by Ofgem based on deployment earlier in the year. It also increased the export tariff for installations with an eligibility date of 1 August 2012 onwards (to |

[94] Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48184/3136-guide-carbon-valuation-methodology.pdf.
[95] Available online at: https://www.gov.uk/government/consultations/feed-in-tariffs-first-phase-of-a-comprehensive-review.
[96] Available online at: https://www.gov.uk/government/consultations/solar-pv-cost-controls-comprehensive-review-phase-2a.

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| | 4.5p/kWh) and reduced the tariff lifetime from 25 to 20 years.<br>• Phase 2B consultation (published July 2012)[97] on tariffs for non-PV technologies and administrative issues. This set tariffs for wind, hydro, AD and micro-CHP with an eligibility date of 1 December 2012 onwards, and introduced a degression mechanism for these technologies. |
| Green Deal and Energy Company Obligation (ECO) | The Green Deal has established a framework to enable organisations ("Green Deal Providers" – who could include private companies, local authorities, charities and trade associations) to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost, and to recoup payments through a charge in instalments on the energy bill.<br>The new ECO will require energy companies to support households in improving the energy efficiency of their homes, both improving the ability of the vulnerable and those on lower incomes to heat their homes affordably, and supporting households who live in harder and more expensive to improve homes (e.g. homes needing improvements such as hard to treat cavity wall insulation and solid wall insulation).<br>The main analysis presents a combined impact of the Green Deal and ECO on households, encompassing the cost impact of the ECO support, the admin cost to energy suppliers of the Green Deal (captured in the ECO support cost component, but it is very small), the average efficiency saving from both ECO and Green Deal measures and the Green Deal loan repayments (see below) based on estimates of costs and savings consistent with the latest Impact Assessment. The ECO and Green Deal policies have been designed to support each other, and many measures will receive support from both policies. Many ECO measures may not be fully subsidised by the ECO policy and may also include an element of Green Deal or other finance methods (such as savings, mortgages, etc) to cover the full upfront cost of installation.<br>Green Deal efficiency savings are shown net of expected repayments. We have included this cost despite this being a voluntary means of payment which happens to be collected via bills and which is only borne by those consumers who choose to sign up to Green Deal, rather than being an integral part of the cost of energy. To avoid overstating net energy bill savings, we have also conservatively assumed that work which can be funded under the Green Deal will be, without any supplementary funding sources such as cash. In practice it is possible some people will combine Green Deal finance alongside alternatives which would mean lower energy bills than presented here.<br>The efficiency savings from the household measures include an 'In-Use' factor based on a review of measured versus theoretical energy savings. In addition, it is estimated that approximately 10% of the building stock have parts of their external walls that are inaccessible, reducing performance of installations. In addition, a 15% comfort factor is assumed.<br>The Green Deal will also be introduced into the business buildings |

[97] Available online at: https://www.gov.uk/government/consultations/tariffs-for-non-pv-technologies-comprehensive-review-phase-2b.

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| | market but there will be no corresponding business ECO.<br><br>The Government response to the Green Deal and ECO consultation was published in June 2012. Much of the Green Deal legal framework was in place from October, with consumers able to sign Green Deal plans and see work undertaken from 28 January 2013. Following the response, the Government consulted on a technical revision to the draft ECO Order. ECO came into force on 1 January 2013.[98] |
| Products Policy | Under the 2009 EU Framework Directive for the Eco-Design requirements for Energy Related Products, Products Policy includes legally binding EU minimum standards which raise the minimum level of efficiency of energy using products available on the market. Households and businesses automatically comply with these standards when purchasing products sold within the EU. For certain products, the Energy Labelling Directive also applies - 'A to G' labelling ranks the products by energy efficiency and shows consumers which are the most efficient products available.<br><br>There are a number of EU implementing measures (minimum standards and energy labels) that have already been agreed by EU Member States covering a range of products used by households and businesses (such as lighting, TVs, washing machines, dishwashers, electric motors and circulators), in order to improve their energy efficiency.[99] The associated impacts are detailed in relevant Impact Assessments.[100]<br><br>The EU Ecodesign and Energy Labelling Directives also cover a second tranche of measures, which are also analysed, noting that the impacts are more uncertain due to the exact shape/timing/stringency having not yet being finalised in Europe for a number of these measures. Impact assessments for some of these measures have either: (i) been agreed (air conditioning, fans, pumps, tumble dryers, and directional lighting & LEDs); (ii) are awaiting EU vote (boilers, water heaters, computers, vacuum cleaners); or (iii) have not yet been produced and so the previous cautious indicative estimates are retained (to reflect uncertainties in the final shape/timing/stringency of these measures).<br><br>The Products Policy energy savings estimates draw on a wide range of empirical and estimated data including present and historic data on the stock of products, product sales, energy efficiency of products, product lifespan, and usage. Data on energy efficiency is commonly taken from existing market research as well as manufacturers' literature.[101] An 's-shaped' take-up curve of purchases of more efficient products is assumed up until 2020. The savings from Products Policy are more uncertain over later years as it becomes less clear whether policies drive efficiency improvements or whether this would have been driven |

[98] For further details, see Green Deal policy page online at:: https://www.gov.uk/green-deal-energy-saving-measures.
[99] The full list of products covered by the first tranche of measures is available at: http://ec.europa.eu/enterprise/policies/sustainable-business/documents/eco-design/legislation/implementingmeasures/index_en.htm.
[100] The IAs are available in Defra's IA library at: http://www.ialibrary.bis.gov.uk/search/index.cfm?Page=1&searchparam=%22energy%20using%20products%22&SortOrder=1.
[101] More data on individual product assumptions is available online at: http://efficient-products.defra.gov.uk/product-strategies/viewall/briefing-note#viewlist.

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| | regardless by e.g. (i) forecast increases in energy prices, or ii) consumers' future preferences for better products. For this reason, the projected impacts are tapered beyond 2020.<br><br>The savings from Products Policy are net of a heat replacement effect (HRE). The HRE occurs where improved efficiency results in a reduction in the amount of useful space heating from products, resulting in an increase in the use of heating systems. Comfort taking (the direct rebound effect whereby the reduced cost of running appliances means they will be run more often) has not been modelled, with the exception of boilers. For many products the a priori expectation is the magnitude of the comfort taking impact is likely to be small. For instance, for fridges comfort taking would not be likely to occur, and for TV use the magnitude may be expected to be small. Finally, a risk of overlapping benefits between specific product areas may always remain – the modelling strips out such impacts where possible. It is also worth noting that the modelling is being reviewed, and that future impacts will be updated to reflect this, including the treatment of uncertainty in the longer term.<br><br>In order to realise savings associated with Products Policy, upfront financial costs are incurred to purchase the more efficient products. The increased costs of products are included in the relevant IAs. |
| Renewable Heat Incentive (RHI) | The RHI consists of tariffs paid to eligible commercial, public and industrial consumer groups who choose to take up renewable heat generating technologies.<br><br>A second phase of RHI support, including long-term tariff support for the domestic sector, was consulted on in late 2012. The distributional analysis in this report (section 4.4) captures the effects of take up of renewable heat measures (through fuel switching and Incentive payments) using assumptions consistent with the analysis in the published Impact Assessment and accompanying spreadsheet.[102]<br><br>The RHI is funded through direct taxation rather than a levy on the supply of fossil fuels. |
| Renewables Obligation (RO) | Introduced in April 2002, the RO is a mechanism for incentivising large-scale renewable electricity generation in the UK. It requires retail electricity suppliers to source an increasing proportion of their electricity from renewable sources by purchasing Renewables Obligation Certificates (ROCs) issued to generators of renewable electricity by Ofgem. Suppliers who do not have sufficient ROCs to cover their obligation must pay a buy-out price.<br><br>The RO support bill impacts cover all RO support and assume that suppliers pass on the costs of RO support evenly across all electricity sales. The RO support costs themselves are taken from analysis by Pöyry for the RO banding review, and assume the proposed technology bands in the Government response to the Consultation on the RO banding review,[103] published in July 2012, are implemented for all |

[102] Available online at: https://www.gov.uk/government/consultations/renewable-heat-incentive-proposals-for-a-domestic-scheme.
[103] Available online at: https://www.gov.uk/government/consultations/supporting-large-scale-renewable-electricity-generation.

