An Analysis on the Developments of Voluntary Emission Reduction Credit Systems in Japan

Yoshiki Ogawa

Abstract

In Japan, various efforts of global warming measures to achieve the reduction target of Kyoto Protocol were made eagerly. In this paper, I made an analysis on the development of voluntary emission reduction systems in Japan by focusing espesially on the situations of J-credit system integrated after 2013. Important results of this study are as follows.

First, the vital developments of unique activities made by final users of environmental value in the green certificate system and the existence of strong potentials to environmental-friendly activities shown by many diverse players in the domestic CDM system suggest a new compelling power required for advancing Paris Agreement.

Second, the voluntary emission reduction systems such as J-Ver and domestic CDM started from 2008. Especially the expansion of domestic CDM system was remarkable up to 2012 which was the end of Kyoto Protocol due to the needs for the voluntary action program by large size companies.

Third, the activities of J-Credit system integrated from two preceding systems was worried to drop sharply due to the end of Kyoto Protocol. However, the cumulative reduction amounts of the project registrations by the J-Credit system shows that this fear would not be suitable.

Fourth, the cumulative reduction amounts by the J-Credit system increased drastically in 2016. The recent movements of RE100 (100% renewable energy) is possible to influence to this increase. The similar movement was also observed in the activities of green electricity certification in Japan and these facts would be quite crucial.

Fifth, Japan just started non-fossil fuels values trading market. However, this market would not become attractive and vital unless the environmental values of non-fossil fuels certificates are transferred to final users by remaining a virgin state. The design and establishment of non-fossil fuels values trading market should be pursued in anticipation of behavior changes in the user side.

Sixth, the companies who hold up RE100 target are increasing recently also in Japan. To bring on large movements of environmental-friendly activities in the user side can become a new compelling power for promoting efforts of Paris Agreement.

Contents

1. Introduction

In Japan, various efforts of global warming measures to achieve the reduction target of Kyoto Protocol were made eagerly. One of such efforts was the introduction of voluntary emission reduction credit systems. From 2008, the Japan-Verified emission reduction (J-Ver) system was started mainly for the purpose of producing emission reduction credits to use for carbon offset activities. Also from 2008, the domestic version of clean development mechanism (CDM) was started mainly for the purpose of produce credits to use the voluntary action program in the large-scale industries. After the ending of the first commitment period of Kyoto Protocol, these systems were integrated to the Japan Credit (J-Credit) system in 2013.

In December 2015, the Paris agreement on post Kyoto GHGs reduction was finally approved by many countries including various developing countries. The specific character of Paris agreement is a flexible setting of the target for reducing or mitigating GHGs emissions. In May 2016, Japanese Government has authorized the new target of GHGs reduction to achieve 26% reduction from the emission level in 2013 up to 2030. In addition, Japan need to intensify GHGs reduction measures, because she already committed 50% (or 80%) reduction of GHGs in 2050 in the long-run.

Two and half years are now passing after the Paris agreement on post Kyoto GHGs reduction and this year, 2018 is positioned as the crucial year to substantiate full-scale activities for the Paris agreement. However, the US withdrawal from the Paris agreement by the Trump Administration chilled these GHGs reduction activities involving various developing countries widely. We have to say that the elation of international activities on GHGs reduction is falling into a kind of stagnation. In order to get out of this stagnation, we can say that new movements different from a conventional idea which can make a fair wind will be required.

Therefore, the voluntary emission reduction systems will be one of important options to achieve the GHGs reduction target in Japan from now on. In this paper, I made an analysis on the development of voluntary emission reduction systems in Japan by focusing especially on the situations of J-Credit system integrated after 2013, because it seemed that the activities of this system have not been always vital up to now but this system will be indispensable for users in the demand side to join GHGs reduction activities positively.

2. Methods

First, I considered various historical experiences made in the GHGs reduction efforts based on the Kyoto Protocol, from the viewpoint of new forces of GHGs reduction movements. I pointed out specific characters of some attractive experiences in the past.

Second I surveyed historical changes in the cumulative dealing numbers and the cumulative reduction amounts of the project registrations and of the credit certifications by the individual voluntary systems since

2008. I gathered various data on the J-Ver, domestic CDM and J-credit system as widely as possible[1~4] and linked these data continuously.

