

INFRASTRUCTURE

The Committee's main focus this year regarding energy continues to be the adequacy, reliability, and cost of the electrical power supply. There is also concern as to whether Taiwan can meet its commitment to reduce carbon emissions by 20% by 2030 and 50% by 2050 compared to the emission level of 2005. In addition, we suggest that the government aggressively address Taiwan's energy capacity issues by adopting new Demand Side Management technologies and providing greater government support for offshore wind-farm development.

Regarding government procurement, since the opening of the Taiwan market seven years ago to the Government Procurement Agreement (GPA) signatory countries, the results have not been impressive. Our members urge the government to take steps to attract more foreign companies to participate in the government procurement market. Some key measures toward that goal would be to amend the current terms and conditions for tendering public projects, as well as the unfair provisions in Taiwan's Government Procurement Law as discussed in Suggestion 5.

Suggestion 1: Ensure that Taiwan's power supply continues to be sufficient, reliable, and competitively priced.

Being assured of an adequate and reliable power supply at competitive cost is a basic requirement for high-tech manufacturers' operations, and therefore for the economic well-being of Taiwan as a whole. A fraction of a second of power interruption or voltage fluctuation can result in lost production and severe damage to valuable assets, and competitive energy costs are extremely important to the profitability of industrial users. We therefore encourage the government and the Taiwan Power Co. (Taipower) to continue to focus on the three key factors of adequacy, reliability, and cost.

With the mothballing of Nuclear Unit No. 4 and with the other three units slated to be decommissioned by 2025, concerns about power-supply adequacy and reliability have increased. Considering that 17% of the country's power

output is currently generated by nuclear plants, it is vital to set a long-term energy policy that maintains robust supply and competitive tariffs into the future, despite the decreased dependence on nuclear sources.

Our suggestions:

- a. *Set a clear direction and policy to mitigate the concerns of large industrial power users.* It is likely to be extremely expensive to replace nuclear power with other sources, particularly if the replacement is done too quickly, without time to enable lower-cost resources to be developed efficiently.
- b. *Identify the specific root causes of power interruptions and take proper corrective actions to minimize the risks.* Taipower should continue to meet with their large industrial customers on a periodic basis to discuss mid-to-long term power supply and demand opportunities and challenges.
- c. *Conduct a detailed analytical survey of the requirements for a stable electricity supply by large users in the strategic high-tech manufacturing sector.* These companies should be given the highest priority for non-interruptible service because they make a crucial contribution to employment and GDP growth in Taiwan. Their heavy investment signals a long-term commitment to Taiwan and promotes more long-term, efficient planning by Taipower. In addition, the Ministry of Economic Affairs (MOEA) and Taipower should greatly increase efforts to promote energy conservation and support for Demand Response (DR) programs (see Suggestion 3.1 below). In our view, DR is the only program that can be developed quickly, aided by increased financial incentives, to assist in maintaining reliable supply across Taiwan. Additional programs to consider as part of a detailed plan include economic grants, energy audits and reviews with large customers, etc.
- d. *Maintain a robust cost-competitive position with respect to energy supply among Asian countries to support stronger economic growth.* Large industrial customers in Taiwan compete in a global marketplace, and the price of power has a significant impact on their bottom-line profitability. These large users need more clarity on the details, methodology, and process by which power tariff adjustments are made in order to prepare for future changes and avoid adverse surprises affecting their budgeting and planning. In particular, the cost associated with the construction and potential decommissioning of nuclear unit 4 merits careful attention. These costs should not be recovered from power users, as the unit will never have generated any electricity or served a useful purpose. The most efficient way forward would be for Taiwan to cover any such “stranded costs” by allocating a separate budget

to absorb them. If the costs were to be included on Taipower’s balance sheet it would likely bankrupt the company and cause electricity bills to soar.

- e. *Provide sufficient and reliable gas supply for power generation and to support other industrial usage.* MOEA and the national oil company, the CPC Corp., should ensure timely construction of the proposed No. 3 LNG receiving station. Over the next several years, CPC must also ensure that its gas purchases are prudently priced, given the rapidly changing international gas market. As the sole importer of Taiwan’s LNG, CPC should provide more transparency about how it balances spot and term LNG purchases.

Suggestion 2: Set a realistic energy plan that considers both energy demand and carbon-emission reduction goals.

Last December, the Taiwan joined other members of the international community in announcing Intended Nationally Determined Contributions (INDC) for reductions in carbon emissions. Taiwan committed to cutting the level of carbon emissions by 20% by 2030 and 50% by 2050, compared to a base line of 2005 emissions. The path to meeting that commitment remains unclear.

