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Introduction of Carbon Pricing Mechanisms in Several Asian Economies

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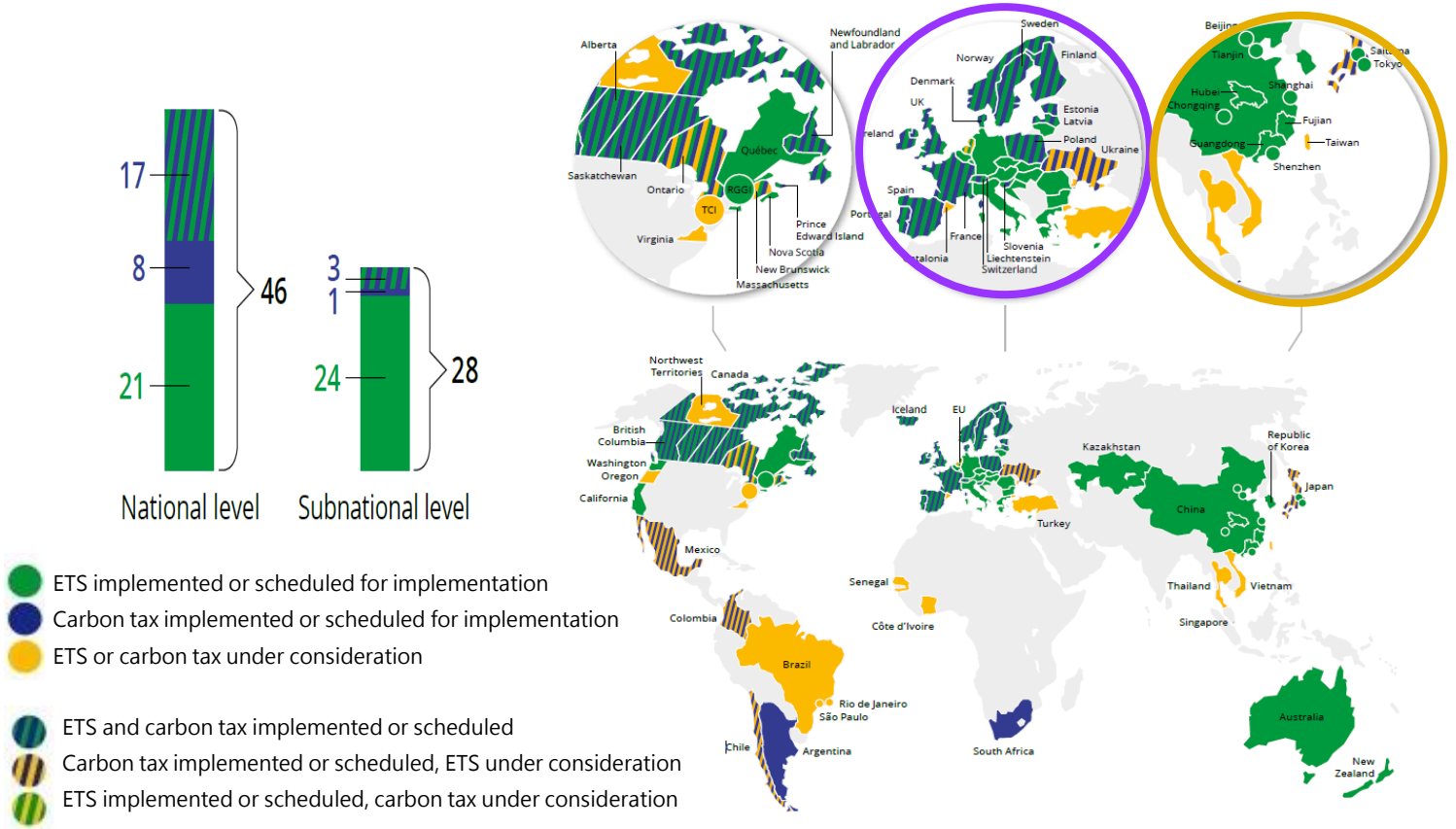
Carbon Pricing Mechanisms in The World

- According to the 《State and Trends of Carbon Pricing》 report of World Bank in 2019, 57 carbon pricing initiatives have been implemented or are scheduled for implementation. These carbon pricing initiatives would cover 11 gigatons of carbon dioxide equivalent (GtCO2e) or about 20% of global greenhouse gas (GHG).

- Economies choose different policy mix according to their economical and political situation:
  - European economies tends to execute both carbon tax and ETS but avoids double charge.
  - Asian economies tends to choose one from carbon tax and ETS.



