

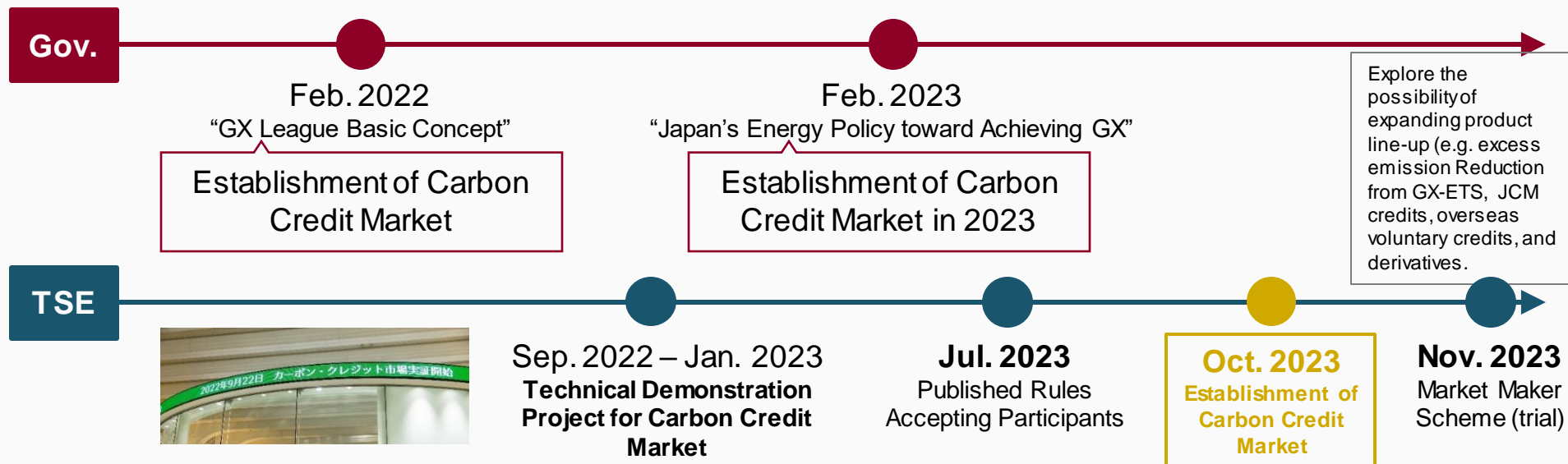
The Carbon Trading Marketplace in Japan

Tokyo Stock Exchange
March 26, 2024

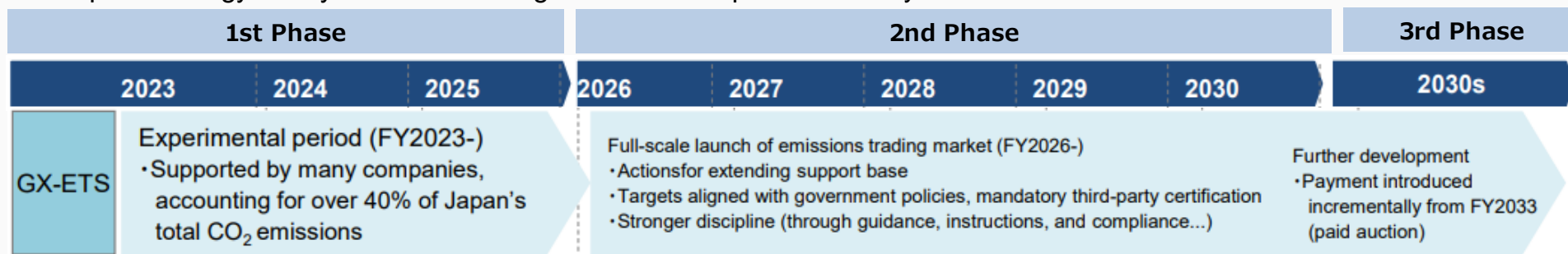


Establishment of Carbon Credit Market

- Based on the knowledge and market operation experience gained from the “Technical Demonstration Project for Carbon Credit Market” commissioned by the Ministry of Economy, Trade and Industry (METI) in FY2022, TSE opened the carbon credit market and began trading in October 2023.



