



CLP's pumped storage power station in Guangdong.

SMART POWER USE NEED CLEAR AS NIGHT AND DAY

Minimizing power use has become a habit for all who are responsible. It is not only our duty but also a smart way to live.

Most people turn on devices based on habit rather than need.

How often do we see people turning on lights in all rooms and the television set the minute they return home, then proceed to do something else!

Is this really necessary?

I have earlier tried to explain the need to keep maximum power demand and the power tariff for all as low as possible, the former so as to delay the need to build new generating plants.

We have all heard stories of surges in demand during major sports events.

At halftime during the Super Bowl years ago, a lot of Americans turned on stoves and coffee machines at the same time, causing overloads. The resulting loss in power supply meant many missed the second half of the game.

We, in Hong Kong, seldom suffer from power failures, but that should not encourage bad habits. We must all aim to offset our power demand to help even out the peaks.

Through community education to cut unnecessary consumption, we have been able to achieve slow growth in maximum generation capacity for years. With smart usage, we can afford to use more without increasing maximum demand as a whole.

To help this, the new worldwide trend is the use of "smart meters."

In its simplest form, they allow online monitoring of usage by consumers.

In a more advanced form, the utilities can give timely advice to consumers to switch off non-essential devices to help lower peak demand. Often this will be incentivized by a discount on tariffs.

In many countries, there are different tariffs for day and night, encouraging the use of power to be spread out to "off-peak" hours in the evening and nights.

Here, we have a flat rate throughout



the day all year round. This is because of a relatively flat demand curve (the peaks and troughs are not severe), thanks to a general absence of large industries.

Our commercial activities are spread throughout the day cycle.

While demand for air-conditioning for offices and restaurants is reduced at night, that is offset by residential air-con demand in crowded lodgings.

When electric cars become more common, demand at night will also rise.

A lot of families, especially small and young ones, do not cook and that indirectly helps reduce demand.

Technically-minded readers will ask what happens to large generating plants when demand at night falls below the generating capacity?

Power can be "stored." An example is the pump-storage system with one high and one low reservoir, connected by a piping system discharging the stored water through a hydroelectric plant.

When the Daya Bay nuclear plant was built, CLP installed such a system north of the border, in Guangdong.

Excessive power generated at night is used to pump water to the high reservoir. During daytime peaks, water is directed back down, generating power.

This way gets around the problem of not being able to store electricity in large quantities. It helps to smooth out peaks and troughs, long before we learned, as consumers, to offset demand.

I am sure the wise engineers will continue to develop new technologies to help the effective use of electricity, without seriously affecting the essential operations and the enjoyment of electrical appliances by consumers.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure