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NERA Analysis of Energy Supplier Margins

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Even though wholesale energy prices have fallen recently, gas and electricity suppliers are earning very little margin on their sales to domestic customers, according to analysis by NERA Economic Consulting (NERA). The analysis takes the energy regulator's own research, and builds on it using data extracted from public sources or supplied by the energy companies.

The energy regulator, Ofgem, has previously estimated a "gross" margin between the domestic customer bill and some of the costs of a notional energy supply business. At the request of Energy UK, NERA has updated Ofgem's method to current conditions and has extended it to include a more complete set of costs.

Based on current tariffs, Ofgem's method would show an annual gross margin of £204 per dual fuel customer. NERA's analysis shows that additional costs reported in public sources (including Ofgem itself) absorb £133 of this gross margin. Accounting for more realistic customer characteristics (e.g. average consumption and tariff discounts given to customers who shop around) absorbs another £39. NERA also estimates that the cost of specialised energy trading, needed to match energy purchases to customers' demand, costs another £34 for a dual fuel customer. As a result, suppliers are not quite breaking even on dual fuel customers. (The annual overall margin is actually minus £1 per customer.) For customers who take electricity and gas from different suppliers, NERA finds that suppliers make on average a small positive overall margin – £9 and £10 per customer per year, respectively.

Table 1.

2010 Revenues and Costs in £ per Customer per Year (Average)	Electricity	Gas	Dual Fuel
Customer Bill - as per Ofgem	505	700	1,185
Costs - as per Ofgem	-403	-579	-981
Gross Margin - as per Ofgem	102	121	204
Additional Costs - Public Data Sources	-74	-80	-133
More Realistic Customer Characteristics - Industry and NERA Estimates	-0	-16	-39
Additional Trading Costs to Match Demand Profiles - NERA Estimates	-18	-15	-34
Overall Margin	9	10	-1

Source: NERA Analysis

Background

Ofgem has previously estimated a “gross” margin per customer for a notional energy supplier.¹ Ofgem intended to use this margin to analyse the relationship between wholesale and retail energy prices, and omitted a number of costs.

Suppliers have to incur many costs not included in Ofgem’s comparison of prices. These additional costs include the costs of operating a retail business and of a growing number of social and environmental obligations placed upon them by law. They offer various discounts to standard tariffs and they incur costs to meet short-term variations in consumers’ demand. These costs were not included in Ofgem’s analysis of relative prices, but account for a substantial part of a customer’s bill.

The costs of buying energy only make up around half of a customer’s bill, meaning that passing on a 10% rise or fall in energy prices would change a customer’s bill by about 5%. In practice, energy suppliers hold their tariffs stable, rather than passing on temporary gyrations in wholesale energy prices.

¹ Ofgem, *Quarterly Wholesale/Retail Price Report*, August 2009, and previous editions of the same report.

Additional Costs Based on Public Data Sources

In its energy supply probe,² Ofgem listed various non-energy costs, accounting for over £50 pounds per electricity or gas customer, and over £100 per dual fuel customer, which Ofgem does not include in its calculation of suppliers' "gross" margins. Further information is available from public sources on the cost of meter reading, additional environmental obligations and various social obligations. Taken altogether, these costs reduce the margin from serving an electricity customer by £74, a gas customer by £80, and a dual fuel customer by £133. After allowing for these costs, the "net margins" available to suppliers are £28 per electricity customer, £41 per gas customer and £71 per dual fuel customer. However, these figures overstate the profitability of serving real customers.

More Realistic Customer Characteristics

NERA collected industry information on average consumption, bad debt and tariff discounts, as well as some types of cost not reported elsewhere (e.g. the cost of working capital). Accounting for these more realistic conditions reduces the margin for dual fuel customers to £32. The margin for electricity-only and gas-only customers is lower, at £27 and £26, respectively.

Allowing for Matching Energy Purchases to Varying Customer Demand

Ofgem assumes that energy suppliers buy gas in quarterly blocks and electricity in six-monthly blocks. The pattern of a domestic customer's demand is more variable. NERA estimates that the cost of buying and selling the energy needed to match the actual pattern of a domestic customer's demand is £16 for an electricity customer, £3 for a gas customer, and £20 for a dual fuel customer. NERA also estimates that suppliers can expect to be charged for "imbalances" (when they incorrectly predict customers' demand) at a rate of about £2 per electricity customer, £12 per gas customer, and £14 per dual fuel customer.

