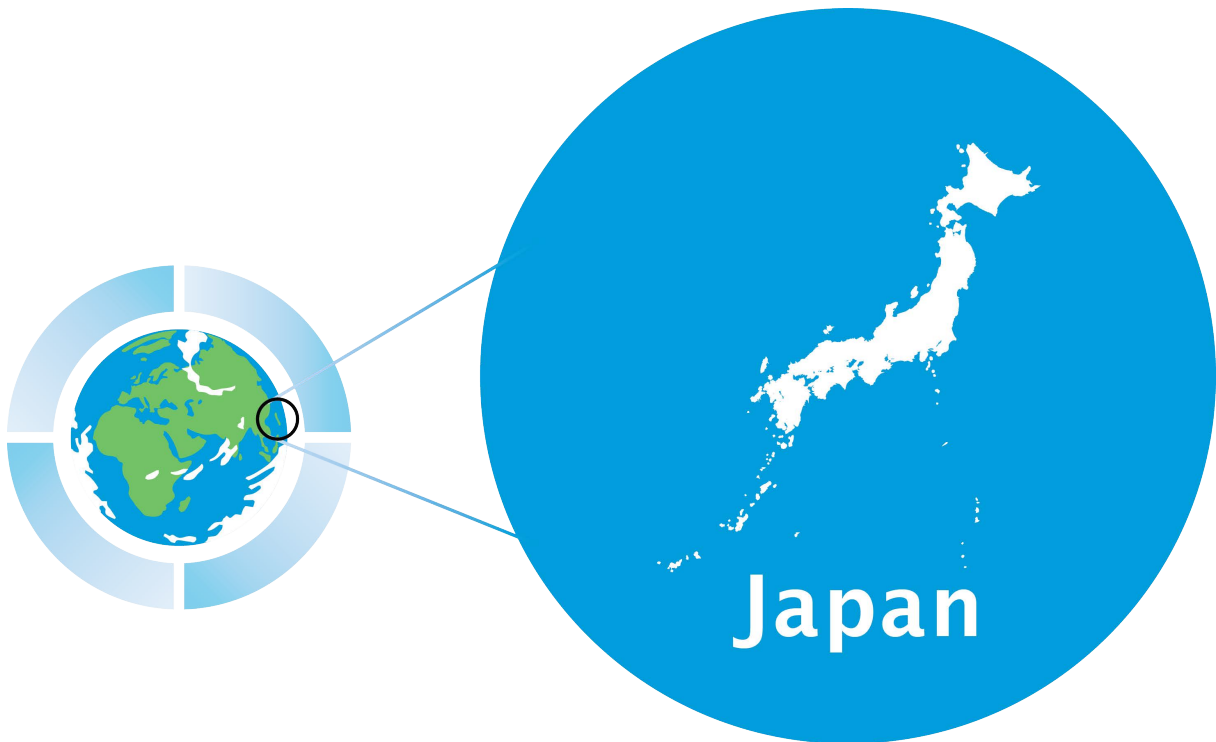




# JAPAN: AN EMISSIONS TRADING CASE STUDY



# Japan

## The World's Carbon Markets: A Case Study Guide to Emissions Trading

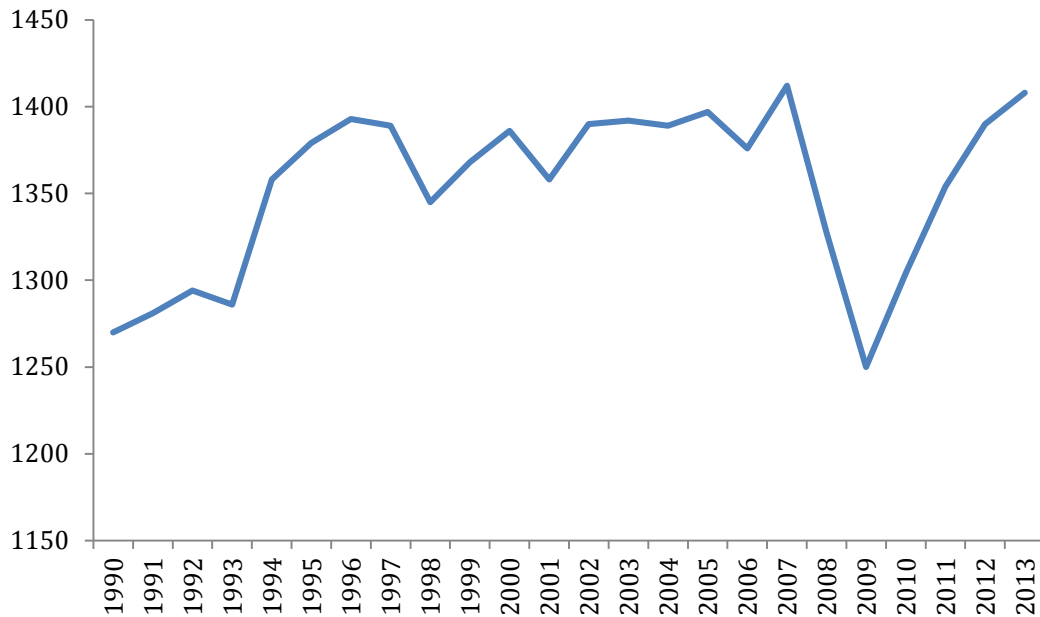
Last Updated: May, 2015

### Brief History & Recent Developments

Date	Event
1998	The Act on the Promotion of Global Warming Countermeasures was enacted
2002	Japan Ratified the Kyoto Protocol, first compliance period
2005	The Act on Promotion of Global Warming Countermeasures was amended to implement the JVETS
2006	Kyoto emission reduction target of -6% compared to 1990 levels was adopted
2008	The Act on Promotion of Global Warming Countermeasures amended to establish the J-VER
2008	Action plan for achieving a low-carbon society established by Council on the Global Warming issue
2010	The Basic Act on Global Warming Countermeasures established a mid-term and a long-term emission reduction targets
2012	Proposed national ETS abandoned Feed-In Tariff System and Global Warming Tax established
2013	Japan revises down 2020 target 3.8% below 2005 levels by 2020 The BOCM and the J-Credit Scheme were launched

**Table 1: Key Dates**

In 2013, Japan was the world's third biggest economy with a GDP of \$4.920 trillion<sup>1</sup> and overall greenhouse gas (GHG) emissions of 1,408 million tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e)<sup>2</sup> – up 10.8% compared with 1990 levels.<sup>3</sup> In 2013, the majority of CO<sub>2</sub> emissions were derived from the energy sector 89%.<sup>4</sup>



**Figure 1: Japan Greenhouse Gas Emissions 1990 to 2012 (million tCO<sub>2</sub>)**

Source: United Nations Framework Convention on Climate Change, 2014. Available at: [unfccc.int](http://unfccc.int)

In 1990, the Japanese government developed the *Action Program to Arrest Global Warming* to stabilise the level of CO<sub>2</sub> emissions (per capita) to 1990 levels by 2020.<sup>5</sup> 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.<sup>6</sup>
- 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 *Japanese Verified Emissions Reduction* (J-VER), which was launched in November 2008.

