

Research Scheme for the Infrastructure Development of the Joint Crediting
Mechanism FY 2016

Survey on the International Negotiation on Market
Mechanism Report

March 2017

The Institute of Energy Economics, Japan

Preface

The Paris Agreement came into force in November 2016. In Article 6 of the Paris Agreement, cooperative approaches, provisions such as sustainable development mechanism, etc. are stipulated. The article allows to trade the emissions reduction amount obtained in other countries and to use it to achieve the target in nationally determined contribution (NDC). In the Kyoto Protocol, flexibility mechanism also allows use of other countries' emissions reduction to achieve their own targets, the mechanism is called market mechanism. Since the structure of the Paris Agreement and the Kyoto Protocol are largely different, rules under the Kyoto Protocol cannot be used for the Paris Agreement as they are. Therefore, negotiation started on May 2016, for the purpose of making consensus on the implementation rules of Article 6 of the Paris Agreement.

Meanwhile, in order to promote the deployment of low-carbon technologies and products to worldwide, and to encourage actions against global warming on a global scale, Japan established Joint Crediting Mechanism (JCM). From 2020 onwards, implementation of article 6 of the Paris Agreement will have relevance to the future operation of JCM. Therefore, research on international negotiation on article 6 of the Paris Agreement, especially accounting methods including avoidance of double counts is necessary.

In addition, efforts related to market mechanisms such as the Transformative Carbon Asset Facility (TCAF) and the Partnership for Market Readiness (PMR) implemented in the World Bank may also have a significant impact on market mechanisms in future international society.

Therefore, in this survey, we research negotiations on the article 6 of the Paris Agreement and analyze the issues of negotiations and the position of each country. Then, we also research on the efforts taken by the World Bank and analyze them in order evaluate the GHG emissions reduction through the market mechanism including JCM.

We hope that this report contributes to debates on article 6 of the Paris Agreement and effective use of JCM.

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**Chapter 1 International Negotiations on Market
Mechanism after 2020**

1. Background of international negotiations on market mechanism

The Kyoto Protocol (adopted in 1997 in Kyoto) included regulations on market mechanism, also known as “flexibility mechanisms” including the clean development mechanism (CDM) and joint implementation (JI). These mechanisms allowed the country parties with emissions reduction targets to use emissions reduction made in other countries—in addition to emissions reduction in its own nation—in order to meet the target. So far, the mechanisms encouraged active development of projects by countries, resulting in more than 1 billion tons of emissions reduction through more than 7,000 CDM projects registered. However, it is facing some challenges, such as uneven distribution of projects among host countries, which led to discussion on improvement of the mechanisms. Although a variety of measures have been taken, the some countries still view the system inadequate.

The importance of the market mechanisms were also recognized in the negotiations started in 2012 which led to the adaptation of the Paris Agreement. Whether the market mechanisms should be included in the Paris Agreement was one of the subjects discussed. Although once denied during the discussion, inclusion of the market mechanism in the final agreement was ultimately decided.

As described below, the negotiation is taking place for the adoption of documents necessary to operationalize the market mechanisms stipulated in Article 6 of the Paris Agreement (e.g., guidance, modalities and procedures) by 2018. Country parties have been expressing various opinions, and none of them seems to be willing to compromise at this moment.

This chapter starts with the summary of the Paris Agreement (with a focus on the differences with the Kyoto Protocol) and then describes the key points of discussion of the market mechanisms and positions of country parties, followed by analysis on the prospect of the negotiations.

2. Summary of the Paris Agreement

The following is a summary of the Paris Agreement and its historical background. As the Paris Agreement has different features from the Kyoto Protocol, the summary will focus on the differences between the two agreements.

(1). Historical background and a summary of the Paris Agreement

i Historical background of the Paris Agreement

The Kyoto Protocol imposed emissions reduction obligation only to developed countries and stipulated no obligation to developing countries. Meanwhile, emissions from emerging countries, such as China and India, have rapidly increased since 2000. China, especially, rapidly increased its emissions and finally exceeded the amount of the U.S. in 2007, becoming the largest greenhouse gasses (GHG) emitter in the world. As a result, reducing the emissions from emerging countries (categorized as developing countries in the Kyoto Protocol) has become an important element not only for the developed countries but also for the whole international community.

The establishment of the Paris Agreement was backed by the concern by the international community on how to solve the problem of the dichotomy of the Kyoto Protocol (obligation to reduce GHG emissions was imposed only to developed countries, while no obligation was imposed on developing countries). While the Paris Agreement was adopted as a result of the international negotiation framework started in 2011 (ADP, described later), one needs to be aware that activities to set an international framework and international agreement to stipulate emissions reduction targets started in 2007. The negotiations faced difficulties during this period, including some occasions where negotiation collapsed, leaving a concern that an agreement would never be reached.

In 2007, negotiation to set reduction targets under the Kyoto Protocol after 2012 was started under the United Nations Framework Convention on Climate Change (UNFCCC). This was due to the fact that the Kyoto Protocol does not stipulate emissions reduction targets after 2012. In the negotiation, countries considered whether to set some kinds of emissions reduction targets for China, India and other emerging countries under the Kyoto Protocol. However, the countries could not reach agreement in the 15th session of the Conference of the Parties (COP 15) of the UNFCCC held in Copenhagen in 2009. The negotiation continued till 2012, when the final agreement for the actions after 2012 was reached. It states that China, India and other developing countries would set voluntary targets to reduce or slow down the growth of emissions within the Cancun Agreement set under the UNFCCC, while the dichotomy of the Kyoto Protocol would be kept until 2020.

In the COP17 of the UNFCCC held in 2011, the country parties agreed that Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) is to be established as an international platform for negotiation for post-2020 framework.

The actions for the period after 2020, which are to be adopted in the ADP, were to be different from the Kyoto Protocol in that they are made with an assumption that they would be applicable to all parties. This suggests that ADP had the same concerns as the negotiation towards the revision of Kyoto Protocol after 2012. The discussion started in 2012, and the Paris Agreement was finally adopted in December 2015 at COP 21 of the UNFCCC held in Paris.

After the adaptation, all countries went through ratification processes at an unexpectedly high speed, enabling the agreement to enter into force in November 2016. In the same month, at the COP22 to the UNFCCC was held in Marrakesh, together with the First Meeting Under the Paris Agreement (CMA1).

ii Summary of the Paris Agreement

Table 1 shows the summary of the Paris Agreement. As shown in Table 1, each country is obliged to stipulate a nationally determined contribution (NDC) in its measures. The NDC includes GHG reduction actions each country will take in order to meet their targets. Unlike the targets set in the Kyoto Protocol, the emissions reduction targets set in the NDC are not legally binding, which was necessary in order bring both developed and developing countries to commit to GHG reductions (See Table 2 for NDCs by major countries).

The Paris Agreement states that the global emission is to be reduced to zero by the latter half of the 21st Century in order to keep the global temperature rise below 2 degrees while making efforts to keep it below 1.5 degrees. Compared with the Kyoto Protocol, which limited its goal at 5% reduction from the 1990 level by 2012 for developed countries only, the Paris Agreement, which sets a goal to reduce the emission levels of the whole world for a long term, greatly expanded the countries and timeframe to be covered by the agreement.

The Paris Agreement lays out measures to support country parties to achieve their targets. For example, a transparency framework was developed to track the progress of measures by each country. Also, global stock-taking and other measures are prepared to track the progress towards the target achievement for the whole world. Through these measures, information on the progress toward the achievement of emissions reduction targets shown in the NDCs and the progress toward the achievement of emissions reduction goal set by the Paris Agreement can be shared among the countries, which in turn encourages higher ambition in emissions reduction target.

In addition, the Paris Agreement stipulated financial mechanisms and technology transfer programs to support developing countries, market mechanisms and similar measures, and compliance promotion measures (market mechanisms are described later).

The Paris Agreement also covers adaptation to global warming and responses to losses, as well as regulations on measures to prevent increase of carbon dioxide emissions due to deforestation.

The Paris Agreement stipulates general rules only, leaving the details to negotiation at the COP. The negotiation to set details rules for the implementation of the Paris Agreement is planned to continue until 2018.

Table 1: Summary of the Paris Agreement

Goals: (Articles 2 and 4)	<ol style="list-style-type: none"> (1) To keep the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. (2) To reach global peaking of emissions as soon as possible, so as to achieve zero net emission in the second half of this century. (Article 4. Paragraph 1)
Measures by parties (Article 4)	<ol style="list-style-type: none"> (1) With some exceptions, all parties are to stipulate nationally determined contributions (NDCs). (2) NDCs stipulated are to be recorded in a public registry maintained by the UNFCCC secretariat. (3) NDCs will be reviewed and updated every five years (with an aim for more stringent targets).
Global stock take: (Article 14)	The progress toward achieving the purpose of the Paris Agreement is to be assessed regularly (every five years). (The first assessment will be made in 2023.)
Transparency framework: (Article 13)	Each party is obliged to provide information on their implementation progress, using the UNFCCC's system to provide reporting documents (national inventory reporting system, biennial update reporting system, etc.).
Financial resource and technology transfer: (Articles 9 and 10)	<ol style="list-style-type: none"> (1) Developed countries are obliged to provide financial support to developing countries. (2) Developing countries can also provide financial support to other developing countries. (3) All parties are obliged to strengthen cooperative scheme to develop and transfer technology. □
Market mechanisms: (Article 6)	<ol style="list-style-type: none"> (1) Countries are allowed to undertake voluntary cooperative approaches. (2) Sustainable development mechanism is to be established. (3) Non-market approaches are to be examined.
Adaptation and loss/damage: (Articles 7 and 8)	Implement measures for adaptation, as well as actions against damages and losses.
Measures for absorption by forests: (Article 5)	Promote measures to prevent increase of CO ₂ emissions from deforestation and forest degradation.
Compliance promotion: (Article 15)	A mechanism to facilitate implementation of and promote compliance with the provisions of the agreement is to be established.

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

Table 2: Specific examples of NDCs

	EU	USA	Mexico	China	India
Base year	1990	2005	BAU emission	2005	2005
Period	2021– 2030	By 2025	By 2030	By 2030	By 2030
Reduction target	40%	26% – 28%	Unconditional: 25% Conditional: 40%	60–65% per unit of GDP	33–35% per unit of GDP
Gases subject to regulation	Gasses subject to regulation in the Kyoto Protocol (CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃)	Gasses subject to regulation in the Kyoto Protocol	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , Black Carbon	Greenhouse gasses	Unknown
Forest sinks	Legislation to utilize forest sinks is under consideration (will be decided by 2020).	Forest sinks are used with the following notes: <ul style="list-style-type: none"> • Absorption is calculated with the net-net approach. • Natural disruption (e.g. forest fire) is excluded. • Absorption by lumber and wooden products is taken into consideration. 		Unknown	Additional 2.5 to 3.0 billion tons of reduction by forest sink is to be achieved by 2030.
Use of international credits	Not used.	International credits are not used for target achievement till 2025.	Used for conditional achievement.	Unknown	

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

(2). Difference from the Kyoto Protocol

The Paris Agreement differs greatly from the Kyoto Protocol in its contents. As described above, the Paris Agreement requires all the country parties to take some kind of measure for GHG emissions reduction and does not legally obligate the achievement of reduction targets, while the Kyoto Protocol impose legal obligation of emissions reduction on developed countries only (see Table 3 for the differences).

Important differences concerning market mechanisms include the fact that all country parties set reduction targets and the fact that the nature of target varies greatly due to “bottom-up” approach that was taken. As shown in Table 2, the gasses to be subject to regulation and the base years vary largely. Kyoto Protocol employed the “top-down” approach with a common base year, common gasses to be subject to, and common areas subject to regulation.

This means different methods have to be used between the Paris Agreement and the Kyoto Protocol when counting emissions reduction from one country through the market mechanism into the target achievement of another country, which has been an important topic in international negotiations. As described later, there are many issues in the specific methods, and each country has different opinions on the issues.