Overall Margins

The overall annual margins earned by suppliers after the adjustments listed above are: £9 per electricity customer; £10 per gas customer; and minus £1 per dual fuel customer.



² See Ofgem, *Energy Supply Probe – Initial Findings Report*, 6 October 2008.

Table 2. Detailed Calculation of Margins in Energy Supply

Revenues, Costs and Margins (in prices of January 2010)	£ Per Customer Per Year			Line No.	Methods and Sources
	Electricity	Gas	Dual Fuel		
Customer Bill - as per Ofgem	505	700	1,185	(1)	Ofgem
Costs - as per Ofgem	-403	-579	-981	(2)	=(3)+(6)
<i>of which:</i>					
Wholesale Energy Costs (Hedging Portfolio)	-209	-350	-558	(3)	=(4)+(5)
<i>of which:</i>					
Hedging Portfolio (Costs of Contracts)	-196	-350	-546	(4)	Methodology of Ofgem QWRPR
Cost of Network Losses (at 6%)	-13	0	-13	(5)	Average network losses (distribution and transmission) based on Ofgem price control data
VAT and Other Costs	-194	-229	-423	(6)	=(7)+(8)+(9)+(10)+(11)+(12)
<i>of which:</i>					
VAT	-24	-33	-56	(7)	Calculated as 5/105 of total customer bill
Meter Asset and Maintenance Costs	-14	-14	-29	(8)	Sourced from Cornwall Energy
CERT	-24	-24	-47	(9)	NERA Estimate using No.10 Press Release and Ofgem Customer Numbers
ROC Costs	-16	0	-16	(10)	NERA Estimate using Ofgem data
Distribution Charges	-76	-126	-202	(11)	NERA Estimate using distribution companies' and Electricity Industry Review data
Other Costs (incl Transmission Charges, Balancing, Other Environmental Costs)	-41	-32	-73	(12)	NERA Estimate - figure from Ofgem QWRPR plus inflation
Gross Margin - as per Ofgem	102	121	204	(13)	=(1)+(2)
Additional Costs - Public Data Sources	-74	-80	-133	(14)	=(15)+(16)+(17)+(18)+(19)+(20)
<i>of which:</i>					
Cost to Serve	-40	-46	-64	(15)	Sourced from Ofgem probe, and updated for inflation
Cost of Competition	-16	-16	-32	(16)	Sourced from Ofgem probe, and updated for inflation
Meter Reading	-9	-9	-18	(17)	Sourced from Cornwall Energy
Overheads	-5	-5	-11	(18)	Sourced from Ofgem probe, and updated for inflation
CESP	-2	-1	-3	(19)	Sourced from DECC
Revenue Reduction from Social Spend Obligation	-3	-3	-5	(20)	Social Spend obligations for 2009/10 and 2010/11, excl 10% allowance for bad debt
Net Margin (After Adjustment for Additional Costs Based on Public Data Sources)	28	41	71	(21)	=(13)+(14)

Table 2. *continued*

More Realistic Customer Characteristics - Industry and NERA Estimates	-0	-16	-39	(22)	=(23)+(26)+(29)
Adjustment to More Realistic Consumption, <i>of which</i> :	8	-4	-6	(23)	=(24)+(25)
Change in Customer Bill	17	-63	-56	(24)	NERA analysis, based on industry sources
Change in Wholesale Energy and Other Costs Related to Consumption	-9	59	49	(25)	NERA analysis, based on industry sources
Reductions In Revenue, <i>of which</i> :	-4	-6	-27	(26)	=(27)+(28)
Discounts on Online Tariffs	-1	-1	-12	(27)	NERA analysis, based on industry sources
Bad Debt	-3	-5	-14	(28)	NERA analysis, based on industry sources
Costs of Retail Business, <i>of which</i> :	-5	-6	-6	(29)	=(30)+(31)
Working Capital	-4	-5	-5	(30)	NERA analysis, based on industry sources
Cost of Implementing Remedies from Ofgem Probe	-1	-1	-1	(31)	NERA analysis, based on industry sources
Margin After Adjustment for More Realistic Customer Characteristics	27	26	32	(32)	=(21)+(22)
Additional Trading Costs to Match Demand Profiles - NERA Estimates	-18	-15	-34	(33)	=(34)+(35)
<i>of which</i> :					
Cost of Shape	-16	-3	-20	(34)	NERA analysis, based on industry sources
Imbalance Penalties	-2	-12	-14	(35)	NERA analysis, based on industry sources
Overall Margin	9	10	-1	(36)	=(32)+(33)