The *Action plan for achieving a low-carbon society*, which began in October 2008 and ended in 2012, and was established by the *Council on the Global Warming Issue*, implemented an **experimental introduction of an integrated domestic market for emissions trading**<sup>7</sup>. 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 Japanese government introduced the *Basic Act on Global Warming Countermeasures* in 2010, which establishes the framework for the majority of Japan's climate and energy policies including:<sup>8</sup>

- A mid-term target to reduce GHG emissions 25% by 2020 compared to 1990 levels
- A long-term target to reduce GHG emissions to 80% below 1990 levels by 2050
- A target to increase the share of renewable energy within the total primary energy mix to 10% by 2020 commitment to establish a domestic emission trading system (ETS)
- A carbon tax
- The introduction of a feed-in tariff programme to promote the use of renewable energy
- Promoting energy efficiency policies, voluntary activities and improve the awareness of the citizens

However, at the UN climate negotiations in Cancun, Mexico at the end of 2010, the government declined to sign up for a second commitment period of the Kyoto Protocol.<sup>9</sup> Following the March 2011 earthquake and subsequent incident at the Fukushima nuclear power plant, the Japanese government halted production at the country's nuclear plants. This prompted the government, at the 2013 UN climate talks in Warsaw, Poland, to announce a downwards revision in the country's 2020 reduction target, to 3.8% below 2005 levels by 2020, a significant reversal from the previous target of 25% below 1990 levels.<sup>10</sup>

Existing climate change programmes, such as the carbon tax and feed-in tariff, were later supplemented by the *Bilateral Offset Crediting Mechanism (BOCM)*<sup>11</sup> – now known as the Joint Crediting Mechanism (JCM) – and the *Japan greenhouse gas emission reduction certification scheme (J-Credit Scheme)*,<sup>12</sup> which were launched in 2013.

