

JAPAN: MARKET-BASED CLIMATE POLICY CASE STUDY

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Japan: Market-Based Climate Policy Case Study



Background

In 2013, Japan was the world's third biggest economy with a GDP of \$4.920 trillion and overall greenhouse gas (GHG) emissions of 1,408 million tonnes of carbon dioxide equivalent (tCO₂e) – up 10.8% compared with 1990 levels. In 2013, the majority of CO₂ emissions were derived from the energy sector, which accounts for 89.5% of total GHGs emissions.

In 1990, the Japanese government developed the *Action Program to Arrest Global Warming* to stabilize the level of CO₂ emissions (per capita) to 1990 levels by 2020. In 2005, the government developed its Kyoto Protocol Target Achievement Plan, which stipulated the necessary measures that would have to be undertaken to achieve Japan's

Kyoto target, under the auspices of the 1998 Law Concerning the Promotion of the Measures to Cope with Global Warming Act (Global Warming Countermeasures Act 1998, 2002). The Act has since been amended three times to include the following measures:

- An obligation for all business operators who consume at least 1.5 million liters of crude oil equivalent (coe) to annually calculate and report their GHG emissions.
- The implementation of the *Japan Voluntary Emission Trading Scheme* (JVETS), the first carbon emissions trading system ever implemented in Japan.
- The adoption of Japan's Kyoto Protocol target, requiring a 6%

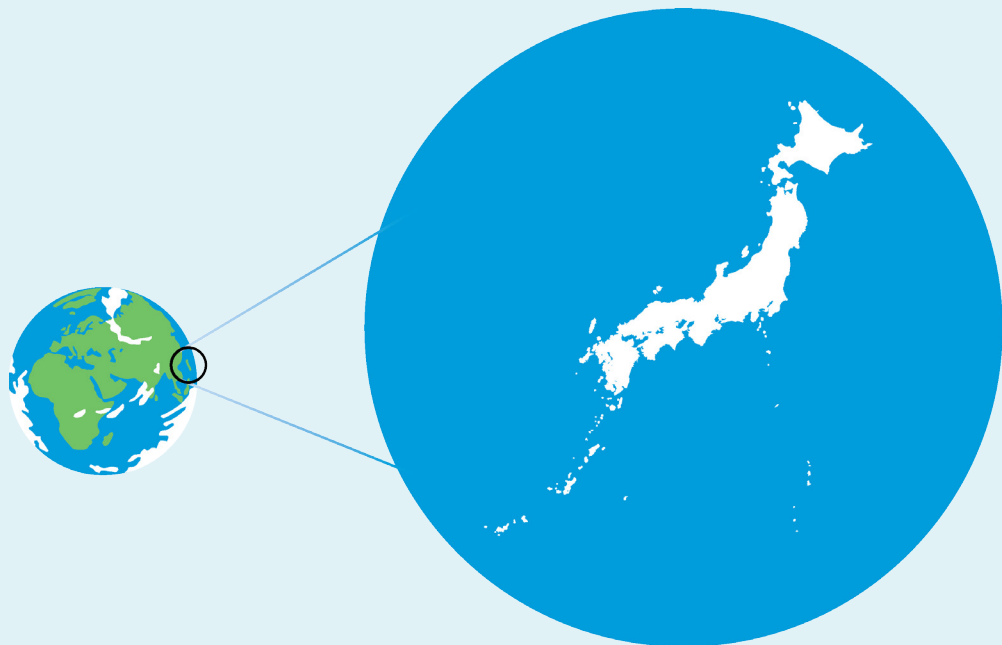
reduction from 1990 emissions by 2012.

- A requirement for local governments to develop action plans to reduce GHG emissions.
- Establishment of an offset crediting mechanism, the *Japan Verified Emissions Reduction* (J-VER), which was launched in November 2008.

The *Council on the Global Warming Issue* established the *Action plan for achieving a low-carbon society*, which ran from October 2008 through 2012 and which implemented an experimental **integrated domestic market for emissions trading**. The objective of the experimental ETS was to establish effective rules that could enhance technological innovation and increase emission reduction efforts towards achieving Japan's Kyoto Protocol target. The experimental ETS consisted of two parts:

- The **experimental domestic ETS**: participating firms set their emissions reduction targets (absolute or intensity-based emissions targets) and had to surrender allowances and credits to comply;
- The **two offset crediting systems** which provided credits to participants firms from the Internal Crediting system (Domestic CDM) and the international Kyoto crediting mechanism.