Line (17) assumes no cost of meter reading is included in Ofgem's "cost to serve".

Energy Supply Glossary

Term	Definition
Bad Debt	Although the electricity industry goes to great lengths to prevent customers defaulting on their bills, every supplier has to write off a percentage of its revenue as debts that will never be paid. The rate of bad debt means that suppliers do not collect the full amount of revenue implied by their tariffs.
Balancing	Energy suppliers purchase energy in longer-term block contracts. The stable supply of energy over these periods needs to be matched to the varying consumer demand for energy. Balancing refers to eliminating excess demand or excess supply by trading energy in the energy markets.
Baseload/Peak Contracts	Ofgem assumes that suppliers purchase a variety of different energy contracts, differentiated by date (quarterly, seasonal) and, in the electricity sector, by time of day. Electricity contracts are described as “baseload” if they deliver the same amount all day and every day of the contract period. Some contracts only deliver energy between the hours of 7am and 7pm on weekdays; demand is generally higher during such periods, so these contracts are known as “peak” contracts. Traders and brokers quote prices for a variety of “baseload” and “peak” contracts.
CERT	The Carbon Emissions Reduction Target (CERT) obliges all domestic energy suppliers with a customer base above 50,000 customers to make savings in the amount of CO ₂ emitted by householders.
CESP	The Community Energy Saving Programme (CESP) requires gas and electricity suppliers and electricity generators to deliver energy saving measures to domestic consumers in specific low income areas of Great Britain. The CESP obligation runs from 1 October 2009 to 31 December 2012 and applies to all licensed gas and electricity suppliers with more than 50,000 domestic customers and to all licensed electricity generators that have generated 10 TWh/yr or more (on average over a three year period). These suppliers and generators are obliged to meet a carbon reduction target of 19.25 million tonnes of carbon dioxide (MtCO ₂) in total.”
Competition Costs	Suppliers incur costs to compete for customers, i.e. when they approach customers by telephone or in person, arrange a new contract, register a new customer and transfer details from the previous supplier. When they lose the customer to another supplier, they also incur costs to terminate the contract and to transfer the customer to the new supplier.
Cost of Shape	Energy contracts offer electricity or gas at a constant rate over a defined period. Customer’s demand varies by half-hour (for electricity) or day (for gas). In order to match their purchases to their sales, suppliers need to buy “shape” as well as arranging a portfolio of long-term energy contracts. To buy “shape”, suppliers must buy and sell energy in shorter term blocks - first monthly blocks to match the monthly pattern of demand and later weekly, daily or half-hourly blocks to match actual demand. This process has a net cost to suppliers, because usually they have to buy energy in periods when demand - and price - is high, and to sell back energy in periods when demand - and price - is low.
Cost to Serve	Energy suppliers incur costs in managing customer accounts. In particular, this item includes the costs of sending out bills, managing payments by customers, handling customer contacts, and dealing with queries.
Distribution Charges	Suppliers pay a charge for using the local distribution network, which delivers energy from the transmission network to domestic (and other) customers.