Resource：p.13, Figure 1., State and Trends of Carbon Pricing 2019, Washington DC, June 2019.

Carbon Tax in Japan

Japan is the first economy implementing carbon tax in Asia.

1. **Coverage** : 68% of GHG emissions in Japan (about 843 $MtCO_2e$) – **Tax is widely applied to the use of fossil fuels.**
2. **Design of the mechanism** : Carbon tax rates were added to the Petroleum and Coal tax which covers all the fossil fuels – **Using existing tax scheme has low executive cost.**
3. **Tax rate** : 3 USD/tCO_2e – **Tax rates were raised in three stages over three and half years to avoid the rapid increase in burden. It can lower concerns from the industries and protect its international competitiveness.**
4. **Usage of tax revenue** : Revenue is earmarked to energy-oriented CO_2 emissions reduction measures – **It can increase supports from the industries.**
5. **Effectiveness** : It was estimated that it will help Japan to reduce up to 2.2% GHG emissions in 2020 comparing with 1990 level (1275.5 $MtCO_2e$). The gross GHG emissions of Japan in 2018 (about 1240 $MtCO_2e$) has decreased 2.74% from 1990.

Carbon Tax in Singapore

Singapore is the first economy implementing carbon tax in South-East Asia.

1. **Coverage**：80% of GHG emissions in Singapore (about 42 $MtCO_2e$) – **Tax will apply uniformly to all sectors without exemption.**
2. **Design of the mechanism**：Singapore adopted a fixed-price credit-based system. Regulated facilities will pay the carbon tax by buying and surrendering carbon credits corresponding to their GHG emissions, rather than through direct payment. These credits can only be bought from the National Environment Agency at a fixed price. – **Lay a foundation to link with regional ETS markets in the longer term.**
3. **Tax rate**：3.67 USD/tCO_2e from 2019. Reviewed by 2023, with the intention of increasing it to between 7.35 USD/$MtCO_2e$ and 11.02 USD/$MtCO_2e$ by 2030. – **It can give the industry more time to adjust and implement energy efficiency projects.**
4. **Usage of tax revenue**：social welfare to cover the expected increase in the cost of electricity and gas arising from the carbon tax; mitigation activities
5. **Effectiveness**：The first payment of the carbon tax will be in 2020. It is expected to stimulate clean technology and market innovation.

Cap and Trade in South Korea

South Korea is the first economy implementing nation-wide ETS in East Asia.

1. **Coverage**： 70% of GHG emissions in South Korea (about 485.87 $MtCO_2e$; sectors: industry, power, buildings, domestic aviation, public sector and waste sectors.)

- **Cap in three phases**
2015-2017: 1,686 $MtCO_2e$
2018-2020: 1,796 $MtCO_2e$
2021-2026: N/A

2. **Design of the mechanism**：

- Stabilization Mechanism (Government hold allowance reserve to adjust market price) and
- Flexibility Mechanisms (Banking allows complying entities to retain unused allowances and use them for future periods, while Borrowing allows participants using allowances from future compliance periods to cover the company's responsibility in the current compliance period.)

3. **Market Price**：20.62 USD/$MtCO_2e$ (average secondary market price in 2018)

4. **Usage of tax revenue**：USD 95.31 million (in 2018); (1)supporting mitigation equipment projects (2) technology development of ETS-covered entities

5. **Effectiveness**： In the first Phase, Korea Faced supply-demand imbalance. There was an oversupply of allowances caused by banking and borrowing behavior of KETS participants, economic downturn and additional allowances released by the government. In the second Phase, steps were designed to facilitate trading, such as expanding rules for early action credits, moving forward the date for approval of overseas emission reduction, and introducing market makers.

Cap and Trade in China

People's Republic of China: China-ETS is scheduled be launched in 2020, which will become the largest carbon market in the world.

