



CTPECC ISSUE PAPER



Make Zero to Net Zero

**Contemplating Solutions to Net-zero Emissions
through Multi-dimensional Considerations and
International Collaboration amid Climate Change**

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CTPECC holds a number of forums and seminars annually based on current issues in the global political economy. Inspired by these events, the *CTPECC Issue Paper* seeks to address opportunities and challenges in future regional development. *Issue Paper* also provides valuable information and perspectives, delivering the insightful views of experts.

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Introduction

Due to the global warming and the following climate change, multinational enterprises have successively started to require their suppliers to achieve the goal of carbon-neutral supply chains. Since Taiwan is an export-oriented country, the global trend of carbon neutrality in supply chains plays an important role in its overall economic development. This trend also makes enterprises accelerate their transformation to net zero.

The government's economic incentive mechanism contributes to foster and to stimulate the development of carbon credit trading and renewable energy technologies industries. In this issue, Mr. Yeh Yang-Che, the Deputy Executive Secretary of the Net Zero and Sustainability Strategy Office, is going to share a practical experience of public-private partnership in Japan, which successfully introduced a greenhouse gas emissions reduction mode, called Joint Crediting Mechanism (JCM), in 23 developing countries.



Contemplating Solutions to Net-zero Emissions through Multi-dimensional Considerations and International Collaboration amid Climate Change

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Foreword

Due to global warming and climate change, achieving net zero emissions is now a goal for numerous countries and enterprises. Till now, there have been 139 countries and over 800 manufacturers announcing their intentions to achieve net-zero emissions. However, to achieve net zero carbon emissions, it needs more than the supply of carbon-free electricity or saving power in the manufacturing industry. It requires international collaboration among various technologies, specialists, industries, and local governments. With nearly three decades to go until 2050, it will need seven presidential terms served to reach the goal of net-zero emissions, which is absolutely a cross-generational project.

Net zero sustainability is a cross-discipline, cross-department, cross-industry, and cross-generation issue

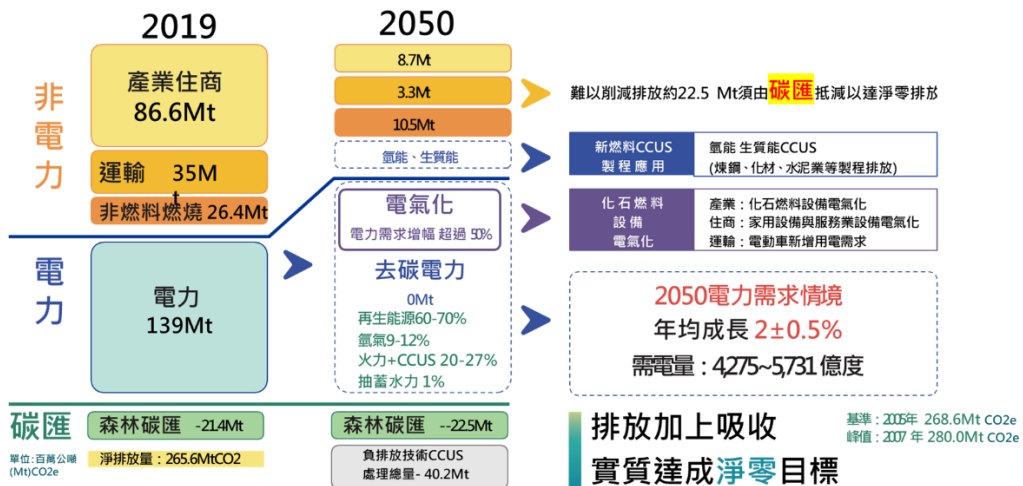
To achieve net-zero emissions, not only do we have to shift to carbon-free electricity such as solar power and wind power, but also need to produce electrical energy from resources that generate no carbon emissions such as geothermal and ocean energy. Besides conserving energy and electricity, the manufacturing industry must also develop emerging technologies to replace existing high-carbon-emission processes. Apart from electrification, we might be able to introduce hydrogen energy to vehicles in the future. Their energy efficiency can be enhanced through smart self-driving.



Lastly, we need to apply negative emissions technologies (NETs) such as carbon capture, storage and reuse to resolve the remaining carbon emissions from petrochemical, steel, and thermal power generation. Moreover, people need to change their ways of living, being encouraged to purchase and use low-carbon food, clothing, housing and transportation. We can make a change through education, civic awareness and engagement. Whether it is introducing green energy or emerging technologies, the financial industry's support is essential. As regards the corporate investment or governments obtaining funding from levying carbon taxes, carbon fees, or tariffs, the rules and acts rely on legislation and regulation.