Table 3: Differences between the Kyoto Protocol and the Paris Agreement

Paris Agreement	Kyoto Protocol
All country parties take measures to reduce GHG emissions.	Developed countries only
Bottom-up method (countries voluntarily set emissions reduction targets)	Top-down method to set targets.
Achievement of reduction targets is not an obligation. The obligation for countries is to develop “nationally determined contribution” (measures to reduce GHG emissions) and report its progress.	<ul style="list-style-type: none"> • Achievement of reduction targets is an obligation. • Submission of annual reports is an obligation. Development of measures to reduce GHG reduction is not obligation for countries.
Based on the progress of the measures for emissions reduction of the whole world, further measures are obliged.	Not stipulated in the Kyoto Protocol articles (not stipulated in the UNFCCC).
Loss and damage, and prevention of deforestation, non-market approaches and other measures are stipulated in articles.	Not stipulated in the Kyoto Protocol articles (not stipulated in the UNFCCC).

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

3. Challenges of the market mechanism in the Paris Agreement

While the market mechanisms are stipulated in the Article 6 of the Paris Agreement, the paragraphs describe only the general framework. Specific guidance and other instructions needed for implementation will be adopted in the future negotiations.

The following section will summarize the issues being discussed in negotiations concerning the market mechanism.

(1). Market mechanism provisions in the Paris Agreement (Article 6 of the Paris Agreement)

Article 6 provides framework on the market mechanism under the Paris Agreement. The measures described as the market mechanism are cooperative approaches (Paragraph 2, Article 6), sustainable development mechanism (Paragraph 4, Article 6), and non-market approaches (Paragraph 8, Article 6).

Table 4: Specific provisions of market mechanism¹

Paragraph and Article	Specific provision	Documents to be agreed in 2018
Paragraph 2, Article 6	A cooperative approach , an approach to recognize market mechanisms country parties independently implemented under the Paris Agreement. For example, Japan's JCM and Europe's EU ETS may be incorporated with other emission trading systems. A bottom-up and decentralized approach each country independently implements.	Guidance
Paragraph 4, Article 6	Sustainable development mechanism (SDM) , an approach to implement market mechanism in a centralized manner under the Paris Agreement. A top-down and centralized approach similar to CDM under the Kyoto Protocol.	rules, modalities and procedures
Paragraph 8, Article 6	Non-market approach , an approach to support developing countries using other methods than the cap-and-trade system or baseline-credit system.	Work programme

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

¹ There are two kinds of emission trading systems. One is the "baseline-and-credit" system of emission trading, where credits are given when the actual emission is lower than the baseline emission (the expected emission set before the emission reduction program is implemented under the assumption that that specific program is not implemented). The other is "cap-and-trade" system, where an upper limit on emissions is fixed for business operators subject to the regulation, and emission permits (allowances) are distributed to operators, who can trade out the allowances.

For these measures, development of documents necessary for implementation (guidance, etc.) at the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement (CMA) is required (see Table 4. Agreement was not reached concerning these documents, which are deemed necessary for implementation of the market mechanism under the Paris Agreement, at the CMA 1 held in Marrakesh. The participants agreed to adopt the relevant documents in 2018 and continue the discussion.

(2). Issues for discussion on the market mechanism

Many concerns have arisen regarding the market mechanism under the Paris Agreement. In the section below, important issues for discussions are described based on the opinions shown in the submissions by different countries between September and November, 2016.

i Definition of ITMOS

Common feature of paragraphs 2 and 4 of Article 6 is that involves “internationally transferred mitigation outcomes (ITMOs) to be used to meet NDC. However, ITMOs is not clearly defined under the Paris Agreement. As described before, countries set a variety of targets under the Paris Agreement, including the targets for the use of renewable energy. Thus, the definition of ITMOs, as well as the units to be used (e.g., tCO₂e, MWh), must be clearly defined.

ii Necessity to avoid double counting

Avoidance of double counting is one of the most important issues in the negotiations on the market mechanism under the Paris Agreement. Under the Paris Agreement, ITMOs are transferred between the transferring country and the receiving country as shown in Figure 1.

If a country that transferred its ITMOs to another country under the Paris Agreement fails to subtract the amount equivalent to the ITMOs to adjust its emission report, and the receiving country used the amount for the achievement of its NDC, this would mean that the same ITMO is counted twice for the target achievement of two countries. This is the double counting that needs to be addressed. It has been discussed what kind of adjustment should be made for the country that transfers its ITMO.

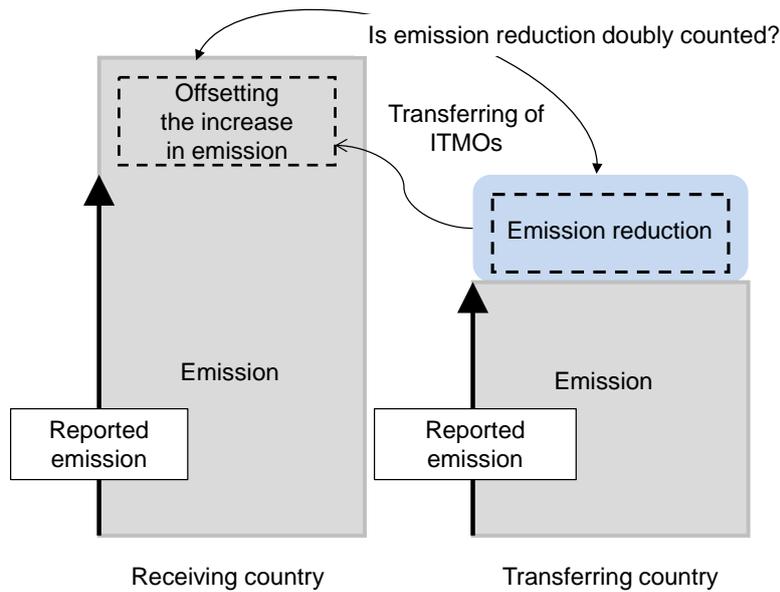


Figure 1: Possible double count under the Paris Agreement

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

iii Adjustment to avoid double count

In the Paris Agreement, parties are required to examine specific adjustment methods to avoid double counting of ITMOs, as referred to as “corresponding adjustment.” Two methods have been suggested in discussions by the country parties. One is to make adjustment at the time of reporting, and the other is to make adjustment on the NDC targets.

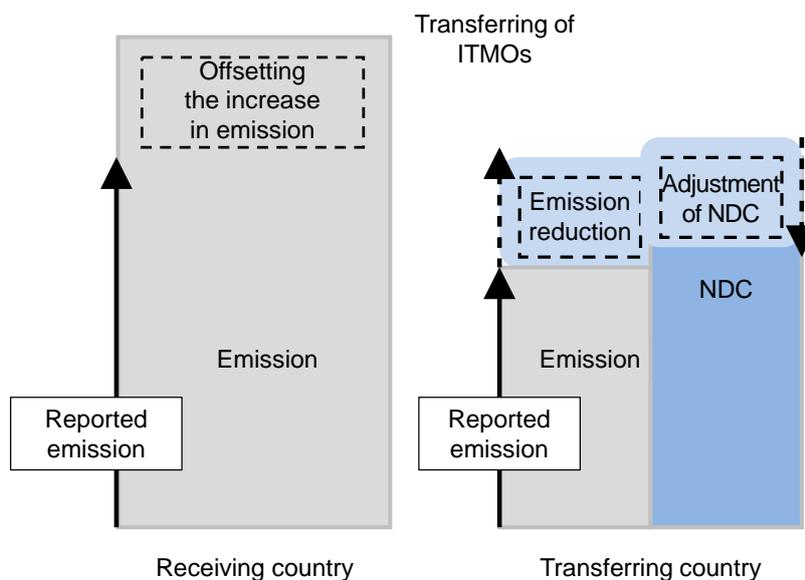


Figure 2: Specific methods of corresponding adjustment

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

More specifically, with the first method, the country that transferred the ITMOs is to increase the amount of emission equivalent to the transferred ITMOs in its report of emission. With the second method, the emission is reported without adjustment and adjustment is made by further lowering the NDC target².

iii. Issues concerning accounting

It has been pointed out that there are three more issues to be solved to use ITMOs for the achievement of NDC targets: the accounting method for single-year targets, the relationship between the NDC and the areas subject to the regulation, and the treatment conditional targets.

(Accounting method for NDCs with single-year targets)

For NDCs, while some countries set carbon budget type of targets, which defines emissions for a certain period of time (a total emission between 2020 and 2030), many countries set single-year targets for emissions reduction (emissions reduction target for 2030). However, it is still undecided whether ITMOs may be used to determine the achievement of NDC with a single-year target, if the ITMOs are obtained in a year other than the year for which the NDC target was set.

Under the Kyoto Protocol, a carbon budget type of target setting was employed, and thus, in principle, the amount of emissions reduction obtained in the period was used for the target. However, for the CDM, which uses credits obtained in the emissions reduction projects conducted in a developing country, use of the credits derived from the projects that are carried out after 2000 and before the start of the first commitment period (2008) were also permitted. If the Paris Agreement employs the same ideas, the ITMOs obtained in a year other than the year for which the NDC target was set may be accepted, but there still is a possibility for the accounting method of the Paris Agreement to be different from that of the Kyoto Protocol.

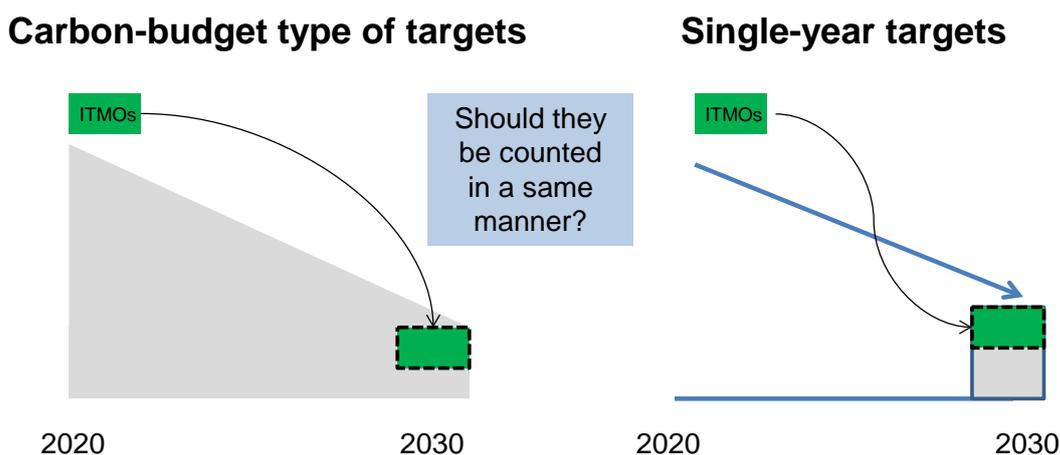


Figure 3: Treatment of different target settings

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

² Another way to make adjustment with the NDC is to add the amount of reduced emission through the ITMO to the NDC target of the receiving country.

(Association with the areas/gasses subject to the regulation)

Some NDCs do not cover some of greenhouse gasses and some NDCs do not cover all economic sectors subject. This can be an issue for discussion whether ITMOs transferred derives from a sector that is not covered by NDC should be treated equally with a case where the ITMOs derives from a sector that is covered by NDC.

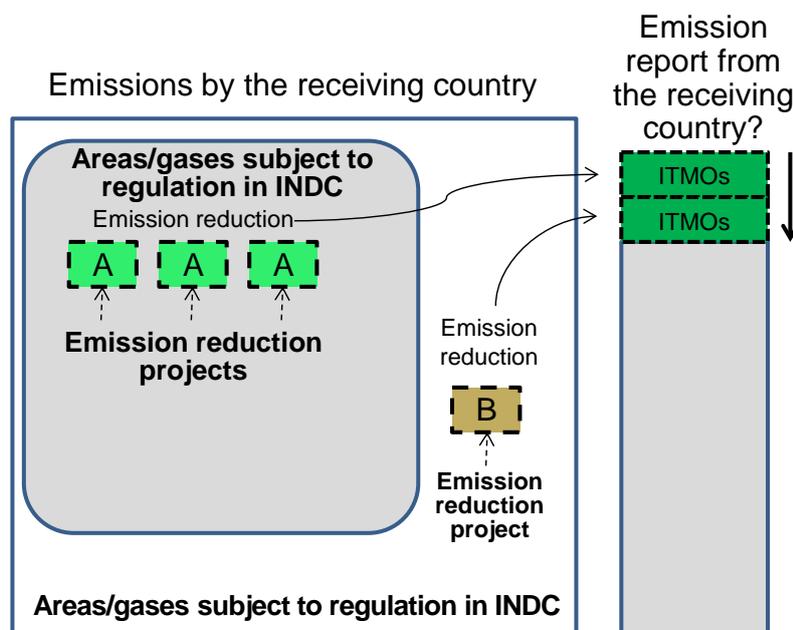


Figure 4: Treatments for different target settings

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

(Treatments for different types of targets)

Countries are discussing various methods to set targets in. For example, some countries set targets for emissions reduction with certain conditions when setting the targets for emissions reduction. When one of these countries transfers its ITMO and tries to avoid double counting by adjusting the NDC targets, the adjustment can be made either with conditional targets or non-conditional targets. It is not described which kind of targets should be used in these cases³. Also, it is not clearly defined what kinds of units are used for ITMOs, if a country that has set a target for renewable energy installation implemented a solar power generation project, and transfer the emissions reduction derived from the project as an ITMO, and the receiving country uses it for its target achievement. Whether to use KWh or tCO₂e should be discussed. Also, the method to set emission coefficient when converting to tCO₂e needs to be defined.