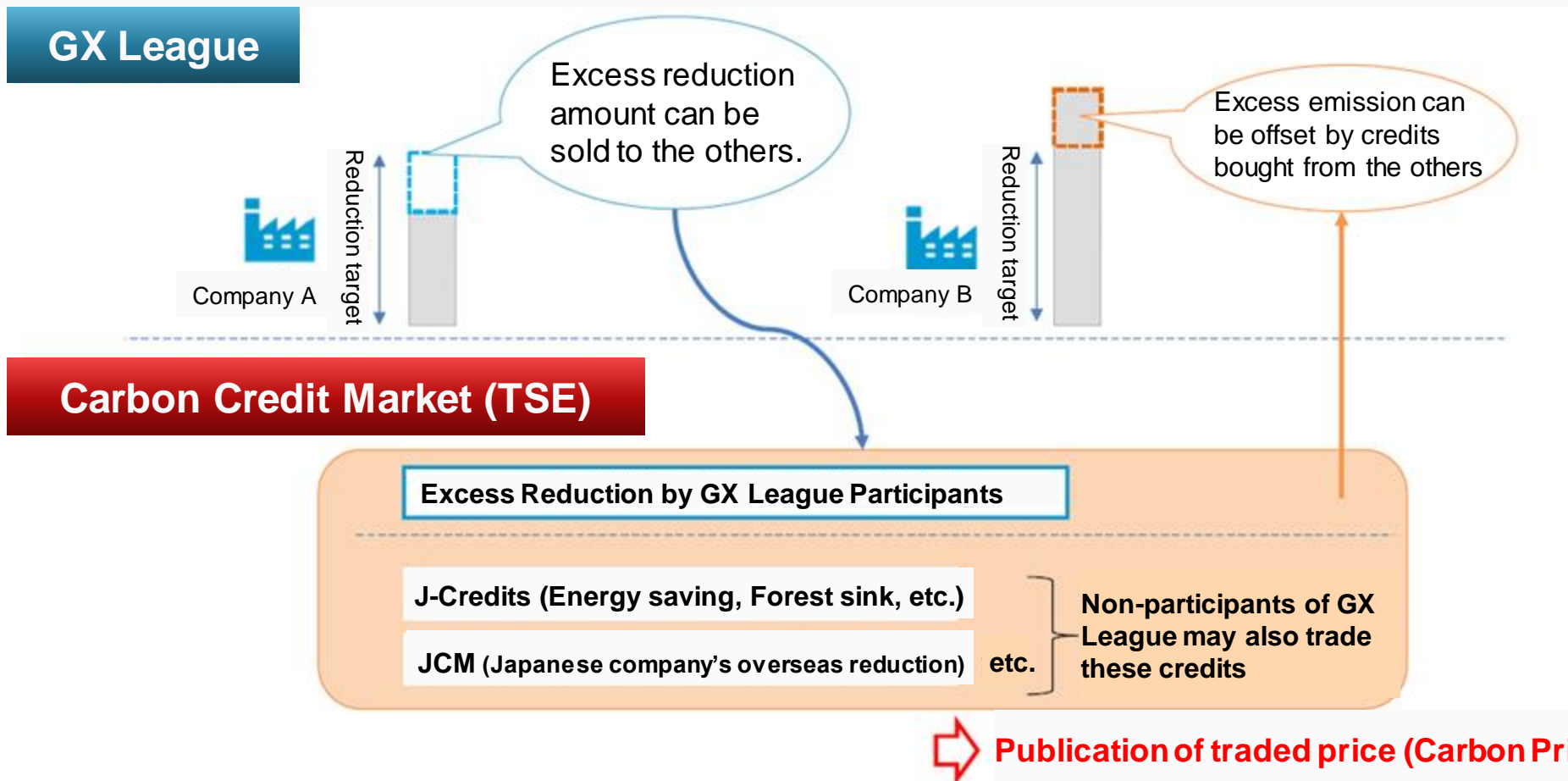
< Japan’s Energy Policy toward Achieving GX – Roadmap for next 10 years – >



Source: METI, “The Basic Policy for the Realization of GX : Reference document”, February 10, 2023

