

## **Submission by Republic of China (Taiwan) Intended Nationally Determined Contribution (核定本)**

The Republic of China (Taiwan) supports the 21<sup>st</sup> Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), to deliver a new strong and effective global climate change agreement in Paris in December 2015. In response to the *Lima Call for Climate Action*, Taiwan is committed to communicating its Intended Nationally Determined Contribution (INDC), following the common but differentiated responsibility under the national circumstance, for the objective in Article 2 of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

### **Emission Target**

Taiwan will implement an economy-wide target, through domestic abatement effort to reduce its greenhouse gas emissions (214 MtCO<sub>2</sub>eq) by 50% from the business-as-usual level (428 MtCO<sub>2</sub>eq) by 2030.

<b>Period</b>	1 January 2021— 31 December 2030
<b>Emission Target</b>	<ul style="list-style-type: none"> <li>Greenhouse gas emission reduction by 50% from the business-as-usual level by 2030</li> </ul>
<b>Scope</b>	<ul style="list-style-type: none"> <li>Economy-wide</li> </ul>
<b>Gases covered</b>	<ul style="list-style-type: none"> <li>CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>, NF<sub>3</sub></li> </ul>
<b>Sectors covered</b>	<ul style="list-style-type: none"> <li>Energy; Industrial processes and product use; Agriculture; Land-use, Land-use change and forestry; Waste</li> </ul>
<b>Assumptions and Methodological Approaches</b>	<ul style="list-style-type: none"> <li>2006 IPCC Guidelines for National Greenhouse Gas Inventories</li> <li>Global Warming Potential used in IPCC AR4</li> </ul>
<b>Credits from International Market Mechanisms</b>	<ul style="list-style-type: none"> <li>The emissions reduction target is committed to the domestic measures mostly. Future reduction potential can benefit from being involved in the international market mechanism.</li> </ul>

### **National Circumstances**

Taiwan is located at the border of East and Southeast Asia; to the west lies the Taiwan Strait and to the east the Philippine Sea. The economy of Taiwan depends upon international trade; the energy demand has rapidly increased over the past 20 years following a rapid economic growth. However, as an island with an independent electricity grid without gas pipelines, Taiwan highly relies on imported energy, which makes up over 98% of its energy demand. Despite such a difficult situation, Taiwan still makes the greatest efforts toward the global 2°C target on low-carbon development.

The Taiwan government began the proactive implementation of GHG emissions reduction in 1998; the Nationally Appropriate Mitigation Actions (NAMAs) was set to a reduction target by 2020 in accordance with the Copenhagen Accord. Accordingly, Taiwan actively promotes energy conservation and carbon reduction, e.g., transforming industrial structure, legislating energy saving related measures, accelerating renewable energy development, and utilizing the use of natural gas. As a result, the CO<sub>2</sub> intensity has significantly improved and under efficient control, with an annual decrease of 2.4% from 2000 to 2014. The total GHG emission in Taiwan (277.2 MtCO<sub>2</sub>eq) has not exceeded the 2007 historical record to date.

Taiwan accounts for about 0.55% of the total global GHG emission in 2012 (according to 2015 World Resources Institute statistics) and about 0.8% of the total global CO<sub>2</sub> emission (according to 2014 International Energy Agency statistics). By gas type, fossil fuel combustion takes up the highest proportion (about 87.55%) in Taiwan's total GHG emission; by sector, the manufacturing and construction industries take up the highest proportion (about 43.25%) in Taiwan's total GHG emission. The Greenhouse Gases Reduction and Management Act, promulgated in 2015, covers the seven major greenhouse gases (Doha amendment to the Kyoto Protocol, 2012) for our ambitious reduction target.

## **Mitigation Contribution**

### **Legal Basis**

The Taiwan government promulgated the Greenhouse Gases Reduction and Management Act on July 1, 2015, to serve as the legal basis for climate change response. Being the first law in Taiwan to empower the government to formulate related regulations and share the common but differentiated responsibility with the global society, the Act not only has a clear emission reduction target of 50% 2005 level by 2050 but also implements carbon reduction through a five-year control cycle. The central competent authority will develop a "National Climate Change Action Guideline", "Greenhouse Gas Reduction Action Plan," and "Greenhouse Gas Emission Control Action Programs for the Sectors", reflecting Taiwan's economy, energy supplies, and environment, with consideration of current international situation. The central competent authority's "Greenhouse Gas Emissions Control Action Program" and local governments' "Emission Control Implementation Program" will be enforced together with the "Energy Management Act" and "Renewable Energy Development Act" for a progressive implementation to effectively manage greenhouse gases and increase energy efficiency.

