Typical energy customer tariff breakdown

Summary of Analysis

12th August 2016

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1. Introduction

PwC were engaged by Energy UK to perform the following services:

- Develop historical and forecast estimates of wholesale, operational, environmental and social policy and network costs that contribute to a typical, dual fuel customer bill, between the years 2010/11 and 2016/17.
- Develop a graphical presentation of the data.
- Keep detailed records of all calculations, data sources and assumptions.

The purpose of this note is to summarise the calculations performed in this analysis. The typical customer in the context of this analysis represents a customer who is served by a large energy supply company and whose consumption is at the medium level based on Ofgem's Typical Domestic Consumption Values (TDCVs) for gas and electricity profile class 1 as of May 2015.

The general methodology employed in this analysis, has been to generate per unit costs (£/kWh) for four components of the domestic customer bill (1 to 4 in the table below). The table summarises where historical and estimated data has been used for these components. It also indicates VAT and consumption levels have been held constant throughout the period of analysis. Each unit cost estimate is multiplied by Ofgem's TDCVs for both gas and electricity (class 1) to produce estimated bills for a typical domestic gas and electricity customer separately. We combine these estimates without adjustment to give the typical dual fuel bill.

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Historical data Held constant Estimated data

Section 2 summaries the major assumptions we have made in the analysis. Section 3, then presents the calculations for each of the cost items in each year of the analysis, in the order below:

- wholesale costs,
- operational costs,
- network costs, and
- environmental and social policy costs (E&SP)

2. Summary of assumptions

Assumption	Description	Source
Price base	All numbers reported in this analysis are in real 2016/17 prices.	N/A
Inflation indices	RPI has been used for indexing network costs and the RO buy-out price, whilst CPI has been used for indexing all other cost items.	Historical and forecast values of CPI and RPI used by the OBR in their March 2016 Economic & Fiscal Outlook http://budgetresponsibility.org.uk/download/economic-and-fiscal-outlook-charts-and-tables-march-2016/
VAT	VAT on electricity and gas supply has been held constant at 5% over the period of the analysis.	HM Treasury
Energy consumption per household	The quantity of annual energy consumption has been held constant, for the period of the analysis, at Ofgem's Typical Domestic Consumption Values (TDCVs) for a medium gas consumer and a medium class 1 electricity consumer as of May 2015. These are 3,100 kWh for electricity consumption and 12,500 kWh for gas consumption.	Typical Domestic Consumption Values for gas and electricity https://www.ofgem.gov.uk/sites/default/files/docs/2015/05/tdcvs_2015_decision_1.pdf
Total energy consumption	Figures for total energy consumption have been taken from DECC statistics on domestic electricity and gas consumption. DECC present this data on a quarterly basis to the end of 2015.	DECC statistics on energy trends for electricity https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/511933/ET_5.2.xls DECC statistics on energy trends for gas https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/511926/ET_4.1.xls
Use of Ofgem's Consolidated Segmental Statements (CSS)	We have used the CSS data to present historical assumptions on energy company costs for the years 2010/11 to 2015/16.	Ofgem's CSS are available at: https://www.ofgem.gov.uk/system/files/docs/2016/05/energy_companies_consolidated_segmental_statements_css_gb.pdf

3. Summary of analysis

Wholesale costs

2010/11 – 2015/16

Historical wholesale electricity and gas costs in the five years of the dataset have been calculated based on the available Consolidated Segmental Statements (CSS).

All companies, other than SSE, report the CSS in calendar years. As a result, at the time of this analysis, SSE's CSS was not yet available for the 2015/16 period. The CSS figures for the other five companies have been converted from calendar to financial years, using the following formula:

*Financial year t ending in March = Data in calendar year t * 0.25 + Data in calendar year t-1 * 0.75*

For 2015/16, where data for Q1 2016 is unavailable, we have used the 2015 data as a proxy for 2015/16, rather than estimate the wholesale costs in Q1 2016. This assumes the outturn costs and volumes in Q1 2016 will equal Q1 2015.

