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SERIES **15** | MODULE **08** | ENERGY PURCHASING

Purchasing energy

By Paul Bennett, executive chairman of BSSEC

Energy is the lifeblood of commerce, business and industry. Organisations are now spending more on energy than they have ever done before, and, energy spend will only go in one direction in the future – up. Therefore, the purchasing of energy is a vital activity in the energy management and procurement profession.

In this CPD article we will take a look at the energy markets and how legislation is impacting future pricing of energy. We will look at the two predominant energy sources of electricity and gas and how these markets operate and consider the information needed to procure energy in these markets. Finally, we will look at practical steps to take when procuring energy.

There are many factors that affect energy markets and their price and stability including:

Global Supply - Global energy producers such as Saudi Arabia and the USA have major influence over oil output and prices. Coupled with European gas connections with Russia it can be quickly understood that the availability and price of energy can vary. Factors such as this mean that the stability of energy can be volatile depending upon global events. While gas in the UK is not imported directly from Russia, their two largest customers, Germany and the Netherlands, are connected to the UK via two major gas pipelines. 57 per cent of the UK’s gas is supplied from imports¹ and this is predicted to rise to 93 per cent by 2040², with Norway supplying approximately 61 per cent of the gas that the UK imports.³

Political Intervention - Governments intervene in the energy market to attempt reforms – however this has directly increased energy costs. A sample of these reforms include the Climate Change Act, Renewable Energy Directive, Energy Act, Feed-in Tariff, Renewables Obligation and Climate Change Levy. The *Climate Change Act* (CCA) was enforced in 2008 with the aim of cutting carbon emissions by 37 per cent by 2020 and 80 per cent by 2050 against a 1990 baseline.⁴ Five-

Figure 1: Energy market forces



year carbon budgets have also been set until 2032, which act as milestones to achieve the 2050 reduction targets set by the CCA. The *Renewable Energy Directive* requires all members of the European Union (EU) to commit to producing and promoting renewable energy, with a target of 20 per cent renewable energy generation by 2020.⁵ The *Energy Act* ensures that energy demands are met despite the discontinuation of older power plants and decarbonisation by investing more money into new infrastructure and schemes. Other measures in place in the UK include the *Feed-in Tariffs* (FIT) scheme which promotes the use of technologies that generate renewable and low-carbon electricity typically on a small-scale, by requiring electricity suppliers to make payments for the generation and export of electricity to eligible installations. Support for large-scale generation of renewable electricity is offered through the *Renewables Obligation* (RO) in which electricity suppliers source increased electricity from renewable sources. The *Climate Change Levy* (CCL) is a tax applied to the energy bill of non-domestic consumers in the UK to encourage a reduction in energy consumption and emissions unless they source or supply low-carbon or renewable fuels.

Traded Commodity - Energy is a commodity that is traded on the stock exchange, meaning that prices constantly fluctuate and there are both good and bad times to purchase energy. Trading enables energy to be bought in advance, from the short term to much longer term. For example, energy can be purchased for the day, week, month, quarter, season, year and up to five years ahead. As this is possible, prices can be locked for identified volumes (a price lock is a firm commitment to Take-Or-Pay). Hedging is a different option, behaving like an insurance policy where a fee is paid upfront to guarantee a capped commodity price. If the market ends up being higher than the cap, the counterpart refunds the difference.

Capacity - The UK infrastructure is ageing, has had little investment and is nearing capacity. 20 per cent of the UK’s electricity generation capacity has been lost since 2010 due to the closure of power stations, and it is estimated that a further 35 per cent will be lost by the end of 2030, however peak demand is expected to increase, adding further pressure to meet our needs.⁶ Energy distributors charge customers on the amount of energy they use, coupled with the maximum demand, and customers are charged on this peak demand whether they

reach it or not. Demand-side response is a new method to increase the flexibility of energy consumption which involves rewarding consumers for changing their consumption patterns through new tariffs and schemes, and technology such as smart meters. Another method that focuses on managing demand, improving network efficiency and reducing the energy charges for large industrial and commercial users is the triad charging system. Consumption is measured every half an hour, and peak demand during the triads is calculated. The triads are three periods during winter where energy demand is at its highest. Energy suppliers receive charges for the transmission and distribution of energy that is purchased, which are then passed on to the customer and are known as TUoS (transmission use of network) and DUoS (distribution use of network) charges. TUoS is where costs are recovered from running and maintaining the national grid, and DUoS is where the costs are recovered for distributing electricity across the national network.

