



↑ ENERGY  
EXPLAINED →

# THE CHANGING COST OF UK ENERGY

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Data and information used in this report is provided for use by the public and in the interests of increasing public awareness. All data referred to is derived from previously published npower data (such as data extracted from our segmental reports) or third party information compiled from publicly available sources. This report does not reflect or indicate in any way npower's future costs, pricing or business strategy. All statements, claims, expectations or assumptions made are based on the data used in this report only.

# INTRODUCTION

Welcome to Energy Explained – a concerted effort to make the complex simple.

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Energy Explained seeks to create a better understanding of the facts behind the energy industry and to help people make informed decisions about the energy they use. The content of this report is based entirely on presenting factual information, not opinion, and that is key. Energy Explained is about transparency and presenting information clearly and simply.

This is the first in a series of reports which will explore the changing landscape of energy costs. We hope you will find it informative.

The logo for 'Energy Explained' features the word 'ENERGY' in a large, bold, solid blue sans-serif font. Below it, the word 'EXPLAINED' is written in a smaller, blue, dashed-outlined sans-serif font. The text is enclosed within a thin black L-shaped frame that has an upward-pointing arrow on the vertical line and a rightward-pointing arrow on the horizontal line.

**ENERGY**  
EXPLAINED

## CEO FOREWORD

The UK is in the process of transforming the way we generate, distribute and use energy. There is an urgent need to rebuild trust in the energy sector, to ensure consumers understand and support the reasons behind this transformation – and the only way we can do this is to start with the facts...



Energy costs are rising. This is an undisputable fact, and it's time that all of us involved in energy in the UK are upfront about it. Even more importantly, it's time we explained to British consumers – from individual households to large businesses – exactly what is driving this increase in costs and where their money goes.

Ensuring a reliable supply of electricity from source to switch is a complex and costly process. Exploration, production and transportation put a commodity cost on energy before it even gets to Britain's shores. Once it's here, there are hundreds of other factors that will influence the final figure that appears on a domestic energy bill.

Everyone will have already come to their own conclusions about who is ultimately responsible for rising energy bills. More often than not, it is energy companies who are blamed. A survey recently carried out

by npower showed that most people think we make profits of around 40 percent. In fact, our 2012 profit margin was around five percent – about the same as most supermarkets, and far lower than many other FTSE-listed companies.

These misconceptions are, at least in part, due to a historic lack of transparency in our industry. We haven't been as clear as we could have been about bills, tariffs and what makes up the cost of energy and, because of this, myths have arisen about the actual influence energy companies have over energy costs. The disparity between perception and reality is very concerning, and something that needs to be urgently addressed.

There are things that we need to change, and we are working hard to improve in these areas. The pledge I made when I took up the post of RWE npower CEO at the start of this year was to put customers at the heart of everything we do, and

we've already started to do this by developing simpler bills, reducing the number of tariffs we offer, and making the customer journey clearer than ever before.

These are the things that we have control over and need to make sure we get right. However, there are a lot of things that are out of our control. The cost of funding government policies for renewable energy, social support and energy efficiency is increasing faster than any other part of an energy bill. These initiatives are all important – but consumers need to be aware that delivering them is causing energy costs to increase, and will continue to do so for some time into the future.

We have launched *Energy Explained* to make sure that people know the facts – so that they understand exactly where their money goes, and can make informed decisions about energy.

We will be publishing a new report every six months, looking at the changing landscape of energy costs, how this impacts businesses as well as households, and what is ultimately driving the increase in energy bills.

This first report looks at exactly what goes into the energy bills of British consumers. It explains the make-up of an energy bill, shows how prices are likely to change in the coming years, and explores what we can all do to help tackle rising energy costs and manage the energy we use. Most of all, it presents the facts about energy, rather than opinion. I hope you find it interesting and informative.



Paul Massara, RWE npower CEO  
July 2013

**Trend of costs**  
(% increase 2007 – 2020)

POLICY & REGULATION



339%

SUPPLIER



30%

ENERGY TRANSPORTATION



124%

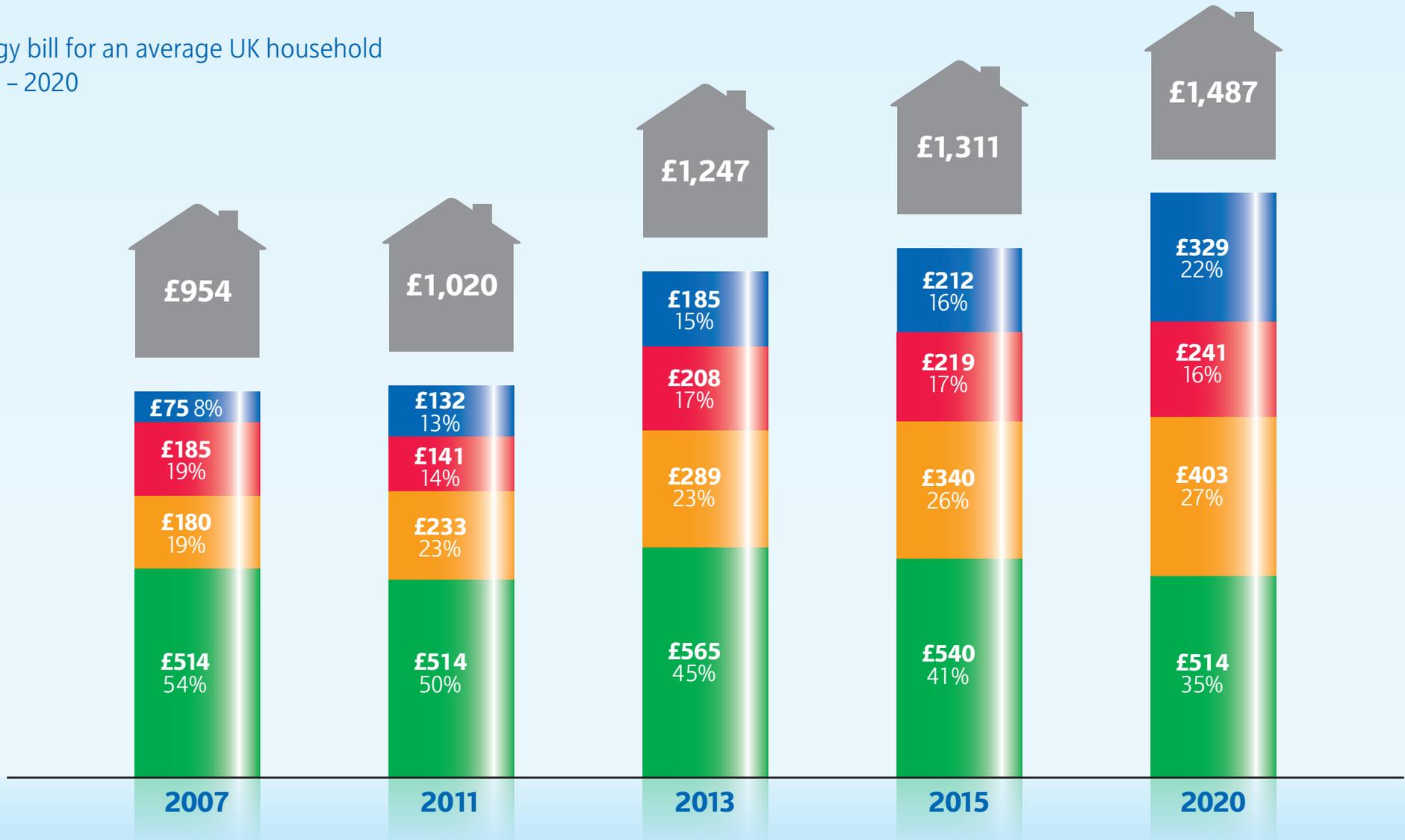
COMMODITY AND PRODUCTION



0%

## THE RISING COST OF UK ENERGY

Energy bill for an average UK household  
2007 – 2020



## Key

 Policy and regulation costs

 Supplier costs

 Transport costs

 Commodity and production costs

**Policy and regulation costs**

- Policy and regulation costs are expected to rise by 78% between 2013 and 2020. This cost will help pay for the UK's move to a low carbon economy and significantly improve the energy efficiency of the UK's housing stock.

