

DUoS Charging for LV and HV Metered Connections

A guide to understanding WPDs charges for using our distribution system

This document provides guidance on the on-going charges that we apply to connections metered at Low Voltage (LV) and High Voltage (HV).

We utilise a number of charging tariffs, the application of which will depend on the maximum energy that you import from or export to our distribution system, the voltage of connection to our network and your premises type. Our charges form only a part of your overall electricity bill and so you should bear this in mind when considering your electricity usage and consumption profile.

Understanding your distribution charges could help you reduce your costs and increase your credits. This is achieved by understanding the components of the charge and identifying whether there may be opportunities to change the way you use the distribution system.



Understanding your distribution charges could help you reduce your costs

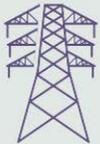
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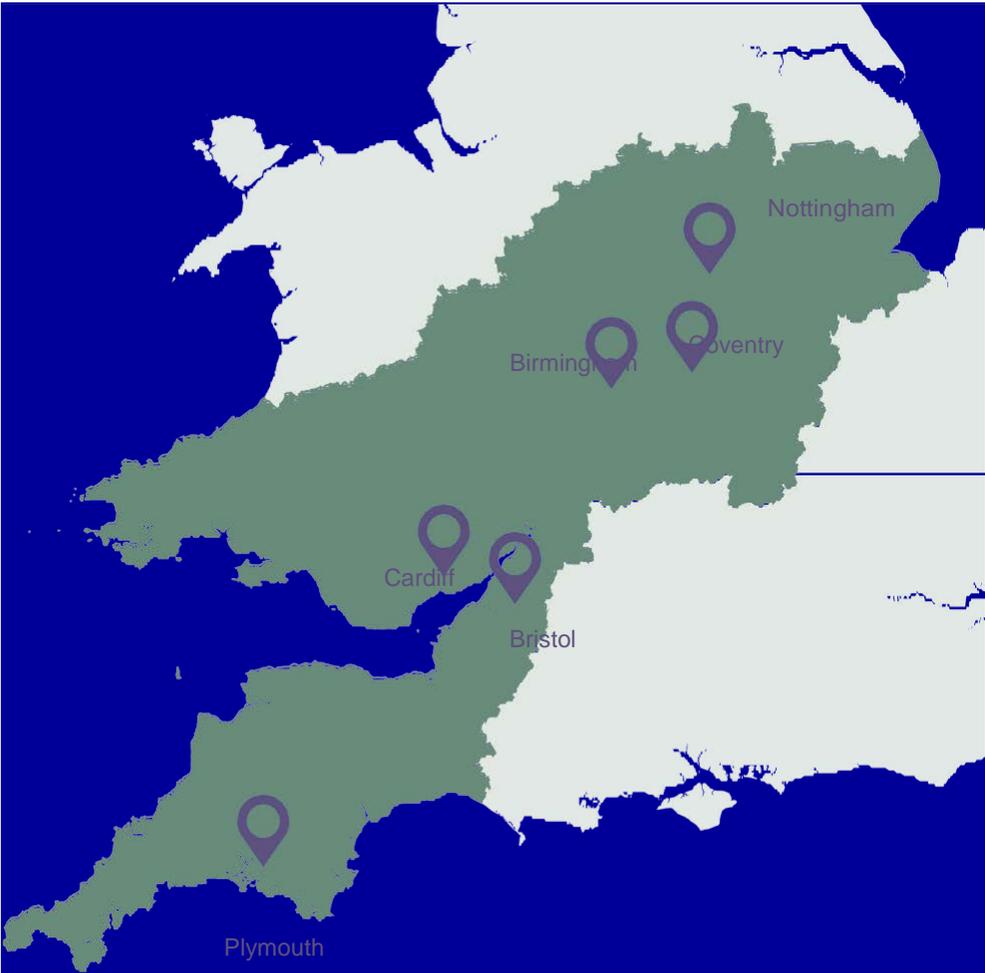
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2. Who we are and what we do

We are one of six Distribution Network Operators (DNO's) who deliver electricity to homes and businesses across England, Wales and Scotland. Our network, which serves 7.9m customers, is the largest in the UK, operating from the Lincolnshire coast, across the Midlands, South Wales and the South West to the Isles of Scilly.

