

City Talk

Daya Bay Nuclear Station.



POWERFUL THINKING MUST RANGE WIDER

The Climate Action Plan, promoted by the Environment Bureau, follows the aims of the policy address, and conforms to the carbon neutral target of 2060 set by Beijing.

The first target is to retire all coal-powered generating plants from 2035, as they are a significant energy producer in Hong Kong but also have a relatively large carbon footprint.

In the old days, power generation in Hong Kong was by crude oil plants. In the 1970s, coal plants were introduced to replace oil plants as they were considered less polluting with fuel more readily available. The abundance of coal at that time provided a more stable source at predictable prices, taking away the commercial and supply risks seen in the oil crisis in the mid-1970s.

It also reduced air pollution sources as crude oil contained sulphur, which when burnt produced sulphur dioxide and sulphur trioxide, the latter being particularly harmful in the atmosphere. But after five decades, coal burning is now seen as a serious air pollutant.

The investment in Daya Bay Nuclear Power Plant in the 1980s provided a stable, affordable and clean source of power for Hong Kong. Currently, 25 percent of our power is nuclear.

The advancing technology of combined cycle gas turbine plants provided another source of electric power generation in the last 30 years, as the much higher thermal efficiency and shorter run-up time made them competitive despite the relatively high cost of the natural gas used as their fuel.

It is this technology that allows natural gas plants to gradually replace coal plants without significant increase in costs to consumers. They are much cleaner and more able to meet expectations of minimal air pollution.

Recently, the availability of renewable energy offered even more opportunities.



Nuts and bolts

Edmund Leung

However, within Hong Kong we have limited land resources to locate renewable energy sources, both for solar and wind.

Previous estimates were that the maximum proportion of energy from renewable energy sources could only be about 5 percent. But with technology improvements predicted over the next 20 years and a wider application of offshore wind power, the new target has stretched to 7.5 percent by 2035, with a long-term target of 10 percent.

I was wondering how this can be achieved. But on further consideration, as we integrate into the Greater Bay Area there is no reason why we should not rely more on power sources across the border.

We already obtain a quarter of our electricity power from Daya Bay, so there is no valid reason why we cannot buy more nuclear and renewable energy power from other areas in the GBA.

But to import power we need to ensure the reliability of supply matches what is currently acceptable in Hong Kong, which is at 99.99 percent. This high reliability is required especially because of our high concentration of tall buildings, with a lot of people in lifts at most times.

One way to achieve this can be by building a dedicated power transmission network directly from power stations to feed the Hong Kong grid. Like power from Daya Bay, this would ensure high security of supply.

Continuous advances in technology will also offer more opportunities for greater power efficiency and reducing pollution.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over features and forces in modern life