National Development Council (NDC) announces Taiwan's 2050 net-zero emissions approach and strategy

In March 2022, NDC announced "Taiwan's Pathway to Net-Zero Emissions in 2050 and Strategy". In 2019, Taiwan's Greenhouse Gas (GHG) emissions amounted to 287 million tons of CO₂e, while the net emissions after deducting 21.44 million tons of carbon sink was 265 million metric tons of CO₂e. The blueprint proposes an approach to achieve net-zero emissions by 2050, which will build renewable energy installation capacity and realize 100% smart grid deployment. Carbon Capture, Utilization, and Sequestration (CCUS) must be introduced to coal/gas-fired power plants to achieve a final deployment exceeding at least 60% of the renewable power generation ratio. The blueprint will incorporate measures of the demand-side oriented carbon management for various industries, housing, and transportation in an effort to attain the long-term goal of net-zero emissions by 2050. The NDC pointed out that some industries that encounter difficulties to reduce emissions will be compensated for by vigorously planning the country's carbon sinks of forest and wetland conservation. Nevertheless, land resources in Taiwan are limited, and it is extremely difficult to significantly increase natural carbon sinks like forests. In this regard, we can take Japan's joint crediting mechanism into consideration.



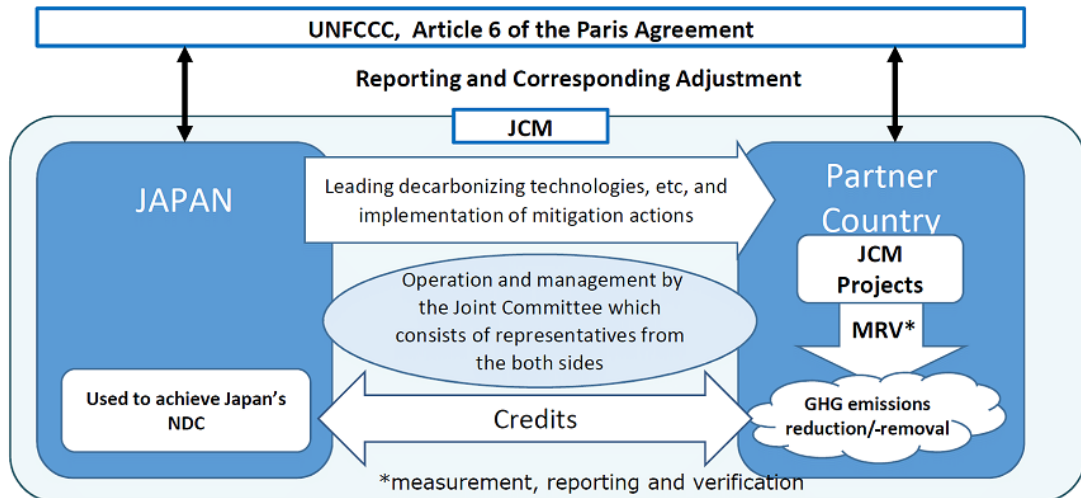
Data source: NDC, March 2022

Fig. 1 Taiwan's net zero emissions plan

Japan's joint crediting system

It requires the collaboration of enterprises, industries and countries to achieve net zero emissions. The "Joint Crediting Mechanism" (JCM) encourages Japanese businesses to implement carbon-reducing infrastructure in foreign countries with its government subsidies. The fundamental concept is inspired by Article 6 of the "Paris Agreement". Capital and technology will be introduced through market mechanism and collaboration with various countries to the most effective areas and projects, increasing the efficiency of carbon reduction and minimizing cost.

JCM aims to facilitate the promotion of Japan's leading carbon reduction technologies, products, systems, services and infrastructure, as well as the implementation of emission reduction practices to contribute to the sustainable development in developing countries. In addition, it quantitatively assesses Japan's contribution to GHG reduction or removal, and it is used to achieve Japan's emission reduction goals. Ultimately, JCM aims to help stimulate the global action of GHG reduction or removal, and achieve the goal of UNFCCC.



Data source: Japan's JCM website (<https://www.jcm.go.jp/about>)

Fig. 2 Japan's JCM system and its relationship with partner countries

Japan has been conducting JCM negotiations since 2011. Currently, it has established JCM partnerships with 23 partner countries including Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Vietnam, Laos, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar, Thailand, Philippines, Senegal, Tunisia, Azerbaijan, Moldova, Georgia, Sri Lanka and Uzbekistan. Through public-private partnerships between the government and the private sectors, Japan's JCM aims to lower cumulative emissions of 100 million tons of CO₂ by 2030. Additionally, Japan will calculate the credits obtained to realize its Intended Nationally Determined Contribution (INDC).