Our four key business tasks:

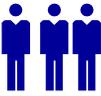
<p>1 </p> <p>Operating our network assets to ensure we 'keep the lights on' for all of our customers</p>	<p>2 </p> <p>Maintaining the condition and therefore reliability of our assets</p>	<p>3 </p> <p>Fixing our assets should they get damaged or if they are faulty</p>	<p>4 </p> <p>Upgrading the existing network or building new ones to provide additional electricity supply or capacity to our customers</p>
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Our role is simple

We are not a supplier. We do not buy and sell electricity, or directly bill customers. Our focus is on looking after the network to ensure you receive a reliable supply

 Isles of Scilly



7.9m

Our network which serves 7.9 million customers, is the largest in the UK

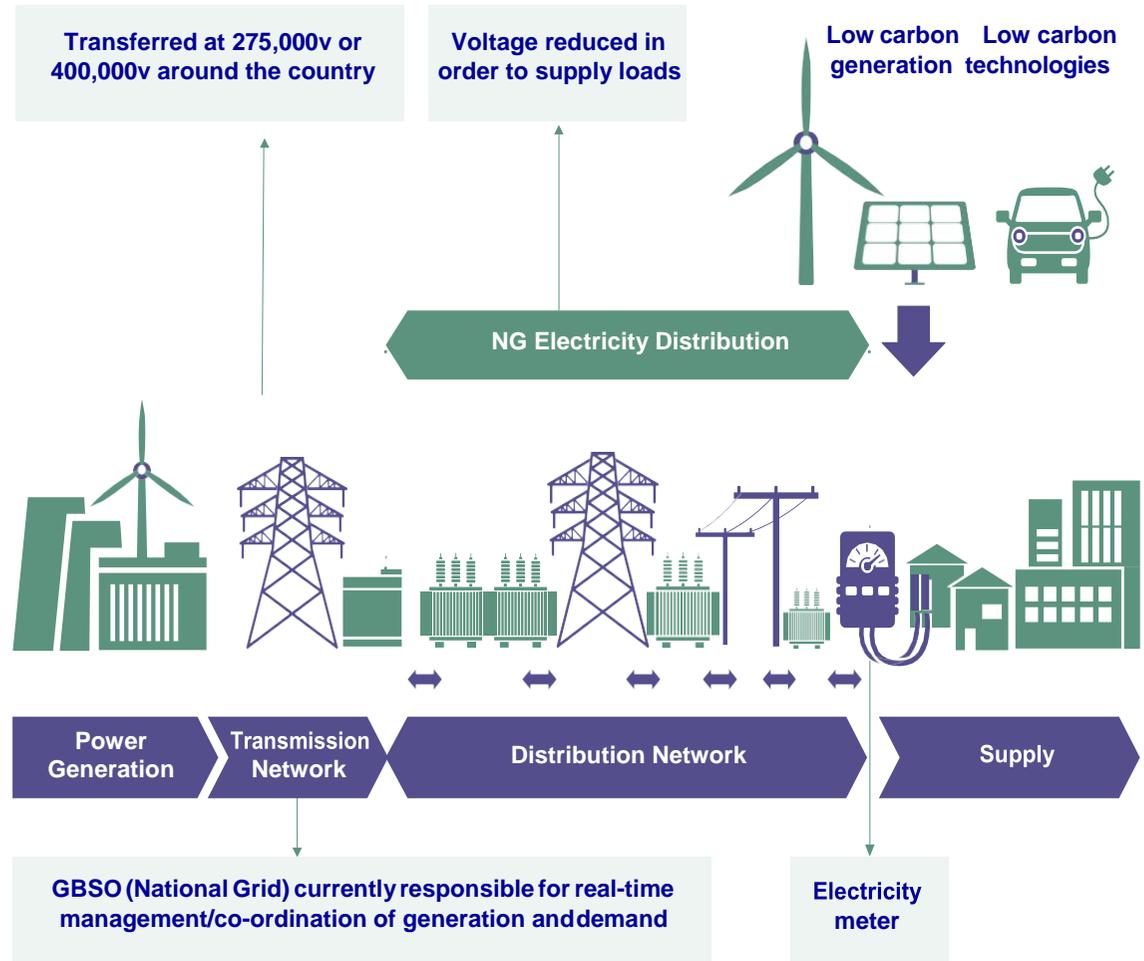
2. Who we are and what we do

We are responsible for distributing electricity across our network area and to make sure you receive a safe and reliable electricity supply. We look after the network from 132kV all the way down to low voltage, typically where it enters your home or business at 230/400V.

Our role within the electricity supply business

The electricity supply industry is complicated as different agencies have responsibility for transmission, distribution, supply, metering and data collection. All these agencies work together to bring electricity to your home or business.

Our role is to distribute electricity between the transmission network and your premises.



3. Charges for Connection and Use of System

New connections and upgrades to existing electricity supplies

If you require a new LV or HV connection or wish to upgrade an existing LV or HV supply you need to contact us to discuss your requirements.

We can help you through the process and provide advice along the way. For further information on how to apply visit our website: www.nationalgrid.co.uk

For more information on connection charges please refer to our Statement of Methodology and Charges for Connection.

<https://www.nationalgrid.co.uk/our-network/use-of-system-charges/charging-statements-and-methodology>

Ongoing charges for use of system