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| | technologies apart from solar PV (see below). This assumes that new renewables stations are supported under the RO until 2015/16. From 2016 onwards new renewables stations are supported by the new EMR support mechanism, whose bill impacts are described separately.[104] From 2017, modelling of legacy RO spend is drawn from a combination of Poyry and DECC dynamic dispatch modelling (reflecting modelling in the latest EMR analysis supporting the Energy Bill).<br><br>Solar costs are based on projections for the Government response to the consultation on solar PV support rates under the RO. This was published in December 2012, and lowered support significantly from current levels, as well as creating separate bands under the RO for ground mount and roof mount solar PV.<br><br>The RO support costs make up virtually all the impacts of RO policy to increase renewables on consumer bills. There is also a small offsetting reduction in wholesale prices through increased renewables which is included separately under Wholesale electricity impacts. |
| Smart Metering | The lack of consumer information about energy consumption will be addressed through the deployment of Smart Meters. Consumers will have real time information on their energy consumption to help them control and manage their energy use, save money and reduce emissions. Smart meters will also bring an end to estimated billing, and are an important step towards the development of a smart grid, delivering improved network efficiency and responsiveness. Energy suppliers will be responsible for replacing over 53 million gas and electricity meters, involving visits to 30 million homes and small businesses. The mass roll-out of smart meters is expected to start in late 2014 and to be completed by the end of 2019.<br><br>The Government is setting the framework for a successful rollout that delivers benefits for and protects consumers. Industry and the private sector will be responsible for delivery and for the investment required. A major programme, managed by DECC, is under way to design and implement new cross industry arrangements for smart metering.<br><br>In April 2012 the programme issued the first version of the Smart Metering Equipment Technical Specifications (SMETS) – allowing compliant meters to be installed against roll out targets. SMETS 1 has since been agreed with the European Commission (EC) and designated in December 2012 alongside changes to the existing regulatory and commercial framework governing the electricity and gas markets. Following consultation, DECC has also now published the first iteration of SMETS2 in January 2013 – which will provide a specification for the smart meter enduring stage - and notified this to the EC.<br><br>The latest Smart Meter Impact Assessment, published in January 2013, estimated that, over the next 18 years, the rollout will deliver a net benefit of around £6.7 billion.[105] |

[104] For further information, see policy page at: https://www.gov.uk/government/policies/increasing-the-use-of-low-carbon-technologies/supporting-pages/the-renewables-obligation-ro.
[105] The latest Impact Assessment is available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78666/IA-Feb.pdf.

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| Warm Home Discount (WHD) | The Warm Home Discount scheme was launched in April 2011 and is presently set to run until March 2015, providing £1.1bn of support in total over this period. Energy Suppliers are obliged to provide support with energy costs to more of their most vulnerable customers and those on the lowest incomes. This support requirement is assumed to be passed onto the bills of all consumers.<br><br>Suppliers' compliance is monitored and enforced by Ofgem. Decisions on funding the scheme after March 2015 are yet to be taken; therefore going forward the scheme is assumed to be maintained at the same level as from April 2014 to March 2015. For the purpose of the modelling, the scheme is assumed to continue to 2030. The modelling uses actual reported data for 2011/12 from Ofgem's first annual report on the scheme,[106] and projected delivery rates from the final Impact Assessment for future years.[107]<br><br>No changes to the scheme have been made following its introduction in April 2011. The latest published policy updates on the scheme include the consultation response and final impact assessment published in February 2011 prior to the launch of the scheme.[108] Ofgem's first annual report on the scheme was published in October 2012.[109] |
| Wholesale electricity price impacts (merit order effects) | Energy and climate change policies will also affect investment and dispatch decisions in the wholesale electricity supply market. Policies such as the EU ETS and CPF will affect the relative cost of generating electricity among existing plant. They will likely lead to the market switching away from carbon intensive unabated coal-powered generation towards less carbon intensive gas-powered generation in the short-term. This merit order effect can increase or decrease the wholesale electricity price (before the cost of carbon is accounted for) depending on the relative cost of fuel and plant efficiency.<br><br>In the medium- and longer-term, policies such as the RO and EMR will encourage greater investment in low-carbon generating capacity which typically has a lower short-run marginal cost than unabated coal- or gas-powered generation. This will lead to more instances where lower marginal cost plant (such as nuclear, CCS or renewables) generate at the margin. This merit order effect would *decrease* the wholesale electricity price – any support costs associated with these low carbon technologies will be reflected in the final *retail* price.<br><br>The wholesale price impacts have been estimated by comparing the difference between wholesale price projections before and after policies (net of carbon costs). These are modelled using DECC's Dynamic Dispatch Model.[110] |

[106] Available at: http://www.ofgem.gov.uk/Sustainability/Environment/WHDS/Documents1/WHD_AR_08_Oct_2012.pdf.
[107] Final Stage Impact Assessment for the Warm Home Discount available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42595/1308-warm-home-disc-impact-assessment.pdf.
[108] Final Stage Impact Assessment for the Warm Home Discount available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42595/1308-warm-home-disc-impact-assessment.pdf.
[109] Available at: http://www.ofgem.gov.uk/Sustainability/Environment/WHDS/Documents1/WHD_AR_08_Oct_2012.pdf.
[110] Further information on this model is available online at: https://www.gov.uk/government/publications/dynamic-dispatch-model-ddm.

## Annex C: Scope of the analysis

An analysis of electricity and gas bills does not in itself tell us whether energy consumers, particularly businesses, are financially better or worse off as a result of energy and climate change policies or how international business competitiveness will be affected. A number of other important factors need to be taken into account:

i. **The commercial arrangements and contracts established between energy users and retail energy suppliers –** There is currently limited evidence on how retail energy suppliers' costs are spread across their users. Our central assumption is that policy costs are spread evenly per unit of energy consumption across all relevant energy users. The costs of policies may be distributed in such a way that a few large users may face a smaller impact per unit of energy compared with smaller users.

ii. **Large energy users' consumption of electricity generated on-site –** Some large users use a significant amount of electricity which is generated on-site, which may not be subject to the costs of a number of policy costs (RO, EMR and small-scale FITs). The analysis for large energy intensive users presents a range. The lower bound estimates are more reflective of a user who generates electricity on-site and include carbon costs (EU ETS and CPF) and the CCL, as well as efficiency improvements from CCAs and Products Policy. The upper estimates are more reflective of a user purchasing their electricity from an energy supplier and therefore also include the costs of EMR, RO and small-scale FITs. In reality, some large industrial users may also be exempt from the CCL in its entirety. This has not been reflected in the range as this is an exemption specific to particular production processes.

iii. **Businesses' ability to pass on rising costs of energy to their customers –** The extent to which energy costs can be passed onto prices of other goods and services depends on a number of factors including the exposure to international competition and the degree of competition on non-price characteristics (e.g. quality). The evidence on this is mixed and the effect can vary greatly by sector. The analysis presented here does not take this into consideration.

iv. **Direct benefits of fuel switching and small-scale renewables –** The <u>average</u> price and bills analysis[111] <u>does not</u> take into account potential savings to households and businesses from switching to renewable energy sources, including payments users could receive from the RHI and small-scale FITs[112] if they adopt these policies. However, the analysis of impacts across the household distribution (Section 4.4) <u>*does*</u> include the impact of fuel switching as a result of certain policies (for example, switching from electric to gas heating under the ECO) and the savings and tariffs received by households that take up RHI and small-scale FIT measures.