More than half of Taiwan’s carbon emissions come from power generation. There are three types of power plants: fossil fuel (basically coal or gas), nuclear, and renewable. Fossil-fuel power plants produce carbon emissions, while nuclear and renewable power facilities are carbon-free. Currently 78% of Taiwan’s power demand is met by fossil-fuel plants, 17% by nuclear, and 5% by renewable sources. To meet the INDC commitment, Taiwan would have to greatly reduce its reliance on fossil fuels power and greatly increase its capacity for power generation from other energy sources.

However, the government’s adoption of a “Nuclear Free Homeland” policy would seem to rule out any increase in the use of nuclear power, which currently contributes 40 billion kWh of electrical energy annually. Besides mothballing the uncompleted fourth nuclear power plant, the government’s intention is to retire the existing three nuclear plants by 2025. That raises the question of whether it is possible to generate an additional 40 billion kWh of energy from renewable energy sources. But even if that can be done, it would merely keep carbon emissions at the current level rather than achieving the proposed 20% reduction.

Two major technical issues confront renewable power development in Taiwan. First, Taiwan’s power grid is isolated, not interconnected with those of any neighboring countries. As the availability of both wind and solar power varies with weather conditions and time of day, the proportion of wind and solar power in the total installed capacity must be kept limited in order to ensure the stability of the power grid. The second issue is capacity factor – how much power is actually

generated over a period of time compared to the maximum designed output. The capacity factor for fossil and nuclear power can be higher than 80%, but it is just 15% for solar and 30% for wind power. Due to these technical constraints, it is questionable whether renewable energy could fill the 40 billion kWh gap that would be created if all nuclear power plants are retired.

Another factor to be considered is growth in power demand. Even if only very modest (<2%) annual power growth occurs, the increased demand by 2030 will come to more than 60 billion kWh. If most of this demand must be met by fossil power, fulfilling the INDC commitment becomes even more problematic. Even with life extensions of the existing nuclear power plants and operation of the fourth plant, Taiwan would still fall short of its carbon reduction goals.

INDC commitments cannot be taken lightly. Neither can the government's responsibility to ensure an adequate energy supply. We urge the government to come up with a realistic energy plan that gives proper consideration to both carbon-reduction goals and national energy demand.

Suggestion 3: Adopt new Demand Side Management technologies and provide greater support for offshore wind farm development.

Given the new administration's goal of achieving a nuclear-free Taiwan by 2025, the challenge of guaranteeing a stable and reliable energy supply becomes even more urgent. Without nuclear power, Taiwan's reserve margin will likely drop to about 5%, much lower than the internationally recognized safe margin of 15%. Thus, major energy-policy measures need to be urgently adopted to safeguard the Taiwan economy as it transitions away from nuclear energy.

The Committee recognizes that the new administration intends to manage peak-hour demand, enhance the efficiency of electricity distribution, and amend the Electricity Act to encourage the development of renewable energy. We respect the government's determination and offer the following specific recommendations:

3.1 Embrace new trends in Demand Side Management (DSM), including Demand Response (DR) and Energy Efficiency (EE) measures.

a. Demand Response is a clean, cost-effective and quick method to reduce peak demand. Utilities need enough electricity generating capacity to meet peak demand, even though demand only reaches that peak for a limited number of hours per year. Building and maintaining generating capacity is very expensive. Demand Response is a collection of innovative methods that incentivize industrial and commercial users to shift some of their energy consumption to non-peak hours. For utilities, lowered peaks reduce the need for additional investment on capacity.

Demand Response has proven successful in the United States, Europe, Australia, South Korea, and other countries, in part due to the introduction of Demand Response Aggregation. DR Aggregators organize groups of industrial and commercial users that collectively commit to reduce their peak-hour demand by a negotiated amount. The utility benefits from reduced peak-hour demand. Users benefit from reduced energy costs and the ability to monitor their energy consumption more closely. The aggregator realizes a profit for success and pays a penalty for failure.

