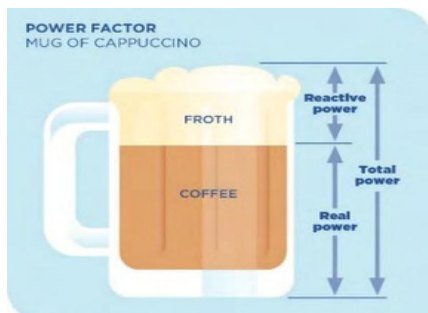


Queensland Farmers' Federation

Power Factor and Demand Factsheet

What is Power Factor?

Power factor is an indicator to help understand the efficiency of your site.



It represents the relationship between total power or apparent power (kVa) demanded by your site, and the real power (kW) that is used on your site.

The difference, called reactive power is not utilised effectively. The ideal power factor is where total power equals real power so the ratio is 1.0, although, power factor over 0.9 is considered good.

In Ergon's cappuccino example (image), the real power, like the coffee in a cappuccino, is the part that does the work, so it should be optimised.

When the reactive power or Froth, is eliminated, real power will equal total power.

Power Factor Terms

Reactive Power (FROTH)	Power losses on site. The unit of reactive power is Kilovolt Amps Reactive kVAR.
Real Power (COFFEE)	Actual power used by the site in kilo Watts kW
Total Power	The total or apparent power demanded by your site in kilovolt Amperes kVA

Ergon requires that low voltage electrical installations are to be no less than 0.8 lagging, measured at the consumers terminals.

How do I know my Power Factor?

If you are paying demand charges your power bill may include demand in either kW or kVA. If you are not in an Ergon Retail area, your power bill may include your Power Factor. Within Ergon areas, if you have a suitable meter, your Power Factor may be included on your Energy Analysis dashboard. It can be monitored using a real time energy monitoring device or voltage measurements taken at the point of supply and consumers terminals.

Poor Power Factor

If your site has poor power factor (lower than around 0.9), you may be paying a higher demand charge as you are paying for the reactive power losses. Demand charges may be a proportion of your energy bill depending on your tariff.

The way it is calculated varies and is based on your maximum demand during the billing cycle. If your demand charge is based on your total power (shown in kVA) and you have poor power factor, you will be paying higher demand charges.

Causes of Poor Power Factor.

A number of factors can cause poor power factor including:

1. Inductive loads such as pumps and transformers.
2. AC induction motors and transformers
3. Welders.
4. Fluorescent lighting.
5. Arc furnaces

Low power factor results in increased network demand and higher operating costs to the energy system as more power needs to be supplied than is necessary. These costs are passed onto electricity customers through higher costs. On site, poor power factor may cause some equipment to run less efficiently and shorten its operating life.

Improving Power Factor

You can improve power factor by;

- Limiting the amount of equipment running at one time as the power supplied from the network is utilised more effectively.
- Using correctly sized motors and Variable Speed Drives.
- Implementing Power Factor Correction (PFC) equipment.

Why Improve Power Factor

With improved power factor you can reduce operating costs by reducing demand charges. The supply voltage will improve and lead to an increase in equipment longevity. The improved voltage can increase the network capacity and may allow connection of additional equipment onsite.