A £/kWh figure, for both gas and electricity wholesale costs has been calculated for each year, by dividing the sum of the large energy supply companies total wholesale expenditure on electricity and gas by the total domestic volumes reported in the CSS.

Sources: Ofgem's CSS are available at:
https://www.ofgem.gov.uk/system/files/docs/2016/05/energy_companies_consolidated_segmental_statements_css_gb.pdf

2016/17

The £/kWh figure for 2016/17 has been calculated using an estimate of the costs of an 18 month hedging strategy for purchasing electricity and gas.

Energy UK provided PwC with a dataset containing the costs for a range of forward contracts. Contract values had been averaged across each season. For an 18 month hedging strategy, the assumption was made that a supplier would purchase electricity on a uniform basis, starting from 1st October 2014 (18 months from the start of FY 16/17) and finishing on 31st March 2016 (i.e. by the start of FY 16/17 the supplier would have purchased 100% of their electricity requirement for the year and would not need to enter the spot market).

For electricity purchases, we calculated separate peak and baseload prices and combined the data to create a single annual £/MWh forward contract price for electricity purchases, using the assumptions in the table below. We also applied a weighting to the summer and winter contract prices, to reflect the difference in electricity purchase volumes.

	Assumed split		Source
Peak / Baseload split	30%	70%	PwC
Winter / Summer split	58%	42%	Last 5 years average summer / winter split from DECC consumption data

The same approach was taken for gas contracts, with the differences being that a summer/winter split of 30/70 was used to weight the contracts purchased for summer and winter, respectively, and there was no need for a baseload or peak assumption.

The table below summarises the resulting p/kWh contract prices for the 18-month hedging strategy used and the final contribution to the bills of a typical dual fuel customers after multiplying by the TDCV volumes.

	p/kWh	Bill (£)
Gas	1.44	180
Electricity	4.39	136
Dual Fuel		**316**

Operational costs

2010/11 – 2015/16

Historical operational costs for electricity and gas supply in the first five years of the analysis have been calculated using data available in the CSS.

The same adjustments made to wholesale costs to move them from calendar to financial years, have also been applied to operational costs.

A £/kWh figure for both gas and electricity costs has been calculated for each year by dividing the sum of the large energy supply companies' total operational expenditure on gas and electricity by the total domestic volumes supplied.

Sources: Ofgem's CSS are available at:
https://www.ofgem.gov.uk/system/files/docs/2016/05/energy_companies_consolidated_segmental_statements_css_gb.pdf

2016/17

To estimate the £/kWh figure for 2016/17 we have multiplied the £/kWh figure for 2015/16 by CPI inflation between 2015/16 and 2016/17.

Network costs

2013/14 – 2015/16

For the three years where CSS data is available on network costs, we have calculated a £/kWh network charge based on the total domestic network costs and supply volumes reported by the large energy suppliers.

The same adjustments made to wholesale costs to move them from calendar to financial years, have also been applied to network costs.

2010/11 – 2012/13 & 2016/17

For the years outside the CSS range, we have based our estimates on the total allowed revenues for distribution and transmission network companies published in their final price control determinations.

For 2010/11 to 2012/13, we have used the network costs reported in suppliers' 2013/14 CSS as the basis for allocating the sum of total network revenues across the first three years of the analysis.

For 2016/17, we allocate total network revenues as above, but use the proportion in the 2014/15 CSS. We have not separately calculated external SO costs in the forecast analysis. However, because all network cost estimates

are based on figures reported by the companies in their CSS, our calculations will include a proportion due to external SO costs for both NGET and NGGT.

To calculate £/kWh unit rates, we have divided the calculated domestic network costs by a forecast of CSS volumes in 2016/17.