Big Players - UK energy companies are very large and operate with power, with the largest known as the 'Big Six' which is comprised of SSE, EDF Energy, British Gas, npower, EON UK and Scottish Power. Suppliers must manage commodity costs, transport costs and government taxes that result from policy to fund renewable energy.

Energy Markets Regulator - Regulated by Ofgem in the UK and Ofreg in Northern Ireland. The Office of Gas and Electricity Markets (Ofgem) regulates the monopoly companies which run the gas and electricity networks. It makes decisions on price controls and enforcement, acting in the interests of consumers and helping the industries to achieve environmental improvements. Ofgem is a non-ministerial department that is governed by the Gas and Electricity Markets Authority (GEMA) which make regulatory decisions, determines strategy and sets priorities for policy and consists of members with a wide range of experience from sectors such as industry, economics, science and the environment.

Smart Meters - The Smart Meter rollout is a Government led programme with the goal of upgrading the UK's energy systems by requiring energy suppliers to install smart meters into all homes and small businesses by 2020 to save energy and reduce costs for customers. It is estimated that between 2020 and 2030, the installation of

Figure 2: Electricity market structure



Customer	The customer enters into a contract with an energy supplier to provide metered electricity. Large consumers of electricity are provided with electricity meters to code of practice 5 (up to 1MW), 3 (1MW to 10MW) and 2 (10MW to 100MW) which record consumption over each 30-minute period and are therefore often referred to as half hour meters or half hourly read meters. Smaller consumers of electricity below the Code 5 threshold are sub-divided into profile classes ranging from domestic users (profile classes 1 & 2) to significant energy users (profile classes 7 & 8). The vast majority of business customers in profile classes 3-8 have manually read meters.
Supplier	The supplier is licensed to supply electricity to the customer and charge them for their consumption. The supplier also coordinates the associated contracts with the meter operator, meter asset provider, data collector and data aggregator. The supplier uses an electricity meter to bill the customer. The unit charge of electricity is the kWh and is billed per unit consumed. The electricity supplier collects the consumption data through the Balancing and Settlement Code system. This provides accurate bills for the customer as well as accurate predictions of electricity demand for all parties within the electricity industry. Customers with a capacity of less than 100kW are entitled to opt into the settlement system if they are prepared to pay additional charges and upgrade their meter.
Generator	The generator owns the plant which generates the electricity and is licenced to sell electricity directly to the supplier. Some generators are owned by suppliers.
Distributor	The distributor owns the local distribution network through which the electricity reaches the customer. This includes cables, transformers, meters and other infrastructure assets.
Meter operator	The meter operator has overall responsibility of operating and maintaining metering equipment. The meter operator is contracted to the supplier and normally has a separate contract with the meter asset manager to manage the meter.
Meter asset manager	The meter asset manager is contracted to install, commission, maintain, remove and dispose of the meter and to ensure that it complies with regulatory requirements.
Data collector	The data collector is responsible for the collection and processing of consumption data from actual meter readings, or the determination of an estimate. This consumption information is then passed to the data aggregator.
Data aggregator	The data aggregator is responsible for the aggregation of data regarding the electricity supplied to customers. The supplier uses this aggregated information for balancing and settlement purposes and to ensure that customers are billed correctly.

smart meters will provide the UK with a net economic benefit of £6.2bn.⁷ As of September 2017, small and large energy suppliers are responsible for the operation of 7.67m smart meters in domestic properties, and 939,700 smart meters in smaller non-domestic sites.

In recent years the commodity price of energy has reduced against projections. However, owing to renewables obligations and infrastructure management non-commodity costs of energy are predicted to rise. According to the Committee on Climate Change, energy bills for consumers could increase by 10 to 15 per cent by 2020 and 30 to 45 per cent by 2030.⁸

Electricity Market

The electricity market is structured as customer, supplier, generator, distributor, meter operator, meter asset manager, data collector and data aggregator.

Gas Market

The gas market is structured as customer, supplier, shipper, transporter, meter operator and meter reader.

Energy brokers can be used to procure energy on behalf of customers, and provide services such as data collection, tendering, invoice audits, remote access, standardised reports, market intelligence, budgeting support and optimisation of commodity cost.