**Supplier costs**

- Energy suppliers like npower have costs that make up around 16% of an average domestic bill. In this data set, the only element of supplier costs set to increase by 2020 is the new cost of rolling out of smart meters to all UK households.

**Transportation costs**

- The cost of updating the UK's network infrastructure to accommodate lower carbon and more distributed generation technologies is expected to add an additional £114 on the average domestic bill by 2020 – a 124% increase compared to 2007 prices.

**Commodity and production costs**

- These costs currently make up 45% of an average bill, but by 2020 this will reduce to 35% as rising policy and transportation costs become more significant elements of the bill.

Breakdown of an average dual fuel energy bill based on Ofgem notional consumption of 16,500kWh gas and 3,300kWh electricity.

## POLICY AND REGULATION COSTS

Policy and regulation costs account for the cost of supporting low carbon technologies; carbon tax and VAT; maintaining security of supply; and delivering energy efficiency obligations and vulnerable customer support.

Energy policy is critical for both Britain's economy and our wellbeing. Government policy aims to tackle climate change, improve the UK's housing stock and move to a low carbon economy, whilst maintaining the security of our energy supplies and keeping energy costs affordable, particularly for the country's most vulnerable people. In doing so, the British Government has chosen to move the cost of delivering these policy objectives from the tax payer to the energy consumer.

The cost of supporting low carbon technologies is estimated to grow from £12 on the bill in 2007 to £82 in 2020,

whilst the cost of carbon will increase by £45 over the same period. The cost of obligating energy supply companies to improve the energy efficiency of Britain's homes will mean a rise to £88 on the average energy bill by 2020 (an increase from £17 in 2007), driven primarily by the increased cost of delivering the Energy Company Obligation.

By 2020, the relative influence of Government policy and regulation costs on energy will have increased by almost 340%. These policy and regulation costs are predominantly increased charges on the electricity bill rather than the gas bill.



**339%**

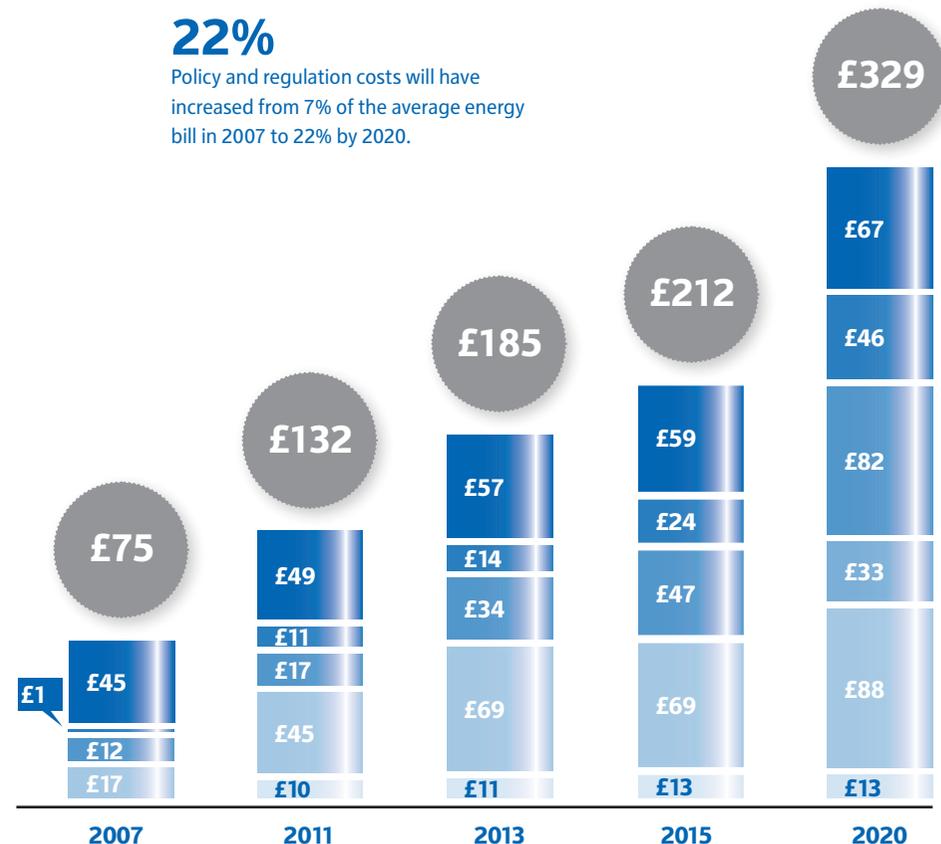
The impact of Government policy and regulation is the single biggest cause of the increasing cost of energy between 2007 and 2020: a 339% increase totalling an extra £252 on an average bill.