**EXPERIMENTAL JAPANESE VOLUNTARY EMISSIONS 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*<sup>a</sup> (VAP).<sup>13</sup> The scope of the JVETS covered CO<sub>2</sub> 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 CO<sub>2</sub> emissions produced. Participants whose emissions were below their established cap were permitted to sell allowances to other participants. The programme allowed an **unlimited use of Certified Emissions Reduction credits (CERs)** for compliance so long as these credits were not the primary means for achieving pledged targets. **Banking** of allowances and credits was allowed, but not **borrowing**.<sup>14</sup> Facilities could join and leave the scheme on a term basis.<sup>15</sup>

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.<sup>16</sup> In the event of non-compliance, entities were forced to return this subsidy to the government.<sup>17</sup>

#### Monitoring, Reporting & Verification system

Regulation of the JVETS was overseen by the Competent Authority Committee (CAC). Their responsibility was to draft guidelines, approve companies' monitoring plans, verify reports, and evaluate verifiers' achievements.<sup>18</sup> The Monitoring and Reporting (MR) guidelines for JVETS were equivalent to the EU ETS MR guidelines and the emission verification guidelines were set to encourage appropriate emissions verification by third party verifiers.

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<sup>a</sup> The goal of the Voluntary Action Plan (VAP) was for participants to stabilize CO<sub>2</sub> emissions from industrial processes and fuel combustion at the 1990 level by 2010. The VAP began in 1997, and 35 industries participated including energy, mining, manufacturing, and construction. While the Japanese government included the VAP in its Kyoto Protocol Target Management Achievement Plan, the voluntary nature of the VAP means that VAP participants made no commitment to the government about achieving stated targets.

## Results

During Phase 7 (2012), the final phase of the JVETS, the programme had 389 participants<sup>19</sup> and achieved a 59,419 tCO<sub>2</sub> reduction in emissions. The average trading price was roughly JP¥ 216 (USD\$2.60)<sup>b</sup>/tCO<sub>2</sub>.<sup>20</sup>

From fiscal 2006-fiscal 2012, 389 companies participated in JVETS, and over this period the cumulative emissions reductions achieved was 2,217 million tCO<sub>2</sub>e, an amount that exceeded the covered firms' emissions reduction commitment of 1,245 million tCO<sub>2</sub>e (Table 2).<sup>21</sup> The average price was JP¥ 810 (USD\$9.76). At its peak, the JVETS covered 0.3% of 1990 emissions (3.4 million tCO<sub>2</sub>/year as observed in the fourth term).<sup>22</sup>

	2006	2007	2008	2009	2010	2011	2012
Base year reference (tCO <sub>2</sub> ) <sup>c</sup>	1,288,543	1,122,593	1,661,251	3,368,915	624,546	483,137	669,690
Reductions achieved by measures implemented by participants (tCO <sub>2</sub> )	911,487	842,401	1,278,626	2,418,618	527,550	412,326	610,271
Issued allowances to participants (tCO <sub>2</sub> )	1,015,467	905,426	1,524,841	3,034,298	524,739	400,210	568,240
Achieved Reduction (tCO <sub>2</sub> )	377,056	280,192	382,625	950,297	96,996	70,811	59,419
Achieved Reduction (compared to the base year in %)	29%	25%	23%	28%	16%	15%	9%
Reduction Commitment (tCO <sub>2</sub> )	273,076	217,167	136,410	334,617	99,807	82,927	101,450
Reduction Commitment (compared to the base year in %)	21%	19%	8.2%	9.9%	16%	17%	15%
Number of Transactions	24	51	23	24	41	46	24
Emission trading volume (tCO <sub>2</sub> )	82,624	54,643	34,227	57,930	29,649	30,481	129,689
Average Price (JP¥ /tCO <sub>2</sub> )	1,212	1,250	800	750	830	610	216

**Table 2: JVETS results for fiscal 2006 - fiscal 2012**

Source: Ministry of Environment, 2014. Available at: [env.go.jp](http://env.go.jp)

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. However, the proposed national ETS was formally abandoned when Prime Minister Noda dissolved the Lower House at the end of 2012.<sup>23</sup>

**J-CREDIT SCHEME:** The J-Credit Scheme was created by merging the aforementioned J-VER and Domestic CDM. In 2013, a Certification Committee was established to oversee the new J-Credit Scheme and began its work to approve offset project methodologies and protocols.<sup>24</sup>

This domestic **credit certification scheme** allows the government to certify credits for the amount of GHG emissions reduction achieved by Japanese firms through the implementation of energy saving equipment, the use of renewable energy as well as the amount of GHG emissions removed through forest management within Japanese territory. The objective of the J-Credit system is to support regional efforts toward GHG emissions reduction.