As stated above, there are a variety of target settings, for which a variety of reduction targets are developed under NDC. What kind of ITMO units should be used is another issue for future

³ Some developing countries set up conditional and unconditional target; conditional target is established under the condition of having adequate international assistance, and unconditional target is set up without assistance international society.

discussion.

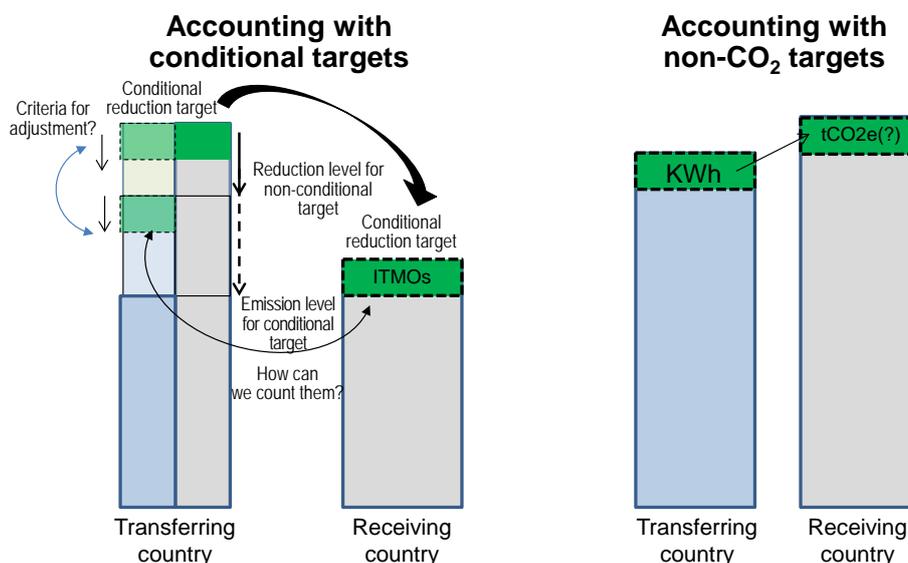


Figure 5: Treatments for different target settings

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

(3). Other issues for discussion

The following sections summarize other issues concerning the market mechanisms (see Table 5). Although it is still true that measures to avoid double count and methods of accounting are the top priorities in decision making, there are other issues for discussion because some countries and groups place importance to environmental integrity and sustainable development.

i Environmental integrity and sustainable development

Environmental integrity has been discussed as a most important issue in the market mechanisms under the Kyoto Protocol. Among the various discussions, the main question is whether a regulation (guidance, etc.) of some sort on environmental integrity is necessary. Although Paragraph 2 of Article 6 of the Paris Agreement clearly states the importance of environmental integrity and countries that value environmental integrity argue for the importance of guidance, some countries do not agree with the idea. For sustainable development, while some countries argue for development of some kind of guidance under the Paris Agreement is necessary, some claim that sustainable development is an issue that must be left under the sovereignty of each country. Thus, sustainable development is an issue for future discussion.

Table 5: Issues on market mechanism (Paragraph 2 and 4 of Article 6)

Issues on Paragraph 2, Article 6 of the Paris Agreement	Issues on Paragraph 4, Article 6 of the Paris Agreement
a. Scope of the guidance	a. Scope and principle of modalities and procedures (scope of the SDM)
b. Robust accounting	b. Voluntary participation
c. Avoidance of double count (corresponding adjustment)	c. Applicable activities
d. Transparency	d. Meaning of “overall mitigation”
e. Environmental integrity	e. Double count
f. Sustainable development	f. Environmental integrity
g. Governance	g. Sustainable development
h. Association with other regulations	h. Governance
	i. Association with the CDM
	j. Association with other regulations

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

ii Overall mitigation

Although it has not been discussed in detail yet, the term, “overall mitigation,” stated in Paragraph 4 of Article 6 is also an important issue in the future negotiations. At this point, the term has not been clearly defined. In order to implement the SDM, specific conditions must be clearly explained.

The market mechanism under the Kyoto Protocol was merely a system for offsetting of the increased emission using credits. Under the Paris Agreement, however, achievement of overall mitigation is required in a provision, showing a difference in its requirements from the Kyoto Protocol. This means that for the SDM, overall mitigation (emissions reduction) by the two countries (transferring country and receiving country of the ITMO) (or overall mitigation of the whole world) is required at the level exceeding the offset. While specific methods to achieve overall mitigation are to be decided in future negotiations, it has been shown that the SDM under the Paris Agreement should be developed in a different way from the Kyoto Protocol

iii Relationship between Paragraph 2 and Paragraph 4 of Article 6

How to regard the relationship between Paragraph 2 and Paragraph 4 of Article 6 is another issue for discussion. As described above, a difference in the basic concept (decentralized, bottom-up approach of Paragraph 2 of Article 6 and centralized, top-down approach of Paragraph 4 of Article 6) is recognized. However, how these two paragraphs relate to each other when a specific system is implemented is not elaborated. Under the Kyoto Protocol, three provisions were laid down: Article 6 (joint implementation, JI), Article 12 (clean development mechanism: CDM), and Article 17 (international emission trading system). Specifically, Articles 6 and 12 stipulated a system for how to earn credits, and Article 17 described the regulation regarding how to transfer the earned credit. For

the Paris Agreement, re between Paragraph 2 and Paragraph 4 of Article 6 must be clearly described. This should be discussed in negotiations.

(4). Difference between the Paris Agreement and the Kyoto Protocol

As described above, the Paris Agreement and the Kyoto Protocol differ greatly in their basic features. These differences may potentially give a large impact on the specific system designing of the market mechanism.

The biggest difference is that only developed countries set targets in the Kyoto Protocol, while all the countries, including developing countries, set some kind of targets under the Paris Agreement. The CDM implemented under the Kyoto Protocol was designed with the premise that emissions reduction actions are conducted in developing countries that have no targets. Therefore, a different system is needed for the SDM under the Paris Agreement.

For example, recognition of additionality of emissions reduction and calculation for emissions in case the project is not conducted (the baseline emission) were based on the premise that reduction targets are not set for the host countries (developing countries). Under the SDM, however, these systems must be designed with the premise that targets are set for developing countries and policies are implemented to achieve those targets.

In addition, as described above, the SDM includes a new concept, such as overall mitigation, which was not included in the CDM. This is another reason why a new approach is needed to develop the systems.

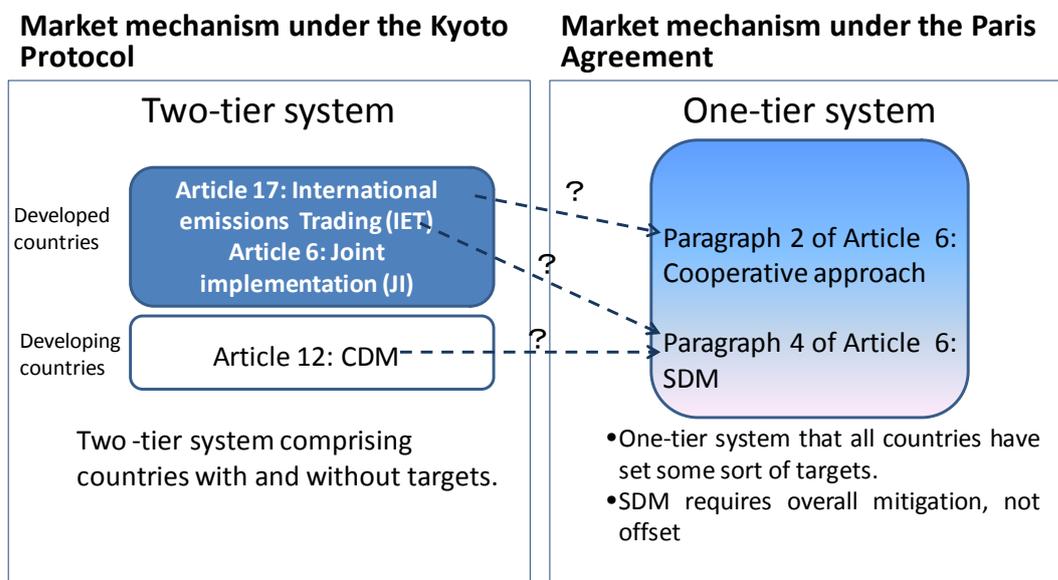


Figure 6: Difference between the Kyoto Protocol and the Paris Agreement

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

As shown later, some countries argue for the use of the systems of the existing market mechanisms under the Kyoto Protocol, especially the CDM as they are. In reality, however, it is difficult to use the existing CDM as it is under the Paris Agreement.

On the other hand, over 7,000 projects have been already registered for the CDM, and many regulations and documents necessary in order to implement the base-line credit types of emission trading systems, including many methodologies, have already been developed. Therefore, the idea to ignore the achievement made under the CDM and develop a totally new system under the Paris Agreement are effective is questionable.

How to use the existing market mechanisms of the international community while recognizing the differences between the Kyoto Protocol and the Paris Agreement should be an issue to be examined in the future negotiations.

4. Analysis of positions of country parties for Article 6 of the Paris Agreement

As stated above, a variety of issues have arisen regarding specific implementation methods of the market mechanisms under the Paris Agreement. The views for these issues also vary among the countries. In this section, views submitted by countries on the market mechanism are summarized based on the meeting of subsidiary bodies in May 2016, and trends that can influence the future negotiations (e.g., the trends by the U.S.) are analyzed.

(1). Influence of the existing market mechanism

As described before, the Paris Agreement has different features from the Kyoto Protocol. On the other hand, when different countries' views on Article 6 were analyzed, many of them show an influence of the policies of the Kyoto Protocol.

As shown above, in the Kyoto Protocol, provisions on generation of credit are described in articles 6 and 12, and regulations on the credit transfer were stipulated in Article 17. In addition, several conditions must be fulfilled to use these market mechanisms. If the conditions are not met, the party is not allowed to use the market mechanisms.

Provisions for the market mechanisms under the Kyoto Protocol

- Unit transferring is managed under Article 17 alone; JI and CDM are stipulated in Articles 6 and 12

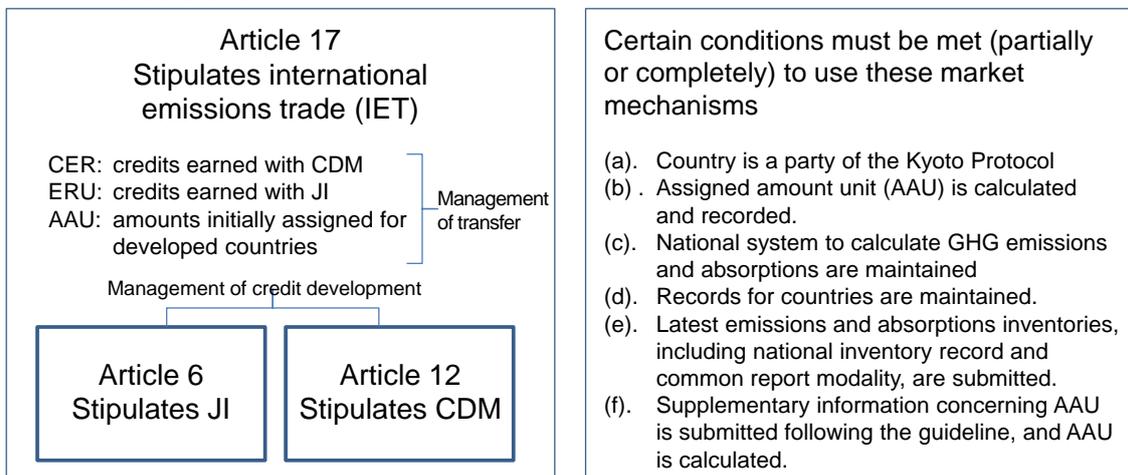


Figure 7: Association of provisions concerning market mechanism under the Kyoto Protocol

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

Aside from above-mentioned examples, some countries maintain the same positions that they have shown in the negotiations for the market mechanisms in the UNFCCC and the Kyoto Protocol. These countries participate in the negotiation for the Paris Agreement in light of the position shown in the existing market mechanisms.