When using energy brokers, it is important to ensure that they are an independent broker and follow an internal or external code of practice ensuring good governance and assurance that they are acting in the interests of their clients in an honest and transparent manner.

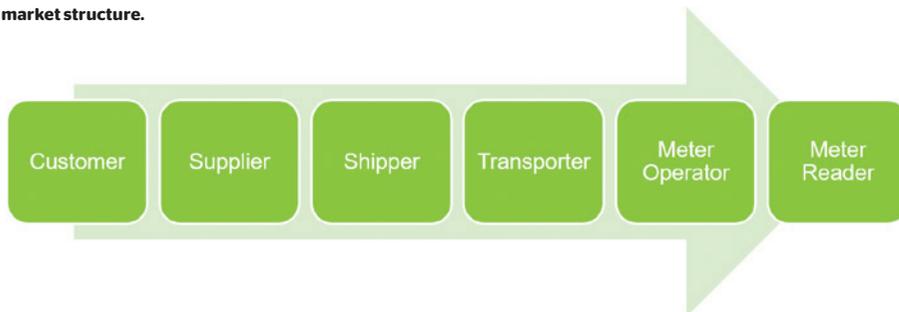
It is recommended that a written contractual arrangement is entered into between the broker and customer that defines objectives, key performance indicators and reporting and information sharing.

Information needed for energy procurement

Once the site information has been collected as previously outlined, the information can be organised for procurement into a tender pack which should include:

- site and energy details;
- length of contract period to be considered (including options for locking and hedging);
- payment terms - e.g. net 30 days, net 60 days etc;
- trading strategy - frequency of events and volumes to be locked or exposed for hedging;
- agreement for a capital risk position - the absolute maximum position that volumes must be locked if triggered;
- documented approvers who are authorised to act (names and contact details);
- reporting requirements - e.g. trading activities and market conditions versus budget;
- market intelligence and tracking

Figure 3: Gas market structure.



Customer	The customer enters into a contract with a supplier for the provision of gas. The largest consumers are provided with daily metering. Smaller consumers without daily metering are termed non-daily metered.
Supplier	The supplier is licensed to supply gas to the customer and to charge them for their consumption. The supplier also coordinates the associated contracts with the meter operator. Gas is invoiced in kilowatt-hours (kWh) consumed, and supplied on a 'firm' or an 'interrupted' basis. A firm basis ensures that the customer will have constant gas availability during the period stated in the agreement. Gas supplied on an interrupted basis to industrial and commercial organisations costs less, but the organisations agree to an interruption at short notice as specified in their contract. This would occur when there is a shortage of gas in the market. The cost of gas consists of a price for the gas itself and a price for transportation, both of which vary between summer and winter. The customer will pay a total price to its supplier.
Shipper	The shipper buys gas directly from the producers and sells this to the supplier. To keep the level of gas in the UK network at a constant level, the shippers balance the amount of gas in the system with that which is being consumed.
Transporter	The transporter (or network operator) owns the gas pipeline system. The supplier needs consumption information for billing and the transporter needs the same information to ensure balance in the network. As a result, most meters on the customer's side of the network are owned and maintained by the major gas network owner, the National Grid.
Meter Operator	The meter operator is responsible for keeping the meter in order and contracts a meter asset manager to install, commission, maintain, remove and dispose of the meter and to ensure that it complies with regulatory requirements.
Meter Reader	The meter reader gathers gas consumption data which is fed back to the Supplier for the purpose of billing and also for the shipper to ensure the gas on the network is balanced.

Details	Gas	Electricity
Contract expiry date	Expiry date and the notice period for switching, giving notice to avoid rolling over to the next period.	Expiry date and the notice period for switching, giving notice to avoid rolling over to the next period.
Site name and postcode	All site addresses are required along with the information below.	All site addresses are required along with the information below.
Connection type	Peak demand capacity in KW. Daily or non-daily metered.	Low voltage or high voltage connection. Maximum demand reached in the past 12 months (KVA).
Meter details	M number - unique identifier for the gas supply point.	MPAN (Meter Point Administration Number) which is the unique identifier for the electricity supply point.
Annual consumption	Monthly usage over the past 12 months. Maximum use on any day.	Annual kWh consumption in the past 12 months. Monthly, weekly and daily half hourly profiles are best. Shows night and day and wintertime peak use during the 4-7pm period.
Changes in the future	Impacts of any energy efficiency programmes.	Plans to reduce usage during Triad DUoS peak periods. Availability promise. Impacts of any energy efficiency programmes.
Availability	Firm or interruptible.	Capacity (KVA).
Other	Gas pressure.	Details of power factor.

requirements;

- contractual requirements (including data collection and data visibility);
- assessment methodology (including consideration to renewable energy, cost, data provision, payment terms, options for price fixing and hedging, risk, clear invoicing, reporting and account management preferences);
- tender return date; and
- contract award date.