Key to chart

- Direct tax
- Carbon tax
- Supporting low carbon technologies
- Maintaining security of supply
- Improving customer energy efficiency
- Supporting vulnerable customers

**22%**

Policy and regulation costs will have increased from 7% of the average energy bill in 2007 to 22% by 2020.



# SUPPLIER COSTS

Energy suppliers like npower have to cover their cost to operate. Combined, these costs make up 16% of a bill and represent the only part of the bill that energy suppliers are able to control.

Although the operational costs associated with running a supply business are reducing over time as costs are controlled in a highly competitive market, the supplier costs on customers' bills are showing a slight overall upward trend to 2020. In this dataset, this rise is due to the increased metering costs associated with rolling out new smart meters to all 26 million households in the UK – expected to add £24 to the average bill by the end of the decade.

Supplier profit varies, but can be thought of as generally around 5% of the energy bill. This margin is significantly lower than many FTSE100 companies report. A reasonable level of profit is also required to enable energy companies to invest in new infrastructure and generation capacity.



## 2020

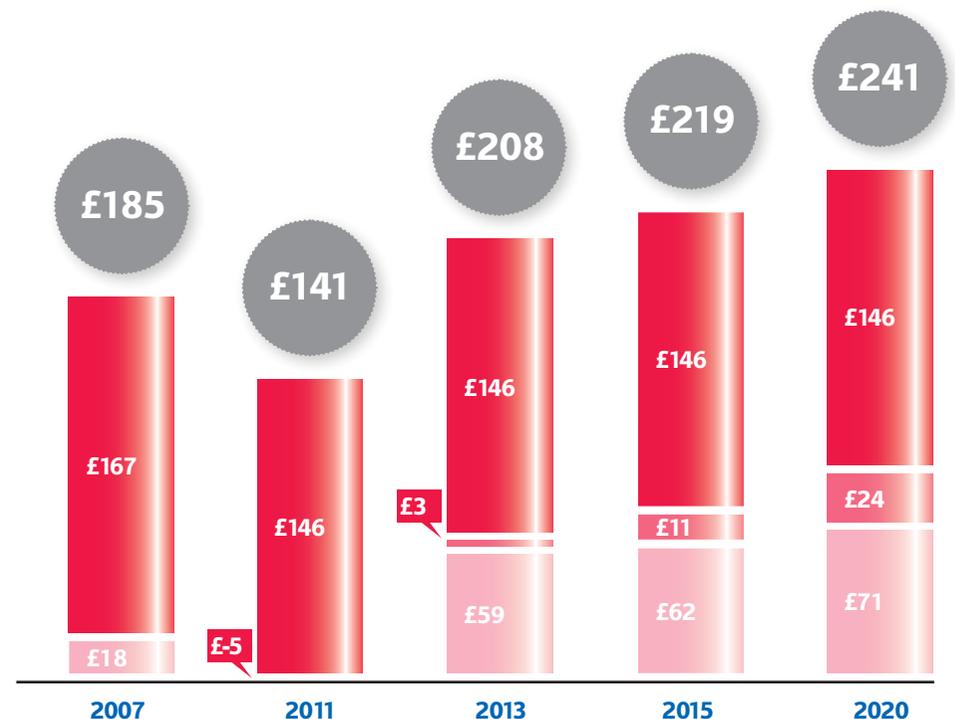
The cost of delivering the government's smart meter programme is the only element in supplier costs expected to increase by 2020.