### **INDC Working Group**

The Executive Yuan has set up the INDC Working Group to coordinate all measures from the Environmental Protection Administration, Ministry of Science and Technology, National Development Council, Ministry of Economic Affairs, Ministry of the Interior, Ministry of Transportation and Communications, and Council of Agriculture to review the maximum potential of reduction measures and the energy provision policy by using multiple energy simulation scenarios based on the 2030 GHG reduction target, in preparation for timely announcement.

### **Sectoral Mitigation Measures**

#### **A. Energy**

Taiwan is highly dependent on imported energy, which accounts for 98 percent of its energy supply and is easily influenced by the fluctuation of global energy supply. The choice of energy mix will have an impact on national energy security, economic and social development. To reduce energy consumption from the demand side, the government will introduce advanced energy conservation measures regardless of their cost-effectiveness, in addition to the present feasible energy conservation technology measures. As for the supply side, the government has spared no effort to plan and formulate the following strategies to reduce the GHG emissions in the energy sector.

The electricity sector's development will move toward low-carbon operations. Given that the existing nuclear power plants will be gradually decommissioned according to schedule under the nuclear-free homeland policy, and considering the principles of ensuring a stable

electricity supply, maintaining reasonable electricity prices and fulfilling international carbon emission reduction commitment, the government will raise the renewable energy development target to 17,250MW in 2030, increase the use of natural gas, replace old power plants with the best feasible technology, and promote infrastructure construction of smart grids to further enhance the power system stability and increase the efficiency of power supply and demand. In the refining sector, the strategy of energy conservation operation will be achieved through using low-carbon fuel and high energy-efficiency equipment, and promoting energy integration and management. Existing refineries will replace their old facilities with the best feasible technology to enhance energy efficiency.

## **B. Industry**

The CO<sub>2</sub> emission intensity of energy use of the industrial sector has been continuously declining. In the future, the industrial sector development will include promoting GHG emissions reduction and management tasks through the following measures: industrial structure adjustment, technical advice service of energy conservation and carbon reduction, integrated utilization of energy and resources in industrial zones, regulating energy efficiency standards, alternative fuels, heat recovery, and a renewal of facilities. The fluorinated greenhouse gas emissions in electronics industry have shown a significant decline since it started to introduce alternatives and installation of local scrubbers in 2005.

## **C. Residential Sector**

In the residential sector, energy conservation and carbon reduction measures such as the Minimum Energy Performance Standards (MEPS), Energy Label, Green Building Regulations and Green Building Label will be promoted. The rates of energy use and the average energy consumption per capita have been declining. In the future, energy conservation and carbon reduction in the residential sector will focus on two main strategies: (1) Encourage energy-saving designs of new buildings (the government will amend existing Green Building Regulations for energy-saving design improvement. In addition, the percentage weight of energy conservation in the assessment of green and smart building labels will likewise be gradually increased to encourage the development of innovative energy-saving construction processes and technologies); (2) Introduce more stringent energy performance standards for energy-saving appliances and increase the penetration rate of energy-efficient products. (The government will improve higher energy-efficiency standards for households and gas appliances, increase the penetration rate of energy-efficient products, encourage renewal of appliances, and introduce the Smart Energy Conservation Program to shape electricity consumption patterns of the public.) The use of smart meters, energy management systems, differential electricity pricing, and summertime energy conservation measures will be taken into account to facilitate strategies of energy conservation and carbon reduction in the residential sector.

## **D. Commerce**

Electricity intensity in the service sector in Taiwan is 89.5 kWh/k\$, lower than the global average (104.4 kWh/k\$). In the future, efforts in the service sector towards energy conservation and carbon reduction will focus on the implementation of energy conservation measures along with mandatory and comprehensive energy-saving and management regulations. The regulations will include the following: (1) Major service industries spearheading efforts to conserve energy and reduce carbon emissions: promote energy-saving regulations for 20 service industries, achieve one percent energy saving target on average annually for large energy users, and encourage voluntary energy conservation actions for enterprises in the service sector; (2) Provide consultation service for energy saving and carbon

reduction: provide business districts, chain businesses, and logistics companies with complementary resources to their energy-saving and carbon reduction efforts, and to carry out energy audits on the service sector and provide technical assistance; (3) Promote the Smart Energy-Saving Program: the central and local governments jointly promote energy conservation actions through incentive subsidies and public participation to foster changes in the public's mindset and behavior.