As shown above, the existing systems for market mechanisms and other factors are imposing influence on the positions taken by the country parties in the Paris Agreement.

(2). Analyses of positions of country parties

At the meeting of the Subsidiary Bodies (SB) held in Bonn in May 2016, it was agreed to compile the views of each country on Article 6 of the Paris Agreement through submissions by the end of September 2016. For example, some submissions by countries for paragraph 2 of Article 6 propose that only transferring and management of ITMOs is covered under this paragraph. This is analogous to Article 17 of the Kyoto Protocol (stipulating international emission trade). Setting eligibility criteria to use ITMOs is also proposed, suggesting that of the Kyoto Protocol. On the other hand, some countries suggest measures to avoid double counting with a different idea from the Kyoto Protocol. For example, the idea to deal with double counting by adjusting the emission reports is not a concept seen in the Kyoto Protocol.

These differences are especially obvious in the governance of the mechanisms, specifically the views on how to implement Paragraph 2 of Article 6. One position is to take the cooperative approach stipulated in Paragraph 2 of Article 6 as a new, bottom-up and decentralized measure under the Paris Agreement. Contrarily, some countries claim to incorporate more centralized factors based on the ideas of Kyoto Protocol in to the approach.

In addition to these differences in positions, some countries take different position. They point out issues seen in the market mechanism conducted under the Kyoto Protocol and seek improvement in the Paris Agreement, such as those emphasize environmental integrity. These countries are in the position to value the environmental integrity and have been making a variety of proposals during the negotiations for the market mechanisms under the UNFCCC and the Kyoto Protocol. They have expressed similar views under the Paris Agreement.

In the negotiations on non-market approaches, these countries have been maintaining the positions they have shown in the existing market mechanisms. These countries pointed out specific issues regarding the CDM, such as the uneven distribution of the projects among countries and intend to limit the use of the market mechanisms. To this end, they have been taking a position to seek a non-market approach to support developing countries in the past negotiations, and continue taking the same position in the negotiations for the Paris Agreement.

These various views of different countries can be largely categorized into four groups. Although some distinction is less clear than the other, it is important to keep in mind the different positions and the views shown by each country.

The four categories are: the group that value bottom-up and decentralized approaches, the group that value top-down and centralized approaches, the group that value the environmental integrity, and the group that value non-market approaches.

As show in Table 6 and Table 7, countries have expressed a variety of views. These differences derive from the two different positions as described before: the position to develop a system based on the system under the Kyoto Protocol and the position to develop a new system different from the Kyoto Protocol.

Table 6: Summary of submissions by major countries and groups

Country	Summary of submitted views
Japan	<ul style="list-style-type: none"> • Paragraph 2 of Article 6 is to be applied to the accounting of all ITMOs (including those derived from Paragraph 4 of Article 6). Double counting is to be dealt with through information disclosure. • The SDM should be designed based on the lessons learned from CDM. Different measures should be taken for cost allocation, etc.
US	Information on ITMOs used in the achievement of the NDC is to be provided in the progress report.
EU	Pointed out issues to be addressed, such as double counting. No particular position was made
Brazil	<ul style="list-style-type: none"> • Paragraph 2 of Article 6 is to manage the transfer of ITMOs only. Use of ITMOs is to be done under the condition of issuing an amount of allowance equal to the NDC. Eligibility criteria for the use of cooperative approach. • The SDM is regarded as enhanced CDM.
AOSIS ⁴	Both Paragraph 2 and Paragraph 4 of Article 6 must be subject to international supervision. The two paragraphs should be treated as regulations at a same level. Both of them should exceed mere offsets.
African Group	<ul style="list-style-type: none"> • When using ITMOs, eligibility criteria should be applied, and the use should be made under a supervising organization. • Sustainable development is a national prerogative. The PoA registered under the CDM should be transferred to Paragraph 4 of Article 6, as well.
EIG	Although Paragraph 2 of Article 6 is a bottom-up approach, internationally recognized methods, etc. should be used. Paragraph 4 of Article 6 should be based on a top-down approach.
LMDC	Paragraph 2 of Article 6 should take a facilitative approach, and transparency must be ensured.
ALBA	Treat them as measures to encourage the participation by the governments and private sectors and facilitate linkage with other mechanisms in order to incorporate non-market approaches into the mitigation and adaptation.

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

⁴ EIG, LMDC, ALBA are taking the same position.

Table 7: Summary of submissions regarding major issues

Issue	Views of different countries and conflict among them
Scope of adopted documents	Japan, Australia and New Zealand among others claim that the guidance of the Paragraph 2 of Article 6 manages the ITMOs issued within the Paragraph 4 of Article 6. Brazil claims that Paragraph 2 of Article 6 manages only the transfer of ITMOs (Paragraph 2 of Article 6 does not apply to emissions reduction activities). EU claims that different measures should be developed for Paragraph 4 of Article 6 between areas that are within the scope of NDC and areas outside the scope.
Double count	Japan proposes to deal with the issue with information disclosure. The U.S. claims that it should be dealt with by reporting the use of ITMOs in the progress report. Brazil proposes to issue allocations and manage the transferring of the allocations to avoid double counting (same as the approach in Article 17 of the Kyoto Protocol).
Environmental integrity	AOSIS proposes a system to supervise the environmental integrity. Brazil proposes that trading should be allowed only for the difference between the emission of the year and the average emissions of the previous 3 years. Australia takes a position to leave the issue to the discretion of each country.
Sustainable development	Australia, African group, etc. takes a position that measures by each country should be respected. AOSIS claims that sustainable development is an issue to be regulated with the guidance.
Governance	African group and EIG propose the establishment of a supervising organization regarding Paragraph 2 of Article 6. The LMDC points out that it is important to ensure transparency.
Overall mitigation	Brazil proposes a limited vintage to deal with the issue, while the LMDC argues for contribution to other measures in the Paris Agreement.

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents.

(3). Results of the negotiation at Marrakesh and expected actions

i Results of the negotiation at Marrakesh

At the COP22 held in Marrakesh, Morocco in November 2016, countries discussed how to operationalize the market mechanisms under the Paris Agreement. As described above, it was decided that rules for the implementation of the Paris Agreement would be submitted at CMA1. However, the ratification of the Paris Agreement went unexpectedly fast, and the CMA1 was held at the same time of the COP22 without adoption of any decision.

At COP22, development of rules concerning implementation of not only the market mechanisms but also other provisions in the Paris Agreement was discussed. However, no substantial decision was made and countries agreed to continue the discussion towards adoption of rule in 2018.

As steps forward, the followings were agreed as short-term actions:

- More detailed submission from countries, due March 13, 2017.
- A roundtable meeting is to be held at the time of the meeting of subsidiary bodies in May 2016.

ii Implications for the future negotiations

As described above, there are many issues to be resolved prior to the adoption of the rules. However, with the diversity of views among the countries, the path to agreement is still unclear. Also, the result of the US presidential election may affect the Paris Agreement negotiations.

Until the Paris Agreement was adopted, the U.S. used various means of influence to contribute to the consensus-building. However, due to the Trump Administration's negative attitudes toward climate change mitigation, such positive influence of the U.S. can no longer be expected. The future negotiations will face a challenge in this sense.

The future of the CDMs the Paris Agreement framework is controversial among the country parties at this point. Also, under the SDM, new elements, such as overall mitigation, are required. These challenges can result in prolonged negotiations for years to come.

For non-market approaches, countries are yet to have concrete ideas on what can be done under this approach. The document to be adopted in 2018 is a work plan, not a guidance or regulation to implement the system. This can be another cause for prolonged discussion.

For both cooperative approaches and SDMs, measures to avoid double counting must be clearly defined. At this point, the negotiation is facing difficulty finding a solution between those who prefer more discretion of each country and those who prefer strong international oversight.

iii Actions needed for consensus-building

At this point, views submitted in 2016 by country parties can be divided into four categories. Necessary actions vary among the issues, and the countries may differ from each other in some cases, while they can cooperate in other cases. Within terms of Paragraph 2 of Article 6, for example, the countries that value bottom-up, decentralized approaches and those that value top-down, centralized approaches are confronted with each other. Meanwhile, both the countries that value top-down, centralized approaches and those that value bottom-up, decentralized approaches show concern against the countries that value the environmental integrity as it can undermine the feasibility of market mechanisms.

As shown above, country parties have different views, and their interests are entwined. In order to build consensus under this situation, the countries must find common grounds in a variety of occasions—both formal and informal meetings.

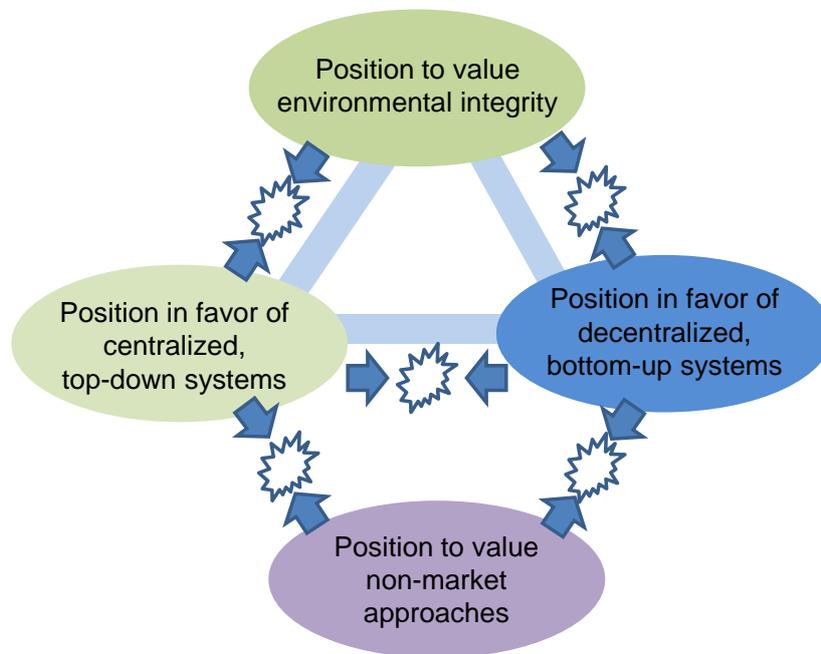


Figure 8: Views of countries relating to market mechanisms

(Source) Compiled by the Institute of Energy Economics, Japan based on various documents

**Chapter 2 Greenhouse Gas Emissions reduction
through Market Mechanisms
including JCM**

1. Background requiring the analysis on the schemes for Greenhouse gas (GHGs) reduction

Under the Paris Agreement, while negotiations are in progress toward the launch of a new market mechanism, Japan initiated the Joint Crediting Mechanism (JCM), and in 2016, it issued credits for the first time. Additionally, the number of partner countries increased to 17 countries, and it is expected that GHG emissions reduction will be achieved through JCM in many countries in the future.

However, challenges have emerged. In this Chapter, first, we analyze the challenges faced the current practice of JCM. Second, we will assess the potential of new schemes of GHG emissions reduction in the future. In carrying out the analysis, we look into the development initiatives that are under way by the World Bank.

2. Results and issues of the Joint Crediting Mechanism (JCM)

(1). Past results of JCM

In the process of establishment of JCM, many feasibility studies have been carried out, together with the formulation of a method for monitoring, reporting and verification of the emissions reduction (MRV), and the number of partner countries increased to 17. The following tables show the summary of achievements of JCM.