Sources used:

Gas and electricity distribution:

Electricity distribution, 2010/11 – 2014/15: DPCR5 Close out report
https://www.ofgem.gov.uk/sites/default/files/docs/dpcr5_performance_report_2010-2015_data_table.xlsx

Electricity distribution, fast-track, 2015/16 – 2020/21: Decision to fast-track Western Power Distribution, 2014 (Table 1.1: WPD's base revenue ("PU" term in the licence) and forecast impact on bills over RIIO-ED1)
https://www.ofgem.gov.uk/sites/default/files/docs/2014/02/fast-track_decision_letter.pdf

Electricity distribution, slow-track, 2015/16 – 2020/21: RIIO-ED1: Final determinations for the slowtrack electricity distribution companies (Table 1.1: Slow-track DNO base revenues at draft and final determinations (£m, 2012-13 prices))
https://www.ofgem.gov.uk/sites/default/files/docs/2014/11/riio-ed1_final_determination_overview_-_updated_front_cover_0.pdf

Gas distribution, 2010/11 – 2012/13: Ofgem, 2007, Gas Distribution Price Control Review Final Proposals Document (Table A14.1 - National Grid Gas - East of England price control allowances, 2008-13, (£m, 2005-06 prices))
https://www.ofgem.gov.uk/sites/default/files/docs/2007/12/gdpcr-final-proposals-appendix-rev.pdf

Gas distribution, 2013/14 – 2020/21: Ofgem, 2012, RIIO-GD1: Final Proposals - Finance and uncertainty supporting document (Appendix 2 – Allowed revenues)
https://www.ofgem.gov.uk/ofgem-publications/48156/3riiogd1fpfinanceanduncertainty.pdf

Gas and electricity transmission:

Gas and electricity transmission, 2010/11: RIIO-T1: Transmission Annual Report for 2010/11 (Table 1: Comparison of Total Allowed Revenue (nominal prices))
https://www.ofgem.gov.uk/sites/default/files/docs/2012/03/transmission-annual-report-2010-11-final.pdf

Gas and electricity transmission, 2011/12 – 2012/13: TPCR4 Rollover (Table 3 Comparison of final decision and the licensees' forecast allowed revenues for 2011-12)
https://www.ofgem.gov.uk/sites/default/files/docs/2011/11/tpcr4_rollover_final_proposals_0.pdf

Electricity transmission, 2013/14 – 2020/21: RIIO-T1: Final Proposals update letter in respect of the statutory consultation on the licence modifications for SP Transmission Ltd and Scottish Hydro Electric Transmission Plc, 2012 (Appendix 1: Impact on 'Best-View')
https://www.ofgem.gov.uk/sites/default/files/docs/2012/12/sptl_shetplc_updateletter-21_12_2012.pdf

Gas transmission, 2012/13 – 2020/21: Ofgem, 2012, RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas (Table 4.5: Allowed Revenues (Best View))
https://www.ofgem.gov.uk/ofgem-publications/53599/1riiot1fpoverviewdec12.pdf

Environmental and social policy costs

2010/11 – 2012/13

Until 2013, companies were only required to report operational costs in three categories in their CSS: direct fuel costs, direct costs and indirect costs. The figures for total direct costs included network costs, E&SP costs and other direct costs. To estimate total E&SP costs between 2010/11 and 2012/13, the calculated estimates for network costs in £/kWh (explained above) have been subtracted from the implied £/kWh direct costs reported by the suppliers in the CSS.

Source: Ofgem guidance on producing the CSS:
https://www.ofgem.gov.uk/sites/default/files/docs/2015/05/css_guidelines_jan_2015.pdf

2013/14 – 2015/16

Environmental and social costs have been reported by the six large energy suppliers since 2013 in the CSS. These figures have been used to calculate the costs between 2013/14 and 2015/16.

The same adjustments made to wholesale and operational costs to move them from calendar to financial years, have also been applied to the reported E&SP costs.

2016/17

Separate calculations for each environmental and social levy have been generated for 2016/17 in the analysis. These are explained separately below.

All of the costs of E&SP levies have been allocated to the electricity bill other than those for smart meters, WHD and ECO. For these three levies the costs have been allocated 50:50 to reflect the approximate proportions of the dual fuel bill that gas and electricity expenditure contribute.

The calculations of total E&SP costs represent industry totals. To calculate a £/kWh figure requires assumptions on:

- the proportion of costs allocated to domestic consumers, and
- total domestic electricity and gas consumption volumes.