Entities are able to trade approved credits, and such credits can be used for various purposes, including:<sup>25</sup>

<sup>b</sup> Figures have been converted to USD using the US Internal Revenue Service average currency exchange rate for 2012. Where USD\$1 is equal to JP¥ 83.008 and rounded to two decimal places. Available at: [irs.gov](http://irs.gov)

<sup>c</sup> Base year references are calculated using the average of emissions over a three-year period.

- Compliance with the “*Keidanren’s Commitment to a Low-Carbon Society*”; the voluntary programme was launched in 2009 to reduce emissions in industry and energy sectors by setting company-level target reductions to 2020;<sup>26</sup>
- Reporting of emissions after adjustment under the greenhouse gas accounting and reporting system (*Act on the Promotion of Global Warming Countermeasures 1998*);
- Reporting of joint energy efficiency projects under the Act on Rational Use of Energy (1979); and
- As a voluntary carbon offset.

The J-Credit system is scheduled to end on 31 March 2021. Credits from the Domestic CDM and J-VER programmes will expire on the same date. The expiration date for J-Credits is yet to be determined.<sup>27</sup>

### Management & Operation

Management of the J-Credit Scheme is overseen by three Ministries (The Ministry of Economy, Trade and Industry, the Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries). They all have the authority to:

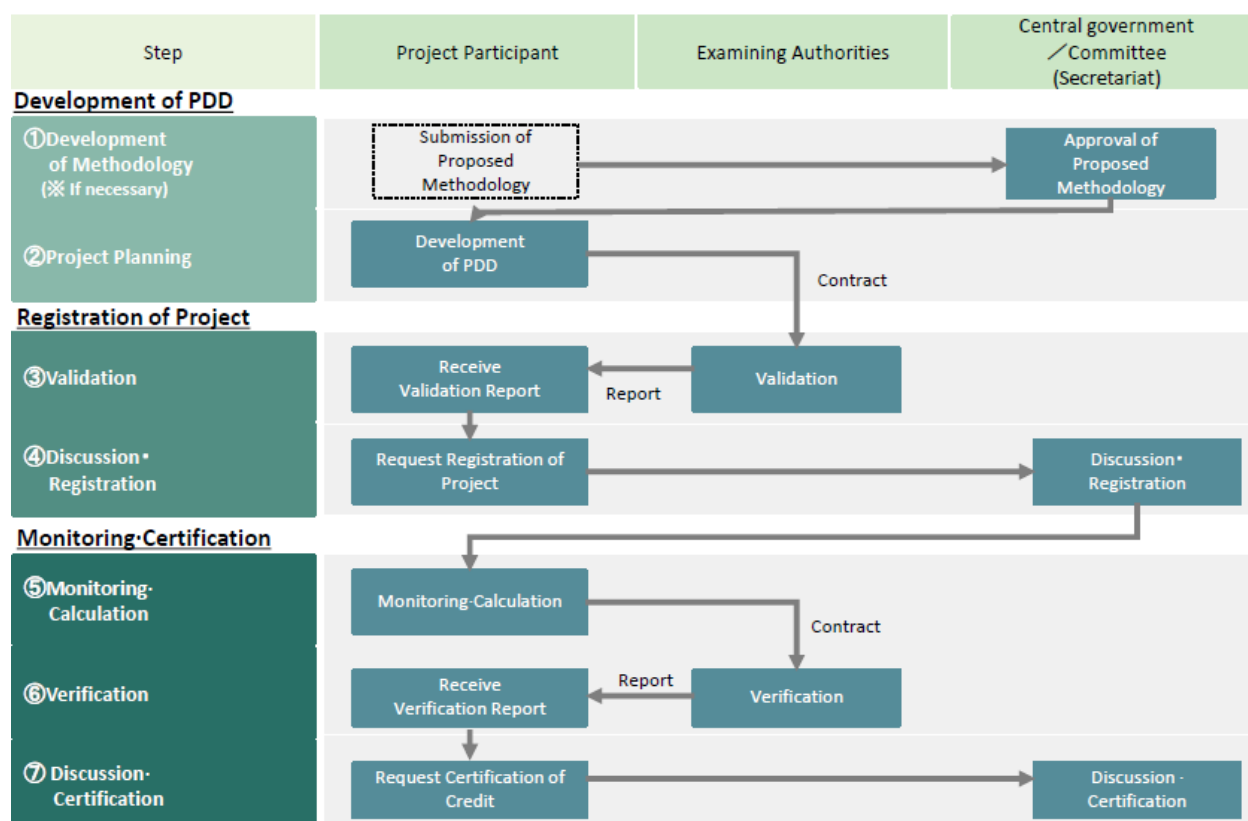
- approve and revise the J-Credit Scheme framework;
- register projects and certify credits;
- manage the system’s registry;
- establish the Steering Committee and the Certification Committee; and
- register examining authorities who execute both the validation of project (examination before registration) and the verification of registered projects (examination before certification).