Relations between GX League and Carbon Credit Market

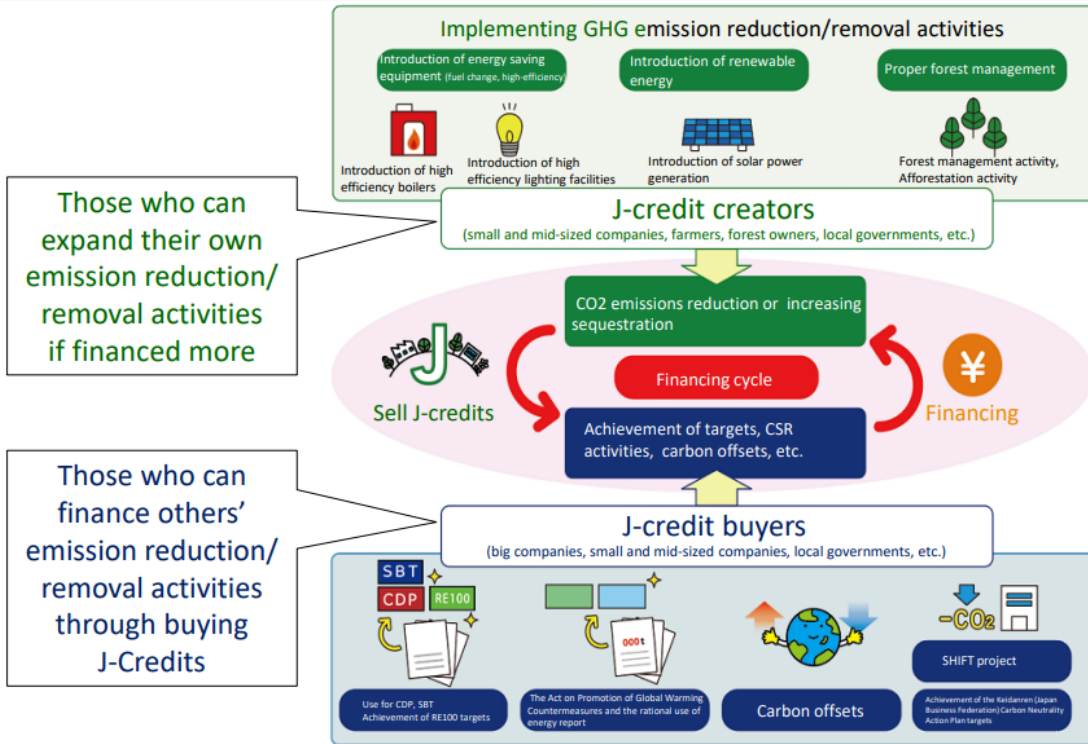
- GX League initiates the establishment of carbon credit market in which GX League participants can trade excess reduction credits of GX-ETS or other credits available to achieve their own reduction targets of GHG emission.



(Source) METI, "The Direction of Emissions Trading in the GX League, which will be fully operational from the next fiscal year", https://gx-league.go.jp/aboutgxleague/document/02_来年度から本格稼働するGXリーグにおける排出量取引の考え方について.pdf

Outline of J-Credit

- Promote GHG emission reductions and removals in Japan
- Enhance CSR activities and voluntary carbon offsetting



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Methodologies (6 Types)	Individual Methodologies (70 Types) ※ Examples
Energy Saving	Introduction of high efficiency boilers, Introduction of high efficiency air conditioning facilities, Introduction of high efficiency lighting facilities
Renewable Energy	Introduction of solar power generation, Introduction of hydroelectric power generation
Industrial Process	Switch cover gas in casting magnesium from SF6 to lower GWP gases
Agriculture	Conversion of disposal management system for livestock excreta, Biochar addition to mineral soil in cropland/grassland
Waste	Reduction of fossil fuel for incineration by reducing volume of sludge utilizing microbially-activated solvent
Forest Sink	Forest management activity, Afforestation activity

Source: J-Credit Scheme, https://japancredit.go.jp/english/pdf/credit_english_001_41.pdf