During the lifetime of your connection we will also charge you for the costs of operating and investing in our electricity network by charging for use of our distribution system. These charges are called Distribution Use of System Charges or 'DUoS' Charges. The way we calculate our charges for LV and HV connected customers is governed under the common distribution charging methodology (CDCM). The methodology is published in the Distribution Connection and Use of System Agreement (DCUSA) under schedule 16. DCUSA is a multi-party contract between licensed electricity distributors, suppliers, and generators concerned with the use of the electricity distribution network. This document can be found on the DCUSA website www.dcusa.co.uk.

The electricity bill provided by your electricity supplier is the mechanism by which DUoS charges are invoiced. We will charge the supplier who then passes this on to you. Typically DUoS charges make up approximately 9.3% of a domestic customer's final bill.

3. Charges for Connection and Use of System

Tariffs for connections that attract Red, Amber and Green rates:

All connections will incur unit charges that vary according to the time of day to reflect the different costs of supplying electricity at these times. Table 1, 2 and 3 sets out the timescales that apply for each rate in each of our distribution areas.

Table 1: South West

Time bands for half hourly metered properties			
Time periods	Red time band	Amber time band	Green time band
Monday to Friday	17:00-19:00	07:30-17:00 19:00-21:30	00:00-07:30 21:30-24:00
Weekends	n/a	16:30-19:30	00:00-16:30 19:30-24:00
Notes	All of the above times are in UK clock time		

Table 2: S Wales

Time bands for half hourly metered properties			
Time periods	Red time band	Amber time band	Green time band
Monday to Friday	17:00-19:30	07:30-17:00 19:30-22:00	00:00-07:30 22:00-24:00
Weekends	n/a	12:30-13:00 16:00-21:00	00:00-12:00 13:00-16:00 21:00-24:00
Notes	All of the above times are in UK clock time		

Table 3: Midlands

Time bands for half hourly metered properties			
Time periods	Red time band	Amber time band	Green time band
Monday to Friday	16:00-19:00	07:30-16:00 19:00-21:00	00:00-07:30 21:00-24:00
Weekends	n/a	n/a	00:00-24:00
Notes	All of the above times are in UK clock time		

3. Charges for Connection and Use of System

Tariffs for domestic connections

Tariff groups and descriptions for HV and LV metered customers

Your connection will be assigned a specific tariff for DUoS charging depending on its characteristics. These characteristics include the voltage of connection, the type of use (i.e. residential or business) and the types of metering involved.