The domestic system covers emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub>, and main economic activities: energy sector, industrial processes, agriculture, waste and forestry.<sup>28</sup>

Conditions for registration
1. Implemented within Japan
2. Implemented after 1 April, 2013
3. Satisfied additionality: in principle, payout time for project facilities need to be more than three years
4. Implemented based on approved methodologies
5. Passed the validation step
6. Take action to keep permanence (only for forest sink projects)

**Table 3: Required criteria for registration of a project under the J-credit Scheme**

*Source: Ministry of Economy, Trade and Industry, 2014. Available at: [jst.go.jp](http://jst.go.jp)*



**Figure 2: J-Credit system**

Source: Ministry of Economy Trade and Industry, 2013. Available at: [jst.go.jp](http://jst.go.jp) pg. 19

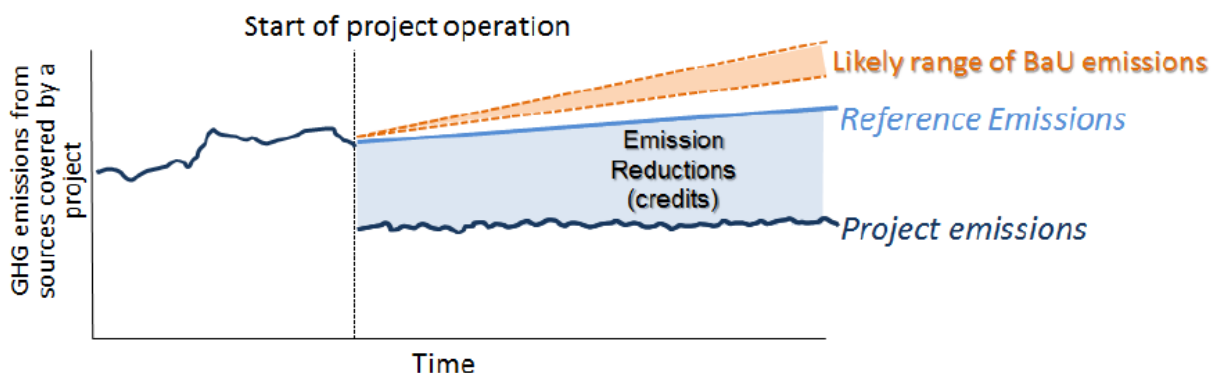
Methodologies are approved by the three Ministries (see above). As of May 2015, 60 methodologies have been approved, including 39 energy saving, nine renewable energy, 5 industrial processes, three agriculture, two forestry and one waste sector methodology.<sup>29</sup>

**BILATERAL OFFSET CREDITING MECHANISM/JOINT CREDITING MECHANISM:** Japan has implemented its own offset mechanism to drive emission reductions internationally through the Bilateral Offset Crediting Scheme which is now known as the Joint Crediting Mechanism (JCM). The objective of the JCM is to help Japan to reach its 2020 emissions reduction target at least cost and to develop export markets for low carbon technology, products and services. The mechanism allows Japanese firms to invest in emission reduction projects and programmes in developing countries to earn offset credits. The first bilateral agreement was signed with Mongolia in January 2013 and the first project was registered in Indonesia in October 2014.<sup>30</sup> To date, 12 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 and, Vietnam.<sup>31</sup>

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.