[111] i.e. the analysis in Sections 4.3 and 5.2.
[112] Although the analysis *does* consider the impact on electricity prices and bills of suppliers passing on the costs of the FITs obligation onto electricity users.

v. **The wider benefits of energy efficiency –** This analysis does not value the wider benefits of insulation, for example health benefits, improved comfort and security of supply. This is considered in wider policy Impact Assessments.

vi. **The direct costs of policies –** Households and businesses will face up-front costs of purchasing small-scale renewable measures and some energy efficiency measures. In addition, increased costs to businesses that manufacture energy using products sold in the EU (such as TVs and electric motors) which meet more stringent efficiency standards will likely be passed on to the retail prices of these products. As these costs are largely one-off costs and are separate to the energy bill, they have not been included in this analysis.[113]

In addition, there will be costs incurred by businesses covered by the CRC Energy Efficiency Scheme and EU ETS from purchasing allowances. As all the CRC allowances cover direct energy consumption (i.e. not additional process emissions as in the EU ETS), this additional carbon cost has, for illustrative purposes, been applied to the retail electricity and gas prices estimated for the medium-sized business users who fall within the CRC to generate total gas and electricity unit costs. The direct cost of the EU ETS for businesses in the traded sector is more complicated because, for some sectors, process emissions make up a significant share of their total emissions and some allowances have also been allocated to some firms for free (see next bullet). As such, the direct cost of the EU ETS on businesses has not been assessed.[114] The direct cost of the EU ETS on power generators is expected to be passed onto electricity users through the wholesale cost of electricity. This *indirect cost* of EU ETS on business and household users *has* been included.

vii. **The impact of the free allocation of (direct) EU ETS allowances** – Free allocation covers direct emissions and not indirect emissions costs through the purchase of electricity from energy suppliers. The impact will depend on the number of allowances allocated to firms for free, their level of emissions and their abatement opportunities. We estimate that the majority of firms will receive fewer free allowances than their forecast emissions in Phase III. However, a comparison of verified emissions and allocations (based on the European Commission's publicly available data: http://ec.europa.eu/clima/policies/ets/registry/documentation_en.htm) indicates that most UK and EU energy intensive industries have built up a surplus in Phase II (34% more free allowances were allocated to these UK industries in 2008-10 compared to their emissions). These allowances can be carried over from Phase II to Phase III and will have a value to firms that can be used to help offset increases in costs and/or reductions in turnover. On average, this surplus is likely to remain significant throughout much of Phase III.

[113] However, these costs have been considered in the relevant policy impact assessments.
[114] However, DECC's estimates of the future cost of carbon allowances has been published separately at: hhttps://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48185/3138-carbon-values-decc-energy-modelling.pdf.

viii. **The impact of policies on transmission, distribution and balancing costs –** The transmission and distribution costs in the analysis are based on data from price controls – Ofgem's regulatory mechanism for setting the investment allowances of transmission and distribution companies.[115] These costs are driven by a number of factors, including the replacement of aging infrastructure, the connection of low-carbon generating capacity and the reinforcement of networks to cater for increased peak demand due to electrification of heat and transport. Not all of the connection of low-carbon generation and network reinforcement may be considered "additional as a result of policy" if it partly replaces aging infrastructure. Moreover any additional costs of investment needed to upgrade the network will be spread over a number of years. In addition, where polices drive load shifting in consumption or generally reduced consumption, this may save on the costs involved in improving network infrastructure in the long-term to deal with peak demand periods compared with in the absence of such policies. The net effect of policy on future transmission and distribution costs has not yet been estimated.

Balancing cost assumptions are based on historic National Grid data.[116] No estimate has been made of the impact of grid access reforms made by Government in August 2010 to speed up the connection of all types of new generation projects. This is because timely grid connections are expected to have important but largely unquantified benefits relating to lower wholesale prices and a higher degree of energy security, as well as an impact on balancing costs.

ix. **Energy used for transport –** The analysis in this document focuses on the use of energy for heat and power in the home, workplace or industrial site. The analysis does not consider the use of energy for transport.

x. **The wider business environment –** For most businesses, direct energy costs are a relatively small proportion of total costs. For example, in 2011, purchases of energy and water accounted for around 2.5% of total costs for the UK manufacturing sector as a whole. In contrast, employment costs represented around 18% of the total. The wider business environment (e.g. corporation tax levels, labour costs etc) will also have important implications for the ability of UK businesses to compete internationally.

xi. **The wider tax and benefit system –** Vulnerable and low-income households may receive additional benefits and allowances, such as Cold Weather Payments and means-tested benefits which do not directly affect energy bills. These have not been captured in the analysis. The Warm Home Discount also provides targeted rebates on energy bills for eligible vulnerable households – the impact of this is reflected in the analysis.

[115] Offshore transmission costs are outside of Ofgem's price controls. DECC has factored them into the analysis by using internal analysis based on a calculating Offshore transmission costs as a proportion of projected future offshore generation capex costs, as advised by Ofgem.
[116] Available online at: http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/PG/.

# Annex D: Breakdown of an average household gas and electricity bill in 2013

Table D1 presents an estimated breakdown of an average household gas and electricity bill in 2013. These figures are based on household consumption in 2013 after efficiency savings of 14.8MWh gas and 3.8MWh electricity.

**Table D1: Breakdown of average household gas, electricity and energy bill in 2013**

| Real 2012 prices | Gas bill | Electricity bill | Energy bill |
|---|---|---|---|
| Wholesale energy cost | £383 (55%) | £215 (37%) | £597 (47%) |
| Network costs | £124 (18%) | £133 (23%) | £257 (20%) |
| Other supplier costs and margin | £119 (17%) | £121 (21%) | £240 (19%) |
| Energy and climate change policies | £33 (5%) | £80 (14%) | £112 (9%) |
| *ECO*[117] | *£25 (4%)* | *£22 (4%)* | *£47 (4%)* |
| *RO* | - | *£30 (5%)* | *£30 (2%)* |
| *EU ETS* | - | *£8 (1%)* | *£8 (1%)* |
| *CPF* | - | *£5 (1%)* | *£5 (0%)* |
| *Warm Home Discount* | *£6 (1%)* | *£6 (1%)* | *£11 (1%)* |
| *FITs* | - | *£7 (1%)* | *£7 (1%)* |
| *Smart Meters & Better Billing* | *£2 (0%)* | *£1 (0%)* | *£3 (0%)* |
| VAT (5%) | £33 (5%) | £27 (5%) | £60 (5%) |
| Total (no Warm Home Discount rebate) | £691 | £576 | £1,267 |
| Average rebate (inc VAT) | - | -£13 | -£13 |
| Total (with rebate) | £691 | £563 | £1,255 |

Source: DECC 2013. Figures may not add due to rounding.

The average household energy bill before receipt of any Warm Home Discount rebates is estimated to be £1,267 in real 2013 prices with energy and climate change policy costs accounting for 9% of the bill. In Ofgem's latest "Updated Household Energy Bills Explained" factsheet for January 2013[118] they estimated the average household energy bill to be around £1,342 with environmental costs including EU ETS accounting for 9% of the average household dual duel bill. Any differences between the two sets of underlying results are largely accounted for by the different consumption assumptions and the fact that the Ofgem environmental costs do not include the cost of the CPF and other accounting difference.

The figures in this table should not be confused with the numbers in Annex F which answer a separate question. The numbers in Annex D look at the *costs* of policies

[117] Including administrative costs of the Green Deal.