Energy Supply Glossary *continued*

Term	Definition
Distribution Network	In both the electricity and gas sectors, local distribution networks take energy from the transmission network and deliver it to domestic (and other) customers. There are fourteen electricity distribution networks and eight gas distribution networks in Great Britain. These networks run at lower voltages and pressures than the transmission networks (down to the levels at which energy is delivered to households, e.g. 220 volts).
Dual Fuel Customers	Dual fuel customers are those that purchase both electricity and gas from the same supplier.
EEC	The Energy Efficiency Commitment (EEC) set targets on energy suppliers to improve energy efficiency in households across Great Britain. The scheme has now been replaced by the CERT.
Energy Trading	Energy producers, importers and suppliers all need to buy and sell energy. They trade energy primarily via wholesale markets. In those markets, participants - as well as specialised energy traders and brokers - arrange contracts to supply energy in multiples of a megawatt-hour. Much of this trade involves standard contract designs - e.g. a contract for the sale of a constant volume of gas on every day in a particular quarter (e.g. the first three months of 2010). Various bodies report the prices at which these standard contracts are currently changing hands.
Environmental Obligations	Suppliers face obligations under the law and their supply licence to pursue environmental objectives (as well as serving their customers). For every unit of electricity they deliver to a customer, they must buy a certain proportion (currently about 10%) from renewable energy sources. To show that they have met this obligation, they must buy "Renewables Obligation Certificates" (ROCs) from renewable generators (or face a penalty for any shortfall). Suppliers also have to spend money on meeting the obligations imposed by the "EEC", "CERT" and, from 2010, "CESP".
Gigawatt-hour (GWh)	= 1,000 MWh. Used to measure the output of a large power station, for instance.
Gross margin (as per Ofgem)	The margin in pounds per year between (1) a standard customer's bill (calculated using standard tariffs) and (2) a narrow range of costs that Ofgem attributes to the standard customer. Ofgem publishes data on this "gross margin" at quarterly intervals, to monitor how wholesale and retail prices are moving over time. See "Net Margin".
Imbalances	Suppliers arrange in advance to purchase the electricity and gas that they think a customer will need. However, usually the customer's demand is higher or lower than the suppliers' forecast, because of unpredictable variation in the weather and other factors. The difference between (1) the energy that the customer consumes and (2) the energy that the supplier has bought is called an "imbalance". Both the electricity and gas wholesale markets have centralised systems for putting a price on imbalances - usually a high price on any deficit and a low price on any surplus. Suppliers therefore buy at a loss when demand rises and sell at a loss when demand falls. Imbalances impose a cost on each market, which is fed back to suppliers (and ultimately to customers).
Kilowatt-hour (kWh)	A basic unit of energy, equivalent to the consumption of an old 100 watt bulb over 10 hours, or a new energy efficient 10 watt bulb over 100 hours.
Market Remedy Costs	Ofgem has recently told the suppliers that they must take additional measures to remedy potential problems in the retail market. In particular, suppliers must now report more information to Ofgem and must monitor their own tariffs more closely, to ensure that price differences reflect cost differences. These new obligations cost a certain amount to administer - the "market remedy costs".