A Joint Committee (JC) of representatives of the Japanese and host governments develops the rules and guidelines to ensure the implementation of the mechanism, develops and approves proposed JCM methodologies, designates third-party entities (who are required to validate projects and verify GHG emissions reductions or removals), registers JCM projects and decides the amount of offset credits to issue.<sup>32</sup> While the JCM is more simplified than the CDM, the mechanism uses CDM methodologies where possible. Governments have approved 10 JCM methodologies so far.<sup>33</sup>

Both participating countries hold registries to account for reductions and the issuance of credits. This decentralised structure facilitates the promotion of mitigation actions that suit the host country's circumstances. As project logistics will differ from country to country, the Japanese government has established a "reference scenario" which determines "baseline emissions" and tends to be more conservative than business-as-usual (BAU) scenarios.<sup>34</sup> The objective is to ensure a net decrease in, and/or avoid GHG emissions. Emission reductions are the difference between "reference emissions"<sup>d</sup> and project emissions.<sup>35</sup>



**Figure 3: Calculation of emission reduction (credits)**

Source: Japan Government, 2013. Available at: [mmechanisms.org](http://mmechanisms.org)

	JCM	CDM
Nature of the mechanism	Bilateral	Multilateral
Governance	Decentralized structure: each government and the Joint Committee	Centralize structure: CDM executive Board
Sector/project coverage	Broader coverage	Specific projects
Calculation of emission reductions	Spreadsheet (data) and default values are provided	Various formula, strict requirements for measurement of parameters
Verification of projects	Third party entity : the one who validated the project can also conduct the verification process. Validation and verification can be conducted simultaneously	Third-party entity: in principle, two distinct entities for the validation process and the verification process. These two steps have to be conducted separately.

**Table 4: Key features of the JCM in comparison to the CDM**

Source: Partnership for Market Readiness, 2013. Available at: [thepmr.org](http://thepmr.org)

<sup>d</sup> Reference emissions refer to plausible emissions overtime which could maintain the same level of service/output under the JCM.



## Results

In 2013, seven projects in three countries (Indonesia, Mongolia and Palau) were approved and in 2014, 15 projects were approved from seven countries (Bangladesh, Indonesia, Kenya, Maldives, Malaysia, Palau and Vietnam).<sup>36</sup> The draft budget for the fiscal year 2015 included JPY¥2.4 billion (around US\$ 24million) per year from 2015 to 2017.<sup>37</sup>

**REGULATION & OVERSIGHT:** Since the implementation of the Act on Promotion of Global Warming Countermeasures, operators who consume at least 1,500 kiloliter of crude oil equivalent (coe) annually are required to calculate and report their GHG emissions. Covered entities calculate their emissions of the previous fiscal year and submit their emissions report by the end of July of the current year. Ministers compile the information that has been reported and notify the Minister of the Environment and the Minister of Economy, Trade and Industry. Thereafter the compiled emissions data is publicly announced and published. The accounting and reporting regulations aim to provide the foundation for emitters' voluntary action while at the same time promoting voluntary action.

## COMPLEMENTARY MEASURES:

### Energy efficiency

Energy Efficiency standards have been in place for more than 30 years in Japan. The main component of this effort is the **Rational Use of Energy Act**<sup>38</sup> (Energy Conservation Act) which was enacted in 1979. The Act includes five pillars where energy efficiency measures should be encouraged; 1) industries 2) commercial buildings, 3) transport, 4) residential, 5) consumer products and public awareness.

In April 2013, the Rational Use of Energy Act was amended<sup>39</sup> to begin to evaluate measures to deal with peak demand of electricity by reinforcing measures to accelerate the creation of a new energy supply-demand structure.<sup>40</sup> The Act provides a means to evaluate the efforts of energy consumers to reduce energy consumption during peak hours through the use of energy management systems and storage batteries. The Act also includes the **“Top Runner Approach”** to improve the energy efficiency of end-use products, targeting products which amount to more than 70% of residential electricity consumption.<sup>41</sup> It encourages industry to identify and implement cost effective innovations to increase energy efficiency by creating a criteria against which certain products are measured: 1) products involving large domestic shipments; 2) products that consume a large amount of energy when in use; 3) products with room for energy efficiency improvements.