There follows a number of tables showing different tariff groups with a basic description of the characteristics of the customers within the groups. For further information relating to the types of charge please refer to page 10.

Tables 1, 2 and 3 sets out the tariffs that attract Red, Amber and Green rates.

Table 1: Domestic Customers

Tariff name	General description of characteristics of customers that belong to the particular tariffs groups
Domestic Aggregated with Residual	Domestic properties with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also includes a fixed charge.
Domestic Aggregated (Related MPAN)	This is the DUoS charge for the metered electricity used by Domestic properties which have a second meter.

Table 2: Non-Domestic Customers

Tariff Name	General description of characteristics of customers that belong to the particular tariffs groups
Non-Domestic Aggregated No Residual	Small businesses generators with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also include a fixed charge.
Non-Domestic Aggregated Band X	Small final demand businesses grouped into band X (1, 2 3, or 4) based on consumption with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also include a fixed.
Non-Domestic Aggregated (related MPAN)	This is the DUoS charge for the metered electricity used by Small businesses which have a second meter.

Table 3: Small Business Customers

Tariff name	General description of characteristics of customers that belong to the particular tariffs groups
LV Site Specific No Residual	LV connected Generators, with red amber and green rates. This will also include a fixed charge, capacity charge and reactive power charge.
LV Site Specific Band X	Final demand large businesses connected at LV and grouped into band X (1, 2 3, or 4) based on capacity with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also include a fixed, a capacity charge, an excess capacity charge and a reactive power charge.
LV Sub Site Specific No Residual	LV Sub connected Generators with red amber and green rates connected at LV. This will also include a fixed charge, a capacity charge, an excess capacity charge and a reactive power charge.
LV Sub Site Specific Band X	Final demand large businesses connected at LV substation and grouped into band X (1, 2 3, or 4) based on capacity with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also include a fixed, a capacity charge, an excess capacity charge and a reactive power charge.
HV Site Specific No Residual	HV connected Generators, with red amber and green rates. This will also include a fixed charge, capacity charge and reactive power charge.
HV Site Specific Band X	Final demand large businesses connected at HV and grouped into band X (1, 2 3, or 4) based on capacity with three (3) DUoS rate divided into Red, Amber and Green unit charge. This also include a fixed, a capacity charge, an excess capacity charge and a reactive power charge.

For further information relating to the actual charges that apply please visit our website: <https://www.nationalgrid.co.uk/our-network/use-of-system-charges/charging-statements-and-methodology>

3. Charges for Connection and Use of System

Tariffs for generation

If you generate electricity and export energy through the meter, you are seen to support the network. As a consequence the charges will be negative and you will receive credits for exported energy. Generation capability can be classed either as Intermittent or Non-intermittent;

Intermittent is where the prime fuel source of the generator cannot be made available on demand, examples of which are generally wind, tidal, wave, photovoltaic and small hydro.

Non-intermittent is where the prime fuel source of the generator can be made available on demand and generally includes combined cycle gas turbine (CCGT), gas generators, landfill, sewage, biomass, biogas, energy crop, waste incineration and combined heat and power (CHP).

From April 2023, both the Intermittent and Non-intermittent generation are credited on red, amber and green unit rates based on the time of day so it is typically more beneficial to generate at times of peak demand



Generation capability can be classed either as intermittent or Non-intermittent.

3. Charges for Connection and Use of System

Table 5 below shows the generation tariffs available and describes when they apply.