Table 8: Amount of credit issued under JCM

Country/Type	Energy-saving	Renewable energy	Total (tCO ₂ e)
Indonesia	20		20
Palau		296	296
Mongolia	78.5		78.5
Total	49.25	296	98.6

Table 9: Expected emissions reduction amount registered under JCM

Country/Type	Renewable energy	Energy-saving	Total (tCO ₂ e)
Indonesia		115.2	115.2
Palau	216.7		216.7
Vietnam		423.3	423.3
Mongolia		149.0	149.0
Total	216.7	223.5	222.1

(Source) Data from the New Mechanism Platform

Created by the Institute of Energy Economics, Japan

Table 10: The number of approved methodologies under JCM

Country/Project type	Renewable energy	Energy-saving	Waste disposal	Total (number of cases)
Indonesia		15		15
Ethiopia	1			1
Cambodia		1		1
Kenya	1			1
Thailand	1	1		2
Palau	1			1
Bangladesh		1		1
Vietnam		4	1	5
Maldives	1			1
Mongolia		3		3
Laos		1		1
Total	5	26	1	32

(Source) Data from the New Mechanism Platform

Created by the Institute of Energy Economics, Japan

(2). Issues identified

As mentioned above, JCM has made some achievements, but there are challenges for further development of JCM projects. Figure 8 and 9 suggest that registered projects are small scale. It is conceivable that the above result is influenced by the fact that the countries currently carrying out JCM are composed mainly of those with a comparatively small GHG emission amount. But on the other hand, the annual average emissions reduction amount expected for projects carried out in Indonesia, which ranks 6th in the world in terms of CO₂ emissions, is still as small as 115tCO₂e. Considering the scale of the potential emissions reduction amount of Indonesia, actions for expanding the scale of JCM projects are required.

3. Efforts of the World Bank concerning the market mechanism

The World Bank has made various efforts concerning the market mechanism since 2000, and has contributed to the development of market mechanism under Kyoto Protocol, such as by involving itself in the development of the CDM project from the initial stage and such efforts began to show a change around 2012. Here, we will introduce the recent schemes initiated by the World Bank in addition to the overview of the above efforts, and will refer to them for the future course of GHG emissions reduction policies.

(1). Overview of the past schemes of the World Bank

i Schemes on the purchase of the Kyoto Credit

The World Bank has made various efforts concerning the market mechanism since 2000, but the properties of such efforts began to show a change around 2012.

The efforts before 2012 were mainly focused on the establishment of funds for purchasing credits from projects carried out under the Kyoto Protocol such as CDM and JI. Many funds have been created since then, and companies purchasing credits as a part of their global warming countermeasures as well as governments obligated to reduce emissions under the Kyoto Protocol have made investments to these funds. The World Bank, as a trustee of fund, involves itself in the development of projects, and has purchased credits from CDM or the JI Project. A wide variety of projects from the HFC Destruction Project to afforestation were the targets for the purchase of credits.

When efforts were initiated in the beginning of 2000's, rules of Kyoto mechanism were not fully established, but no methodology was formulated yet, and, naturally, no project was registered, either. At such an initial stage of market growth, the World Bank provided support for project participants to CDM or JI project through involving in project development, and contributed to the promotion of CDM and JI project development. In fact, the proportion of transactions involved the World Bank reached 39% in 2005, and it is clear that the World Bank played an important role at the incipient stage of market on Kyoto mechanism⁵.

In this manner, the World Bank created funds for project development such as CDM and JI, and contributed to the development of the market mechanism under the Kyoto Protocol by soliciting funds from various investors and allocating the funds to the development of CDM and the JI project, but since 2013, the efforts have changed the form.

ii Support for developing countries through market mechanism

Since 2013, the schemes of market mechanism under the World Bank have been changed from the form of purchasing the Kyoto credit to providing supports for developing countries through the market mechanism.

⁵ World Bank's Carbon Finance Unit "10 Years of Experience in Carbon Finance" World Bank 2010

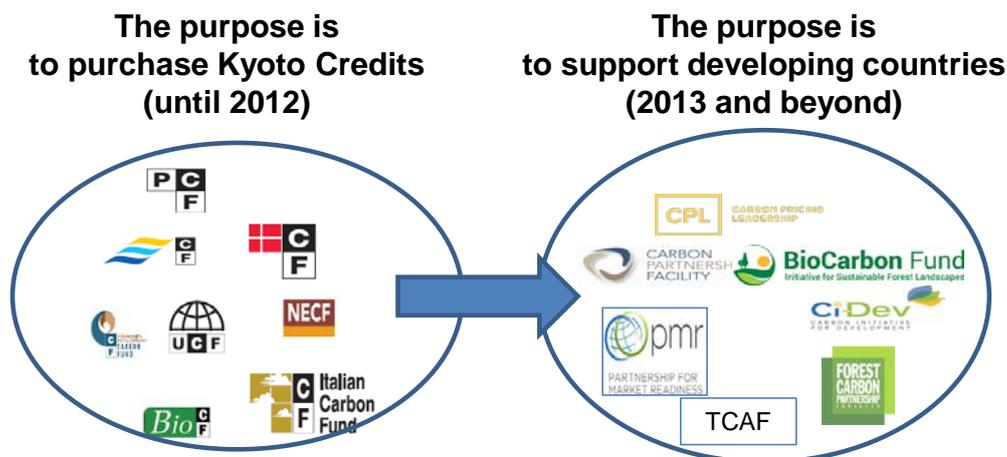


Figure 9: Schemes toward the market mechanism under the World Bank

(Source) Created by the Institute of Energy Economics, Japan from various materials

One of the factors in the background of such a change was that the demand for Kyoto credits has been drastically decreased. This was because the demand from Europe which represents the large part of the total demand of credits until 2012 couldn't be expected after 2013. For this reason, among the efforts for 2013 and subsequent years, the scheme to support the global warming countermeasures of developing countries through the purchase of credits was particularly conspicuous.

For example, the scheme called 'Pilot Auction Facility (PAF)' was launched to give assistance to emissions reduction projects in developing countries by selling the put option through auction. The option ensures minimum price on selling to PAF. This scheme aimed to ensure that those operators secure a certain amount of profit by setting the minimum price of the GHG emissions reduction credit to boost the price of the sluggish Kyoto credit due to the stagnation since 2008.

In addition to this kind of support for developing countries through the purchase of credits, new schemes have emerged to try to get more deeply involved in the policies in developing countries.

(2). New efforts by the World Bank

i Efforts through the Partnership for Market Readiness (PMR)

The Partnership Market Readiness (PMR) is a scheme launched for the purpose of providing technical assistance and sharing information/knowledge with regard to market mechanism (Operation was initiated in 2011.).

13 developed countries including Japan, US, Australia, and Spain have contribute to PMR, and related projects are implemented in 18 developing countries including China, Indonesia, Vietnam, and Thailand etc. Interestingly, local governments such as state governments are allowed to participate in this scheme as technical partners if they have an experience in market mechanism: California (carrying out an emissions trading scheme); Quebec (carrying out an emissions trading scheme).

On receiving the support, the developing countries are required to make a proposal on the preparation work (Market Readiness Proposal, MRP) and PMR is required to give support to them on the basis of the MRP.

Table 11: Overview of PMR

Capital scale	US\$127 million	
Objective	<ul style="list-style-type: none"> • Creating a roadmap for introducing market mechanism in developing countries, • Support the trial implementation of market mechanism, • Exchange information as well as share the knowledge and experience. 	
Participants	Investing countries	13 countries including Japan, US, Australia, and Spain etc.
	Implementing countries	18 countries including Indonesia, Vietnam, Mexico, Thailand, Costa Rica, and China etc.
Overview of activities	Activities were initiated in 2011, and have produced results such as the completion of a roadmap for introducing carbon price in 15 countries and creation of 15 technical notebooks.	

(Source) Created by the Institute of Energy Economics, Japan from various materials

Though experience of 5 years implementation, PMR has made achievements, however, challenges are remaining; the procedure has been delayed due to the time required for financial support, and there are only a few cases where, while MRP was formulated, market mechanism is actually introduced and has reached the stage of trial implementation.

Thus, although issues have been pointed out, as mentioned in Chapter 1, the scheme like PMR for supporting the implementation of climate change policies in developing countries will be more and more important in the future because developing countries are required under the Paris Agreement to set their emissions reduction targets and to pursue emissions reduction.

ii Efforts by means of ‘Transformative Carbon Asset Facility (TCAF)’

A new scheme for providing support for policies in developing countries was announced in November 2015. The World Bank announced that it would launch a new scheme called ‘Transformative Carbon Asset Facility (TCAF)’, which was intended to support the formulation and implementation of climate change policies in developing countries under the Paris Agreement.

Table 12: Overview of TCAF

Amount of contribution	Target contribution:US\$500 million (US\$250 million is minimum contribution of initiating operation of facility)
Targets for support (example)	<ul style="list-style-type: none">• Implement low-carbon policies (by setting the clean energy goal for the industry, and energy-saving standards).• Carry out the decarbonization of urban transport facilities, provide subsidies etc. for green building standards and high-efficiency lighting equipment.• Eliminate subsidies for fossil fuels.
Methods for providing funds	<ul style="list-style-type: none">• Result based finance (financial supports are provided only after the emissions reduction amount is verified.)
Number of supported programs	10 programs(tentatively)

(Source) Created by the Institute of Energy Economics, Japan

TCAF aims to realize further emissions reduction through supports not only for the introduction of policies like PMR but also for the implementation of climate change policies in developing countries. Under TCAF, supports will be provided in the form of purchasing emissions reduction generated by the implementation of climate change policies in developing countries. As of November 2015, Germany, Norway and Switzerland have announced their intention to invest in the scheme.

4. Analysis on the GHG emissions reduction through market mechanism including JCM

In this Chapter, the achievements and challenges of JCM, and efforts taken by the World Bank concerning market mechanism are analyzed. Based on the challenges for JCM and the current status of efforts by the World Bank, we will analyze the GHG emissions reduction through market mechanism including JCM.

As regards JCM, the number of signatories has reached 17, and the potential GHG emissions reduction amount expected from JCM has considerably increased. On the other hand, however, as can be seen from the actually registered projects, expected emissions reduction amount still remains small and this needs to be addressed in the future.

While the World Bank has taken various efforts, in the case of TCAF, beyond 2020, TCAF aims to reduce much more emissions not by implementing individual emissions reduction projects but by supporting the introduction of climate change policies in developing countries. Such a new effort under TCAF is highly suggestive in terms of our consideration of further GHG emissions reduction through market mechanism.

Meanwhile, JCM has formulated many methodologies for measuring the emissions reduction amount. These methodologies will be used not only to issue credits but to measure the emissions reduction through the introduction of low-carbon technologies. In recent years, so called Green bond, bonds for investing to low-carbon technologies have introduced in bond market, and the volume of transaction has rapidly increased. It has potential to become another tool of supporting GHG emissions reduction in the future. In this case, we use these methodologies for measuring the emissions reduction and clarify the effect of investments through the introduced low-carbon technologies. In other words, it could be a mainstay in the future GHG emissions reduction to pursue the “visualization” of effects brought about by the introduction of low-carbon technologies.

Chapter 3 Trend of the Kyoto Mechanism

1. Development trend of projects and methodologies

(1). Trend of CDM

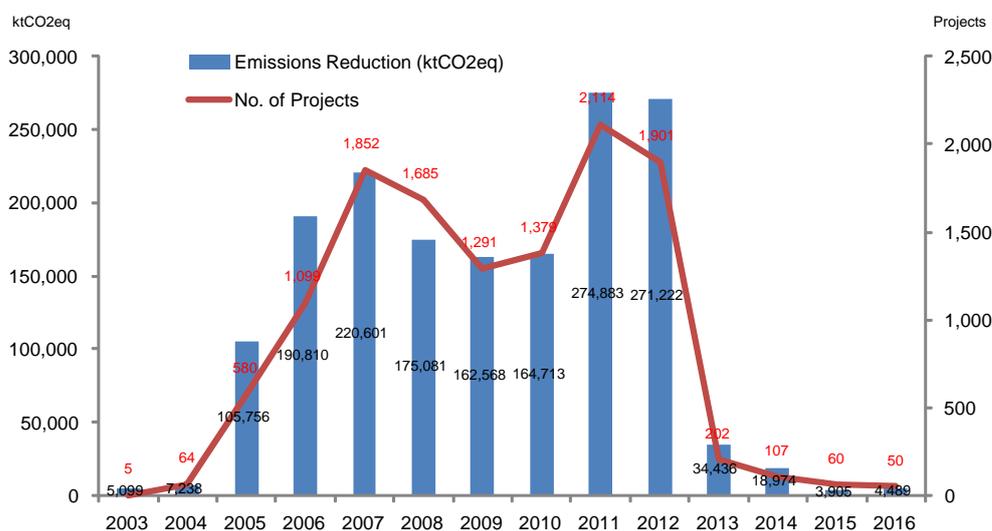
i Project trends

In this section, we will review the trend of CDM projects implemented recently on the basis of the data available on the webpages of UNFCCC as well as the CDM Pipeline published by UNEP⁶.