1. **Coverage**：30% of GHG emissions in China (about 3715.8 $MtCO_2e$, power sector in the first stage)
2. **Design of the mechanism**：

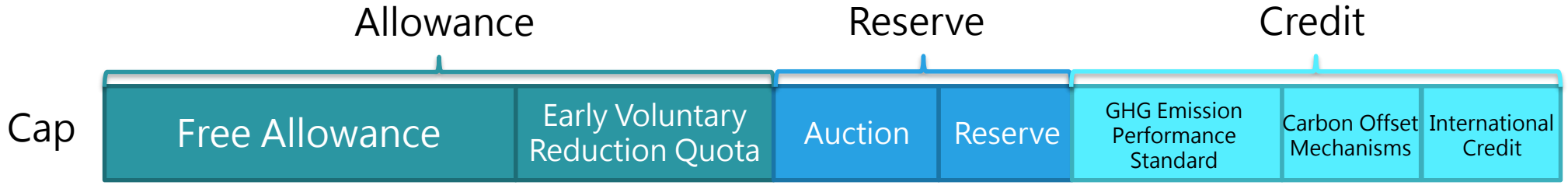
- China adopted a CO_2 intensity trading scheme.
- CO_2 intensity：the amount of CO_2 emitted per unit of electricity generated (in kilowatt-hours).
- Every power plant will be allocated a CO_2 intensity benchmark – **according to one of the two alternatives proposed in the allocation plan by Ministry of Ecology & Environment, there might be different benchmarks for large (300MW and higher) and small plants.**

3. **Market Price**：7.3 USD/$MtCO_2e$ (estimated average price)
4. **Usage of tax revenue**：Climate mitigation and relative capacity building
5. **Effectiveness**：There are some potential challenges for China-ETS to function effectively, including that the scheme does not incentivize reduction of GHG emissions and increase the competitiveness of renewable energy. It also require high quality and integrity of MRV systems.

Cap and Trade in Taiwan

Taiwan: Taiwan-ETS is scheduled be launched in 2025.

1. **Coverage**：80% of GHG emissions in Taiwan (about 232.31 $MtCO_2e$)
2. **Design of the mechanism**：



- GHG Emission Performance Standard：If participants of ETS meet the standard, they can get credits as reward.
- Carbon Offset Mechanisms：Methods for non-participants of ETS to apply and get credits.
- International Credit：There won't be international credit on the market in the first phase of ETS.

1. **Market Price**：N/A
2. **Usage of tax revenue**： Revenue is earmarked to measures responding to climate change, 70% for mitigation, 30% for adaptation.
3. **Effectiveness**： There are some potential challenges for Taiwan-ETS to function effectively, including limited market size, concentration of credits on several emitters and lack of liquidity.

Conclusions (1/2)

Economy	Policy	Start Year	Coverage ($MtCO_2e$)	Coverage	Revenue Options	Rate/Average Price (USD/tCO_2e)
Japan	Surtax on Energy Tax	2012	843	• all fossil fuels	Special Account for Energy Measures	3
Singapore	Carbon Tax	2019	42	• All sectors • Any industrial facility that emits direct GHG equal to or above 2,000 tCO_2e	• Productivity Grant (Energy Efficiency) and the Energy Efficiency Fund • U-Save(household)	3.67
South Korea	ETS	2015	485.87	• Six sectors: power, industry , building, public, waste, and transportation • Company >125,000 tCO_2/year, facility >25,000 tCO_2/year	Low Carbon Green Fund (R&D support of renewable energy, establishment and operation of emission exchange and emissions reduction facilities)	20.62 (in 2018)
China	ETS	2020	3715.8	• Power Sector • Entities with annual emissions greater than 26,000 t/CO_2 (energy consumption of more than 10,000 tons of standard coal equivalent) in any year over the period 2013-2015.	Climate mitigation and relative capacity building	7.3 (estimated)
Taiwan	ETS	2025	232.31	• Two sectors: power, industry • Facility >25,000 tCO_2/year	GHG Management Fund (climate mitigation and adaptation)	N/A

Conclusions (2/2)

1. Several differences between Asia and Europe on applying carbon pricing：

- European economies started to implement carbon pricing mechanisms since 1990, which is 22 years earlier than Asian economies.
- Carbon pricing mechanisms are quite mature in Europe. Some of the European economies not only adopted both tax and ETS, but also integrated the emission trading markets.
- Carbon pricing mechanisms are quite new concepts in Asia. Some of the Asian economies chose one of the tools to use, while most of Asian economies haven't implemented or even considered any carbon pricing mechanism.

2. Which mechanism suits Asian countries more：

- There are pros and cons of both carbon tax and ETS, Asian economies make the choices depend on different economic and political contexts.
- Carbon tax is simple and sends a clear and stable price signal to firms and investors. It is suitable for economies with smaller emission market scale or for economies to lay the foundation for more complex mechanisms.
- ETS can provide more flexibility while requires stronger capacity of both the governments and participants. It can also lay the foundation for future integration with regional ETS.

Thank You

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