Table 5

Tariff name	General description of characteristics of customers that belong to the particular tariffs groups
LV Generation Aggregated	Small generators connected at LV with Red, Amber, and Green charging rates.
LV Sub Generation Aggregated	Small generators connected at the LV Substation with Red, Amber, and Green charging rates.
LV Generation Site Specific	<p>Intermittent and Non-Intermittent generation connected at LV with Red, Amber, and Green charging rates.</p> <p>Intermittent is where the prime fuel source of the generator cannot be made available on demand and these generally wind, tidal, wave, photovoltaic and small hydro.</p> <p>Non-Intermittent is where the prime fuel source of the generator can be made available on demand and generally includes combined cycle gas turbine (CCGT), gas generators, landfill, sewage, biomass, biogas, energy crop, waste incineration and combined heat and power (CHP).</p>

Tariff name	General description of characteristics of customers that belong to the particular tariffs groups
LV Sub Generation Site Specific	<p>Intermittent and Non- Intermittent generation connected at LV Substation with Red, Amber, and Green charging rates.</p> <p>Intermittent is where the prime fuel source of the generator cannot be made available on demand and these generally wind, tidal, wave, photovoltaic and small hydro.</p> <p>Non-Intermittent is where the prime fuel source of the generator can be made available on demand and generally includes combined cycle gas turbine (CCGT), gas generators, landfill, sewage, biomass, biogas, energy crop, waste incineration and combined heat and power (CHP).</p>
HV Generation Site Specific	<p>Intermittent and Non-Intermittent generation connected at HV with Red, Amber, and Green charging rates.</p> <p>Intermittent is where the prime fuel source of the generator cannot be made available on demand and these generally wind, tidal, wave, photovoltaic and small hydro.</p> <p>Non-Intermittent is where the prime fuel source of the generator can be made available on demand and generally includes combined cycle gas turbine (CCGT), gas generators, landfill, sewage, biomass, biogas, energy crop, waste incineration and combined heat and power (CHP).</p>

3. Charges for Connection and Use of System

Types of charge

There are several different types of charges. Not all customers will be charged all of these. Table 6 below is a table of the different charges with a basic description of what they mean and how to calculate the charge in (£s). Note: The time bands for the different unit rates can differ between different electricity distributors.

Table 6

Type of charge	Description and how to calculate the charge in (£)s
Red/black unit charge p/kWh	This covers the Red/Black period for customers with red/black, amber/yellow, and green unit tariffs. It is calculated in (£'s) by taking the usage during this time period in KWHs and multiplying by the rate and dividing by 100.
Amber/yellow unit charge p/kWh	This covers the Amber/Yellow period for customers with red/black, amber/yellow, and green unit tariffs. It is calculated in (£'s) by taking the usage during this time period in KWHs and multiplying by the rate and dividing by 100.
Green unit charge p/kWh	This covers just the Green period for customers with red/black, amber/yellow, and green unit tariffs. It is calculated in (£'s) by taking the usage during this time period in KWHs and multiplying by the rate and dividing by 100.
Fixed charge p/MPAN/day	This is calculated in (£'s) by multiplying the rate by the number of days and dividing by 100.

Type of charge	Description and how to calculate the charge in (£)s
Capacity charge p/kVA/day	Capacity Charges are based upon the Maximum Import Capacity that you request and sign up for under the Connection Agreement held between us. The higher the Maximum Import Capacity, the higher your Capacity Charge will be so it is important that you only sign up for capacity that you realistically need. This calculated in (£'s) by multiplying the rate by the chargeable agreed capacity then the number of days and dividing by 100.
Exceeded capacity charge p/kVA/day	Where a customer takes additional unauthorised capacity over and above the MIC/MEC, the excess will be classed as exceeded capacity. The exceeded portion of the capacity will be charged at the excess capacity charge p/kVA/day rate, based on the difference between the MIC/MEC and the actual capacity used. This will be charged for the full duration of the billing period in which the breach occurs. This calculated in (£'s) by multiplying the rate by the difference between the maximum KVA used in the month minus the chargeable agreed capacity then the number of days and dividing by 100.
Reactive power charge p/kVArh	Reactive power is a separately charged component of connections that are half hourly metered. Reactive power charges are generally avoidable if 'best practice' design of the properties' electrical installation has been provided in order to maintain a power factor between 0.95 and unity at the Metering Point. The charge covers all time periods. It is calculated in (£'s) by taking the reactive power outside of 0.95 in KVARs and multiplying by the rate and dividing by 100.