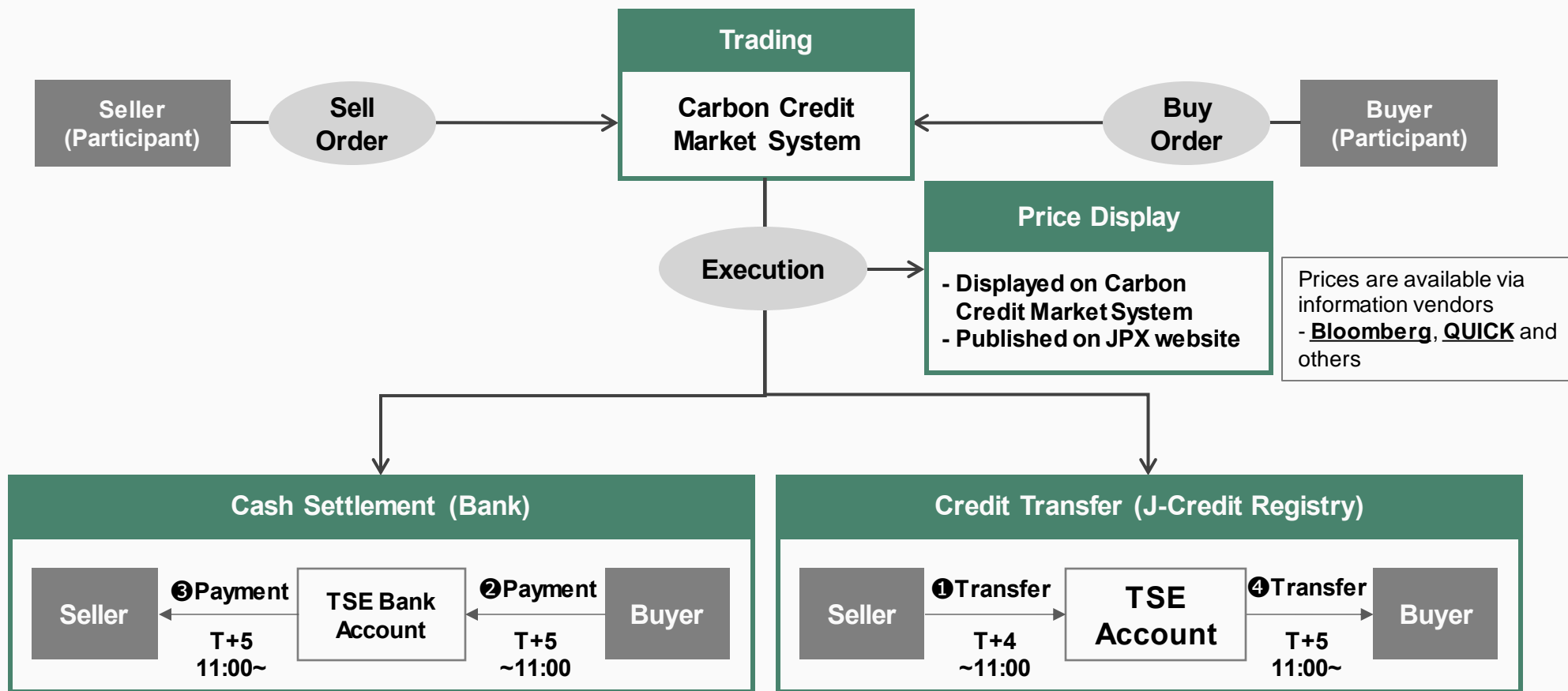
Overview of Carbon Credit Market Specifications

	Overview
Items Eligible for Trading	J-Credit
Trading Method	Call auction 11:30 a.m. and 15:00 p.m. (based on price priority)
Order Acceptance Hours	9:00 – 11:29 / 12:30 – 14:59
Trading Categories	6 categories sorted by project type (for J-Credits)
Tick Size	JPY 1
Trading Unit	1t-CO2
Settlement Date	Fifth business day from day of execution (T+5)
Settlement	Transfer of cash and credits between buyer and seller

Please see the following link for the detailed rules.

https://www.jpx.co.jp/equities/carbon-credit/market-system/nlsgeu000006f14i-att/market-system_appendix_e.pdf

Structure of Carbon Credit Market (Flow of Trading)



Timing of Fund and Credit Transfers

- | | | |
|---|-----------------|---------------------------------|
| ① | T+4 by 11:00 | Seller transfers credits to TSE |
| ② | T+5 by 11:00 | Buyer transfers funds to TSE |
| ③ | T+5 after 11:00 | TSE pays funds to seller |
| ④ | | TSE transfers credits to buyer |

Overview of Market Participants

- Companies directly participate in the carbon credit market. (No brokers)
- 265 participants registered, surpassing the number of demonstration participants (183)
- 5 participants (Sumitomo Corporation, Daiwa Securities, Marubeni, Mizuho Bank, MITSUI & CO., LTD.) were registered as **market makers** under a scheme we operated commissioned by METI from Nov. 2023 to Feb. 2024.

<Participants by Business Category>

Business Category	PCPs	Demo PCPs	±
Governments (National/Local)	4	3	+1
Agriculture/Forestry/Fishery	13	10	+3
Mining	1	1	0
Construction	11	11	0
Manufacturing	29	29	0
Electricity/ Gas	52	22	+30
Transport/ Telecommunication	16	17	-1
Commerce	37	25	+12
Finance/ Insurance	37	20	+17
Real Estate	5	3	+2
Service Industry	38	31	+7
Others	22	11	+11
Total	265	183	+82

(as of Mar. 2024)

Traded Price and Volume (from Oct. 11 to Mar. 19)

Type of Credit	Traded Price (JPY)		Trading Volume (t-CO2)	Average Daily Trading Volume (t-CO2)
	Weighted Average Price	Low~High		
J-Credit Energy Saving	1,660	1,510~2,850	68,941	650
J-Credit Renewable Energy (Electric power)	3,022	2,000~3,900	138,873	1,310
J-Credit Renewable Energy (Heat)	2,282	2,000~2,480	122	1
J-Credit Forest Sink	8,095	6,046~9,900	64	1
J-VER (not yet transferred) forest sink	8,450	8,450~8,450	52	1
Total	—	—	208,052	1,963