The Joint Crediting Mechanism (JCM) – and the *Japan greenhouse gas emission reduction certification system* (J-Credit System) were launched in 2013. The JCM and J-Credit System are covered in greater detail in the sections below.



In 2015, Japan communicated its Intended Nationally Determined Contributions (INDC) to the UNFCCC. It includes a reduction of 26% by fiscal year 2030 compared to FY2013 (a 25.4% reduction compared to FY2005), set by bottom-up calculation based on the amount of domestic emission reductions and removals assumed to be obtained.

The JCM is not included as a basis of the bottom-up calculation of Japan's emission reduction target, but the amount of emission reductions and removals acquired by Japan under the JCM will be counted as Japan's

reduction. Accumulated emission reductions or removals by FY 2030 through governmental JCM programs to be undertaken within the government's annual budget are estimated to range from 50 to 100 million t-CO₂.

This case study is intended to cover a number of climate policies with market features, namely:

- The Joint Crediting Mechanism,
- The Tokyo ETS
- The J-Credit System
- The Japanese Voluntary Emissions Trading System

Summary of Key Policy Features

1. EXPERIMENTAL JAPANESE VOLUNTARY EMISSIONS TRADING SYSTEM:

TRADING SYSTEM:

In April 2005, the Japanese Voluntary Emissions Trading System (JVETS) was launched to provide government support to Japanese companies to reduce GHG emissions through activities falling outside the scope of the *Voluntary Action Plan (VAP)*. The scope of the JVETS covered CO₂ emissions from industrial process (production and energy consumption), offices (energy consumption) and waste management (waste incineration, waste combustion, and waste recycling).

Participants with absolute emissions targets were obligated to submit a corresponding amount of Japanese Emission Allowances (JPAs) for every tonne of CO₂ emissions produced. Participants whose emissions were below their established cap were permitted to sell allowances to other participants. **Banking** of allowances and credits was allowed, but not **borrowing**. Facilities could join and leave the scheme on a term basis.

JVETS participants became part of the Experimental Integrated ETS in 2008. From April 2009, participants received **subsidies** of up to a third of total project costs for installations that can produce emission savings. In the event of non-compliance, entities were forced to return this subsidy to the government.

During Phase 7 (2012), the final phase of the JVETS, the program had 389 participants and achieved reductions totalling 59,419 tCO₂. The average trading price was roughly JP¥ 216 (USD\$2.60)/tCO₂. From fiscal 2006-fiscal 2012, 389 companies participated in JVETS, and over this period the cumulative emissions reduction achieved was 2,217 million tCO₂e, an amount that exceeded the covered firms' emissions reduction commitment of 1,245 million tCO₂e. The average price was JP¥ 810 (USD\$9.76). At its peak, the JVETS covered 0.3% of 1990 emissions (3.4 million tCO₂/year as observed in the fourth term).

While the intention of the JVETS was to establish the foundation for a mandatory domestic ETS as per the mandate of the *Basic Act on Global Warming Countermeasures*, the proposal was never approved. The proposed national ETS was formally abandoned when Prime Minister Noda dissolved the Lower House at the end of 2012. In 2012, the JVETS was discontinued and replaced with a new subsidy-based voluntary emission trading system called ASSET (Advanced technologies promotion Subsidy Scheme with Emission Reduction Targets). To be eligible for ASSET subsidy, entities set baselines based on emissions over the last three years, establish an emissions reduction target, and propose implementation of new technologies to achieve that target. The current list of technologies specified by MOEJ eligible for a subsidy rate of one-third cost includes 27 types of new technology, such as high-efficiency heat pumps, LED lighting, transformers, and co-generation systems. From 2012 to 2016, 366 entities have been listed as ASSET participants with targets. Entities that cannot meet their target are allowed to purchase credits from other participating entities, CERs from Domestic CDM projects or J-Credits. The first implementation period of ASSET started in 2013 and will finish in 2017. Entities may also join as participants only to trade credits. There are currently 3 entities eligible for trading activities.

2. J-CREDIT SYSTEM:

The J-Credit System was created by merging the aforementioned J-VER and Domestic CDM. In 2013, a Certification Committee was established to oversee the new J-Credit System and began its work to approve offset project methodologies and protocols.

