Managing Your Electrical Demand

All the information presented in this article is directed to farmers who are classified as "commercial" or "industrial" customers of electricity. If you are classified as a "residential" customer, this article does not apply to you because your price for electricity is based on a flat (or nearly flat) rate of x cents per kWh (kilowatt-hour).

Cost for electricity on the commercial and industrial tariffs is not a flat fee per kWh, even when the billing formula may appear to be constant. The cost per kWh is significantly influenced by the load factor for the billing period. Load factor is a good index of how well (or how poorly) the demand for electricity is being managed. Load factor is defined as

LF = kWh x 100% / (kW x Days in Billing Period x 24)

where kWh is the amount of electricity used and kW is the peak demand in the billing period. The load factor is not shown on your utility bill, but you should calculate it using the equation above based on values for kWh and kW that can be read directly from your utility bill.

Under realistic conditions, probably the highest load factor that can be achieved consistently on most farms (without any supplemental on-site generation) is 80 percent, which is considered excellent. If load factor dips below 50 percent there should be a review of your entire operation to analyze why the load factor is low and to consider various approaches to remedy the situation.

The electricity used during your peak demand period for each month is the most expensive electricity on a per-kWh basis. Effective electricity demand management involves flattening your profile of electricity use throughout a billing period to avoid excessive peak demands. In the PECO (Philadelphia Electric Co.) territory, peak demand is defined as the highest average use of electricity for a 30-minute interval throughout the monthly billing period. With other electric utility companies in PA, the interval varies from 15 minutes to one hour.

The price of electricity from any utility company on a commercial or industrial tariff is strongly influenced by the demand pattern, as reflected in the load factor. The figure below presents the cost of electricity for a summer month on the 2007 PECO commercial tariff for the case of a consumption of 30,000 kWh. Each component cost of the electricity (generation, transition, distribution, and transmission) decreases as the load factor increases. For this example of a monthly consumption of 30,000 kWh, the price is $6,671 (22.2 cents per kWh) for a 10 percent load factor. The price drops way down to $2,477 (8.3 cents per kWh) for a 100 percent load factor, even though the same amount of electricity is used (30,000 kWh). A worthy goal for any farmer should be to achieve a load factor of at least 60 percent. It is not possible to achieve a 100 percent load factor.

It is important to know when the peak demand is occurring each billing period and what equipment was operating at the time. With such records, one can develop an effective demand management program to reduce electricity expenses without necessarily reducing electricity consumption.

Deregulation of electricity generation in Pennsylvania will be completed with the expiration of the electricity rate caps. Depending where you live, the rate caps may have already expired. On December 31, 2009, PPL will be deregulated and by December 31, 2010, Allegheny Power, MetEd, PECO, and Penelec will be deregulated. No one knows for sure exactly what will happen when deregulation is completed, but the very best thing you can do to prepare for the deregulation is to learn how to manage your electricity expenses by lowering your peak billing demand in each month.

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