Third, I made an analysis on changes in the reduction size of individual projects and the players' structure of individual projects, respectively, through the J-Ver, domestic CDM and J-credit system. I checked what were key specific characteristics in the transition from the J-Ver and domestic CDM systems to the J-Credit system.

Fourth, I discussed how recent movements on Renewable Energy 100 (REN100) influenced to the voluntary market activities. I also discussed the establishment and introduction of new market trading non-fossil fuel values in Japan which was just starting from this May and I pointed out some problems held by this new market activity.

Finally, I discussed the present problems and future subjects on the further development of voluntary emission reduction system in Japan.

3. Results

3－1 Historical experiences (1) green electricity certificates

What kinds of movements can contribute as a new force to go out of the recent stagnation of international activities in post Kyoto? After the Kyoto Protocol was adopted in 1997, the similar stagnation of activities also happened because the US withdrawal of Kyoto Protocol by the Bush Administration in 2001 chilled them and the Kyoto Protocol could not fulfil conditions for effectuation easily and wandered, till it finally enacted in 2005. The first commitment period of Kyoto Protocol finished in 2012 and Kyoto Protocol passed the baton to Paris Agreement at the end of 2015. It is considered that we can get some hints on new forces from measures already tackled by Japan to achieve the target of Kyoto Protocol.

The expansion of renewable energies is one of important fields which Japan made large efforts in order to achieve the GHGs reduction target of Kyoto Protocol. Japanese government enacted the RPS (Renewable Portfolio Standards) Law in 2003, introduced the FIT (Feed in Tariff) system on surplus solar electricity in 2009, and then finally started the full-scale FIT system covering various renewable energies widely from 2012. However, the activity focused firstly in this paper is not such governmental movements but the green electricity certificate system started by the private sector from 2001.

The aim of green electricity certificate system was to demonstrate publicly that there is another method which can contribute to the expansion of renewable energy even if the government does not impose an obligation or a regulation[5]. At first, the broker company of this project gathers necessary funds from customers who would like to get environmental values finally and ask for the producer to construct a power

generation plant using renewable energies. After the operation of this power plant is started, the actual amounts of electricity generated by this plant are confirmed and the environmental values are transferred to the customers who provide necessary funds based on the third party approval.

Since the compelling force of green electricity certificate system was far weak compared with the RPS Law, this system was expected to go out of business before long at that time. However, the green electricity certificate system could survive toughly and on the contrary, from 2005, the participants of this system were made diverse and the trading volumes of this system were also expanded. The green electricity certificate system could survive, as the result that the environmental values which were possessed by the home use of renewable electricity were also treated as an object of trading on green electricity certificates.

It is the most notable characteristic in the green electricity certificate activities that the users expand various unique activities furthermore by using environmental values of green electricity obtained. Sony Corp. which was the first purchaser of green electricity certificate advertised her office building in Osaka as an environmental-friendly activity base using 100% wind electricity. Ikeuchi Organic in Imabari gave a name of "Wind Angel" to the homemade original towel and impressed an environmental-friendly product also by 100% wind electricity strongly. These activities introduced here is only a few example of the utilization of environmental values, but the vital developments of unique activities made by users who obtained environmental values of green electricity is the first of past experiences pointed out in this paper.