Metering equipment is required at your premises to measure the energy you either import from or export to our network so that your bill can be calculated correctly. Your electricity supplier is responsible for arranging the metering.

Your supplier will install either Whole Current Metering or CT Metering according to your capacity requirements. If your capacity requirement is in excess of 100kW you will generally need to enter into an agreement with the appointed Meter Operator for a prescribed period. There will be an additional charge for this service and if you wish to terminate your agreement early the Meter Operator may request an exit charge so you should be certain of your capacity requirements before entering into this agreement.

If you wish you can appoint a Meter Operator directly. A list of Meter Operators can be obtained from the Association of Meter Operators, www.meteroperators.org.uk. If you do appoint a Meter Operator directly it will be necessary for you to ensure in conjunction with the Meter Operator, that suitable metering exists/is installed for the required level of import/export capacity.

Voltage level definitions

Customers will be connected at different voltages which will reflect different costs to the network and therefore different tariffs.

Table 7 describes the different levels of connection.

Table 7

Voltage level of connection	Description of the voltage level of connection
LV	Metered below 6,600 volts.
LV Sub	Metered at the LV Substation in between the HV and the LV wires.
HV	Metered above 6,600 volts and below 22,000 volts.
HV Sub	Metered at the HV Substation in between the EHV and the HV wires. These customers are included in the EHV charging methodology.
EHV	Metered above 22,000 volts.

Term	Description
CT metering	Means where the connection is metered indirectly by using current transformers to induce a reference current which is then put through the meter. This is usually required with larger industrial and commercial properties with a MIC of 70kVA and above.
Whole current metering	Means where the connection is metered directly by putting the full electrical current through the meter.

4. Metering Requirements

Smart Metering

Smart meters record detailed energy consumption remotely and shares this data with customers putting them in control. Access to data profiles of your energy usage allow you to manage consumption more effectively and save money.



5. Reducing DUoS Charges

How can I reduce my energy bill?

Decrease consumption

The most effective way of reducing energy charges is to decrease consumption, particularly in the peak periods. This peak time band is known as the Red period and in WPD regions covers week day early evening. Conversely generators can gain credits for exporting during these time periods.

Set reasonable capacity requirements (new business connections only)

If you require a new electricity connection it is essential that you first talk to an accredited electrical contractor who can advise you of your energy requirements and the need to ensure the installation complies with all relevant regulations and standards.

They should be able to advise you of your capacity requirements by taking in to account diversity. The diversified demand takes in to account that not all the electrical equipment within the premises will be operating at the same time or at full power. By making an allowance for diversity we can potentially install lower rated assets at a cheaper cost and can apply a lower ongoing capacity charge.



The most effective way of reducing energy charges is to decrease consumption, particularly in the peak periods.

Review capacity requirements

Demand customers can also reduce charges by ensuring that they are not paying for more capacity than they need. For example, it might be the case that the MIC arranged by a half hourly metered customer many years ago is no longer reflective of the current operating conditions of that business. In such a scenario it might be in the interests of the customer to arrange for a lower MIC and reduce capacity charges. However this needs to be balanced against the knowledge that once capacity is released back to WPD it may be utilised elsewhere, and so if the customer requires additional capacity again in the future, we may need to reinforce the network and charge for the works.

Also if the revised lower agreed capacity is exceeded in any given month, an excess capacity charge, which is typically two or three times the base capacity tariff, is applied.

Following an agreement of the MIC (be it at the time of connection or later) no reduction in MIC will be allowed for a 12 month period.

Reductions to the MIC will only be permitted once in a 12 month period. Where the MIC is reduced the new lower level will be agreed with reference to the level of the customer's maximum demand. The new MIC will be applied from the start of the next billing period after the date that the request was received.

