Challenges and financial schemes in green policies in Taiwan

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Keywords. Environmental taxation, renewable energy, feed-in-tariff, green finance

I. Background information

There is no comprehensive framework of promoting green economy in Taiwan. Even the most recent campaign by the government, "Circular Economy" since 2016, is not a regular governmental policy through particular financial measures but more an ideal status of economy for industries. Instead, Taiwan's green economy has been supported by individual policies, such as environmental taxations, Feed-in-Tariffs and corporate governance regulations.

Environmental taxation has a long history in Taiwan. The promotion of renewable energy is only lasting for 10 years so far. Year 2025 is a key year for Taiwan's energy sustainability because the goals of two major policies are set to be achieved: Taiwan to become a nuclear-free homeland, and renewable energy to account for over 20% of energy use in Taiwan. In addition, how to incorporate environmental values with the more easily recognized economic values into to corporate operation is also a priority for governments. Especially, green finance operated by public or private financial institutions is playing an important role to further boost green economy from the private sectors.

In this paper, we try to analyze the financial schemes for green policies in Taiwan in tree domains: environmental taxation, renewable energy development fund and corporate governance for sustainable business. All the policies are reflecting the leading role of government but with different financial mechanisms behind.

II. Current status of environmental taxation

The environmental taxation has been adopted for more than 30 years in Taiwan. The fees to prevent pollution from the manufacturing process, such as air pollution abatement, soil and groundwater remediation, and the recently started water pollution

abatement, are imposed on manufacturers.

1. Air pollution abatement fees

Taiwan has implemented the first stage of air pollution abatement fee since 1995, which is levied along with fuel oil and targeted for various pollutants including sulfur oxides (SOx) and nitrogen oxides (NOx). The second stage of air pollution abatement fee starting from 1997 is focused on particulate pollutants (TSP) and volatile organic compounds (VOC, since 2007); the charge calculation is based on the actual emissions and the fee rate is mainly based on the cost of abatement with references to the social benefits generated after abatement. However, Taiwan's air quality has not been really controlled; the environmental effects from air pollution abatement fees are not obvious.

2. Soil and groundwater remediation fees

After the 'Soil and Water Contamination Remediation Act' was promulgated in 2000, the soil and water pollution fund was established (EPAT, 2011). Since 2001, manufacturers and importers have been levied soil and groundwater remediation fees for the production and import of designated chemical substances including petroleum-based organics, chlorinated hydrocarbons, non-petroleum-based organics, pesticides, heavy metals, and heavy metal compounds. However, soil and groundwater remediation fees were more focused on petrochemicals but indeed the illegal disposal sites are mostly caused by heavy metals, which has caused controversy over the allocation of fee sources.

3. Recycling fees for mandatory recycling products

Taiwan implemented a national recycling system in 1998 with mandatory recycling fees imposed on producers (Fan et al., 2005). Different from other funds, the recycling fund is designed for sustainable operation with a trust fund designed for subsidizing the recycling process and a non-trust fund for the administrative transaction costs. According to the statistics of the Recycling Fund Management Board (RFMB) of the Taiwan Environmental Protection Administration, the fee-rate system has achieved high performance.

4. Energy tax

There is no real energy tax in Taiwan so far. In 2008, the then President Ma Ying-jeou claimed an energy tax would be levied to reflect the social cost of greenhouse gas

emissions. Energy tax revenue would be used to deduct other taxes, such as goods tax and income tax and have the "double dividend" effects (Shaw, 2009b). However, the main reasons for the policy failure are as follows.

(1) Energy tax cannot specifically grasp the environmental effect like the direct effect by carbon tax unless the tax rate is calculated on the carbon content of energy.

(2) Energy tax also has the problem of tax distortion and the expected double dividend effect is not easy to achieve, still controversial in theory and practice.

(3) Cap control policy has more obvious environmental effects and is more in line with the development of environmental and economic benefits (Hahn, 2009; Shaw, 2009a).

5. Issues about environmental taxation

The principles applied to the environmental taxation in Taiwan are the Extended Producer Responsibility (EPR) and the Polluter Pays together with the legal basis of "*Umweltabgaben*" or environmental levy. The comparison between different schemes is as the Table 1.