## 5%

Supplier profit margins account for around 5% of the total energy bill.

### Key to chart

- Operating costs excluding smart meter roll out
- Introduction of smart meters
- Profit



# TRANSPORTATION COSTS

The prices energy suppliers are charged by the companies who own and operate Britain’s electricity and gas networks are expected to increase significantly. The amount customers pay for the use of these networks is expected to rise by 124% between 2007 and 2020, meaning an extra £223 added to the average domestic bill over that time.

Britain’s networks are undergoing substantial investment to ensure they are fit for a low carbon future. New power stations need to be connected to the network with new lines, and new renewable energy technologies tend to be located in areas with little existing network infrastructure. Planning difficulties have meant a new emphasis on underground lines which can be up to ten times more expensive than traditional overhead lines.

Smart technologies, and the increasing use of smaller generation technologies across the networks, also require substantial upgrades to network infrastructure not originally designed to operate in this way.

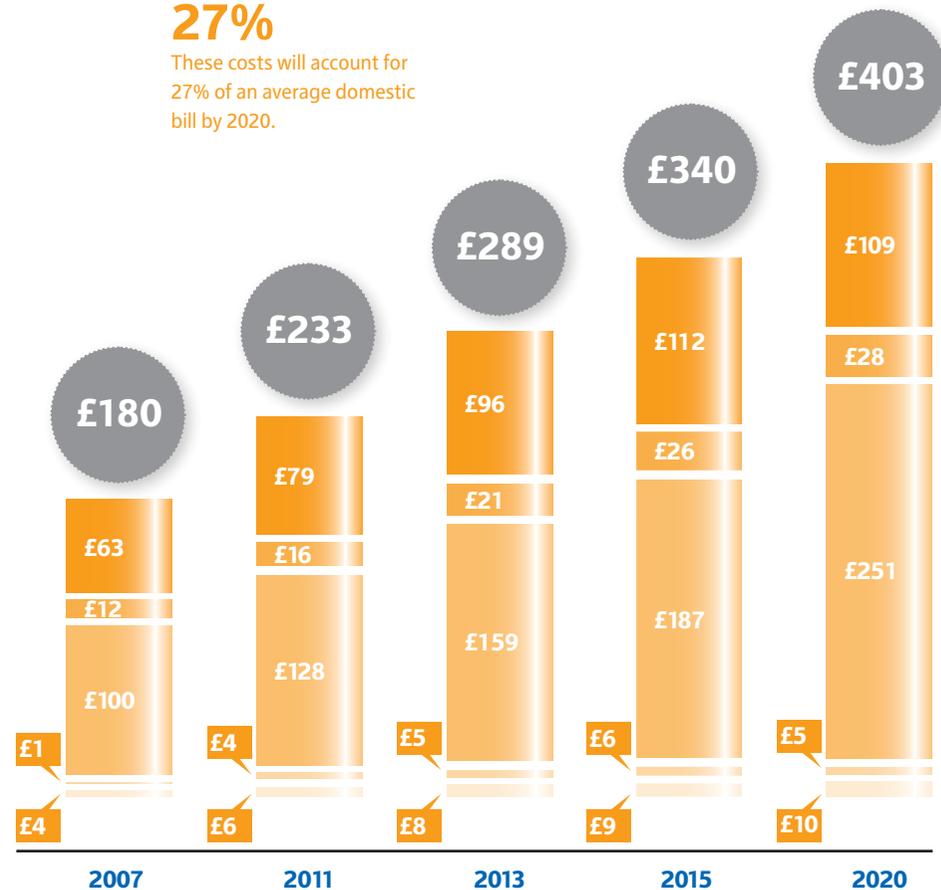
Networks are natural monopolies and cannot operate in a competitive environment. The profit they make is therefore controlled by the energy regulator, Ofgem.