In addition, the Energy Conservation Act was also the first piece of legislation to support an increase in energy efficiency for passenger and heavy duty vehicles. In 2012, the largest share of the energy sector emissions was derived from fuel consumption in the transport sector, which accounted for 18% (226 million tCO<sub>2</sub>).<sup>42</sup> Japan has employed several measures to cut emissions from transport, including tax breaks, energy efficiency standards and subsidies for low-emission vehicles. The current target for fuel efficiency for passenger vehicles (set in 2011) is 20.3km/l, which is expected to increase the average fuel efficiency of passenger vehicles by 24.1% compared to 2009.<sup>43</sup> Additionally in, 2015, Japan's *“Basic Energy Plan”* set a target to increase the share of “next generation vehicles” (electric hybrid, clean diesel, natural gas, fuel cell vehicles etc.) to 50-70% by 2030.<sup>44</sup>

### Renewable Energy

Japan's *Renewable Energy Act*, which came into force in July 2012, requires electric utility operators to purchase all renewable energy generated from Japan's pool of renewable energy sources (solar, onshore wind, geothermal, biomass, and sub-30MW hydropower).<sup>45</sup> As part of the scheme, power utilities companies collect surcharges from electricity users to cover the cost of purchasing renewable electricity. Generated renewable electricity purchases have a fixed price. The rate and contract period is determined in correspondence to the type, form, size etc. of the installation.<sup>46</sup>

The installed capacity of renewable energy power generation had grown by 34% (excluding hydropower) by the end of 2013.<sup>47</sup> The main measure to promote and deploy renewable energy sources is the **Feed-in tariff (FIT) scheme**

supported by the *Act on Special Measures concerning the Procurement of Renewable Electric Energy by Operators of Electric Utilities* (Renewable Energy Act 2011).<sup>48</sup>

### Global Warming Countermeasures Tax

The Global Warming Countermeasures tax (GW Tax) came into force gradually from October 2012, with the objective of limiting energy-related CO<sub>2</sub> emissions by placing a levy on fossil fuels.<sup>49</sup>

Fossil Fuel Energy Source		Tax Rate 2011 (JP¥)	From 1 Oct. 2012 (JP¥)	From 1 Apr. 2014 (JP¥)	From 1 Apr. 2016 (JP¥)
Crude Oil & Petroleum Product (per kl)	Carbon tax	-	250	250	260
	Full tax	2040	2290	2540	2800
Gaseous Hydrocarbon (per tonne)	Carbon tax	-	260	260	260
	Full tax	1,080	1340	1600	1860
Coal (per ton)	Carbon tax	-	220	220	230
	Full tax	700	920	1140	1370

**Table 5: Carbon Tax Rate**

Source: Ministry of Environment, 2012. Available at: [env.go.jp](http://env.go.jp)

The tax has been designed to increase in steps to JP¥ 289/tCO<sub>2</sub> by April 2016 for all fuels.<sup>50</sup> Exemptions were set to avoid heavy burden on specific sectors (aviation for example) or types of fossil fuels (e.g. heavy oil for agriculture, forestry and fishing). Revenues from the tax are allocated towards energy-related measures that mitigate CO<sub>2</sub> emissions such as energy-saving measures, promote the development of renewable energy and the development of clean and efficient fossil fuel use. Revenue from the GW tax's first year in FY2012 has been estimated at JP¥ 39.1 billion and JP¥ 262.3 billion for each year after FY2016.<sup>51</sup> The tax rate and the expected revenue after FY2016 suggest that the GW Tax should cover the equivalent of 80% (910 million tCO<sub>2</sub> per year) of energy related emissions in FY2010.<sup>52</sup>

## What Distinguishes this Policy?

### UNIQUE ASPECTS

1. One of the positive byproducts of JETS has been the development of its competent Japanese **monitoring, reporting, and third-party verification capacity as well as an established registry** for emissions trading.<sup>53</sup>
2. 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, JETS and the EI ETS 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.
3. Public backlash against **nuclear power** in the wake of the Fukushima power plant disaster will require Japan to restructure its plans in order to meet its 2020 climate targets. As a result, the country may be forced to significantly increase its use of international offsets.

### CHALLENGES

1. As evidenced by the deferral of a nation-wide ETS in December 2010 and the subsequent abandonment in November 2012, **concerns over ETS costs in Japan are influential.**
2. Without an ambitious emission reduction target for 2020 it is unlikely that the Japanese Government will be able to gather sufficient support from businesses and industry to enact a full-fledged national scheme in the future.

## Author Acknowledgements

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