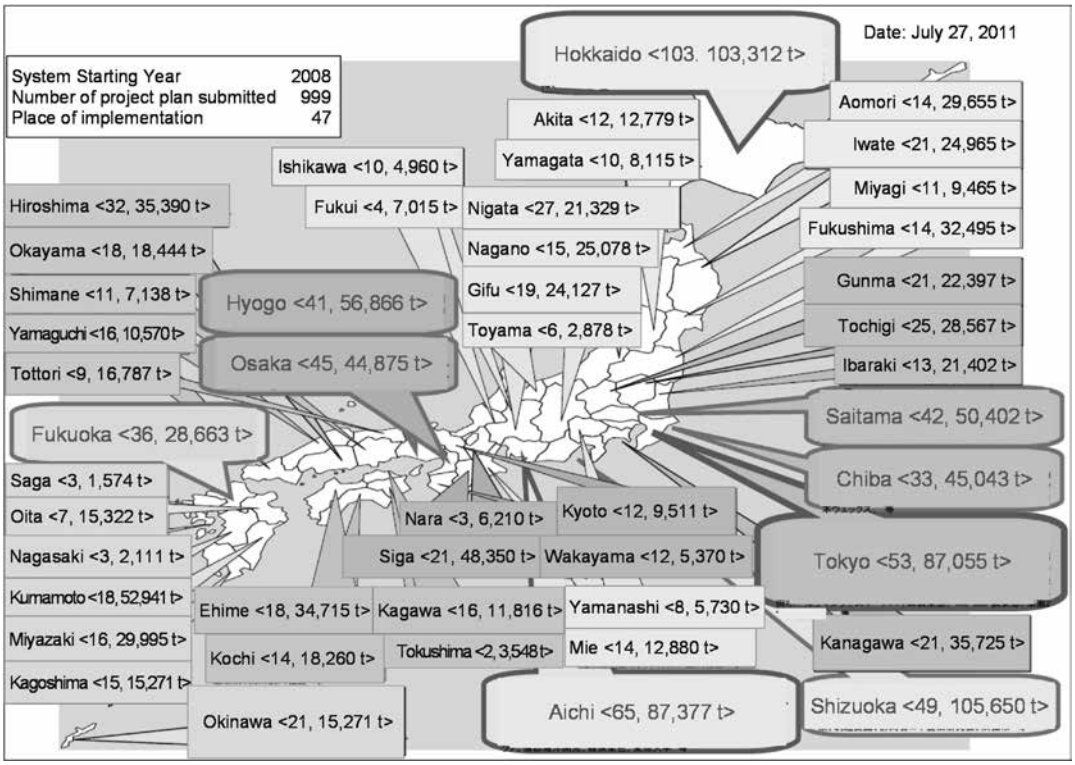
3 － 2 Historical experiences (2) Domestic CDM system

Another past experience related to measures for Kyoto Protocol was the domestic version CDM (Clean Development Mechanism) system which was introduced as a part of establishment of the domestic emission trading system. Under the domestic version CDM system, GHGs reduction measures were made in small- and medium-scale companies and in the residential sector such as offices and households based on funds and technologies provided by large-scale companies[6]. The large-scale companies could get certain reduction credits through the third party approval as a compensation of supporting and could use these credits for the achievement of GHGs reduction target under the voluntary action plan.

The domestic CDM projects were of course evaluated as higher cost and smaller-scale reduction amount, compared with the overseas CDM project under Kyoto Protocol. Therefore, it was expected before the starting of system that no one accesses such a non-attractive system. However, when it came to an open, various players gathered, made a unique project and access to this system from all over the country, as shown in Fig. 1.

Each project accessed to the domestic CDM system was of course quite small standing in terms of reduction size. It was reality that the reduction amounts could reach only to the size of little significance even if the

summing up of reduction amounts for the whole access projects was made. However, the specific character of the domestic CDM system more than offsets this reality was for individual remarkable players in each local area to access to the domestic CDM initiatively by making cooperation to one project. We can recognize the existence of quite strong potentials to environmental-friendly activities which were also shown in the utilization activities of environmental values obtained by green electricity certificates. The enthusiasm and potentials shown through the domestic CDM system is the second of past experiences pointed out in this paper.



(Note) The figure shown in left side is the number of projects and the figure in right side is the CO_2 reduction amount.
(Source) Made from METI committee document