**39%**  
Transportation costs are set to increase by an additional 39% by 2020.

**27%**  
These costs will account for 27% of an average domestic bill by 2020.

- Key to chart
- Use of distribution network charge
  - Use of National Grid charge
  - Use of national gas network charge
  - Gas storage costs
  - Balancing and other charges



# COMMODITY AND PRODUCTION COSTS

The UK is a net importer of oil and gas, meaning it must compete on the global market for the energy we need to fuel our homes and businesses. Competing on the global commodity market means costs are strongly influenced by many factors, from global politics to natural disasters.

Minute-to-minute and day-to-day, these commodity prices fluctuate. One of the main jobs of energy suppliers is to buffer customers from these wholesale price spikes.

Future commodity costs are difficult to estimate, but the continued growth of developing economies like India and China is likely to drive prices up overall as global demand for energy increases in the long-term. New sources of fossil fuel like shale gas may have an impact, but current expectations do not see this outweighing the pressures driving costs upwards.

The displacement of fossil fuels by alternative sources of energy will eventually make energy costs less reliant on global commodity costs.

However, this transition takes time and major investment to be delivered, the impacts of which can be seen in the increase in Government policy and regulation costs and a significant portion of the increased transport costs.

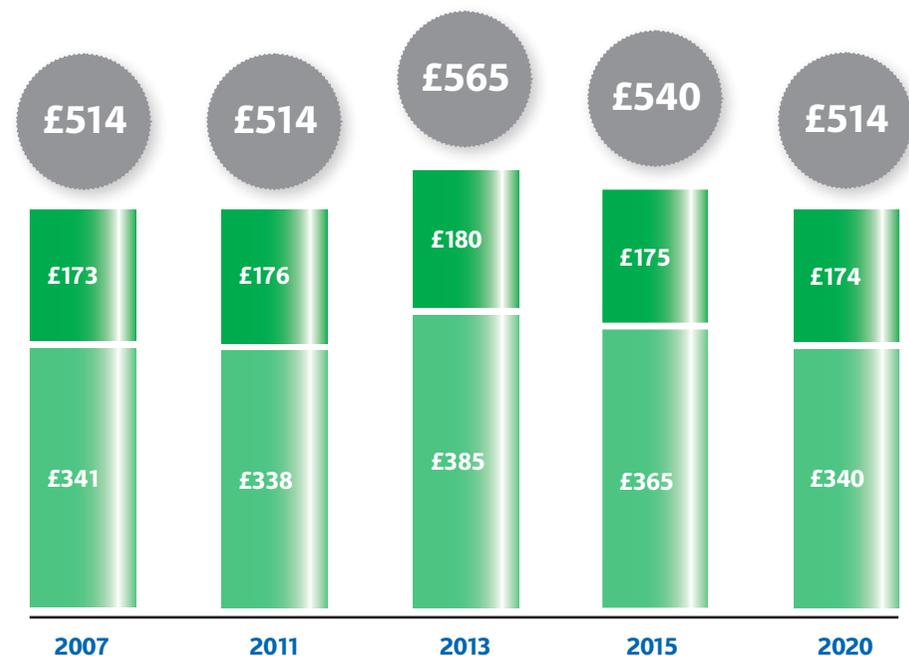
\*The cost of the EU Emissions Trading Scheme and Carbon Floor Price are included within Policy and Regulation Costs.



**45%**  
Commodity and production currently account for 45% of an average household bill.

**35%**  
By 2020, this will have changed to around 35% as other costs increase.

Key to chart  
■ Electricity costs  
■ Gas costs



## TACKLING HOUSEHOLD ENERGY COSTS

Only by giving equal scrutiny to all cost areas will we be able to give the fairest deal to customers. However, the cheapest unit of energy is always the one that isn't used. We must all play our part in ensuring customers are better engaged in how they use energy.

# 16%

Suppliers currently only control around 16% of a average customer's bill.

# £477

The increasing cost of policy, regulation and transportation together account for a £477 increase in customers' bills between 2007 and 2020 .