[118] Available online at: http://www.ofgem.gov.uk/Media/FactSheets/Documents1/household-bills.pdf. They have a separate bill estimate as part of their Supply Market Indicators work which is updated every two weeks based on different consumption assumptions. However, the only available bill breakdown consistent with this work is from January 2012. The factsheet is therefore used for comparison due to a more recently dated bill breakdown.

after all efficiency savings have taken effect and provide a comparable breakdown to those which are published by Ofgem and individual energy suppliers. It is estimated by multiplying the price breakdowns from Annex E with estimated household consumption after policies to generate a final bill breakdown. Annex F shows the effect the policy package has in both increasing and lowering bills against a counterfactual scenario where no policies are introduced.

# Annex E: Breakdown of estimated average impact of energy and climate change policies on gas and electricity retail prices

**Table E1: Estimated average impact of energy and climate change policies on household gas and electricity prices (including VAT)**

| Real 2012 £/MWh | 2013 | | 2020 | | 2030 | |
|---|---|---|---|---|---|---|
| | Gas | Electricity | Gas | Electricity | Gas | Electricity |
| Estimated average price without policies (inc VAT) | 44 | 130 | 50 | 150 | 51 | 149 |
| *Wholesale energy costs* | *26* | *57* | 30 | 66 | *30* | *62* |
| *Network costs* | *8* | *35* | 9 | 43 | *11* | *46* |
| *Other supply costs and margins* | *8* | *32* | 9 | 34 | *9* | *35* |
| *VAT @ 5%* | *2* | *6* | 2 | 7 | *2* | *7* |
| Estimated impact of policies (inc VAT) | 2 | 22 | 3 | 49 | 0.1 | 61 |
| *ECO support cost*[119] | *2* | *6* | 2 | 7 | *0.005* | *0.02* |
| *Warm Home Discount support cost* | *0.4* | *2* | 0.4 | 2 | *0.4* | *1* |
| *Smart Meters net supplier cost* | *0.1* | *0.4* | 0.2 | 1 | *-0.3* | *-1* |
| *Better Billing supplier cost* | *0.002* | *0.01* | 0.002 | 0.01 | *0.002* | *0.01* |
| *EU ETS carbon cost* | - | *2* | - | 4 | - | *4 to 26* |
| *CPF carbon cost* | - | *1* | - | 11 | - | *22 to 0* |
| *RO support cost* | - | *8* | - | 14 | - | *5* |
| *EMR support cost* | - | - | - | 10 | - | *25* |
| *Small-scale FITs support cost* | - | *2* | - | 5 | - | *4* |
| *Wholesale price effects* | - | *0.1* | - | -5 | - | *0.1* |
| Estimated average price with policies (inc VAT) | 47 | 152 | 52 | 198 | 51 | 210 |
| % impact (on baseline) | 5% | 17% | 5% | 33% | 0% | 41% |

Source: DECC 2013. Figures may not add due to rounding, where figures would round to zero one significant figure is shown. All policy impacts include an additional 5% VAT impact.

[119] Including administrative costs of the Green Deal.

**Table E2: Estimated average impact of energy and climate change policies on gas and electricity unit costs paid by medium-sized business users**

| Real 2012 £/MWh | 2013 | | 2020 | | 2030 | |
|---|---|---|---|---|---|---|
| | Gas | Electricity | Gas | Electricity | Gas | Electricity |
| Estimated average unit cost without policies | 32 | 81 | 34 | 90 | 35 | 90 |
| *Wholesale energy costs* | *24* | *54* | *25* | *58* | *25* | *55* |
| *Network costs* | *5* | *23* | *6* | *28* | *7* | *30* |
| *Other supply costs and margins* | *3* | *4* | *3* | *4* | *3* | *5* |
| Estimated impact of policies – no CRC | 2 | 18 | 2 | 42 | 2 | 60 |
| Estimated impact of policies – with CRC | 5 | 25 | 5 | 44 | 5 | 61 |
| *CRC* | *3* | *6* | *3* | *2* | *3* | *2* |
| *CCL* | *2* | *5* | *2* | *5* | *2* | *5* |
| *EU ETS carbon cost* | - | *2* | - | *4* | - | *4 to 24* |
| *CPF carbon cost* | - | *1* | - | *11* | - | *20 to 0* |
| *RO support cost* | - | *8* | - | *13* | - | *5* |
| *EMR support cost* | - | - | - | *10* | - | *24* |
| *Small-scale FITs support cost* | - | *2* | - | *5* | - | *4* |
| *Wholesale price effects* | - | *-0.3* | - | *-6* | - | *-3* |
| Estimated average unit cost with policies – no CRC | 34 | 100 | 36 | 132 | 37 | 149 |
| % impact (on baseline) | 5% | 22% | 5% | 46% | 5% | 66% |
| Estimated average unit cost with policies – with CRC | 37 | 106 | 39 | 135 | 40 | 151 |
| % impact (on baseline) | 14% | 30% | 14% | 49% | 14% | 68% |

Source: DECC 2013. Figures may not add due to rounding, where figures would round to zero one significant figure is shown.

**Table E3: Estimated average impact of energy and climate change policies on average gas and electricity prices paid by large energy intensive users (excludes measures government is considering on EU ETS, CPF and CfDs)**

| Real 2012 £/MWh | 2013 | | 2020 | | 2030 | |
|---|---|---|---|---|---|---|
| | Gas | Electricity | Gas | Electricity | Gas | Electricity |
| Estimated average price without policies | 26 | 71 | 28 | 79 | 29 | 78 |
| *Wholesale energy costs* | *24* | *53* | *25* | *57* | *25* | *54* |
| *Network costs* | *4* | *19* | *5* | *22* | *6* | *24* |
| *Other supply costs and margins** | *-2* | *-0.5* | *-2* | *-0.5* | *-2* | *-0.5* |
| Estimated impact of policies | 1 | 4 to 14 | 1 | 15 to 37 | 1 | 25 to 55 |
| *CCL* | *1* | *1* | *1* | *1* | *1* | *1* |
| *EU ETS carbon cost* | - | *2* | - | *4* | - | *4 to 24* |
| *CPF carbon cost* | - | *1* | - | *11* | - | *20 to 0* |
| *RO support cost* | - | *0 to 8* | - | *0 to 13* | - | *0 to 5* |
| *EMR support cost* | - | - | - | *0 to 10* | - | *0 to 24* |
| *Small-scale FITs support cost* | - | *0 to 2* | - | *0 to 5* | - | *0 to 4* |
| *Wholesale price effects* | - | *0 to -0.3* | - | *0 to -6* | - | *0 to -3* |
| Estimated average price with policies | 27 | 75 to 85 | 29 | 94 to 116 | 29 | 103 to 133 |
| % impact (on baseline) | 2% | 6 to 19% | 2% | 19 to 47% | 2% | 32 to 71% |

Source: DECC 2013. Figures may not add due to rounding, where figures would round to zero one significant figure is shown.
*Includes negative adjustment factor to align with historic prices.