5. Reducing DUoS Charges

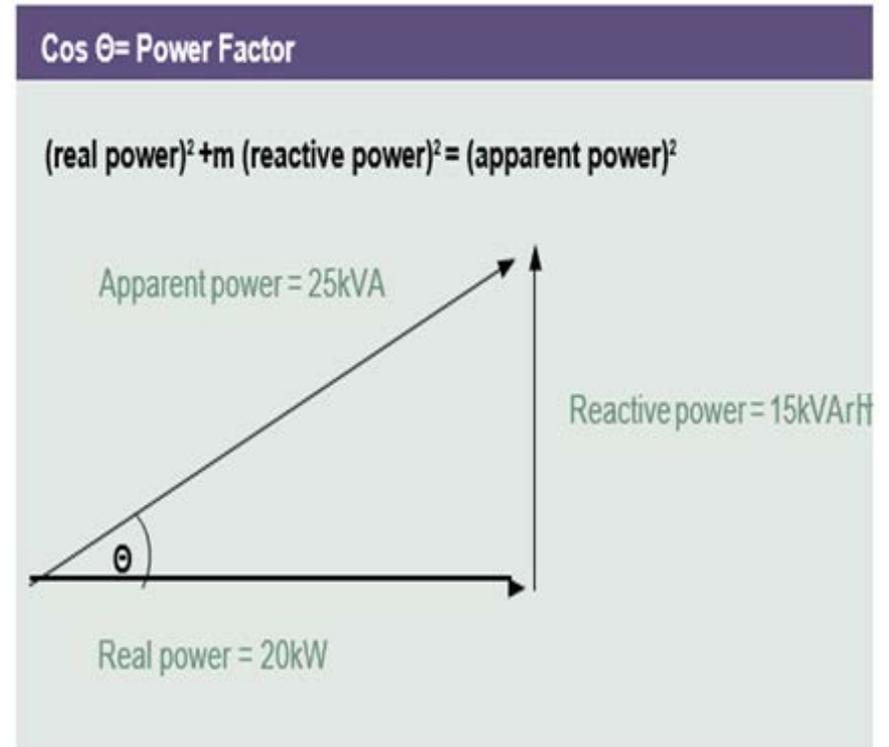
Manage power factor

Reactive power (kVArh) is a separately charged component of connections that are half hourly metered. Reactive power charges are generally avoidable if 'best practice' design of the properties' electrical installation has been provided in order to maintain a Power Factor between 0.95 and unity at the metering point.

Reactive power is the difference between working power (active power measured in kW) and total power consumed (apparent power measured in kVA). Essentially it is a measure of how efficiently electrical power is transported through an electrical installation or a distribution system.

Power flowing with a Power Factor of unity will result in the most efficient loading of the network. Power flowing with a Power Factor of less than 0.95 will result in much higher losses in the network, a need to potentially provide higher capacity electrical equipment, and consequently a higher bill for you the consumer. A comparatively small improvement in Power Factor can bring about a significant reduction in losses.

Different types of electrical equipment require some 'reactive power' in addition to 'active power' in order to work effectively. Electric motors, transformers and fluorescent lighting, for example, may produce poor Power Factors due to the nature of their inductive load. However if good design practice is applied, then the poor Power Factor of appliances can be corrected as near as possible to source. Alternatively, poor Power Factor can be corrected centrally near to the meter.



Potential future changes to charges?