**Scrutiny is currently directed at energy suppliers to control and lower energy bills, but suppliers currently only control around 16% of a typical customer's bill, whilst direct and indirect policy-related charges, including increased costs on networks, could soon account for more than half of energy costs.**

The increasing cost of policy, regulation and transportation together account for a £447 increase in customers' bills between 2007 and 2020. Even with a tighter control on network charges and increased scrutiny to ensure new policy is delivered in the most cost-effective way, Government objectives will mean a significant rise in the cost of energy.

In May 2013, the Department of Energy and Climate Change published a report on the estimated impact of policies on energy bills. It stated that household bills would be £166 lower in 2020 than they would have been without these policies – but only providing ambitious energy efficiency targets are achieved.

The figures in this report assume that energy use does not decrease to give a true reflection of the possible impact of the rising cost of energy if consumer behaviour does not change. It anticipates that energy bills could rise to £1487, a £240 rise from today's average bill.

**“The clearest message presented in this report is that without reducing their energy consumption, consumers will face significantly higher energy bills by 2020.”**

A major strand of energy policy – and key to tackling rising costs – is supporting consumers to improve the energy efficiency of their homes. RWE npower is fundamentally changing the way we do business to support this objective. Since 2008, 2.4 million wall cavities, 4.9 million lofts and 88,000 solid walls have already been insulated by major energy suppliers through Government schemes. The challenge is now to move on to the harder-to-tackle homes and progress the proper integration of new technologies that will allow consumers to engage with their energy use more effectively.

One concern is that those households who do not reduce their consumption will end up subsidising those who do, as the unit cost of energy increases to cover the cost of government policy and regulation. This means that it is vital that vulnerable customers, in particular, receive the right support to ensure they are able to take

advantage of the free and discounted efficiency measures available to them. RWE npower is working hard to make this happen, in coordination with local government and communities across the UK.

Government policy is rightly addressing the need to reduce consumption, but a major step change across the country in attitudes and behaviour is required to achieve the ambitious targets Government has set out.

The UK needs new policy to deliver a clean, secure and affordable energy supply for the future, and the data presented in this report is not intended as a critique of Government policy. The rising cost of energy can be tackled – but only if Government, industry and business work together to present a clear message to consumers to convince them of the need to take action.

## DATA TABLES

## Average\* Domestic Customer at 2013 prices

Dual Fuel Bill at 2013 prices		Cost (£)				
		2007	2011	2013	2015	2020
	<b>Government energy policy &amp; regulation costs</b>					
	- Direct tax	45	49	57	59	67
	- Carbon tax	1	11	14	24	46
	- Supporting low carbon technologies	12	17	34	47	82
	- Maintaining security of supply	0	0	0	0	33
	- Improving customer energy efficiency	17	45	69	69	88
	- Supporting vulnerable customers	0	10	11	13	13
<b>Total</b>	<b>75</b>	<b>132</b>	<b>185</b>	<b>212</b>	<b>329</b>	
	<b>Supplier Costs</b>					
	- Operating costs exc Smart	167	146	146	146	146
	- Introduction of smart meters	0	0	3	11	24
	- Profit	18	-5	59	62	71
<b>Total</b>	<b>185</b>	<b>141</b>	<b>208</b>	<b>219</b>	<b>241</b>	
	<b>Energy transportation costs</b>					
	- Use of distribution network charge	63	79	96	112	109
	- Use of National Grid charge	12	16	21	26	28
	- Use of national gas network charge	100	128	159	187	251
	- Gas storage costs	1	4	5	6	5
	- Balancing and other charges	4	6	8	9	10
<b>Total</b>	<b>180</b>	<b>233</b>	<b>289</b>	<b>340</b>	<b>403</b>	
	<b>Commodity &amp; production costs</b>					
	- Electricity costs	173	176	180	175	174
	- Gas costs	341	338	385	365	340
<b>Total</b>	<b>514</b>	<b>514</b>	<b>565</b>	<b>540</b>	<b>514</b>	
<b>Total</b>	<b>954</b>	<b>1020</b>	<b>1247</b>	<b>1311</b>	<b>1487</b>	

\*All figures are at 2013 realtime values

Volumes are normalised to notional average  
(3300 kwh power, 16500 kwh gas per account)

## NOTES AND ASSUMPTIONS

### Element of bill

### Basis/source(s)

#### General

- RPI factors taken from a modelled average derived from Government DMO published Conventional & Index-Linked Gilts and Treasury data. This is used to adjust all periods to 2013 real costs.
- Power 3300 kWh & Gas 16500kWh average consumption values based on current OFGEM notional average.
- Margins are equalised across fuels to show no bias.
- Historical data for 2011 and 2007 based on published npower actual figures on all lines unless stated.

