

What is Power Factor (PF)?

When you pay for a latte, the last thing you want is more froth than coffee. The same thing can be said about power. Froth on a latte is like wasted energy.



Reactive power
kVAr (froth)

Real power
kW (coffee)

Apparent
power
(latte)

$$\text{Power Factor} = \frac{\text{kW (coffee)}}{\sqrt{\text{kW}^2 + \text{kVAr}^2 \text{ (coffee + froth)}}$$

PF is the ratio between Active – or Real – Power (kW) and Apparent Power (kVA) i.e. a measure of efficiency. It is a measure of how effective incoming power is being used by your electrical equipment, and is expressed as a numerical value between zero and one.

The higher the power factor, the more effective the electrical equipment is being used e.g. a power factor of 0.7 means that 70 per cent of power supplied to the equipment is being used effectively, and 30 per cent is being wasted. This wastage is an unnecessary cost!

An appliance with a low PF draws more current from the available power supply than an appliance with a high PF. Circuits with purely resistive heating elements (e.g. filament lamps, cooking stoves, etc.) have a PF of 1.0; circuits containing inductive or capacitive – reactive – elements (e.g. Transformers, Induction motors, Welding equipment, Arc furnaces, Fluorescent lighting, Electric motors, Solenoid valves, Lamp ballasts, etc.) often have a PF below 1.0.

Ideally your power factor should be as close to one (1.0) as possible to ensure your site is using energy efficiently.



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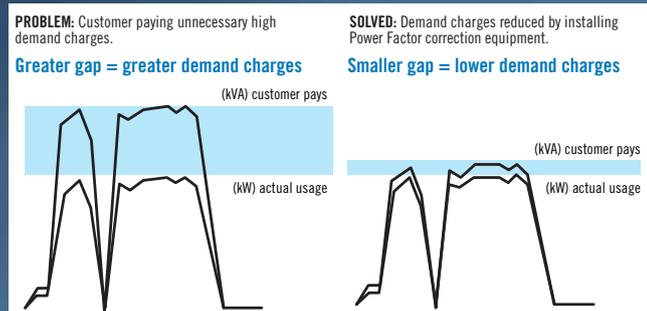
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How does Power Factor impact my business energy cost?

Taking control of and monitoring Power Factor can lead to reduced kVA demand and therefore reduced electricity costs. Improving Power Factor can lead to savings on your business electricity bill.

Installing Power Factor Correction (PFC) equipment can be a cost effective measure to reduce your electricity bill. Energy Systems & Services has delivered PFC projects with short payback periods, in some cases less than a year!



Benefits of PFC...

- Reduced cost: Reduction in kVA demand and therefore electricity costs
- Equipment life: Extend the life of your equipment
- Compliance: Compliance with regulatory codes
- Expansion: More power available for site expansion without the need for new switchboards and cable
- PFC reduces the amount of reactive power required to be sourced from the electricity supplier
- Smaller sized transformer and installation power wiring (less current required due to PFC).
- Future plans of expansion (of plants, etc.) are more greatly obtainable.
- Financial (tariff) example:
 - 1000 kW load at PF of 0.75, S = 1333kVA
 - 1000 kW load at PF of 0.95, S = 1053 kVA
 - Difference is 280 kVA => $280 \times \$0.3757 = \105.20 penalty per day or \$3,156 penalty per month.

Energy Systems & Services (ESS) Holdings Pty Ltd.

ESS offer the following range of products and services:

- Supplier of PFC equipment
- Installer of PFC equipment
- Technical adviser on PFC equipment
- Project manager for supply and installation of PFC equipment
- Provider of specialised Financial Packages* for funding PFC supply and installation.

ESS are non-biased in the selection of components and systems adding flexibility to ensure a design, program, procedure or system is 'fit for purpose' and cost effective, with minimal disruption to the facility's operations.

Talk to ESS (www.energyservices.com.au) today to learn more about our specialised Financial Packages and to see if PFC equipment could benefit your site.

Financial Assistance for Business

Did you know supply authorities offer businesses in eligible areas funding to help cover the cost of installing PFC equipment? PFC could be a cost-effective initiative for your business to reduce electricity costs. Also ESS offer project finance for all electrical asset upgrade projects including power factor correction.

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