# Annex F: Breakdown of estimated average impact of energy and climate change policies on average gas and electricity bills

**Table F1: Estimated average impact of energy and climate change policies on household energy bills (including VAT)**

| Real 2012 £ | 2013 | | | 2020 | | | 2030 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gas | Electricity | Dual Fuel | Gas | Electricity | Dual Fuel | Gas | Electricity | Dual Fuel |
| Estimated bill without policies | 738 | 582 | 1,319 | 826 | 670 | 1,496 | 849 | 667 | 1,516 |
| Estimated impact of policies (with boiler regs) | -46 | -18 | -65 | -94 | -72 | -166 | -107 | 67 | -41 |
| *ECO support cost*[120] | *30* | *27* | *57* | *33* | *33* | *66* | *-* | *-* | *-* |
| *EEC 1&2, CESP, CERT efficiency savings* | *-43* | *-48* | *-91* | *-43* | *-55* | *-97* | *-33* | *-11* | *-45* |
| *Green Deal*[121] *& ECO efficiency savings* | *-1* | *-3* | *-4* | *-7* | *-29* | *-36* | *-15* | *-20* | *-35* |
| *Warm Home Discount support cost* | *7* | *7* | *14* | *7* | *8* | *15* | *6* | *6* | *13* |
| *Warm Home Discount rebate* | *-* | *-14* | *-14* | *-* | *-15* | *-15* | *-* | *-13* | *-13* |
| *Smart Meters* | *2* | *1* | *3* | *-11* | *-18* | *-29* | *-18* | *-28* | *-47* |
| *Better Billing* | *-2* | *-2* | *-4* | *-2* | *-2* | *-4* | *-2* | *-2* | *-4* |
| *Products Policy* | *11* | *-51* | *-41* | *9* | *-167* | *-158* | *5* | *-137* | *-132* |
| *EU ETS carbon cost* | *-* | *10* | *10* | *-* | *17* | *17* | *-* | *19 to 115* | *19 to 115* |
| *CPF carbon cost* | *-* | *6* | *6* | *-* | *50* | *50* | *-* | *96 to 0* | *96 to 0* |
| *RO support cost* | *-* | *37* | *37* | *-* | *63* | *63* | *-* | *24* | *24* |
| *EMR support cost* | *-* | *-* | *-* | *-* | *47* | *47* | *-* | *114* | *114* |
| *Small-scale FITs support cost* | *-* | *9* | *9* | *-* | *22* | *22* | *-* | *18* | *18* |
| *Wholesale price effects* | *-* | *1* | *1* | *-* | *-24* | *-24* | *-* | *0.3* | *0.3* |
| Estimated bill with policies (no boiler regs) | 741 | 563 | 1,304 | 814 | 598 | 1,412 | 792 | 734 | 1,526 |
| % impact (on baseline) (no boiler regs) | 0% | -3% | -1% | -1% | -11% | -6% | -7% | 10% | 1% |
| *Boiler Regulations* | *-49* | *-* | *-49* | *-81* | *-* | *-81* | *-50* | *-* | *-50* |
| Estimated bill with policies (with boiler regs) | 691 | 563 | 1,255 | 733 | 598 | 1,331 | 742 | 734 | 1,476 |
| % impact (on baseline) (with boiler regs) | -6% | -3% | -5% | -11% | -11% | -11% | -13% | 10% | -3% |

Source: DECC 2013. Figures may not add due to rounding, where figures would round to zero one significant figure shown. Green Deal savings are net of the estimated loan repayment.

[120] Including administrative costs of the Green Deal.
[121] Green Deal efficiency savings are shown net of expected loan repayments, even though they are not an integral part of the cost of energy; see Annex B for details.

**Table F2a: Estimated average impact of energy and climate change policies on energy costs for medium-sized business users – non-CRC participant**

| Real 2012 £s | 2013 | | | 2020 | | | 2030 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gas | Electricity | Total | Gas | Electricity | Total | Gas | Electricity | Total |
| Estimated bill without policies | 490,000 | 900,000 | 1.39m | 520,000 | 1.00m | 1.51m | 530,000 | 990,000 | 1.52m |
| Estimated impact of policies | 30,000 | 180,000 | 200,000 | 20,000 | 370,000 | 390,000 | 30,000 | 580,000 | 600,000 |
| *Green Deal efficiency savings*[122] | *-100* | *-100* | *-200* | *-10,000* | *-10,000* | *-10,000* | *-1,000* | *-1,000* | *-2,000* |
| *Products Policy* | *1,000* | *-20,000* | *-20,000* | *1,000* | *-90,000* | *-90,000* | *-100* | *-80,000* | *-80,000* |
| *CCL* | *30,000* | *60,000* | *80,000* | *30,000* | *60,000* | *80,000* | *30,000* | *60,000* | *80,000* |
| *EU ETS carbon cost* | - | *20,000* | *20,000* | - | *40,000* | *40,000* | - | *40,000 to 270,000* | *40,000 to 270,000* |
| *CPF carbon cost* | - | *10,000* | *10,000* | - | *120,000* | *120,000* | - | *230,000 to 0* | *230,000 to 0* |
| *RO support cost* | - | *90,000* | *90,000* | - | *150,000* | *150,000* | - | *60,000* | *60,000* |
| *EMR support cost* | - | - | - | - | *110,000* | *110,000* | - | *270,000* | *270,000* |
| *Small-scale FITs support cost* | - | *20,000* | *20,000* | - | *50,000* | *50,000* | - | *40,000* | *40,000* |
| *Wholesale price effects* | - | *-3,000* | *-3,000* | - | *-60,000* | *-60,000* | - | *-40,000* | *-40,000* |
| Estimated bill with policies | 520,000 | 1.07m | 1.59m | 540,000 | 1.36m | 1.90m | 560,000 | 1.57m | 2.13m |
| % impact (on baseline) | 6% | 20% | 15% | 4% | 37% | 26% | 5% | 59% | 40% |

Source: DECC 2013. Figures may not add due to rounding. Figures rounded to the nearest £10,000, where figures would round to zero one significant figure is shown. Green Deal efficiency savings are net of the estimated loan repayment.

[122] Green Deal efficiency savings are shown net of expected loan repayments, even though they are not an integral part of the cost of energy; see Annex B for details.

**Table F2b: Estimated average impact of energy and climate change policies on energy costs for medium-sized business users – CRC participant**

| Real 2012 £s | 2013 | | | 2020 | | | 2030 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gas | Electricity | Total | Gas | Electricity | Total | Gas | Electricity | Total |
| Estimated bill without policies | 490,000 | 900,000 | 1.39m | 520,000 | 1.00m | 1.51m | 530,000 | 990,000 | 1.52m |
| Estimated impact of policies | 50,000 | 240,000 | 300,000 | -40,000 | 380,000 | 330,000 | -1,000 | 590,000 | 590,000 |
| *Green Deal efficiency savings*[123] | *-200* | *-100* | *-200* | *-10,000* | *-10,000* | *-20,000* | *-1,000* | *-1,000* | *-2,000* |
| *Products Policy* | *1,000* | *-20,000* | *-20,000* | *1,000* | *-90,000* | *-90,000* | *-100* | *-80,000* | *-80,000* |
| *CCL* | *30,000* | *60,000* | *80,000* | *30,000* | *60,000* | *80,000* | *30,000* | *60,000* | *80,000* |
| *CRC* | *30,000* | *70,000* | *90,000* | *-60,000* | *10,000* | *-50,000* | *-30,000* | *10,000* | *-10,000* |
| *EU ETS carbon cost* | - | *20,000* | *20,000* | - | *40,000* | *40,000* | - | *40,000 to 270,000* | *40,000 to 270,000* |
| *CPF carbon cost* | - | *10,000* | *10,000* | - | *120,000* | *120,000* | - | *230,000 to 0* | *230,000 to 0* |
| *RO support cost* | - | *90,000* | *90,000* | - | *150,000* | *150,000* | - | *60,000* | *60,000* |
| *EMR support cost* | - | - | - | - | *110,000* | *110,000* | - | *270,000* | *270,000* |
| *Small-scale FITs support cost* | - | *20,000* | *20,000* | - | *50,000* | *50,000* | - | *40,000* | *40,000* |
| *Wholesale price effects* | - | *-3,000* | *-3,000* | - | *-60,000* | *-60,000* | - | *-40,000* | *-40,000* |
| Estimated bill with policies | 550,000 | 1.14m | 1.68m | 480,000 | 1.37m | 1.85m | 530,000 | 1.58m | 2.11m |
| % impact (on baseline) | 11% | 27% | 21% | -8% | 38% | 22% | 0% | 60% | 39% |

Source: DECC 2013. Figures may not add due to rounding. Figures rounded to the nearest £10,000, where figures would round to zero one significant figure is shown. Green Deal efficiency savings are net of the estimated loan repayment.