This domestic **credit certification system** allows the government to certify credits for the amount of GHG emissions reduction achieved by Japanese firms through energy saving, the use of renewable energy as well as GHG emissions removed through forest management within Japanese territory.

The objective of the J-Credit system is to support regional efforts toward emissions reduction.

Management of the J-Credit System is overseen by three ministries (Economy, Trade and Industry; Environment; and Agriculture, Forestry and Fisheries).

The domestic system covers emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, in the main economic activities: energy sector, industrial processes, agriculture, waste and forestry. Actions that reduce GHG emissions or enhance GHG removals are required to meet the following requirements:

- they must be implemented within Japan;
- they must have been implemented after 1 April, 2013;
- they can demonstrate additionality: in principle, payout time for project facilities need to be more than three years;
- they employ approved methodologies;
- reductions are validated by examining authorities; and
- reductions are permanent (only for forest sink projects)

Methodologies are approved by the three ministries. As of August 2016, 61 methodologies have been approved, including 40 in energy-saving, 9 in renewable energy, 5 in industrial processes, 3 in agriculture, 2 in forestry and 2 in the waste sector.

As of August 2016, 176 projects have been registered with an expected emissions reduction amount of 2,322,000 tCO₂. Credits have been issued for a total of 1,073,000 tCO₂. Since the start of J-Credits 244,000 tCO₂ have been cancelled and used for compliance and offset. The system is scheduled to end on 31 March 2021. Credits from the Domestic CDM and J-VER programs will expire on the same date. The expiration date for J-Credits is yet to be determined.

3. TOKYO CAP-AND-TRADE PROGRAM:

In December 2006, the Tokyo Metropolitan Government (TMG) announced its target of reducing GHG emissions by 25% by 2020 from the 2000 level, followed by the establishment of Tokyo Climate Change Strategy and the Tokyo Metropolitan Environmental

Master Plan in June 2007. To achieve its goal, the TMG introduced the Tokyo Cap-and-Trade emissions trading program, which enforces mandatory reduction greenhouse gas emissions targets for large-scale emitters in the industrial and commercial sectors. Launched in 2010, the TMG cap-and-trade program is the first of its

kind to be implemented in Japan and Asia. ASSET system participants are also allowed to participate in the Tokyo cap-and-trade system.

Table 1: Overview of Tokyo cap-and-trade

Long-Term Reduction Goal	Contribute to the TMG's overall goal: 25% GHG reduction below 2000 levels by 2020 30% reduction below the 2000 level by 2030
Cap	Absolute cap of total reduction target First compliance period: 6% or 8% lower* than the base year emissions** Second compliance period: 17% or 15% lower* than the base year emissions * 6% for factories and buildings receiving energy from district heating and cooling plants, 8% for rest of the buildings. 17% for businesses and 15% for industrial facilities. ** base year emission: average emission of past 3 years
Compliance Periods	5 years First compliance period: fiscal year 2010-2014, second: fiscal year 2015-2019
Greenhouse Gases Covered	Energy-related carbon dioxide (CO ₂)
Sectors Covered	Large-scale facilities (buildings/factories) for industrial and commercial sector purpose
Number of Obligated Entities	1,400 facilities
Point of Regulation	Downstream (at the facility as end-user)
Threshold	Facilities with a total fuel consumption of 1,500 kL per year (crude oil equivalent) are eligible for an allowance allocation
Average Carbon Price	3,500 JP¥ or 31.5 US\$ for excess reduction credits (2015, decided among facilities)
Allowances Allocation	"Grandfathering" Allowances: Base year emission × Compliance factor × Compliance period (5 years)
Carbon Leakage Provisions	New office buildings and other new entrants built after fiscal year 2010 are allocated allowances free of charge. Base year emissions are set based on the average actual emissions over 2-3 years with the execution of certain energy-saving measures specified by TMG to prevent deliberate large emissions.

