

A guide to reactive power

For large business customers

Changing energy prices explained

What is reactive power and how is it measured?

Reactive Power (kVARh) is the difference between working power (active power measured in kW) and total power consumed (apparent power measured in kVA). Some electrical equipment used in industrial and commercial buildings requires an amount of 'reactive power' in addition to 'active power' in order to work effectively.

Reactive power therefore generates the magnetic fields which are essential for inductive electrical equipment to operate - especially transformers and motors. This load is measured via the reactive register on your half hourly meter.

What is Power Factor and how is it caused?

Power Factor is the relationship between 'active' and 'reactive' power and indicates how effectively electrical power is being used:

Bad power factor - is low (less than 0.95) so more reactive power is required.

Good power factor - is high (greater than 0.95) so power is used more effectively.

'Perfect' power factor - (1.0) this is known as unity and does not use any reactive power.

Most electrical equipment, such as motors, compressors, welding sets and even fluorescent lighting, create an inductive load on the supply. An inductive load requires a magnetic field to operate, which then causes the electrical current to "lag" the voltage - i.e. the current is not in phase with the voltage.

How is Reactive Power charged?

Reactive power is charged according to the accumulated volume on your reactive register.

These charges will also vary depending on two elements:

1. Contract type
2. Local Network Operator charging methodology

Contract type

If you have a fully inclusive contract, you will pay the rate which you agreed to on your contract. If you have an energy only (supply only) contract, you will pay the rate which has been passed through from your Local Network Operator; which may change if they alter their charging methodology.

Local Network Operator charging methodology

Local Network Operator charging steps differ depending on the location of your site in Great Britain and who serves your network (*see table). Where the first step excludes a percentage figure, the Local Network Operator does not currently charge for reactive power. Where the first step is 33%, the Local Network Operator does not

charge for reactive power for the first 33% of units (kWh). Charges therefore apply when the difference between the total units recorded on the reactive register (kVArh) is less than 33% of the total units consumed (kWh).

Where the first step is 50%, the Local Network Operator does not charge for reactive power for the first 50% of units (kWh). Charges therefore apply when the difference between the total units recorded on the reactive register (kVArh) is less than 50% of the total units consumed (kWh).

For example:

Where a meter consumes 2,500 kWh and 2,000 kVArh, reactive charges would be applied on 1,175 units if the charging step was 33% or 750 units if the charging step was 50%:

33% charging step

2,500 kWh x 33% = 825 units
2,000 kVArh – 825 = 1,175 chargeable units

50% charging step

2,500 kWh x 50% = 1,250 units
2,000 kVArh – 1,250 = 750 chargeable units

How will this be shown on my bill?

If reactive power charges are applicable for your site, they will appear within the 'Consumption charges' section of your bill, specifically:

MPAN	Local Network Operator	1st step	2nd step
10	UK Power Networks	33%	90%
11	Central Networks	33%	-
12	UK Power Networks	33%	90%
13	Scottish Power	33%	-
14	Central Networks	33%	-
15	CE Electric UK	-	-
16	United Utilities	33%	-
17	Scottish & Southern Energy	-	-
18	Scottish Power	33%	-
19	UK Power Networks	33%	90%
20	Scottish & Southern Energy	-	-
21	Western Power Distribution	50%	-
22	Western Power Distribution	50%	-
23	CE Electric UK	-	-

How will this be shown on my bill?

If reactive power charges are applicable for your site, they will appear within the 'Consumption charges' section of your bill, specifically:

	Price per unit	Total units	Amount (£)
Reactive power charge	XXX	XXX	XXX

From 1st July 2008, you may also notice some additional lines which reconcile and adjust for differences between previous reactive power units billed and units charged from your Local Network Operator. This will be shown as follows, for example:

	Price per unit	Total units	Amount (£)
Reactive power charge adjustment for 30 June 08	XXX	XXX	XXX



What can I do to avoid reactive power charges?

To avoid reactive power charges, you can install Power Factor Correction equipment.

If you are interested in a quotation to install this equipment, please contact our expert:

Andrew Morpew

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