## **E. Transportation**

Energy use in the transportation sector includes gasoline for automobiles, diesel fuel, liquefied petroleum gas, aviation fuel, marine fuel, and electricity. Through the development of green transportation system, enhancement of transportation demand management, and energy efficiency improvement, the CO<sub>2</sub> emissions from the transportation sector has remained at a constant level since 2005. In the future, the measures will focus on the development of green transportation systems, which include the following: (1) increase the capacity and market share of public transportation systems through the use of convenient public transportation networks and the development of seamless interfaces between public transportation and major road networks; (2) improve transportation demand management through the transit-oriented development to gradually reduce the reliance on private vehicles; (3) improve the energy efficiency of transportation systems by accelerating vehicle renewal and promoting the use of energy-efficient vehicles, such as encouraging the use of electric cars or motorcycles and imposing more stringent energy-efficiency standards for new vehicles.

## **F. Agriculture**

While agricultural production provides food to the public and ensures food security, the GHG emission from energy consumption during agricultural production accounts for a mere one percent of Taiwan's total emission. Agricultural production value in Taiwan has continued to increase despite a decline in both energy consumption and energy intensity within the sector since 1990. This shows that energy efficiency within the agricultural sector has increased and is decoupled by economic development. In 2007, the sector started to use Voyage Data Recorder to keep track of the length of fishing operations, and as a result, fuel consumption by fishery has dropped significantly. Measures have been taken to assist agricultural electricity users to improve their energy-efficient facilities, livestock farming, and to instruct energy-saving equipment installation in fungus farms and fruit/vegetable freezing facilities. The government has been promoting an arboriculture plan that strengthens afforestation on hillside and rewards afforestation on flat land such as marginal cropland of poor production. In addition, the government is also promoting the use of reasonable amount of fertilizers and organic farming to discourage farmers from overusing fertilizers and to lower GHG emissions.

## **G. Waste**

The Taiwan government has promoted the "Zero-Waste Policy". Most of the waste was treated through waste incineration with comprehensive classification and recycling of wastes, and power generation. All of the domestic waste incinerations will gradually be transformed to regional biomass centers for comprehensive classification and zero waste, and resource recycling in the future. Through the measures of landfill gas recycling generation, methane recycling from wastewater treatment, increasing the installation rate of household wastewater pipelines, the amount of GHG emissions of the waste sector is gradually reduced.

## **Adaptation Measures**

To enhance national adaptation capabilities and reduce social vulnerability, Taiwan on June 25, 2012 proposed the Adaptation Strategy to Climate Change in Taiwan, focusing on the following eight major adaptation sectors: disasters, infrastructure, water resources, land use, coastal zones, energy supply and industry, agricultural production and biodiversity, and health. The aim is to investigate the impact on and challenges facing these sectors a result of climate change, put forward a set of comprehensive adaptation strategies, and implement measures to expedite actions and results.

Under the policy framework, relevant government agencies proposed action plans for the aforementioned eight major sectors, and on May 22, 2014 compiled the Action Plan for Adaptation to Climate Change in Taiwan (2013- 2017). The adaptation measures were thus transformed into concrete action plans, which include the establishment of a solid foundation for climate change adaptation and 64 priority action plans. Relevant government agencies are currently working to implement the action plans and at the same time carry out rolling assessment of the plans.

## **Vision and Ambitious Commitment**

Taiwan is limited by its geographic condition with an independent electricity grid and high dependence on imported energy. Although the manufacturing industry has been increasing its energy efficiency to reduce GHG emissions, it still makes up a major proportion in the total industrial structure with high energy demand in order to maintain international competitiveness. With the non-nuclear homeland policy, it makes it a real challenge to reduce emissions. Even so, representing about 0.55% of the world's greenhouse gas emissions, Taiwan has been committed to the common but differentiated responsibility in Article 2 of the UNFCCC and contributed to our mitigation target.

This target is ambitious yet achievable. Achieving the target requires new integrated policies for all sectors with additional coordination and actions. Taiwan has a strong and direct action policy for our commitments, including the "Greenhouse Gas Reduction and Management Act", "Energy Management Act", and "Renewable Energy Development Act", supporting businesses to reduce emissions, maximizing renewable energy use, and improving economic growth. Meanwhile, Taiwan may use international mechanisms to achieve the target.

Toward this end, Taiwan has proactively, and in a pragmatic manner, proposed this ambitious target for short to medium-term carbon reduction contributing to the domestic reduction in GHG emissions. It is challenging for Taiwan to meet the targets that can satisfy both GHG emissions and economic growth. Taiwan is facing the unavoidable threat of climate change in all aspects from business to people's daily life. Through the cooperation between central and local governments, the public and private sectors, Taiwan will increase the capacity in its response to climate change and achieve the goal as a paradigm shift in pursuit of a sustainable low carbon society.