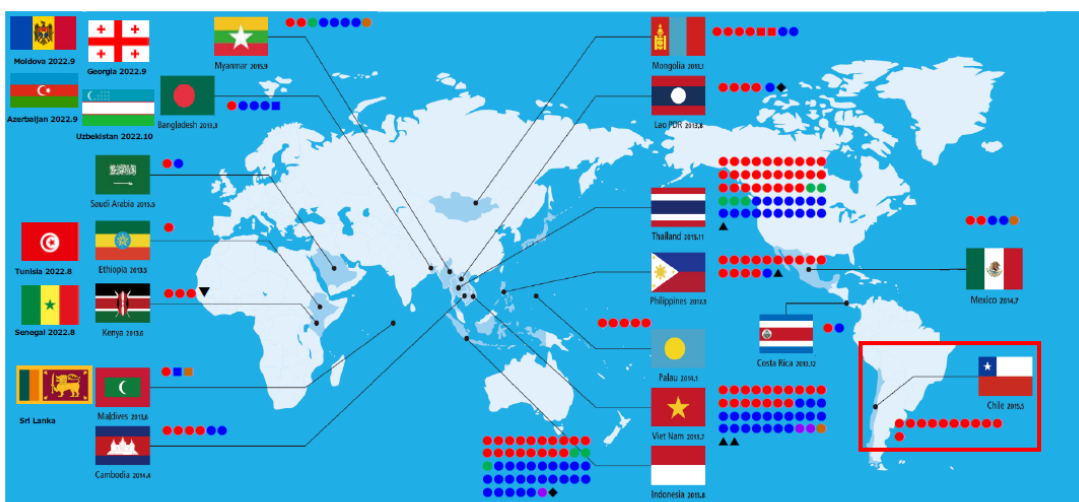
Establish and promote the JCM

Japan's JCM is a council consisting of five relevant ministries: the Ministry of the Environment, the Ministry of Economy, Trade and Industry, the Ministry of Foreign Affairs of Japan, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of Land, Infrastructure, Transport and Tourism. The credits of JCM are used to obtain authorization as a contracting party to the Paris Agreement, to determine the adjustment of utilization to prevent double counting, and to revise the JCM implementation guideline.



In particular, the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Land, Infrastructure, Transport and Tourism are responsible for agriculture, forestry and transport-related reduction techniques, while the Ministry of Economy, Trade and Industry is in charge of low-carbon technology demonstration and feasibility assessment. The execution of these measures is commissioned by New Energy and Industrial Technology Development Organization (NEDO). The Ministry of the Environment is responsible for policy research and recommendations, as well as subsidizes half of the JCM fund through the global warming countermeasure tax, and assists Japanese businesses to engage in international financing and interest subsidies via the Asian Development Bank (ADB) in order to conduct various carbon-reducing businesses in partner countries.

As of October 2022, a total of 223 projects have been implemented in 23 countries, focusing mainly on renewable energy installations and energy efficiency enhancement. Japan's Ministry of the Environment is expected to allocate approximately USD 156 million in funding in 2022. Meanwhile, the Japanese Cabinet Office has decided to expand and expedite Japan's partnerships with associate countries in June 2022. By 2025, the number of JCM partner countries is expected to rise to 30.



Total 223 projects / 23 countries

(● Model Project:211, ■ ADB:5, ◆ REDD+:2, ▲ F-gas:4, UNIDO▼:1)

- Renewable Energy
- Effective Use of Energy
- Energy Efficiency
- Transport
- Waste Handling and Disposal

Data source: Global Environment Centre Foundation
 Fig. 3 The implementation status of JCM over the years



Conclusion

To facilitate the achievement of global reduction goals, we need to complete the legal basis, boost public-private partnerships to reach an agreement with foreign governments or international organizations, and encourage the application of international collaboration reduction mechanisms in accordance with Article 6 of the Paris Agreement. To follow suit, Taiwan's government could use international cooperative development institutions as the intermediary and apply our existing net-zero technology to assist developing countries which are friendly with us to deal with our diplomatic dilemma. Further, via public welfare organizations, we can pursue a multi-dimensional carbon reduction mechanism and achieve sustainable development. This net zero emissions strategy is one that Taiwan should consider using in the future.



Conclusion

The article illustrates the connection between public-private partnership and the net zero emissions. It shares a practical experience, which has been implemented in Japan, the Joint Crediting Mechanism, as well. Net zero emissions has been the global trend not only in supply chains, but also in the plans for national development these years. In the opinion of Mr. Yeh, to achieve the goal of net zero emissions, we need to broaden the resources of carbon-free and renewable energy, to improve the energy efficiency, and methods of carbon capture and storage.

Since June 2022, Pakistan has faced numerous floods which caused economic damage and took lives away. More and more evidences show that the impact of climate change has become more severe these years. To reduce the loss of lives and economy, it is urgent for individuals, enterprises and governments to take actions. JCM is an idea which helps build partnership between governments and private sectors to facilitate the cross-border carbon credit trading and to fulfil the Intended Nationally Determined Contribution (NDC) based on the requirement of the Paris Agreement.

We, the CTPECC, hope this issue could spark discussions among our readers from various sectors and rise the awareness of the significance of climate change and global warming.