

CHAPTER 14

The Energy Situation and Related Policies in Taiwan

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Growth demands energy. It is no wonder that Taiwan—with 0.34% of the world's population and 0.65% of the world's GDP—has developed an appetite for bulk energy. Taiwan's energy supply and consumption in 2009 were $117,720 \times 10^6$ and $113,085 \times 10^6$ liters of oil equivalent, or around 1% of world energy consumption. With an economy that has grown at 4.85% a year for the past twenty years, Taiwan's total energy consumption in 2009 was 2.3 times its total consumption in 1990. Because Taiwan is an isolated island with a very high-density population (639 persons per km^2) that lacks energy and natural resources, Taiwan's imported energy ratio increased from 86.2% in 1982 to 95.3% in 1989 and to over 99% in 2009. Thus, energy imports account for one-fourth of Taiwan's total imports. Although Taiwan is an export-oriented economy (exports account for 70% of Taiwan's GDP), energy imports account for 15.3% of Taiwan's GDP.

In 2009, total energy supply included five major primary forms of energy, namely, coal (30.4%), oil (51.8%), natural gas (8.6%), nuclear energy (8.7%), and renewable energy (0.5%, including conventional hydro power). Fossil fuels, including coal, oil, and natural gas, accounted for 90.9% of all energy supply. Furthermore, Taiwan's electricity generating capacity reached 229,068 GWh in 2009. Coal, oil, natural gas, nuclear power, cogeneration, renewable energy, and pumped storage contributed 38.4, 2.7, 20.1, 18.1, 15.8, 3.5 and 1.4%, respectively, to total power generation. Low-carbon energy, including natural gas, nuclear energy, and renewable energy, only made up 43.1% of all power generation. Because CO₂ emissions are largely based on fossil fuel burning, Taiwan's CO₂ emissions from energy use have increased significantly from 109 million tonnes of CO₂-equivalent in 1990 to 257 million tonnes CO₂-equivalent in 2005 as well as in 2008. Taiwan's per capita CO₂ amounted to 11.14 tonnes per person in 2008, compared to 5.37 tonnes per person in 1990.

Unless measures are taken to decrease such emissions, Taiwan's CO₂ emissions from energy use could increase by 79% over the period from 2008 to 2020, according to an estimation made by Taiwan's Environmental Protection Administration (EPA). It is obvious that reducing energy use and increasing low-carbon energy use are critical for decreasing CO₂ emissions. Since President Ma Ying-jeou took office in May 2008, building Taiwan into a low-carbon society has become one of the government's priority policies. In order to aggressively create policies and strategies to balance energy security, economic development and environmental protection, the Ma administration announced the "Framework of Taiwan's Sustainable Energy Policy" one month after President Ma's inauguration, which included the following targets:

1. Improving energy efficiency by more than 2% per annum and decreasing energy intensity by 20% by 2015;
2. Reducing nationwide CO₂ emissions to their 2008 level between 2016-2020, and to the 2000 level in 2025;
3. Increasing the share of low-carbon installed power generation capacity from 40% to 55% in 2025, which includes the share of renewable energy to 8% and the share of natural gas to 25%;
4. Promoting energy conservation schemes, especially an increase of 30% in terms of the carbon intensity of the industrial sector and 25% of the fuel efficiency standards for private vehicles by 2015;
5. Providing a comprehensive regulatory framework and relevant mechanisms, including legislation on the “Greenhouse Gas Emissions Reduction Act,” the “Renewable Energy Development Act” and the “Energy Tax Act,” the revision of the “Energy Management Act,” the establishment of a fair, efficient and open energy market, increasing the annual energy research budget within the next four years to NT\$10 billion, the design of a carbon emission trading scheme, and the promotion of education regarding energy and climate change; and
6. Securing a stable energy supply.

Following the goal of the framework, the 3rd National Energy Conference was held in April 2009 in order to develop new guidelines on energy strategies. This conference concluded by outlining the following three goals on future energy development:

1. Working toward a “low-carbon homeland”;
2. Developing a future economy, society, environment and technology based on the concerns of energy; and
3. Coordinating government policies to achieve a “low-carbon society” and “low-carbon economy.”

This conference also reached many important agreements, which led to the drafting of new legislation and the amendment of renewable energy and energy efficiency regulations to develop low-carbon communities and low-carbon cities, to rebuild a low-carbon industrial structure, to encourage green architecture and green transportation means, and to introduce an energy tax, etc.

In accordance with the framework and the conference conclusions, a concrete action plan has been formulated in Taiwan. During the past year (2009), the Government approved a project to invest NT\$25 billion (US\$740 million) over the next five years in the development of renewable energy and the subsidization of the installation of energy saving devices. The Government also planned to provide NT\$20 billion for research and development of green energy technologies, which is expected in turn to attract NT\$200 billion in private investment. Furthermore, the Legislative Yuan has quickly passed legislation on the “Renewable Energy Development Act,” which sets a target of 16% for newly-installed power capacity for renewable energy by 2025. The Legislative Yuan has also passed the revision of the Energy Management Act, which tightens energy efficiency standards and establishes energy information labeling systems for energy products and vehicles and requires advanced management for large energy users. Moreover, the Greenhouse Gas Reduction Bill, which has not been passed by the legislators, will adopt a three-step greenhouse gas (GHG) emission control strategy, the implementation of compulsory inventory and reporting, the adoption of an emission trading system and efficiency standards, and the promotion of a cap-and-trade and emission offset trading scheme.

After the UNFCCC Conference, which was held in Copenhagen

in December 2009, the Government set up two Executive Yuan (cabinet) level institutions. The first institution is the “Executive Yuan Steering Committee on Energy Conservation and Carbon Reduction,” which is actively designing a “National Energy Conservation and Carbon Reduction Master Program.” Several key strategies in this program include organizing Taiwan’s experts to establish a task force in order to help the industry to resolve all problems associated with the development of technology, investment and operations regarding energy conservation and carbon reduction, thereby introducing the “Dawning Green-energy Industry Program,” and starting the “National Science and Technology Program-Energy (NSTPE).” The second institution is the “Executive Yuan Steering Committee on New Energy Development and Promotion”, which is comprehensively assisting in the development of Taiwan’s green energy industry and encouraging the continuous growth of markets for different types of green energy. In March 2010, the Taiwan Government announced plans to boost green-energy and low-carbon industry by investing NT\$45.4 billion in “green flagship” projects this year. These projects are designed to build on the foundation of Taiwan’s leading IT, semiconductor, electromechanical, and composite material industries.

Most importantly, Taiwan, which accounts for approximately 1.7% of global economic power and 1% of global GHG emissions, should not be excluded from the operation of the UNFCCC. Taiwan’s industries need to join the Kyoto Mechanisms and the mechanisms for clean technology development and transfer in order to reduce mitigation costs and to ensure competitiveness. On the other hand, Taiwan’s leading scientific and technological power will be able to significantly contribute to global clean technology development under the UNFCCC

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mechanisms for clean technology development and transfer. Thus, Taiwan declared its intention to participate in the operation of the UNFCCC on September 2009 in order to link up with international efforts to combat climate change. Furthermore, the Government has decided to support the Copenhagen Accord with a voluntary commitment to a target of at least a 30% reduction in total GHG emissions by 2020 based on the concept of business-as-usual (BAU).

To sum up, Taiwan's energy security and the efforts being made to reduce GHG emissions should be improved through aggressive domestic actions and the progress of international cooperation. Further support from the international community will lead to substantial participation by Taiwan in the UNFCCC and will enhance Taiwan's international contribution.