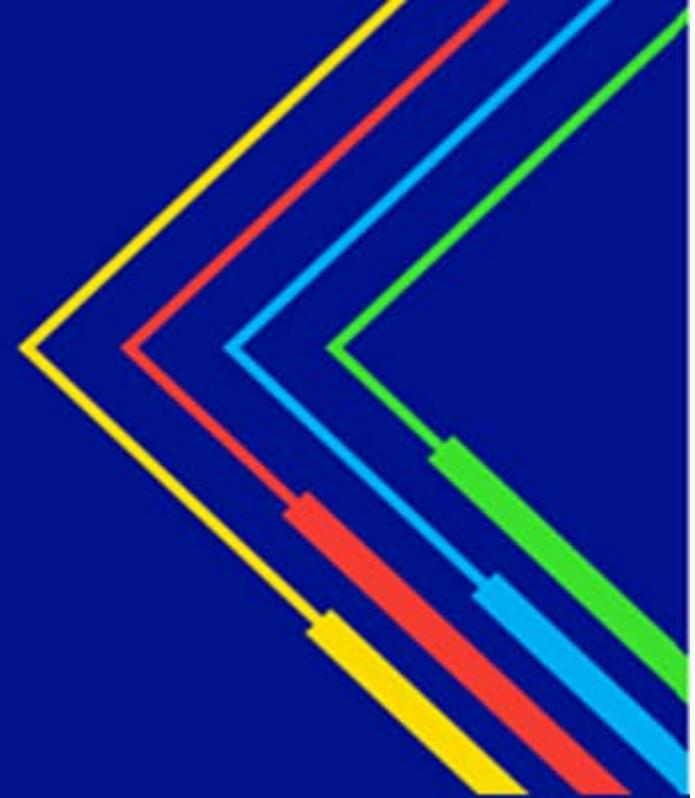
The electricity sector is undergoing significant change; more local generation is being connected at the distribution voltages, and intermittent generation is replacing larger transmission connected generation (decentralisation); the electrification of transport and heating is gathering pace (decarbonisation); and the rollout of smart meters is enabling increased half hourly settlement and billing of customers. These developments have raised the question of how fit for purpose the current network charging methodologies are with regard to incentivising customer consumption behaviour. Ofgem has developed the idea of a Charging Futures Forum in order to better facilitate co-ordination of network charging developments. More information about this can be found at www.chargingfutures.com.

7. Glossary

Glossary of terms and further information you may find helpful

Term	Description
Data aggregator	Responsible for aggregating consumption and submitting it into the settlement process.
Data collector	Responsible for validating meter readings and calculating consumption.
Half Hourly	Energy flows are recorded every half hour.
Kilovolt ampere (kVA)	The resultant effect of the active (kW) and reactive (kVAr) power is the total power measured in kilovolt amperes.
Kilovolt ampere reactive hour (kVArh)	This is the amount of reactive power drawn in one hour by one kilovolt ampere reactive and is measured in kilovolt ampere reactive hour.
Kilowatt (kW)	Electrical power is measured in watts. One kilowatt is one thousand watts. It is the rate at which electricity is supplied and is frequently referred to as either active, Real, useful or working power.
Kilowatt hour (kWh)	This is the amount of electricity drawn during a given period, thus an item of electrical equipment rated at one kilowatt will use in one hour, one kilowatt hour.
Maximum demand	This is expressed in kilowatts and in relation to any month means twice the maximum number of units supplied in any hour in that month.
Maximum Export Capacity (MEC)	Means the maximum export power in kilovolt amperes which has been requested by the customer and which WPD is prepared to make available. Once agreed the MEC shall normally be fixed for a period of 12 months unless varied by agreement with us. We accept no obligation to provide capacity in excess of the MEC.

Term	Description
Maximum Import Capacity (MIC)	Means the maximum import power in kilovolt amperes which has been requested by the customer and which WPD is prepared to make available. Once agreed the MIC shall normally be fixed for a period of 12 months unless varied by agreement with us. We accept no obligation to provide capacity in excess of the MIC.
Meter operator	Responsible for installing and maintaining meters.
Meter asset provider	Owns meters and charges suppliers rental.
MPAN	Metering Point Administration Numbers are allocated against each connection. These are unique identifiers to the premises and need to be quoted if you change electricity supplier.
Non-half hourly	Energy flows are recorded continuously.
Power factor	Power Factor is the relationship between kW (active power) and kVA (total power). See "How can you reduce your bill?" for further information.
Unit	<p>The amount of electricity used is measured in kilowatt hours (kWh) and shown on your bill as units. A Unit is the amount of electricity which a 1000 watt appliance would use in one hour.</p> <ul style="list-style-type: none"> • A 100 watt light bulb would use one Unit if it was on for 10 hours. • A 2000 watt (2 kilowatt) fan heater would use 2 Units if used for 1 hour. <p>The Unit charge will vary between tariffs and at different times of the day and this reflects the different costs of supplying electricity at those times.</p>



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