Use of Revenues	No revenue from allowances as they are given free of charge.
Price/Market Control Measures	Price is not regulated, but excessive price evolution is prevented by increasing the supply of credits available for emissions trading.
Offsets	Eligible credits include: 1) Small and Medium-sized Facility Credits Within the Tokyo Area, 2) Outside Tokyo Credits, 3) Renewable Energy Certificates, and 4) Saitama Credits.
Linkages	Two-way trading link with the Saitama ETS.
Market Regulation and Oversight	TMG's "Guidelines for Emissions Trading" include mechanism of the Tokyo Registry System, credit issuance and transfer procedures, and trading policies.
Complementary Policies	Tokyo Metropolitan Environmental Security Ordinance and TMG Green Building Programs require energy-saving by new large-scale buildings.
Enforcement/Penalties	Two-step penalties are enforced on facilities in case of non-compliance: 1) Requirement to reduce 1.3 times the shortfall 2) Fine (up to JP¥ 500,000), publication of the breach, and surcharge proportional to the shortage.
Banking	Excess credits and offset credits issued during the first compliance period can be banked for compliance use in the second compliance period.
Monitoring and Reporting	Mandatory annual report to the Governor under the "Guidelines for Calculating Greenhouse Gases" are verified by a third-party verification agency registered with the Governor of Tokyo.

The first compliance period of the Tokyo cap-and-trade ended at the end of fiscal 2014 (April 2015) with a 5-year total reduction amount of 14 million tCO₂ below base year. In fiscal 2015, the program achieved a 25% reduction in emissions compared to base-year emissions. It was noted that over 90% of targeted facilities have surpassed their reduction targets of 6% or 8% for the first compliance period, and 76% of those have surpassed the second period targets of 15% or 17%. Two types of technologies implemented stood out as the largest contributors to reduced emission: high-efficiency heat source equipment and high-efficiency lighting equipment and lighting control. Around 520,000 tCO₂ of excess reduction credits (excess allowances) have been issued in 2015. The price of excess reduction credits continues to decline, leading to the current JP¥ 3,500 or US\$ 31.5 (2015). Nevertheless, this price is high compared to the average price of J-VETS credits in its period. Trade of credits between participating facilities has fluctuated since the

opening of market, reaching an amount of 163,870 tCO₂ of all types of credits transferred. A survey on credit supply and demand according to facilities conducted by the TMG indicated the potential of excess credits issued (9.75 million tCO₂) to be higher than demand for its purchase in the coming years. However, facilities intend to hold their credits, leading to only 1.32 million tCO₂ to be supplied to the market.

4. JOINT CREDITING

MECHANISM:

Beyond its domestic programs, Japan has implemented its mechanism to facilitate emission reductions internationally through the Joint Crediting Mechanism (JCM). The objective of the JCM is to deploy low carbon technology, products and services while evaluating their emission reduction contribution. The JCM is implemented bilaterally by Japan and its various partner countries and the joint committee (represented by the relevant ministries and high level officials from both sides) is established to

administer the scheme. The mechanism allows Japanese and foreign firms to invest in emission reduction projects and programs in developing countries to earn offset credits. The JCM is not included as a basis of the bottom-up calculation of Japan's emission reduction target, but the amount of emission reductions and removals acquired by Japan under the JCM will be counted as Japan's reduction. Apart from contributions achieved through private-sector based projects, accumulated emission reductions or removals by FY 2030 through governmental JCM programs to be undertaken within the government's annual budget are estimated to be ranging from 50 to 100 million tCO₂. The first bilateral agreement was signed with Mongolia in January 2013 and the first project was registered in Indonesia in October 2014. To date, 16 countries have signed bilateral documents for the JCM; they include: Bangladesh, Cambodia, Costa Rica, Ethiopia, Indonesia, Kenya, the Lao People's Democratic Republic, Maldives, Mexico,

Mongolia, Palau, Vietnam, Saudi Arabia, Chile, Myanmar, and Thailand.

The JCM covers a wide range of sectors such as electricity production and distribution, transportation, industry and waste management, and activities including energy efficiency measures, renewable energy and avoided deforestation. The Japanese government also implements various project financing programs to promote the mechanism. As of June 2016, the budget for these financing programs accumulated to around JP¥5.88 billion (around US\$56.67 million) for fiscal year 2016, continuing the budget of JP¥25.18 billion (US\$249 million) allocated within 2013-2015.

The decentralized structure of the JCM is intended to facilitate the promotion of mitigation actions that suit each host country's circumstances. Joint Committees (JC), represented by Japanese and each host country government, adopt rules and guidelines to ensure the implementation of the mechanism, develop and approve proposed JCM methodologies, designate third-party entities (who are required to validate projects and verify GHG emissions reductions or removals), register JCM projects and decide the amount of offset credits to issue. JCs have approved 23 JCM methodologies in 5 sectors as of July 2016.