Energy Supply Glossary *continued*

Term	Definition
Megawatt-hour (MWh)	= 1,000 kWh. The basic unit for wholesale energy trading. Over a year, a typical domestic customer uses 3 to 4 MWh of electricity and 15 to 20 MWh of gas, according to industry data.
Meter Asset and Maintenance Costs	Suppliers pay the capital cost of buying and installing meters ("asset cost") and the cost of ensuring that the meter operates properly ("maintenance cost"). They pay separately for the meter to be read from time to time.
Meter Reading Cost	Energy suppliers pay the cost of meter readings from time to time, to establish how much electricity or gas their customers have consumed.
Net Margin	The margin in pounds per year between (1) a customer's actual bill and (2) a wide (but incomplete) set of the costs associated with serving that customer. Some costs are associated with serving customers in general (e.g. overheads), but can only be allocated to a specific customer using an accounting rule (e.g. equal cost per customer). Ofgem's definition of "net margin" explicitly leaves out some costs. See also "Gross Margin".
Network Losses	Some of the energy that suppliers buy in wholesale markets does not reach the final customers due to electrical resistance and heat losses within the transmission and distribution system. Suppliers therefore have to buy more energy than their customers actually consume.
Operating Costs	The costs of operating a retail business are the costs associated with maintaining current customers and winning over new customers. This includes for example the cost of publishing tariffs and advertising special deals.
Overheads	Overheads are costs of activities that do not directly generate profits but that are necessary for the operation of a company. An example of an overhead is the cost of managing the staff payroll.
Portfolio Hedging	Suppliers hold consumer energy tariffs stable for months at a time, rather than changing them every time wholesale energy prices change. Suppliers therefore buy a portfolio of energy contracts in advance, to fix the prices they will have to pay. This strategy protects them against major losses (or profits) when energy prices change. A strategy which reduces the risk to profits is called "hedging". (A strategy which increases the risk to profits is called "speculation".)
Renewables Obligation	Every time a generator using renewable energy sources generates any electricity, it collects Renewables Obligation Certificates (ROCs) from a central agency. (Formerly, renewable generators received one "ROC" per megawatt-hour of output; the ratio of ROCs to output now varies between different technologies.) The generator can sell its ROCs to a supplier, who has an obligation to buy a certain quantity. By these means, suppliers pay a premium for output from renewable energy sources.
Retail Energy Market	Sales of energy from suppliers to final customers.
Shape	Ofgem models energy procurement as buying energy contracts for a block of energy delivered at the same rate throughout a quarter (for gas) or through a six-month season (summer or winter) for electricity. In practice, the demand of domestic customers has a more variable "shape", rising in peak days or hours and falling in off-peak days or hours. Some of this variation in the "shape" of demand is unpredictable until the last minute, e.g. because it depends on the weather.
Social Obligations	Social obligations are the obligations imposed on energy suppliers by the regulator to help vulnerable customers, .e.g. low income customers who have trouble paying their bills and who run into arrears. The suppliers have set aside large sums to fulfil these obligations: £125 million in 2009/10, £150 million in 2010/11 and £175 million in 2011/12.

Energy Supply Glossary *continued*

Term	Definition
Suppliers	Energy companies are only allowed to sell electricity or gas to a final customer if they have a supply licence. Holders of such a licence are known as “suppliers”. There are six major suppliers in the gas and electricity markets, and a number of smaller ones.
Terawatt-hour (TWh)	= 1,000 GWh. Used for measuring quantities of energy at the level of a national market, e.g. total consumption, total production, energy saving targets, etc.
Transaction Costs	In order to transform contracts that deliver energy at a constant rate into the right “shape” to meet domestic customers’ demand, suppliers must buy some energy when demand is higher than average and sell some energy when demand is lower than average. Each time they either buy or sell, suppliers must pay the costs of the transaction, e.g. brokers’ fees.
Transmission Charges	Suppliers pay a charge for using the national transmission network (the “national grid” for electricity and the “national transmission system” for gas). In each sector, the transmission network delivers energy from the wholesale market to the distribution networks (which pass the energy on to final customers). Energy producers and importers pay a separate transmission charge for using the transmission network to send their output to the wholesale energy market.
Transmission Network	In both the electricity and gas sectors, there is a national transmission network (the “national grid” for electricity and the “national transmission system” for gas). The transmission network takes the output of producers (generators in electricity, gas wells) and importers and delivers it to the wholesale market. It then takes the energy from the wholesale market to the distribution networks (which pass the energy on to final customers). Electricity transmission networks operate at high voltage (132,000-400,000 volts). Gas transmission networks operate at high pressures (40-70 bar, i.e. 40-70 times atmospheric pressure).
Wholesale Energy Market	Marketplace in which energy is traded between energy companies and others in bulk quantities. i.e. multiples of a megawatt-hour.
Wholesale Energy Costs (as per Ofgem)	The cost of purchasing the energy (electricity and gas) needed to serve a standard customer’s demand. Ofgem’s term covers the cost of acquiring electricity in six-monthly blocks and gas in quarterly blocks. In practice, suppliers must engage in further trading, in order to convert these flat blocks of energy into the shape that fits the demand of domestic customers, which varies half-hour by half-hour (in electricity) and day-by-day (in gas).

About NERA

NERA Economic Consulting (www.nera.com) is a global firm of experts dedicated to applying economic, finance, and quantitative principles to complex business and legal challenges. For nearly half a century, NERA's economists have been creating strategies, studies, reports, expert testimony, and policy recommendations for government authorities and the world's leading law firms and corporations. We bring academic rigor, objectivity, and real world industry experience to bear on issues arising from competition, regulation, public policy, strategy, finance, and litigation.

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