Development of Carbon Credit System

Requirements for the system development

- Short system development timeline - 3.5 months
- Required high quality expectations for a core trading system in the carbon credit market
- Quick adaptation of system requirements and changes due to simultaneous formulation of market rules
- Compliance with JPX's system security policy



<u>Utilization of AWS</u>	<u>Adoption of Microservice Architecture</u>	<u>Adoption of Incremental Development Model</u>
<ul style="list-style-type: none">☞ Formulating rules previously for safe utilization of public cloud under JPX management☞ Using “J-WS”(JPX`s-maintained AWS), as the common system infrastructure☞ Meeting internal security policy with J-WS☞ Leveraging preexisting AWS parts/ functions for infrastructure, allowing focus on application development	<ul style="list-style-type: none">☞ Implementing loose coupling of components to minimize impact on others even if there were changes☞ Flexibility to handle future market expansion with additional system changes	<ul style="list-style-type: none">☞ Adopting incremental development model for functions with fixed requirements☞ Shorter development period due to this model☞ Starting development with this model while simultaneously formulating rules

(reference) Trading Categories in J-Credit

- TSE provides standardized trading categories for J-Credit.

First layer (Scheme)	Second layer (Main Category)
J-Credit	Energy saving
	Renewable energy (electricity)
	Renewable energy (heat)
	Renewable energy (mixed electricity and heat)
	Forest sink
	Other
Transferred from Domestic Credit Scheme	Domestic credits
Transferred from J-VER Scheme	J-VER (forest sink)
	J-VER (other)
Regional J-Credits, J-VERs (not yet transferred), regional J-VERs (not yet transferred), domestic credits (not yet transferred)	Regional J-Credits
	J-VER (not yet transferred) forest sink
	J-VERs (not yet transferred) other
	Regional J-VERs (not yet transferred)
	Domestic credits (not yet transferred)

(reference) Registration Requirements

- Applicants must meet the following a. through f. to register as a Participant.

Registration Requirements (cited from Outline of Specifications)

a	Being a corporation, government or local government, or nin-i dantai (voluntary organization)
b	Having a system in place to ensure stable operations
c	Having sound management, including having sufficient social credibility to be a TSE trading participant and not being subject to the control or influence of any party lacking social credibility or any other party considered inappropriate in light of the objectives of TSE and its operation of the markets
d	Not being insolvent
e	Having established a bank account and a J-Credit Scheme Registry account in the applicant's own name and being registered as a qualified invoice issuer (see next page for details)
f	<p>Not having representatives, directors, or important employees that fall under any of the following items:</p> <ul style="list-style-type: none">(a) A person who does not have the appropriate recognition, judgement, or two-way communication abilities that are needed to carry out their business due to a mental disorder;(b) A person for whom a decision of commencement of bankruptcy proceedings has been made and who has not obtained restoration of rights, or a person who is treated in the same manner under foreign laws and regulations; or(c) A person who has been sentenced to a punishment at least as severe as imprisonment (including equivalent punishment under foreign laws and regulations), or fines under the provisions of the Commodity Derivatives Transaction Act or equivalent foreign laws and regulations (including equivalent punishment under foreign laws and regulations), where less than five years have passed since the date of completion or cancellation of said punishment.

(reference) Effects of Implementing a Market Maker Scheme

- A trial market maker scheme for J-Credit commissioned by METI increased the market volume.

<Energy Saving>

Term	Traded Price (JPY)		Trading Volume (t-CO2)	Average Daily Trading Volume (t-CO2)
	Weighted Average Price	Low~High		
Whole Term (10/11~2/29)	1,665	1,510~2,850	62,898	676
Before MM (10/11~11/24)	1,642	1,510~2,850	10,682	345
After MM (11/27~2/29)	1,670	1,597~1,700	52,216	842

×2.4

<Renewable Energy (Electricity)>

Term	Traded Price (JPY)		Trading Volume (t-CO2)	Average Daily Trading Volume (t-CO2)
	Weighted Average Price	Low~High		
Whole Term (10/11~2/29)	3,032	2,601~3,900	136,068	1,463
Before MM (10/11~11/24)	3,031	2,601~3,900	10,535	340
After MM (11/27~2/29)	3,032	2,910~3,159	125,533	2,058

×6

※ Trading volume after the introduction of MM includes non-MM transactions.



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