Table 1 Examples of environmental taxation schemes in Taiwan

	Air Pollution Abatement Fees	**Recycling Fees**	**Soil and groundwater remediation Fees**	**Water Pollution Abatement Fees**
Purposes	Prevent or reduce air pollution	Reduce waste production and enhance resource recycling	Prevent soil and groundwater or restore from contamination	Prevent or reduce open water pollution
Starting year	1995	1998	2001	2015
Basis for charge	• Pollutant mission volume	• Sales volume • Import volume	• Sales volume • Import volume	• water usage • wastewater discharge
Target of charge	• Stationary emitters • Retailors or importers of mobile emitters	• Producers • Importers	• Producers • Importers	• Households • Enterprises • Sewage systems

III. Current status of renewable energy deployment

Taiwan started implementing the Feed-in-Tariffs (FIT) system in 2010, which guarantees the purchase price of renewable energy power for 20 operation years (Figure 1) (Chang, 2012).

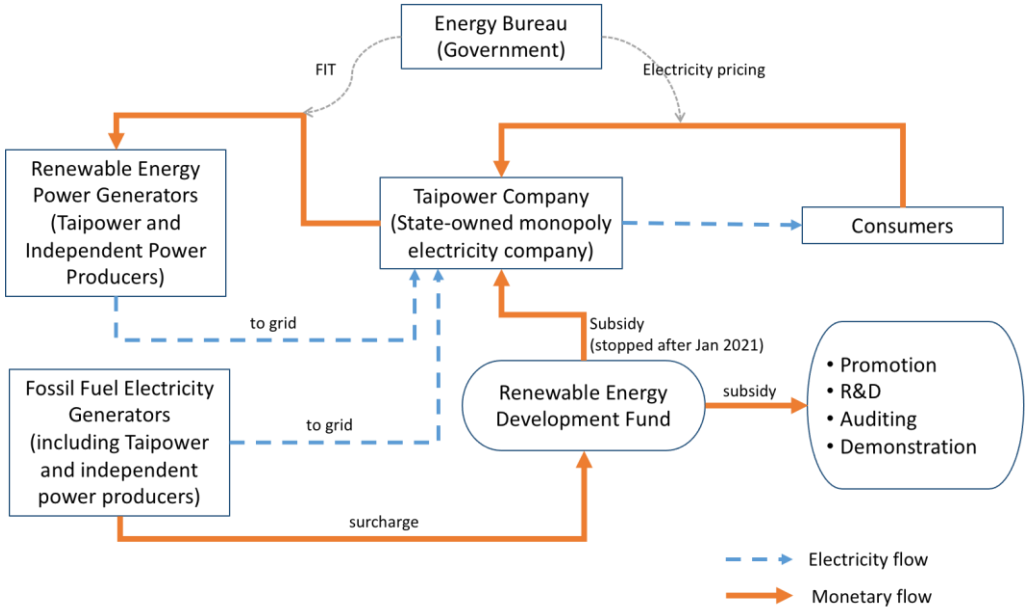

Figure 1 Structure of FiT system in Taiwan

Solar PV installations can be divided into three types, specifically ground-mounted, rooftop, and floating. Figure 2 shows the installed capacity of each type of solar PV installation results.

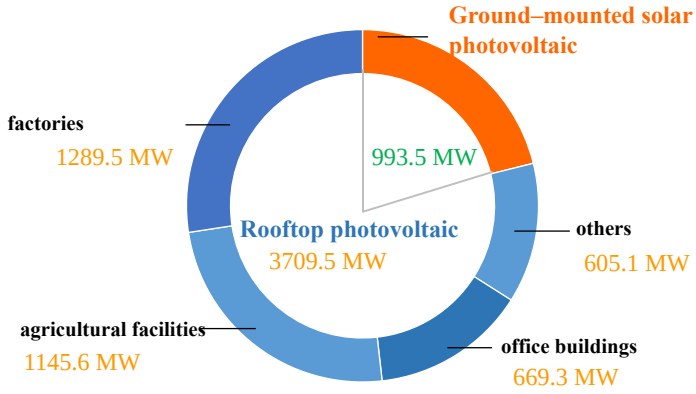

Figure 2 Installed photovoltaic capacity (As of the first half of 2020)

Solar energy and wind energy are the two major options in the national development plan. The obstacles exist for solar PV installation due to the difficulty

of acquiring large areas of land (Huang and Lin, 2020). The government therefore expects more rooftop PV installations utilizing the rooftops of factories or livestock farming facilities. In addition, agriculture or fishery and solar power symbiosis is encouraged (COA, 2018). The integration with agriculture or fishery, however, is relatively controversial and facing stronger resistance, include: (1) legal regulations, (2) land disputes, and (3) livelihood of farmers and fishermen (Luo, 2019; Chen, 2020).