(Validation)

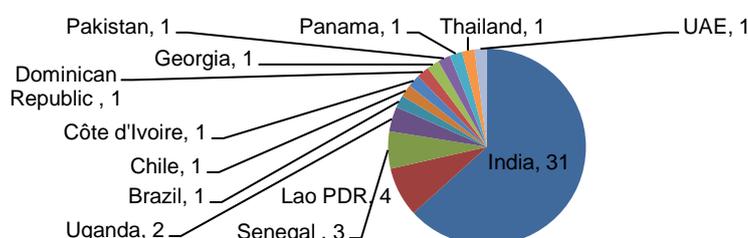
The number of CDM projects on which public comments were invited for Validation in 2016 was 50, and the forecast emissions reduction amount was 4,490,000 tCO₂e. Both the number of CDM projects and the forecast emissions reduction amount have continued to be reduced since 2011. Viewed by host nation, India ranks first with 31 projects submitted, followed by Laos, one of the least developed countries (LDC), with 4 projects.

Figure 10: Projects on which public comments were invited for Validation



(Source) Created by the Institute of Energy Economics, Japan from UNEP RISOE

Figure 11: Projects on which public comments were invited for Validation by Country (2016)



(Source) Created by the Institute of Energy Economics, Japan from UNEP RISOE

⁶The aggregation period is from 2003 to December 31, 2016.

(Registration)

The number of projects newly registered in 2016 was 40, and, similar to the number of projects on which public comments were invited, it is clear that the number continues to decline. The forecast emissions reduction amount of these projects is 4,280,000 tCO₂e, falling short of the half of that in the previous year (refer to the Figure below).

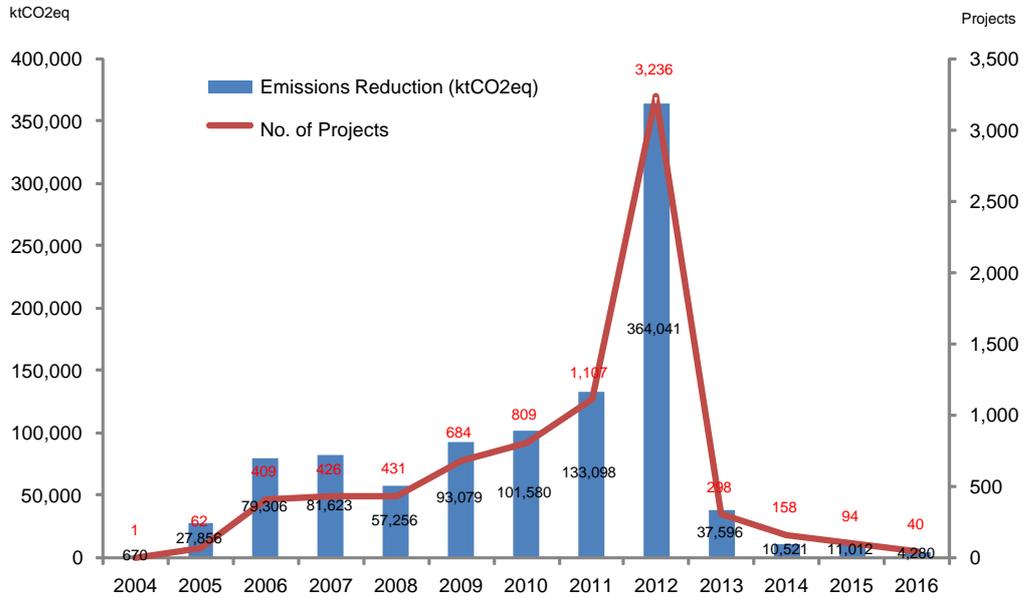


Figure 12: Trend of the number of newly registered projects and emissions reduction amount

(Source) Created by the Institute of Energy Economics, Japan from UNEP RISOE

(Issuance of CER)

Issuance of CER has increased in terms of both the number and amount as compared with the previous year. For this reason, as of the end of 2016, the cumulative issuance amount of CER under CDM is about 1.7 billion and 69 million tCO₂.

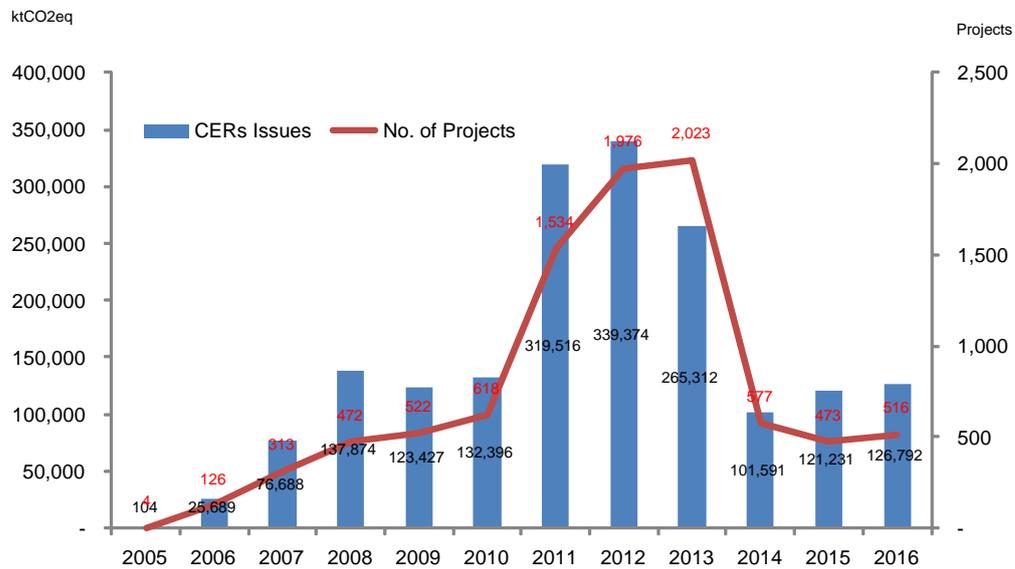


Figure 13: Trend of the number and amount of CERs issued

(Source) Created by the Institute of Energy Economics, Japan from UNEP RISOE

ii Trend of methodologies

The charts below summarize the application situation of methodologies to registered projects. As a whole, the methodology for introducing renewable energy under ACM0002 is most frequently used, totaling 3,156 cases. This figure is followed by AMS-I.D (1,873 cases), a methodology for introducing renewable energy in small-scale projects. The sum of ACM0002 projects and AMS-I.D projects is 5,029, accounting for 65% of all the projects.

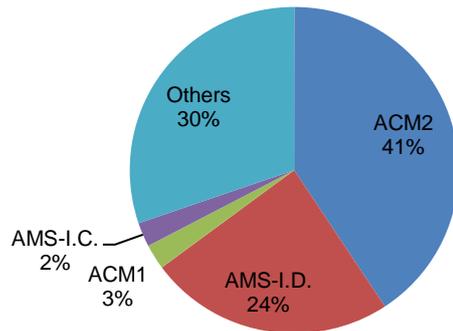


Figure 14: Methodologies applied in registered projects (number of cases)

(Source) Created on the basis of the data published by UNFCCC

When we look at the data of 2016 only, no considerable change can be seen except for the fact that the share of AMS-I.D projects exceeds that of ACM0002.

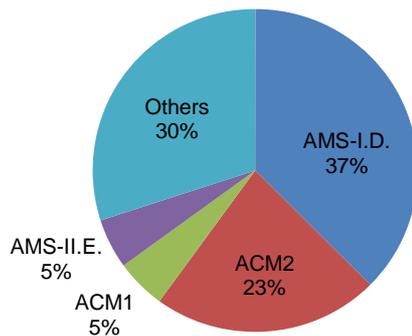


Figure 15: Methodologies for projects registered in 2016

(Source) Created on the basis of the data published by UNFCCC

(2). Trend of JI

As shown in the chart below, no project-related activities have been conducted for JI. At the moment, JI cannot be used since the Doha Amendment, which would issue the allowance for Annex-1 parties to be used for JI, is yet to enter into force. Additionally, for the Doha Amendment to enter into force, the ratification of 144 countries is required. However, according to the announcement of UN, only 75 countries have ratified the Amendment as of December 29, 2016. Therefore, as the Doha Amendment cannot be expected to enter into force in the near future, the situation of no project-related activities has continued.

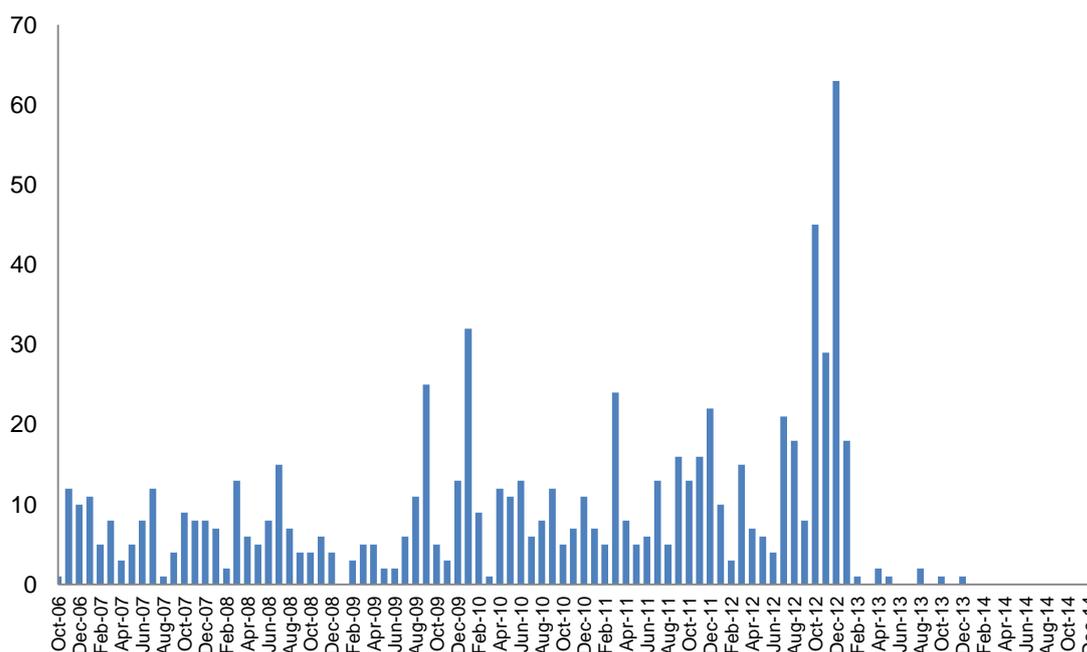


Figure 16: Trend of the number of JI projects as shown on the website of UNFCCC

(Source) Created by the Institute of Energy Economics, Japan from UNEP RISOE⁷

⁷ The values shown here is the number of projects according to the website of UNFCCC. As the Track 1 Project of JI is managed by each country, care should be taken that not all projects are reflected in these values.

2. Activities at the CDM Executive Board and the Joint Implementation Supervisory Committee (JISC)

(1). CDM Executive Board

In this section, we will review some of items among the most recent activities of the CDM Executive Board according to the contents of the annual reports and the FY2016 report of the CDM Executive Board submitted to the 12th Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP) (89th meeting: May 9 to 13, 2016; 90th: July 18 to 22; 91th: September 13 to 16; 92th: October 31 to November 4).

i Operation of CDM on the basis of the Green Climate Fund (GCF)

The CDM Executive Board examined the possibility of utilizing climate finances including the Green Climate Fund (GCF) to carry out CDM, and utilizing the functions of CDM (calculation of emissions reduction amount etc.) to operate the climate funds. The CDM Executive Board shared the view that the past experience and knowledge of CDM are useful for the operation of climate funds, and that linkage with the following mechanisms would be particularly promising.

- Paris Climate Bond
- United Nations Development Programme crowd funding facility
- West African Development Bank
- East African Development Bank climate finance program

ii Use of CDM for other purposes

While the demand for CER is stagnant, it is now under consideration to explore the possibility of using the system and tools of CDM for purposes other than the compliance with the Kyoto Protocol. Among the usages considered, the followings are listed as particularly promising.

