



Andy Pearson

The Role of Utilities

BY ANDY PEARSON, PH.D., C.ENG., FELLOW ASHRAE

In the much-loved board game Monopoly™ the Utilities are the Electric Company and the Water Works; the cards that nobody really knows what to do with and nobody really wants. You can't build a hotel on them, and nobody ever won the game by paying attention to them.

Real life is not really like that, although plenty of refrigeration plant owners persist in ignoring their water and electricity usage. In one site survey a fan motor was found to run continuously even though the fan blades had fallen off the hub years before. This is certainly not a winning strategy. It is generally very well understood that a variable cannot be controlled if it is not being measured, and it is equally true to say that a parameter that is not routinely assessed is very unlikely to be optimized. Despite this there are a remarkable number of people who do not measure their utility consumption at all, or even worse they go to the trouble of measuring it and then do nothing with the hard-earned data. This lassitude is difficult to understand because nowadays data Accumulation, Comparison and Benchmarking are as easy as A-C-B.

However, a further difficulty is headed our way. To deal with the multiple challenges of population growth and sustainable farming while coping with rising temperatures, peak oil and fresh water shortages a parallel strategy is required. In short, we need to learn to multi-task. In particular, to deliver a meaningful reduction in carbon emissions, although it is counterintuitive, we need to shift much of our energy use onto the electrical grid, not off it, while at the same time ensuring that grid electricity is as clean as possible. To succeed at one of these objectives, but fall short in the other, would be disastrous. At present we seem to be moving slowly, perhaps too slowly, towards a cleaner grid, but at the same time trying to reduce carbon emissions by taking load off the existing grid and generating the required electricity locally.

I think we should take an even broader view. In addition to electricity and water we should treat all power input to the plant and all climatic effects as utilities. We can use them to our advantage or we can choose to squander them.

For example, if a cold store operator metered the amount of energy that landed on his roof in the form of direct sunlight and was absorbed into the fabric of his building, he might be more interested in reducing this heat load by fitting solar photovoltaic panels to shield the building and convert the light to electricity; a double benefit.

Wind speed and direction can also have a significant effect on the building heat load by influencing air infiltration at doors and even in some cases at seams in the fabric. While the installation of a wind turbine or two would not mitigate the effect of the air ingress it might at least offset the additional electrical consumption caused by the humidity influx

when those weather conditions prevailed. When the sun is not shining and the wind doesn't blow, there can still be a benefit in collecting gray water from the large roof area of a cold store and using it in evaporative condensers, vehicle washers and toilets. As average temperatures continue to rise, the job of the refrigeration plant gets harder. The heat input to a refrigerated space increases and the temperature lift required to move that heat to the outside world also increases; a double penalty.

When it comes to the utilities, it pays to pay attention. ■

Utilities—Any bright ideas?



© MAMASHIRO

Andy Pearson, Ph.D., C.Eng., is group managing director at Star Refrigeration in Glasgow, UK.