[123] Green Deal efficiency savings are shown net of expected loan repayments, even though they are not an integral part of the cost of energy; see Annex B for details.

**Table F3: Estimated average impact of energy and climate change policies on an energy bill paid by an energy intensive user consuming 100,000MWh each of gas and electricity before policies ("balanced user")[124] (excludes measures government is considering on EU ETS, CPF and CfDs)**

| Real 2012 £s | 2013 | | | 2020 | | | 2030 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gas | Electricity | Total | Gas | Electricity | Total | Gas | Electricity | Total |
| Estimated bill without policies | 2.6m | 7.1m | 9.8m | 2.8m | 7.9m | 10.7m | 2.9m | 7.8m | 10.6m |
| Estimated impact of policies | 10,000 | 180,000 to 1.1m | 170,000 to 1.1m | 60,000 | 990,000 to 3.1m | 1.0 to 3.2m | 60,000 | 2.2 to 5.1m | 2.2 to 5.1m |
| *Products Policy* | *1,000* | *-100,000 to -120,000* | *-100,000 to -110,000* | *1,000* | *-490,000 to -610,000* | *-490,000 to -610,000* | *400* | *-330,000 to -430,000* | *-330,000 to -430,000* |
| *CCL* | *60,000* | *50,000* | *110,000* | *60,000* | *50,000* | *110,000* | *60,000* | *50,000* | *110,000* |
| *CCAs* | *-70,000* | *-130,000 to -140,000* | *-200,000 to -210,000* | *-10,000* | *-2,000 to -10,000* | *-10,000* | *0* | *0* | *0* |
| *EU ETS carbon cost* | - | *220,000* | *220,000* | - | *380,000* | *380,000* | - | *400,000 to 2.4m* | *400,000 to 2.4m* |
| *CPF carbon cost* | - | *130,000* | *130,000* | - | *1.1m* | *1.1m* | - | *2.0m to 0* | *2.0m to 0* |
| *RO support cost* | - | *0 to 780,000* | *0 to 780,000* | - | *0 to 1.3m* | *0 to 1.3m* | - | *0 to 520,000* | *0 to 520,000* |
| *EMR support cost* | - | - | - | - | *0 to 990,000* | *0 to 990,000* | - | *0 to 2.4m* | *0 to 2.4m* |
| *Small-scale FITs support cost* | - | *0 to 200,000* | *0 to 200,000* | - | *0 to 460,000* | *0 to 460,000* | - | *0 to 390,000* | *0 to 390,000* |
| *Wholesale price effects* | - | *0 to -30,000* | *0 to -30,000* | - | *0 to -560,000* | *0 to -560,000* | - | *0 to -330,000* | *0 to -330,000* |
| Estimated bill with policies | 2.6m | 7.3 to 8.2m | 9.9 to 10.9m | 2.8m | 8.9 to 11.0m | 11.7 to 13.9m | 2.9m | 9.9 to 12.9m | 12.9 to 15.8m |
| % impact (on baseline) | 0% | 2 to 15% | 2 to 11% | 2% | 13 to 39% | 10 to 30% | 2% | 28 to 65% | 21 to 48% |

Source: DECC 2013. Figures may not add due to rounding. Figures below £1m rounded to the nearest £10,000. Figures above £1m rounded to the nearest £100,000. Where figures would round to zero one significant figure is shown. The balanced user is presented for illustrative purposes. The gas and electricity impacts can be rescaled to get the energy bill impact for the other illustrative users.

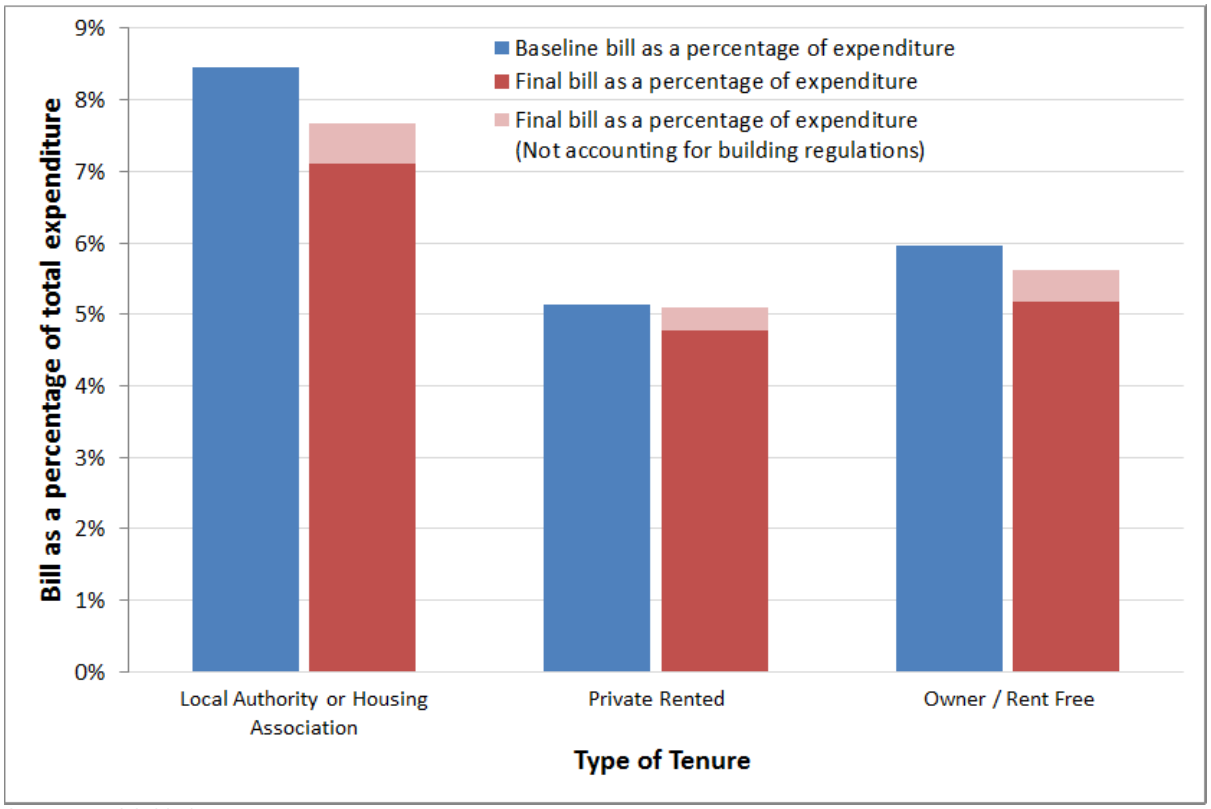
[124] The absolute £ figures in Table F3 are based on a user consuming 100,000MWh each of gas and electricity before policies. These impacts are scalable for larger or smaller scales of consumption. The percentage impacts would remain unchanged. For example, if a user consumes 2million MWh of gas, before efficiency savings, the impact of policies on the average gas bill in 2020 would be (2million / 100,000) x (£60,000) = around £1.2m. The % impact of policies would remain unchanged at 2%.

## Annex G: Further household distributional impacts analysis

This Annex presents additional analysis across the household distribution reflecting feedback received throughout the past year.

Chart G1 shows the differences in bills with and without energy and climate change policies as a percentage of expenditure broken down by the type of tenure. Those living in the private rented sector will, on average, see a smaller saving on their bills, with an average decrease of only 0.4% of their overall expenditure, compared with 1.4% and 0.8% savings for local authority/ housing association and owner occupied homes, respectively. However, on average, households in the private rented sector have bills which make up a smaller percentage of their total expenditure than both those living in local authority/housing associations or owner occupied homes, and this will remain the case.