- Use of CDM under the Paris Agreement
- Use of CDM as a tool for complying with the domestic emissions trading regulations of each country
- Use of CDM as a tool for emissions reduction in civil aviation and shipping industries
- Use of CDM for monitoring, reporting and verification (MRV) of climate bonds
- Use of CDM for monitoring, reporting and verification (MRV) under a financial mechanism
- Use of CER for the Voluntary Cancellation Platform
- Use of CDM for monitoring, reporting and verification (MRV) by international financial institutions or regional development banks

In civil aviation industry in particular, it is expected that negotiations on CO₂ emissions reduction will continue with the International Civil Aviation Organization (ICAO) regarding the Carbon Offsetting & Reduction Scheme for International Aviation (CORSIA), which is currently seen as the most promising for the expanded use of CER, and.

iii Certification of DOE

Together with the decrease in the activities concerning CDM, the number of DOEs shows a declining trend. As the status of three DOEs was withdrawn during the period of the annual report submitted to CMP12, the total number of DOEs became 36. In addition, a part of the sectoral scopes were temporarily suspended from certification.

iv Registration of projects

During the period of the annual report submitted to CMP12, a total of 100,492,477 CERs were issued, but no tCER or ICER was issued during the same period. The overview of the number of applications for the registration of projects and issuance of CERs is as shown in the table below.

Table 13: overview of the number of applications under CDM

Application type	Number of applications	Number of processed applications
Registration of projects	105	50
Issuance of CERs through projects	507	441
Registration of PoA	23	5
Issuance of CERs through PoA	36	27
Extension of the issuance period	96	86
Changes after registration	64	48
Addition of PoA components	82	82

(Source) Annual report of the Executive Board of the clean development mechanism to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol

v The Voluntary Cancellation Platform

Since 2015, project participants have been allowed to cancel CERs on their own using the Voluntary Cancellation Platform. One of the major usages is for offsetting specific activities according to the cancelled amount (Example: An environmental group offsets the CO2 emission amount from events through the use of this platform). Until the period of the annual report submitted to CMP12, 41,482 CERs amounting to US\$55,487 had been cancelled. The CDM Executive Board has been working to improve the user interface of this platform, and indicated to carry out an independent review on the ease of using the website particularly at the 90th meeting. The Board is expected to promote further improvement and the wider use of the platform.

vi Simplification of various schemes for CDM

The CDM Executive Board continued to simplify various elements and schemes for the purpose of improving the user-friendliness of CDM. Most recently, it announced measures such as to eliminate the on-site inspection of each project at the time of registration under certain conditions. Regarding the additionality, the Board conducted studies for creating various PDD templates for automatically approving the additionality. In addition, as for the standardized baseline, it has approved 11 new standardization baselines, and brought the total number to 26. It is scheduled to consider 8 more standardized baselines in the future.

(2). Joint Implementation Supervisory Committee (JISC)

In this section, , we will review the main items of the work of the Joint Implementation Supervisory Committee (JISC) based on the contents of the annual report the Joint Implementation Supervisory Committee (JISC) submitted to CMP12.

i Review of the JI Guideline

Due to the insufficient rules for determining the validity of changes after the registration of a project as well as the procedure for negotiations with project stakeholders, studies were carried out in order to consider the revision of the JI Guideline. However, in the 44th meeting of the Subsidiary Body for Implementation (SBI), it was decided that these negotiations be terminated in consideration of the absence activities under the current JI.

ii Summary of the lessons from the experience under JI

Based on the decision of CMP11, JISC has summarized the lessons from the past experiences under JI and the desirable linkage with other mechanisms.

In the summary, it was mentioned that JI had not only contributed to an emissions reduction of 871 million tCO₂e but had also been a useful tool for the monitoring, reporting and verification of the emissions reduction activities of each country. In particular, the following six recommendations were made for Article 6, Paragraph 4 of the Paris Agreement.

- Modality and procedures of the mechanism should ensure flexibility by formulating the principles for the entire scheme and leaving the detailed operational regulations to the daily decisions of the regulatory body.
- Reliability of the mechanism should be ensured by establishing an international regulatory body in charge of the operation of the mechanism from an objective viewpoint.
- A transparent decision-making procedure, channels for consulting with stakeholders, an adequate preliminary negotiation system, and a procedure for filing complaints against the decision of the regulatory body should be established.
- It should be aimed to operate the mechanism in a cost-effective manner by sharing the functions overlapped with those of other mechanisms as much as possible.
- The future mechanism should be studied not from scratch but by utilizing the past 15 years of experience and knowledge of CDM and JI.
- It should be clarified whether or not the activities under the current mechanisms (projects etc.) can be transferred to the future mechanism.

iii Certification of independent organizations

Under JI, accreditation of independent entities for determination and verification of projects was carried out through JI's own system. However, due to the many similarities with the accreditation of DOEs under CDM, it was decided that the scheme be operated efficiently by unifying the certification systems of CDM and JI, and since August 2016, DOEs have been able to play the role of an accredited independent entity for JI. Under JI, each DOE is required to declare that it would act

as an independent entity of JI. Up to date, 12 DOEs have made such declaration, and they now have a status as an independent entity of JI.

iv Efficient operation of the Joint Implementation Supervisory Committee (JISC)

As the Joint Implementation Supervisory Committee (JISC) will need to use resources including its funds efficiently in order to continue its activities in the future, it has studied various methods for reducing expenses for meetings etc. As a result, in consideration of the currently stagnant JI-related activities, it was proposed to CMP that the Joint Implementation Supervisory Committee (JISC) be held at least once a year, and, as for the participating method of meetings, in addition to actual face-to-face method, participation in the meeting through video teleconference systems etc. should be approved. As mentioned below, CMP12 has approved the proposal.

3. Result of negotiations among COP members

(1). Subjects concerning CDM

In the 22th Conference of the Parties (COP) and related meetings held in Marrakech, Morocco in November 2016, the following subjects on CDM were discussed by the Subsidiary Body for Scientific and Technological Advice (SBSTA) and CMP.

Table 14: List of CDM-related subjects discussed in COP22

Meeting body	Subjects
SBI	7 (a). Review of the modalities and procedures for the clean development mechanism (Reviews on the modality and procedures for CDM) <ul style="list-style-type: none"> • Regulations on Program CDM (PoA) • Regulations on the role of the Designated National Authority (DNA)
SBI	7 (b). Procedures, mechanisms and institutional arrangements for appeals against decisions of the Executive Board of the clean development mechanism (A proposal on the procedure for filing complaints to the CDM Executive Board)
SBSTA	11(b). Carbon dioxide capture and storage in geological formations as clean development mechanism project activities (Treatment of CCS in CDM)
CMP	4. Matters relating to the clean development mechanism

(Source) Created by the Institute of Energy Economics, Japan from the website of UNFCCC

i Reviews on the modality and procedures for CDM

On the basis of the Marrakech Agreement (Decision 3/CMP.1) and the Doha Agreement (Decision 5/CMP.8), the review on the modality and procedures and steps for CDM was started by CMP9 held in 2013. The purpose of the review discussed in SBI45 was to summarize the rules related to the Program CDM and Programme of Activities (PoA) carried out through the accumulated past practices of CDM and the rules of the Designated National Authority (DNA). As PoA is meant to conduct the small emissions reduction activities as a unified program (Example: Program to distribute LED), and the rules were formulated through the past operation of CDM, consolidation and codification of them were the objectives of the review. DNA indicates the governmental entity of each country designate for the operation of CDM, and it was the purpose of the review to summarize and codify the DNA regulations and the past practices scattered across different modalities and procedures. However, since, according to the Earth Negotiation Bulletin of November 11, 2016, some countries proposed new phrases for the documents proposed by the Secretariat, while some countries had different views on many regulations, and no consensus was obtained at the time of the deadline for negotiation on November 15, this subject was carried over to the next meeting without any conclusion.

ii Proposal on the procedure for filing complaints to CDM Executive Board

At present, no procedure exists for filing complaints against the decisions of the CDM Executive Board. In order to formulate the procedure for this, negotiations have continued since 2009. As this subject cannot be expected to be agreed on, it was proposed that the subject be terminated, but some countries opposed this proposal, and ultimately it was agreed that the negotiation be temporarily put off, to be restarted at SBI50.

iii CCS in CDM

The Board was to discuss the establishment of the global reserve fund used as the means to address any leakage after the CCS project has been implemented in the modality and procedures for CDM. However, considering the situation of the markets CDM, the CCS project could not be carried out. Therefore, as there was no country that would be disadvantaged by the termination of this topic, it was decided that the subject be terminated without any rules adopted by SBSTA.

iv Guidance for the CDM Executive Board

The objective of this item is to discuss matters concerning the operation of CDM, which required the decision by CMP, as well as to get CMP to give instructions on the activity of the CDM Executive Board in the coming fiscal year.

According to the Earth Negotiation Bulletin of November 14, 2016, the following proposals were made by countries during the discussions of the Board.

- Brazil: Made proposal that International Civil Aviation Organizations to be emphasized in the context of the use of CER in CORSIA, a CO2 emissions reduction and offsetting scheme.
- India: Made a proposal that small projects be considered.
- Saint Lucia: Made a proposal on the improvement etc. of the transparency of the CER Registry.

It can be assumed that active discussions were conducted on the above proposals, but no final agreement was reached on these, nor any new work was referred to, either. It was only decided that the past work be continued almost as it was.

(2). The subject on JI

The objective of this item is to discuss matters requiring CMP's decision on the operation of JI and to give instructions for the activities of the JISC in the coming fiscal year.

Table 15: JI-related subject discussed in COP22

Meeting body	Subject
CMP	5. Matters relating to joint implementation

(Source) Created by the Institute of Energy Economics, Japan from the website of UNFCCC

In the meeting of this time, they took note of the report on lessons learned from the experience of JI as summarized by JISC. In addition, as a measure to efficiently operate the JISC, they approved that the JISC should be held at least once a year, and that participation in the Joint Implementation Supervisory Committee (JISC) via a teleconference system etc. should be permitted.

4. Trend of the market mechanism in each country

According to the World Bank, many market mechanisms for emission trading scheme etc. are now being considered, planned or implemented in the world at the regional, national and municipal levels.

In this section, we will review the recent trends in USA, China, Korea and EU by paying attention to, among the above markets, the major markets that particularly active.

(1). USA

In USA, no emission trading scheme exists at the federal level, and, under the Trump administration which is extremely indifferent to climate change, no emission trading scheme is likely to be introduced in the near future.

On the other hand, at the state level, the Regional Greenhouse Gas Initiative (RGGI) for northeastern states and the cap-and-trade of the State of California are ongoing.

i Regional Greenhouse Gas Initiative (RGGI)

RGGI has been implemented in Northeastern States since 2009, and, after the withdrawal and new admission of some states, 9 states⁸ are now jointly implementing an emissions trading scheme for power plants.

As RGGI had already determined the total emission allowance for the 1st compliance period before the financial crisis in 2008, along with the decline in electricity demand associated with the economic recession after the financial crisis, a large amount of surplus allowance occurred. As shown in the Figure below, in order to curb this surplus, the total emission allowance was reduced through adjustments twice in the past. However, due to the decline in electricity demand and the shift from coal-fired power generation to natural gas-fired power generation, the surplus continues to exist in a large amount. For this reason, the auction price of the emission allowance has been low. Though the price of the emission allowances increased when the federal government announced the Clean Power Plan (CPP) to regulate CO₂ emissions from existing power plants, it returned to the past low level after the Supreme Court's ruling in February 2016 put a stay on the implementation of CPP.

After the establishment of the Trump Administration, it is expected that regulation on CO₂ will be loosened at the federal level, but some of the RGGI-participant states show their intention to continue their CO₂ emissions reduction measures actively. Governor Andrew Cuomo of the New York State, in particular, has proposed to reduce the RGGI's total emission allowance for 2020 and subsequent years by 30%, which will give rise to discussions on the future course of RGGI toward 2020 and beyond⁹.