#### Policy and regulation costs

##### VAT

- Standard VAT rate of 5% prevails across all future periods.

#### Energy efficiency costs (eg. ECO, CERT, CESP)

- CERT / CESP costs are per npower for 2007 and 2011 (published £/tCO<sub>2</sub>).
- ECO forecasts from 2013-15 assume £1.7bn industry cost pa (NERA 2013 report).
- 2020 cost based on assumption of 10% base cost increase.

#### Supporting vulnerable customers (eg. Warm Home Discount)

- Data from DECC March-13 bill impacts report for 2013 and 2020 – which uses 4.5MWh and 16.6MWh consumption assumptions.

#### Supporting Low Carbon Technologies

##### 1. FITs

1. DECC Bill impacts data used for 2013 and 2020.

##### 2. Renewable Obligations/CfD

2. Figure published by DECC for 2013 of £8.2/MWh. For 2020 DECC have quoted £14/MWh.

#### Carbon cost (EU ETS & CFP)

- DECC and Government budget statements available for years 2013 and 2015.
- DECC carbon cost trajectory referenced for total carbon cost in 2020 of £30/tCO<sub>2</sub> at 2009 prices.

#### EU ETS:

- DECC & OFGEM statements for historical costs (2010 and 2011 bill breakdown papers).
- DECC and Government budget statements used for 2013 and 2015 forecasts.
- Split for 2020 based on latest DECC estimate of 75% carbon support and 25% ETS.

#### Maintaining security of supply

- DECC use £10/MWh at 2012 prices (£12/MWh 2013 price) for 2020.

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## Element of bill

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### Supplier Costs

Operating Costs (excl Smart meters)

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## Basis/source(s)

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Supplier costs comprise all costs to compete, serve and metering, including apportioned central support costs

- 2007 costs stem from OFGEM cost to operate and serve estimates – through 2008 supply probe insights and May-07 supply market indicator (SMI) report.
- Consolidated Segmental submissions from all suppliers for 2011 used to compute metering and operating costs in total. This was then presumed to be flat in future years on a real time basis as no definitive third party forecast is available.

Cost to Meter (excl. smart metering)

- DECC quote £9/MWh (gas) and £34/MWh (elec) at 2012 real prices for 2020 for supplier costs and margin in total.

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Cost to meter (smart meters)

- Adopted DECC March-13 Bill Impact figures of £0.4/MWh for power and £0.1/MWh for gas at 2012 real prices for 2013 trial costs.
- 2020 costs are net of assumed cost to operate benefits and sit within market benchmarking (E&Y) and DECC implementation ranges.

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Margin

- Historical margin % is per npower publicly available financial information and records in 2007 and 2011.
- Forecast margins based on a theoretical average of 5% delivered equally on each fuel. Recent OFGEM segmental results shows an average of c4-4.5%.

### Transportation costs

Distribution and Transportation  
Network charges, and Balancing costs  
(DUoS, TNUoS & BSUoS)

- Network forecast figures are regulated. 2013 prices are based on official OFGEM published prices by region as released in April-13. Guide prices for 2015 are also produced by OFGEM. Costs for 2020 closely align to DECC's estimation.

### Commodity costs

Commodity costs (net purchasing costs)

- Base forward commodity costs sourced from public indexed forward curves (eg. Heron etc.).
- Commodity costs inclusive of transaction costs.
- Method for 2011-2015 costs is consistent with OFGEM's approach for their monthly SMI reporting, using an 18 month ahead buying pattern.
- 2020 cost derived from DECC central price growth % assumptions from 2015 to 2020 at 2012 real costs.
- EU ETS & carbon cost elements deducted from total energy cost to leave net purchase cost.

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