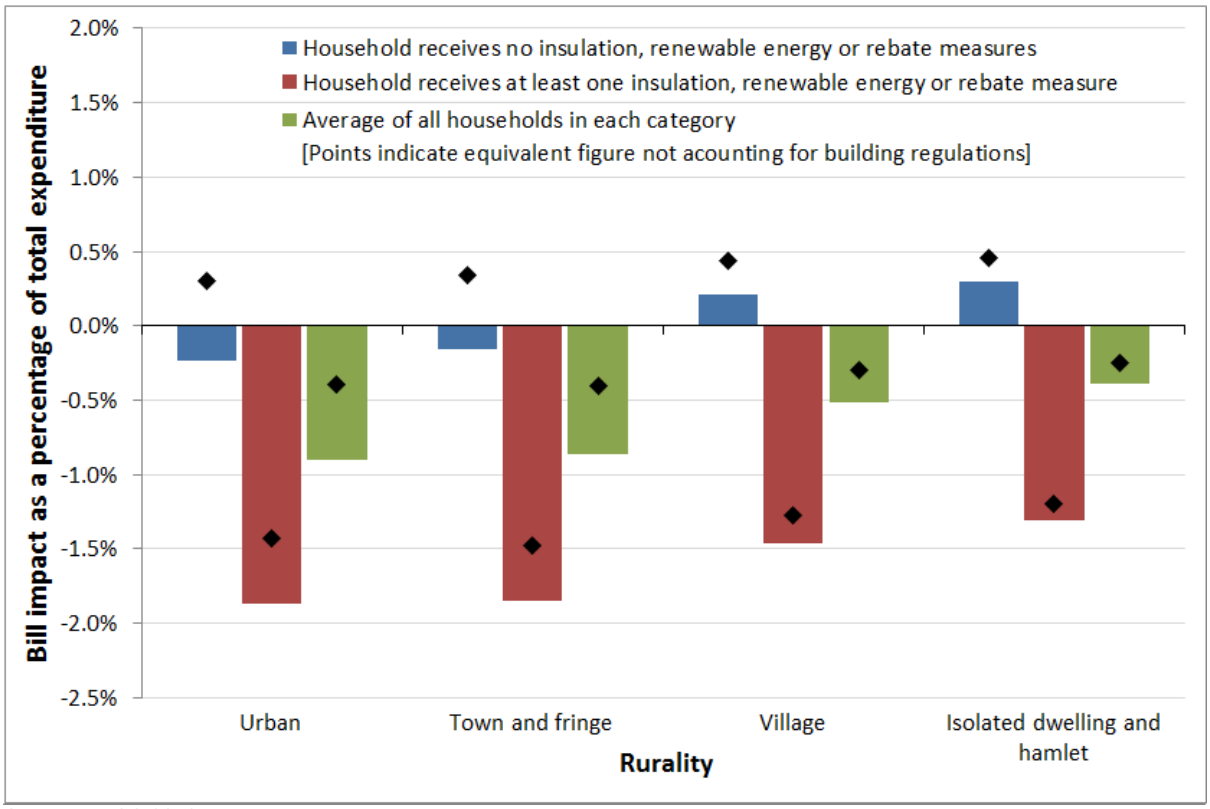
**Chart G1: Energy bill as a percentage of expenditure in 2020, with and without energy and climate change policies, by tenure type**




Source: DECC 2013.

Chart G2 looks at the impact on bills for those who do or do not take up measures, broken down by rurality/location (urban; town and fringe; village; isolated dwelling and hamlet). The modelling shows that average impacts on bills do not vary considerably across different locations, with all categories showing bill reductions.

**Chart G2: The effect of receiving a measure on the impact of policies on household energy bills as a percentage of expenditure in 2020 – across rurality**




Source: DECC 2013.

## Annex H: Results of sensitivity analysis

**Table H1: Estimated average impact of energy and climate change policies on household gas and electricity prices and bills (including VAT) – "Low" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | |
| Average **gas price** without policies | 37 | 39 |
| Average **gas price** with policies | 40 | 39 |
| Impact of policies on average **gas price** | 2<br>(7%) | 0<br>(0%) |
| Average **electricity price** without policies | 124 | 125 |
| Average **electricity price** with policies | 179 | 197 |
| Impact of policies on average **electricity price** | 54<br>(44%) | 72<br>(57%) |
| **Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £617 | £641 |
| Average **gas bill** with policies | £559 | £563 |
| Impact of policies on average **gas bill** | -£59<br>(-9%) | -£78<br>(-12%) |
| Average **electricity bill** without policies | £557 | £561 |
| Average **electricity bill** with policies | £545 | £692 |
| Impact of policies on average **electricity bill** | -£12<br>(-2%) | £131<br>(23%) |
| Average **energy bill** without policies | £1,174 | £1,201 |
| Average **energy bill** with policies | £1,103 | £1,255 |
| Impact of policies on average **energy (gas plus electricity) bill** | -£70<br>(-6%) | £53<br>(4%) |
| *Impact of policies on average **energy bill – Excluding boiler regulations*** | *-£14*<br>*(-1%)* | *£88*<br>*(7%)* |

Source: DECC 2013. Numbers may not add up due to rounding.

**Table H2: Estimated average impact of energy and climate change policies on household gas and electricity prices and bills (including VAT) – "High" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | |
| Average **gas price** without policies | 61 | 64 |
| Average **gas price** with policies | 64 | 64 |
| Impact of policies on average **gas price** | 3<br>(4%) | 0<br>(0%) |
| Average **electricity price** without policies | 174 | 173 |
| Average **electricity price** with policies | 218 | 225 |
| Impact of policies on average **electricity price** | 45<br>(26%) | 52<br>(30%) |
| **Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £1,016 | £1,058 |
| Average **gas bill** with policies | £890 | £920 |
| Impact of policies on average **gas bill** | -£127<br>(-12%) | -£138<br>(-13%) |
| Average **electricity bill** without policies | £778 | £776 |
| Average **electricity bill** with policies | £653 | £781 |
| Impact of policies on average **electricity bill** | -£126<br>(-16%) | £5<br>(1%) |
| Average **energy bill** without policies | £1,794 | £1,834 |
| Average **energy bill** with policies | £1,542 | £1,700 |
| Impact of policies on average **energy (gas plus electricity) bill** | -£252<br>(-14%) | -£134<br>(-7%) |
| *Impact of policies on average **energy bill – Excluding boiler regulations*** | *-£153*<br>*(-9%)* | *-£70*<br>*(-4%)* |

Source: DECC 2013. Numbers may not add up due to rounding.

**Table H3a: Estimated average impact of energy and climate change policies on gas and electricity costs paid by medium-sized business users (non-CRC participant) – "Low" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | |
| Average **gas unit cost** without policies | 22 | 23 |
| Average **gas unit cost** with policies | 24 | 25 |
| Impact of policies on average **gas unit cost** | 2 (8%) | 2 (8%) |
| Average **electricity unit cost** without policies | 66 | 67 |
| Average **electricity unit cost** with policies | 114 | 138 |
| Impact of policies on average **electricity unit cost** | 48 (74%) | 71 (106%) |
| **Total cost/Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £340,000 | £350,000 |
| Average **gas bill** with policies | £360,000 | £380,000 |
| Impact of policies on average **gas bill** | £20,000 (7%) | £30,000 (7%) |
| Average **electricity bill** without policies | £720,000 | £740,000 |
| Average **electricity bill** with policies | £1.18m | £1.45m |
| Impact of policies on average **electricity bill** | £450,000 (63%) | £710,000 (96%) |
| Average **energy bill** without policies | £1.06m | £1.09m |
| Average **energy bill** with policies | £1.54m | £1.83m |
| Impact of policies on average **energy (gas plus electricity) bill** | £480,000 (45%) | £740,000 (68%) |

Source: DECC 2013. Numbers may not add up due to rounding. Bill figures rounded to the nearest £10,000.