⁸ Connecticut, New Hampshire, New York, Rhode Island, Maine, Maryland, Delaware, Vermont, Massachusetts

⁹ Natural Resource Defense Council, "Cuomo Pledges to Lead on Climate, Cut RGGI Cap 30% by 2030," January 9, 2017 <https://www.nrdc.org/experts/jackson-morris/cuomo-pledges-lead-climate-cut-rggi-cap-30-2030>

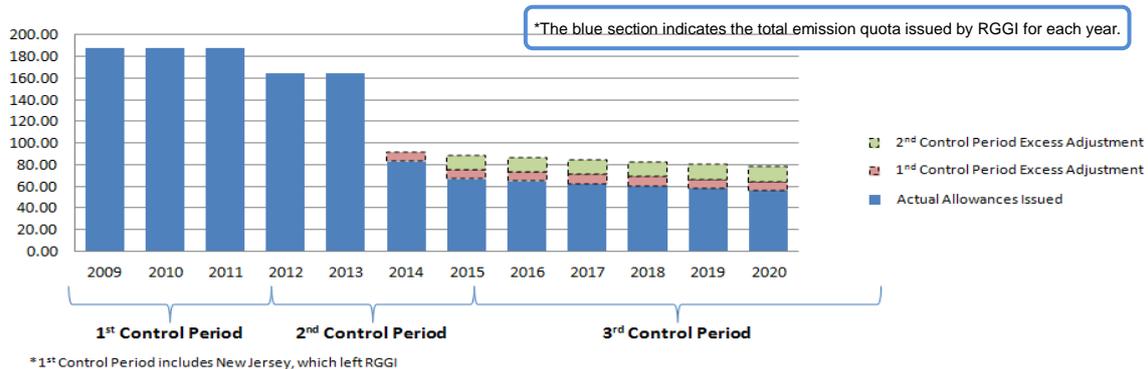


Figure 17: Transition of RGGI's total emission quota

(Source) Created by the Institute of Energy Economics, Japan from the data of RGGI

ii California

California has been implementing a cap-and-trade system for power generation, manufacturing, and fuel suppliers and other industries since 2013. Additionally, it started coordination with the emissions trading scheme of the Quebec, Canada in 2014, and has jointly held auctions for emission allowance. The Ontario, Canada also started an emission trading scheme in January 2017, and at present, efforts are under way to realize coordination with Quebec and California in 2018.

Prices at the auctions for emissions have been kept at a low level since the start. Allowances were auctioned near the lower limit of the price. Moreover, as shown in the chart below, some allowances were not sold. Various factors can be found, but many have pointed out that lawsuit against the legality of the cap-and-trade system have lowered its reliability. In this lawsuit, the state law of California requires a two-thirds vote of the state legislature for a tax bill to be adopted. As the proceeds of auctions works like tax revenues, some citizens' groups cast doubts on the legitimacy of the system, saying that the system did not satisfy the requirement.

Meanwhile, while it is prescribed in the law that the cap-and-trade system of California will be continued until 2020, the continuation of this system in 2020 and subsequent years needs to be determined by a new law. At present, since California aims to reduce GHG emissions by 40% by 2020 as compared with that in 1990, the state government intends to achieve this goal by continuing the cap-and-trade system in 2020 and subsequent years. California is now considering the proposal for a new system for the period after 2020.

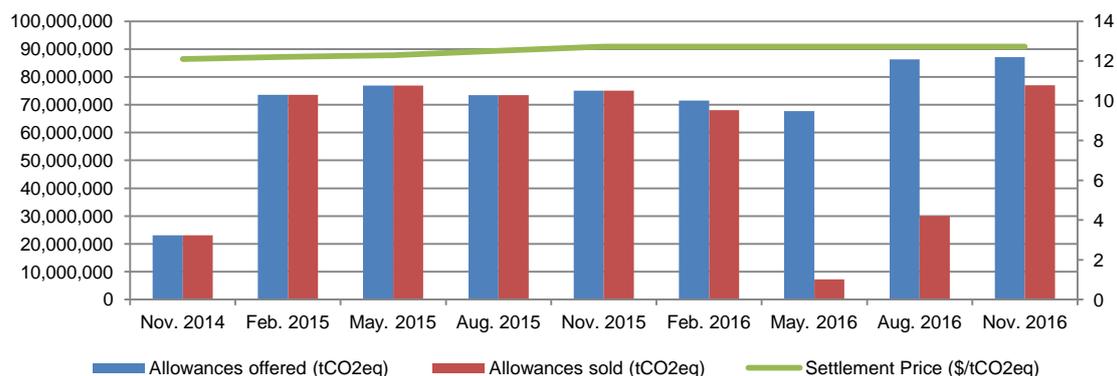


Figure 18: Trend of auctions held for cap-and-trade in California

(Source) Created by the Institute of Energy Economics, Japan from the data of the California Air Resources Board ¹⁰

(2). China

In China, as shown in the Figure below, emission trading schemes have been implemented since 2013 in seven Provinces and cities. These schemes are also positioned as experimental systems toward the establishment of a nation-wide emission trading scheme scheduled to be launched in 2017. A unique feature of the schemes is that they are implemented under different rules.

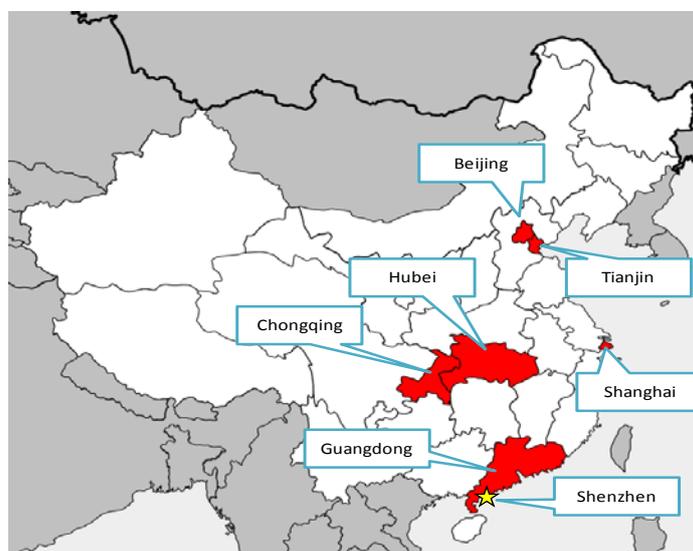


Figure 19: Provinces and cities currently implementing emissions trading markets

(Source) Created by the Institute of Energy Economics, Japan

As no specific information on nation-wide scheme has been provided at this point, a key question is how the experimental markets introduced in provinces and cities will be unified.

¹⁰ California Air Resources Board, California Cap and Trade, Summary of Joint Auction Settlement Prices and Results https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf

According to the estimate of Shen (2016), the scale of the unified markets is expected to reach 4 billion tCO₂eq, and become the world's largest market for trading emissions. In addition, if the price of the emission quota for the market is in the range from US\$5 to 10, the economic value is calculated to reach US\$20 billion to 40 billion¹¹.

On the other hand, some points out that market participants have little hope of the market. According to Carbon Pulse, market participants anticipate that the price of the emission allowance will be low (20 to 50 Chinese Yuan, or approximately US\$2.91 to 7.28), and the liquidity of the market will be low as well. Additionally, as mentioned above, since the specific details of the scheme has not been announced, market participants are said to be concerned, and financial institutions, which should naturally be willing to participate in ordinary times, say that they cannot proceed with preparations due to the delay in the announcement of the details of the scheme¹².

(3). Korea

In Korea, an emissions trading scheme has been implemented for businesses with emission amount over 125,000 tCO₂ since 2015. The main feature of this scheme is that the Korean Certified Emissions Reduction (KCER) can be issued and used for ensuring compliance by voluntarily cancelling the CER issued under the CDM project implemented in Korea. This could be a good example of a new use for the above-mentioned CDM.

In contrast to the markets in EU and US, the market in Korea shows a continuing trend of high price of emission allowance. Allocation in the Korean emissions trading is linked with the national goal aiming for an emissions reduction of 30% by 2020 as compared with BAU level. However, as it is viewed that this BAU was set to too low a value when the scheme was launched, many companies are seen to lack the amount of emission allowances required for compliance. According to the data of the Korea Stock Exchange (KRX), the closing price on February 22, 2017 stood at 24,000 South Korean won (about US\$21), which is the highest level among the current major emission trading schemes in the world. On the other hand, however, the trading amount is not large. This may be because the entire market is short of emission quotas.

Companies lacking emission quota are bitterly criticizing the scheme through lawsuits against the government etc. In contrast, the government has announced that, in order to address this situation, it would add another 3 million tCO₂eq by the final allocation plan of 2017 (as of Jan. 2017)¹³.

¹¹ SHEN, Zhongyuan, "Size of Carbon market of China, estimated to reach 4 billion t-CO₂", webpage of the Institute of Energy Economics, Japan (2016)

¹² Carbon Pulse, "Market expects modest prices and low liquidity in China ETS amid unclear rules -survey," February 17, 2017.

¹³ Carbon Pulse, "South Korea adds 3 mln CO₂ permits to final 2017 allocation plan," January 24, 2017.

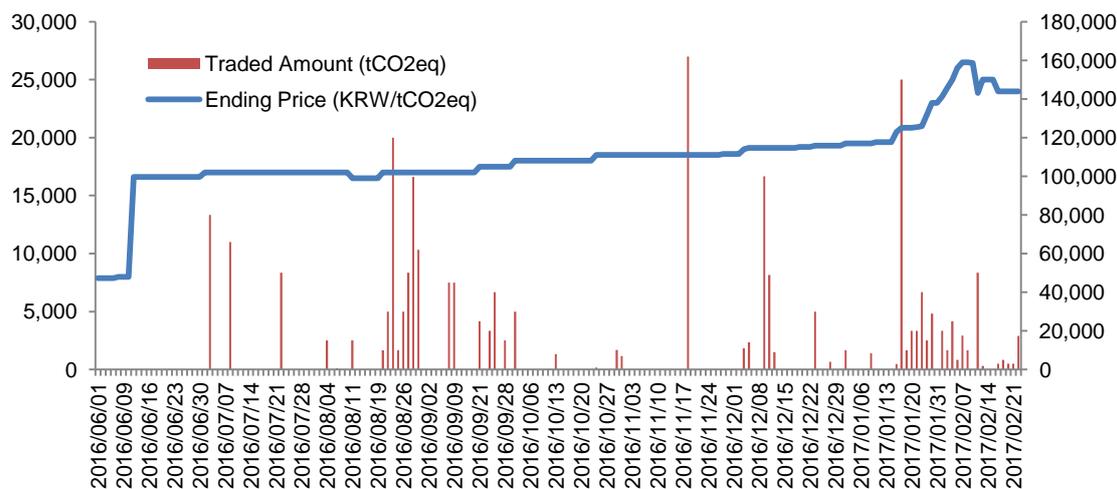


Figure 20: Trend of the prices (left axis) and the traded amount (right axis) in the Korean emission trading market

(Source) Created by the Institute of Energy Economics, Japan from the KRX market data¹⁴

(4). EU

EU-ETS is the major emission trading scheme in EU which was one of the earliest to start. Currently it urgently needs to address the issue of credit surplus. Since the financial crisis in 2008, emissions decreased due to economic recession, resulting in a large amount of credit surplus in the market. A significant amount of surplus was generated in the period from 2009 to 2012, when the gratuitous allocation exceeded the actual emission amount.

EU has announced that it will reduce GHG emissions by 40% by 2030 as compared with that in 1990, and that it will continue to utilize EU-ETS. For this purpose, it is necessary to promote emissions reduction by eliminating the credit surplus as much as possible and maintaining the price higher than the current level.

At present, reduction of credit surplus is aimed in the short term by putting off (i.e. ‘back loading’) the auction for credits amounting to 900 million tCO₂eq until 2019. Moreover, as an important measure for 2019 and subsequent years, the Market Stability Reserve (MSR) is to be introduced. MSR aims to pursue the stabilization of the price level through the elimination of the distributed credit surplus by transferring the surplus in the market to MSR. When the price soars, it is to be lowered by supplying the surplus credits from MSR to the market. Additionally, for 2020 and subsequent years, it is planned that credits that are not subject to free allocation will also be transferred to MSR¹⁵.

Studies are now under way to determine what the future EU-ETS ought to be in 2020 and beyond, including how the ‘cap’ should be determined.

¹⁴ Korean Exchange, <https://global.krx.co.kr/>

¹⁵ European Commission, Structural reform of the EU ETS, https://ec.europa.eu/clima/policies/ets/reform_en

Reference

Meeting report CDM Executive Board eighty-ninth meeting

<https://cdm.unfccc.int/UserManagement/FileStorage/DHAZJIVN509FQL2SO4CT3PYREXU1KM>

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