The procurement process should be well planned with identified time frames for:

- preparation of data e.g. four weeks;
- tender period e.g. four weeks;
- review e.g. two weeks;
- interviews e.g. one week;
- decision and appoint e.g. one week;
- Total of 12 weeks

Planning when to go to market may be a decision based upon market

conditions effected by macro events such as political or economic supply situations that effect price stability or volatility. Unexpected factors such as cold weather may affect the timing of the tender process.

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gas-come-from

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Further Reading

- CIPS A Guide to Purchasing Energy and Carbon Footprint Impacts
- CIPS Negotiating Energy Supply Contracts
- EMA Electricity Procurement
- Energy Institute Energy Management Essentials - Module 2: Metering & Buying

Useful Links

- Ofgem - www.ofgem.gov.uk
- Oreg - www.uregni.gov.uk
- Chartered Institute of Purchasing and Supply - www.cips.org
- Major Energy Users' Council - www.meuc.co.uk
- Energy Institute - www.energyinst.org
- Committee on Climate Change - www.theccc.org.uk

ENERGY PURCHASING

Please mark your answers on the sheet below by placing a cross in the box next to the correct answer. Only mark one box for each question. You may find it helpful to mark the answers in pencil first before filling in the final answers in ink. Once you have completed the answer sheet in ink, return it to the address below. Photocopies are acceptable.

QUESTIONS

1 By how much does the Climate Change Act aim to reduce emissions by 2050?

- 20 per cent
- 40 per cent
- 60 per cent
- 80 per cent

2 Which of the following is part of the 'Big Six'?

- Bulb Energy
- Ecotricity
- EDF Energy
- Flow Energy

3 The Renewable Energy Directive aims to achieve how much renewable energy generation by 2020?

- 10 per cent
- 20 per cent
- 40 per cent
- 70 per cent

4 What is the maximum number of Megawatts that a code of practice 5 electricity meter allows?

- 1
- 10
- 100
- 1000

5 Electricity generators sell electricity directly to whom?

- Customer
- Supplier
- Distributor
- Meter operator

6 What is the current interval between carbon budgets in the UK?

- 6 months
- 1 year
- 5 years
- 10 years

7 Which of the following is NOT a component of the electrical market structure?

- Supplier
- Meter operator
- Shipper
- Data collector

8 Renewables obligations and infrastructure management are predicted to make non-commodity energy costs do what?

- Become eliminated
- Remain the same
- Decrease
- Increase

9 Which is NOT a piece of legislation that aims at improving energy efficiency or the use of renewables?

- Feed-In tariffs
- 2018 IET wiring regulations
- Renewables obligation
- Climate change act

10 Which of the following correctly defines 'hedging'?

- A commodity that is traded on the stock exchange Annual consumption
- Prices can be locked for identified volumes
- The collection and processing of consumption data from actual meter readings
- A fee is paid upfront to guarantee a capped commodity price

Please complete your details below in block capitals

Name (Mr. Mrs. Ms)

Business

Business Address

.....

.....

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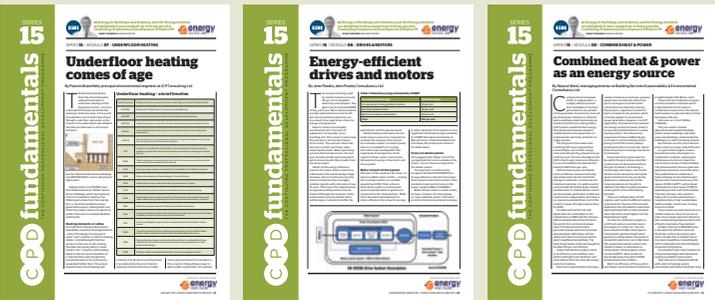
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