The Committee understands that MOEA and its Bureau of Energy (BOE), as well as Taipower and certain Taiwan energy think tanks, have been exploring ways to adopt various DR measures. To deploy DR more quickly and efficiently, we recommend that Taiwan introduce DR Aggregation and establish an attractive compensation formula that encourages participation in DR programs.

b. Evaluate current Energy Efficiency programs for residential users, build consumer awareness, and foster changes in consumer behavior. Energy conservation in the residential sector is usually quite challenging because of difficulties in measuring results and achieving significant improvements. Although Taipower has introduced various EE programs to encourage residential energy conservation, these programs have not yet been shown to be effective. We recommend that MOEA and the BOE conduct a comprehensive review of all EE programs to evaluate their effectiveness. We also urge the MOEA and BOE to consider the more innovative approaches developed in recent years in the United States, Europe, Australia, and certain Asian countries.

3.2 Streamline the application process for offshore wind farm development. The Taiwan Strait is recognized as one of the best locations anywhere for offshore wind farms. In 2015, the BOE announced guidelines for offshore wind farm development and designated 36 potential development sites. Experienced international wind farm developers have expressed enthusiasm to help develop these sites. Upon reviewing the guidelines, however, many concluded that the application process requires too many approvals from different levels of government and other parties with different goals and different levels of expertise and experience. In short, they regarded the process as too lengthy, complex, political, and unpredictable.

The new administration has vowed to prioritize the development of renewable energy, including offshore wind farms. The Committee supports that goal and urges the new administration to review and streamline the current development application process in order

to encourage top international developers to contribute their expertise and experience to this new sector of Taiwan's economy.

Streamlining the application process would also encourage local banks to finance the development of offshore wind farms. As long as the process remains unpredictable, banks will be less likely to finance wind farms, further reducing interest and participation by the most experienced developers.

Suggestion 4: Attract more foreign companies to participate in the government procurement market.

Starting seven years ago with Taiwan's accession to the Government Procurement Agreement (GPA) under the WTO, Taiwan has opened its government procurement market to GPA countries. But so far the results have not been impressive. Two major factors appear to account for that development. First is the diminished interest on the part of foreign companies due to non-technical market barriers, and second is the perception that the procurement system is not very welcoming toward foreign companies' participation.

For reasons that include ease of communication, lower contract prices, and less responsibility in what is sometimes a sensitive political environment, state-owned enterprises have tended to favor local suppliers of equipment and services in the tendering process. In addition, many of the terms and conditions adopted in standard government contracts differ from what prospective foreign bidders regard as fair and internationally accepted conditions. The result is that most first-tier international companies are reluctant to participate in Taiwan's tenders, depriving the government procurement process of the chance to do things better and more efficiently. Besides damaging the international image of the Taiwan procurement market as a whole, the situation prevents Taiwan from raising the quality level of many products and services by adopting the latest worldwide technical developments.

We suggest amending the terms and conditions on public tenders to make them more acceptable to world-class engineering and equipment-supply companies. We also continue to recommend further broadening of the scope of Taiwan's GPA participation by adding the special municipalities created since Taiwan signed the Agreement – New Taipei City, Taichung, Tainan, and Taoyuan – as well as more central government agencies.

Following these suggestions would give the new administration a chance to create a more open government procurement environment in the interest of broader international contacts and encouraging the entry of new technologies.

Suggestion 5: Remove unreasonable provisions in the Government Procurement Law.

Articles 88, 89, 101, and 103 in Taiwan's Government Procurement Law impose particularly harsh penalties on employees of engineering consultant firms working on public construction projects – including those involved in planning, design, procurement, review, project management, and construction supervision services – if the employee has engaged in misconduct for personal benefit while on the project. The punishment is imprisonment for a period of one to seven years and/or a fine of NT\$1-3 million.

We are particularly concerned with an additional aspect of such cases – the stipulation that the employer of such wrongdoers will be prohibited from participating in bidding on or being a subcontractor for public projects for up to three years. In reality, no employer can control the personal behavior of individual employees. But under the Taiwan law, misconduct by a single employee could cause a whole company with hundreds or even thousands of personnel to be severely penalized.

In some cases, the employee is found guilty by a lower court and the prohibition on the company's participation in government projects is publicly announced. But afterward, following a long legal process, the employee may be deemed not guilty by an appellate court. Although the prohibition should be lifted at that point, the damage to the company's business income and reputation is already done and no recourse is available for any remedy. Incredibly, government agencies have sometimes announced the prohibition based solely on the prosecutor's indictment, without any verdict having been reached in court.

This kind of regulation is not found in any other country. It is especially inappropriate when considering this country's need for professional engineers to help promote economic development in general and public construction in particular. We strongly recommend abolishing the relevant portions of the Government Procurement Law to remove an unreasonable regulation facing the consultant engineering industry.