**Table H3b: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by medium-sized business users (CRC participant) – "Low" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | |
| Average **gas unit cost** without policies | 22 | 23 |
| Average **gas unit cost** with policies | 27 | 28 |
| Impact of policies on average **gas unit cost** | 5 (22%) | 5 (21%) |
| Average **electricity unit cost** without policies | 66 | 67 |
| Average **electricity unit cost** with policies | 117 | 140 |
| Impact of policies on average **electricity unit cost** | 51 (77%) | 73 (109%) |
| **Total cost/Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £340,000 | £350,000 |
| Average **gas bill** with policies | £330,000 | £370,000 |
| Impact of policies on average **gas bill** | -£10,000 (-2%) | £20,000 (6%) |
| Average **electricity bill** without policies | £720,000 | £740,000 |
| Average **electricity bill** with policies | £1.19m | £1.46m |
| Impact of policies on average **electricity bill** | £460,000 (64%) | £720,000 (98%) |
| Average **energy bill** without policies | £1.06m | £1.09m |
| Average **energy bill** with policies | £1.52m | £1.83m |
| Impact of policies on average **energy (gas plus electricity) bill** | £460,000 (43%) | £740,000 (68%) |

Source: DECC 2013. Numbers may not add up due to rounding. Bill figures rounded to the nearest £10,000.

**Table H4a: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by medium-sized business users (non-CRC participant) – "High" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | |
| Average **gas unit cost** without policies | 46 | 47 |
| Average **gas unit cost** with policies | 47 | 49 |
| Impact of policies on average **gas unit cost** | 2 (4%) | 2 (4%) |
| Average **electricity unit cost** without policies | 113 | 113 |
| Average **electricity unit cost** with policies | 150 | 162 |
| Impact of policies on average **electricity unit cost** | 37 (33%) | 49 (44%) |
| **Total cost/Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £700,000 | £710,000 |
| Average **gas bill** with policies | £720,000 | £740,000 |
| Impact of policies on average **gas bill** | £20,000 (2%) | £30,000 (4%) |
| Average **electricity bill** without policies | £1.24m | £1.24m |
| Average **electricity bill** with policies | £1.54m | £1.70m |
| Impact of policies on average **electricity bill** | £300,000 (24%) | £460,000 (37%) |
| Average **energy bill** without policies | £1.94m | £1.95m |
| Average **energy bill** with policies | £2.26m | £2.44m |
| Impact of policies on average **energy (gas plus electricity) bill** | £320,000 (16%) | £480,000 (25%) |

Source: DECC 2013. Numbers may not add up due to rounding.

**Table H4b: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by medium-sized business users (CRC participant) – "High" fossil fuel price scenario**

| | 2020 | 2030 |
|---|---|---|
| **Unit cost impacts (real 2012 £/MWh and % change)** | | |
| Average **gas unit cost** without policies | 46 | 47 |
| Average **gas unit cost** with policies | 51 | 52 |
| Impact of policies on average **gas unit cost** | 5<br>(10%) | 5<br>(10%) |
| Average **electricity unit cost** without policies | 113 | 113 |
| Average **electricity unit cost** with policies | 153 | 164 |
| Impact of policies on average **electricity unit cost** | 40<br>(35%) | 51<br>(45%) |
| **Total cost/Bill impacts (real 2012 £ and % change)** | | |
| Average **gas bill** without policies | £700,000 | £710,000 |
| Average **gas bill** with policies | £620,000 | £690,000 |
| Impact of policies on average **gas bill** | -£80,000<br>(-11%) | -£20,000<br>(-3%) |
| Average **electricity bill** without policies | £1.24m | £1.24m |
| Average **electricity bill** with policies | £1.55m | £1.71m |
| Impact of policies on average **electricity bill** | £310,000<br>(25%) | £470,000<br>(38%) |
| Average **energy bill** without policies | £1.94m | £1.95m |
| Average **energy bill** with policies | £2.17m | £2.40m |
| Impact of policies on average **energy (gas plus electricity) bill** | £230,000<br>(12%) | £450,000<br>(23%) |

Source: DECC 2013. Numbers may not add up due to rounding.

**Table H5: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by large energy intensive users compared with prices and bills in the absence of policies – "Low" fossil fuel price scenario (excludes measures government is considering on EU ETS, CPF and CfDs)**

| | 2020 | 2030 |
|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | |
| Average **gas price** without policies | 17 | 18 |
| Average **gas price** with policies | 18 | 19 |
| Impact of policies on average **gas price** | 1<br>(4%) | 1<br>(3%) |
| Average **electricity price** without policies | 56 | 56 |
| Average **electricity price** with policies | 69 to 99 | 81 to 123 |
| Impact of policies on average **electricity price** | 13 to 44<br>(24 to 79%) | 25 to 67<br>(45 to 119%) |
| **Bill impacts (real 2012 £s and % change) – illustrative 100GWh p.a. users** | | |
| Average **gas bill** without policies | £1.7m | £1.8m |
| Average **gas bill** with policies | £1.8m | £1.9m |
| Impact of policies on average **gas bill** | £0.1m<br>(3%) | £0.1m<br>(3%) |
| Average **electricity bill** without policies | £5.6m | £5.6m |
| Average **electricity bill** with policies | £6.5 to 9.4m | £7.9 to 11.9m |
| Impact of policies on average **electricity bill** | £1.0 to 3.9m<br>(17 to 69%) | £2.3 to 6.3m<br>(40 to 112%) |
| **Illustrative energy (gas and electricity) bill impacts[125]** | | |
| Electro-intensive user | 16 to 65% | 38 to 104% |
| Balanced user | 14 to 54% | 31 to 85% |
| Gas intensive user | 10 to 33% | 20 to 51% |

Source: DECC 2013. Figures may not sum due to rounding. Bill figures rounded to the nearest £0.1m.

[125] The illustrative users have been selected based on data on existing consumption mixes by CCA users.

**Table H6: Estimated average impact of energy and climate change policies on gas and electricity prices and bills paid by large energy intensive users compared with prices and bills in the absence of policies – "High" fossil fuel price scenario (excludes measures government is considering on EU ETS, CPF and CfDs)**

| | 2020 | 2030 |
|---|---|---|
| **Price impacts (real 2012 £/MWh and % change)** | | |
| Average **gas price** without policies | 38 | 39 |
| Average **gas price** with policies | 39 | 40 |
| Impact of policies on average **gas price** | 1<br>(2%) | 1<br>(2%) |
| Average **electricity price** without policies | 100 | 100 |
| Average **electricity price** with policies | 116 to 133 | 125 to 144 |
| Impact of policies on average **electricity price** | 16 to 32<br>(15 to 32%) | 25 to 45<br>(25 to 45%) |
| **Bill impacts (real 2012 £s and % change) – illustrative 100GWh p.a. users** | | |
| Average **gas bill** without policies | £3.8m | £3.9m |
| Average **gas bill** with policies | £3.9m | £4.0m |
| Impact of policies on average **gas bill** | £0.1m<br>(1%) | £0.1m<br>(2%) |
| Average **electricity bill** without policies | £10.0m | £10.0m |
| Average **electricity bill** with policies | £11.0 to 12.6m | £12.1 to 14.0m |
| Impact of policies on average **electricity bill** | £0.9 to 2.5m<br>(9 to 25%) | £2.1 to 4.0m<br>(21 to 40%) |
| **Illustrative energy (gas and electricity) bill impacts[126]** | | |
| Electro-intensive user | 9 to 23% | 19 to 37% |
| Balanced user | 7 to 18% | 16 to 29% |
| Gas intensive user | 5 to 11% | 9 to 17% |

Source: DECC 2013. Figures may not sum due to rounding. Bill figures rounded to the nearest £0.1m.

[126] The illustrative users have been selected based on data on existing consumption mixes by CCA users.

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