For the former, for each policy (apart from the WHD, ECO and RO, see above) we have allocated total industry costs based on the domestic proportion of total electricity consumption. For the latter, the estimates of gas and electricity consumption in 2016/17, we have taken the latest available total electricity and gas consumption figures from DUKES, which give consumption figures to the end of 2015. We have multiplied the reported 2015 DECC consumption figures by the compound annual growth rate (which in this circumstance is negative) for total domestic consumption over the period 2010 to 2015. This reflects the decreasing trend in electricity and gas consumption over the past decade. This calculation is completed separately for gas and electricity.

Sources:

Ofgem's CSS are available at:
https://www.ofgem.gov.uk/system/files/docs/2016/05/energy_companies_consolidated_segmental_statements_css_gb.pdf

DECC Digest of UK Energy Statistics 2015 are available at:
https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

ECO

For the years before 2016/17 a separate ECO calculation is not required with the use of the CSS data. Only the costs of ECO 2 is needed for 2016/17. These have been calculated on the basis of DECC's impact assessment on the future of the ECO. We have used a single cost figure in 2016/17 reflecting DECC's Central scenario – averaged costs' for that year.

Source: DECC report 'The Future of the Energy Company Obligation: Final Impact Assessment'.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/373650/ECO_IA_with_SoS_e-sigf_v2.pdf

The Renewables Obligation

For the years before 2016/17 a separate RO calculation is not required with the use of the CSS data.

DECC have already set the size of the obligation for 2016/17 at 0.348 ROCs/MWh and a buy-out price of £44.77. We have used the calculated total domestic customer demand in 2016/17 (explained above) to generate a total cost of the RO in 2016/17.

Sources:
Ofgem's site on Renewables Obligation – Information for suppliers.
https://www.ofgem.gov.uk/environmental-programmes/renewables-obligation-ro/information-suppliers

DECC statistics on Renewable electricity capacity and generation:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/511940/ET_6.1.xls

DECC – The Renewables Obligation 2016/17
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464685/Renewables_Obligation_Level_Calculations_for_2016-17.pdf

FiT

The cost of the FiT scheme has been historically difficult to forecast due to the unexpectedly high volumes of generation being supported. For this reason, we have relied wholly on the data provided by DECC to the OBR on the forecast cost of the FiT scheme.

Source:
http://budgetresponsibility.org.uk/download/economic-and-fiscal-outlook-charts-and-tables-march-2016/

CfD

As with FiTs, DECC produce quarterly CfD cost forecasts for the OBR's Economic and Fiscal Outlook publication. We have used these figures as our estimate for future CfD costs.

Source:
http://budgetresponsibility.org.uk/download/economic-and-fiscal-outlook-charts-and-tables-march-2016/

Capacity market (CM)

The majority of capacity market units sold are from CM auctions run four years in advance. The costs of the first auction (in 2014) will therefore not manifest until 2018-19. However, DECC have recently consulted on a proposal to hold a CM auction in January 2017 for winter 17/18. This would bring forward, by one year, the start of the CM supplier charge. There are no costs associated with the CM in the E&SP costs in 2016/17.

Smart meters

The costs to suppliers of smart metering will increase substantially to 2020. However, as smart meter penetration increases, suppliers will benefit from a number of factors, including lower meter reading costs and lower costs of switching. To establish estimates for the net costs for smart metering in 2016/17, we have used DECC's 2014 smart metering impact assessment, as a basis.

We first removed all items (costs and benefits) that do not apply to suppliers. For each remaining item, we have allocated the total item cost (or benefit) across the 18 years used in the IA. We have rebased the sum of the costs and benefits to 2016/17 prices using CPI inflation.

DECC (2014) Smart meter roll-out for the domestic and small and medium non-domestic sectors (GB), January https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276656/smart_meter_roll_out_for_the_domestic_and_small_and_medium_and_non_domestic_sectors.pdf

Warm home discount (WHD)

The Government announced in its 2015 Spending Review a continuation of the Warm Homes Discount to 2020/21 at "current levels" of £320 million per year, rising with inflation. We have used this estimate for 2016/17, appropriately adjusted by inflation.

Source:
https://www.gov.uk/government/topical-events/autumn-statement-and-spending-review-2015