(1) Legal regulations

Solar facilities on agricultural lands are not restricted to agricultural purposes, creating the issue of "pretending to be farming with the actual intent of electricity generation."

(2) Land disputes

Due to the lack of planning and unethical companies trying to profit, actual solar panels were not used for agricultural purposes, and may also damage farmland.

(3) Livelihood of farmers and fishermen

Farmers argue that solar panels do not let light pass through and will affect the harvest of agricultural crops and fishponds. Besides, the rent of land is raised by electricity enterprises, which might affect the livelihood of farmers.

Besides, also due to the difficulty of land acquisition, the government is aggressively promoting offshore wind power generation. Yet, offshore wind power encountered strong resistance, such as ecological protection, aquaculture economy and transport considerations.

The Renewable Energy Development Act after ten years of activation was revised in April 2019 requiring the domestic heavy electricity consumers to install or purchase 10% power capacity from renewable energy. Therefore, from the demand side, the mass installation and grid connection of solar PV and offshore wind power will be significant.

IV. Private financial resources for corporate sustainability

Currently, together with green finance, the financial industry has promoted the concepts such as the financing Equator Principle, Responsible Principle of Investment,

and Responsible Principle for Insurance. On the corporate side, "Environmental and Social Governance" (ESG) and climate-related finance, the “Task Force on Climate-related Financial Disclosures” (TCFD). Taiwan government have recognized the ESG as the key component in corporate governance, trying to catch up with other countries by developing the taxonomy for sustainable industrial activities, as the first step to induce capital to sustainable enterprises. Therefore, the Financial Supervisory Committee (FSC), the governmental agency at the cabinet level in charge of financial order and capital market released “Corporate Governance 3.0 - Sustainable Development Roadmap” (CG 3.0) in August 2020, trying to regulate Taiwan corporates’ governance and establish a competent ESG ecosystem.

For this roadmap, there is an action plan to direct investment from financial institutions to green and sustainable industries such as green transportation, green construction, green manufacturing etc. At the same time, this action plan will regulate the financial disclosure of ESG related activities, encourage responsible investment, develop sustainable development bunds and raise the awareness of enterprises about climate change risk management.

For financial institutions, this action plan is asking for fulfillment of international initiatives and responses to the questionnaires from the international agencies. The financial institutions are required to take ESG as their evaluation criteria for investment and loaning.

Following the Taxonomy developed by the EU (EC, 2020), Taiwan is set to define the scope of sustainable green activities soon. However, the FSC does not have the scitific knowledge about climate change and need collaborate with other governmental agencies for effective management. Therefore, the FSC is working with the Environmental Protection Administration on the definitions of sustainability and industry taxonomy. In addition, the database of climate change and environmental information is supported by the Ministry of Science and Technology for quantifiable analysis on risks.

V. Conclusions

Based on the experiences of environmental taxation, some issues exist as follows.

(1) The environmental taxation system cannot have a clear correlation with the environmental effects. It is necessary to match with other policy tools to achieve

environmental goals, such as a cap mechanism to avoid the uncertainty of environmental effects.

(2) The integration of all environmental taxes can coordinate the management of related income and expenditures. But the higher environmental goals are achieved, the lower the fiscal revenue generated by environmental tax or fees, different from the general budget principles.

(3) Inter-governmental cooperation is crucial to the success of the environmental taxation system.

For the renewable energy development, it is more hoped to install the facilities of solar photovoltaic power together with agriculture, but the authorities of agriculture are different from those in charge of renewable energy development. Controversial situations frequently occur in policy discussions. In addition, selling solar energy is more profitable than the incomes from agricultural production; more and more "true" farmers complain about the acquisition of land is extremely difficult nowadays. On the other hand, 120 MW of offshore wind power was put into operation in November 2019. It is on the track to achieve 10 GW power capacity by 2026, bringing a better status of local wind farm industry that encourages capitals, technology, jobs and industrial supply chains in Taiwan (Kao and Pearre, 2017; Chien, 2019).

Unlike environmental taxation and feed-in-tariffs that regulate private sectors to provide monetary resources for particular environmental purposes, the strategy for green finance now is more about regulating corporate to become sustainable by corporate governance regulations and by developing taxonomy to identify sustainable corporates for the references of investors and bankers. Hopefully, continuous capitals from private sectors will be induced to the sustainable industries.

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