Measurement, Reporting, and Verification (MRV) system

As project logistics will differ from country to country, the JCM has established a "reference emissions" level which needs to be more conservative than business-as-usual (BAU) emissions. The objective is to ensure a net reduction in, and/or the avoidance of, GHG emissions. Emission reductions are the difference between "reference emissions" and project emissions.

Results

As of June 2016, there are 67 projects in the pipeline under JCM Model Project and JCM Demonstration Project financing programs in 13 countries (Bangladesh, Cambodia, Ethiopia, Indonesia, Kenya, Lao PDR, Maldives, Mongolia, Myanmar, Palau, Saudi Arabia, Thailand, and Vietnam). In fiscal year 2016, 30 projects have been selected to receive financial support as of 1 August. Emissions reductions from those financially supported projects are expected to be between 105-140,000 tCO₂/year in total, mostly up to 1,000 tCO₂/year per project. As of July 2016, 15 projects in four countries (Indonesia, Mongolia, Palau, and Vietnam) have been registered by the Joint Committees. Japan has established the JCM Registry (<https://www.jcmregistry.go.jp/>) in line with the Guidelines for the

Implementation of the JCM in Japan. It can be used by both Japanese and non-Japanese entities, not limited to project participants. The JCM partner countries also establish registries that share common specifications to account for reductions and the issuance of credits². In 2016, the JC between Japan and Indonesia decided the first-ever issuance of 40 tCO₂ verified credits from two projects in Indonesia. From the first project (ID002), 23 tCO₂ were issued to the Japanese side and 6 tCO₂ were issued to the Indonesian side. From the second project (ID003), 8 tCO₂ were issued to the Japanese side and 3 tCO₂ were issued to the Indonesian side. The allocation of credits was decided by the JC based on project participants' request. As the JCM has been implemented as a non-tradable crediting mechanism, there is no financial value imposed on transfer of credits.

Commentary on Market Functioning

The longstanding development of its own domestic system, alongside the CDM, has built the strong capacity and awareness of Japanese private sector in implementing emissions reductions system. These are useful in extending the reach of Japan's own carbon market to the international arena through the JCM. Although the expected outcome of JCM was not included in the calculation of Japan's INDC target, the acquired reductions by Japan under the system

is expected to reach 50-100 million tCO₂ by 2030 (3.5-7% reduction). Nevertheless, enhanced domestic efforts to reduce energy use in end-use sectors are essential to achieve this national target. Achievements by the J-VETS, J-Credits, and the Tokyo and Saitama cap-and-trade, which have exceeded their targets, suggest promising results under a more ambitious domestic carbon market. It is reasonable to say the environment is enabled for a wider

domestic coverage and expansion to other sectors. As a new government takes office this year in the age of low-carbon cities, the timing may be right to reconsider a nationwide ETS.

What Distinguishes this Policy?

UNIQUE ASPECTS

1.

One of the positive byproducts of JVETS has been the development of its competent Japanese **monitoring, reporting, and third-party verification capacity as well as an established registry** for emissions trading.

2.

The **JCM** is a decentralized market-based mechanism, built upon experiences in implementing the CDM and domestic market systems.

3.

Tokyo Cap-and-Trade is the first city-based cap-and-trade system. Its achievements have led it to be an example for other jurisdictions in building a subnational ETS such as Saitama Prefecture.

CURRENT CHALLENGES:

1.

There is **splintered sentiment toward cap-and-trade in Japan**. At the local level, the Tokyo government, the country's largest sub-national governing body, implemented an ETS with absolute, mandatory targets in April 2010. At the national level, J-CREDITS and the JVETS/ASSET have built regulatory and infrastructural capacity for emissions trading. Despite these promising ETS actions, momentum towards a mandatory, nation-wide ETS with absolute caps has stagnated since December 2010. As evidenced by the deferral and the subsequent abandonment in November 2012, **concerns over ETS costs and legal framework need to be addressed**.

2.

An **ambitious emission reduction target** is needed based on the comprehensive and robust climate policy in line with the global goal of 2°C and to mobilize action from the enthusiastic business sector.

3.

The development of new market mechanisms should be further strengthened while the acceleration of the implementation of Article 6 of the Paris Agreement should be further elaborated.

Author Acknowledgements

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