

## Power Factor and It's Effects on Your Business

### I. Power Factor Overview

Power factor is a measure of how efficiently electricity is being used. A higher power factor results in greater customer efficiency, lower power delivery system losses, and requires less system capacity to deliver the same load. A lower power factor indicates inefficient use of electrical power. Maintaining a higher power factor benefits both the customer and the utility.

Some transmission and distribution utilities (TDSPs) include a power factor adjustment in their billing to encourage customers to maintain a power factor above a certain percentage. This is done to increase the TDSP's system capacity and contribute to promoting fair competition to all customers.

The PUC has approved tariffs for all ERCOT TDSPs to adjust demand if the power factor is less than 95%. The power factor used is the average power factor for the 15 minutes during the peak kW demand. The billing adjustment will occur after ratchets, transformer losses, etc.

The calculation of the power factor adjustment is noted in the following example,

- Adjusted billing demand =  $(1000 \text{ kW} \times .95) / .80$
- Adjusted billing demand = 1188 kW

With the power factor adjustment above, the customer would be billed as if peak demand were actually 1188 kW, even though actual peak demand was 1000 kW.

When the TDSP's first enacted this charge it was only calculated for Interval Data Recorder (IDR) meters, and meters peaking at 1000 kW. In the past few years, the advent of reactive metering has made enabled these measurements on non-IDR meters. Currently, in Oncor, any meter that has peaked at 300 kW in a month may be subjected to Power Factor adjustments. The other TDSPs are following suit.

Your power factor can be found on your monthly invoice. It is usually listed towards the end of the bill, with the usage information. You can also track your power factor annually by requesting historical usage data from the TDSP. GDS Associates, Inc. can evaluate those charges for your company by obtaining monthly bills or historical usage. From there, we can recommend ways to increase your power factor and decrease potentially expensive and avoidable adjustments.

### II. Power Factor Corrections

Power factor correction methods often have a quick payback and can improve efficiency of your overall operations. They can range from making slight changes in operational and usage patterns, to installing capacitors or high efficiency equipment.

GDS Associates will review your billing and/or usage histories to see what options are available to your company. If desired, we can conduct a comprehensive energy audit to identify relevant and cost-effective measures to improve the power factor and efficiency of your operations. Areas/energy end-uses that will be assessed include but are not limited to:

- Motors
- Process Cooling
- Rate Analysis and Power Factor Correction
- Heating, Ventilation, Air Conditioning (HVAC) and Controls
- Water Heating
- Lighting
- Compressed Air
- Process Heat
- Standby Power/Office Equipment
- Other Uses

A business can also offset power costs by participating in demand response programs in ERCOT. If your facility has IDR meters and meets a few other qualifications, we can provide a program overview of the LAARs (Loads Acting As Resources) and EILS (Emergency Interruptible Load Service) programs, and model best and worst case scenarios that detail the potential level of curtailment payments, and compare them with the costs incurred by lost production time when an event is called.

### III. Different Types of Equipment Have Different Power Factors

<b>Name of Equipment</b>	<b>Power Factor Percent</b>
Lightly loaded induction motor	.20
Loaded induction motor	.80
Neon-lighting equipment	.30 - .70
Incandescent lamps	1
All types of resistance heating devices (e.g. toaster, space heater)	1