Load shifting taipei

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In light of the US-China trade dispute, Taiwanese companies have been moving production back home. The Taipei Times on June 7 reported that since January, the Ministry of Economic Affairs has approved 69 applications by Taiwanese firms to invest a combined NT$369 billion (US$11.8 billion), which would create more than 33,000 jobs ("MOEA approves three firms" investments," page 12).

As Taiwanese companies -- mainly in the manufacturing sector -- continue to return, the business community is concerned about a surge in electricity demand and potential power shortages. Under these circumstances, power planning is essential.

The nation"s total installed power capacity is 42,133 megawatts (MW) and the system peak load is approximately 36,600MW, implying a reserve capacity of 5,533MW, or a reserve ratio of 13 percent. This means that the nation has adequate installed capacity to meet peak demand in the short run. There is no shortage problem.

However, an electricity system has a maintenance schedule or units to provide backup power. Thus, the effective reserve capacity is much less than 5,533MW. To ensure a reliable supply of power, an electricity utility must implement demand-side management initiatives to cope with surges in peak demand.

Peak demand is defined as the maximum power demand registered by a system within a period, such as a month or a year. The value might be the maximum instantaneous load or more, usually the average load over a designated interval, such as one hour, and is normally stated in kilowatts or megawatts.

Industrial Technology Research Institute president Edwin Liu (), in an interview published on June 10 by the Chinese-language Liberty Times (the Taipei Times" sister newspaper), said that peak power demand occurs for about 200 hours yearly, less than 3 percent of the time.

Peak demand in Taiwan occurs from midday to 2pm from June to August. It is normally caused by residential and small commercial users -- about 3 million households -- turning on air conditioners on hot days.

Demand-side management is the planning and implementation of electric utility activities that influence customers" use of electricity in ways that will promote desirable changes in the utility"s load shape.

The traditional role of the utility has been to respond to increases in demand by building new capacity, such as high-capacity thermal and nuclear power units. This approach has led to surplus capacity and a waste of resources when increased demand did not materialize. Operations designed to meet rather than manage load have cost implications for the utility and, eventually, customers.

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Under traditional planning practices, an increase in load results in the utility bringing additional generating resources online. Over time, utilities are forced to develop more expensive generating resources, such as the NT$400 billion spent on building the Fourth Nuclear Power Plant, which is now mothballed.

There are three demand-side management initiatives that could solve the nation"s power problem: load shifting, energy-efficiency improvements and interruptible load.

Load shifting refers to efforts by a utility to alter the timing of customer demand. The goal is to reduce peak demand that occurs in the daylight hours of summer. Demand is shifted to non-peak periods, but total demand is not reduced.

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