Fig. 1 Area map of emission reduction projects in domestic CDM

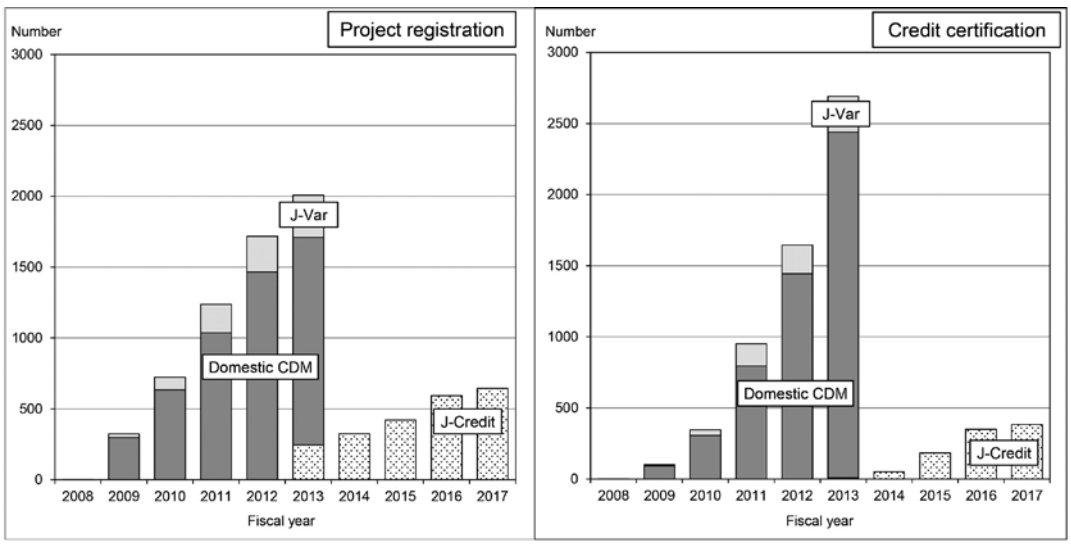
3 － 3 Integration to the J-Credit system from the domestic CDM and J-Ver systems

The domestic CDM system was integrated to the J-Credit system from 2013 together with other domestic credit system such as the J-Ver system[7]. Fig. 2 shows historical changes in the approved cumulative numbers of emission reduction projects in the step of project registration and in the step of credit certification. As shown in Fig. 2, the cumulative numbers increased largely as for the domestic CDM system up to 2012,

compared with the J-Ver and the later J-Credit systems. This increasing trend was considered to be brought by the needs of credits for the voluntary action program by large size companies and for the offset uses.

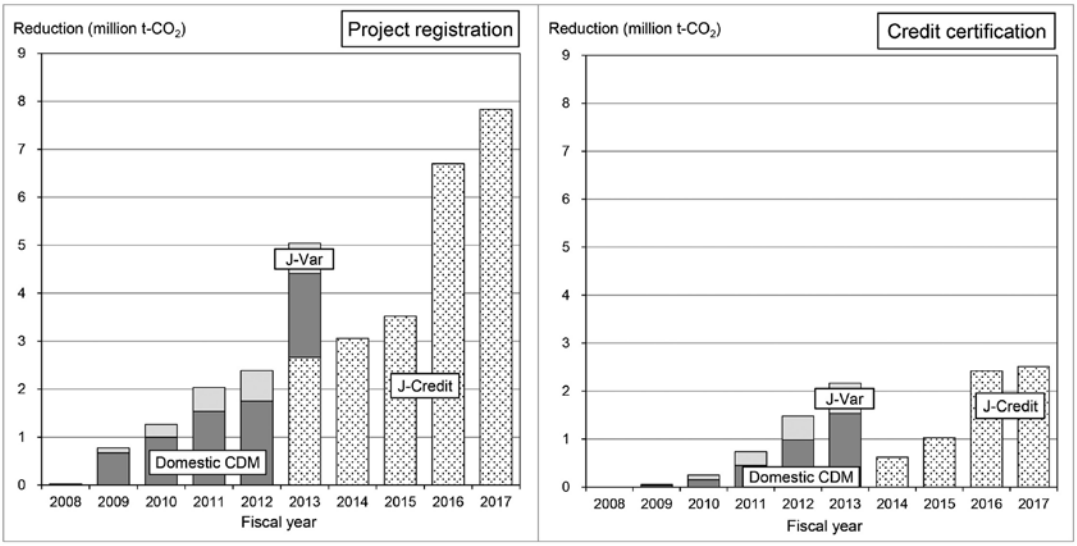
Fig. 3 shows historical changes in the approved cumulative reduction amounts in the step of project registration and in the step of credit certification through various voluntary systems. As shown in Fig. 3, the cumulative reduction amount also largely increased as for the domestic CDM system up to 2012 which was the ending of the first commitment period of Kyoto Protocol. In addition, the cumulative reduction amounts of the project registrations by the later J-Credit system also continued to increase from the same level, though the corresponding cumulative numbers dropped from the level of the domestic CDM systems. Furthermore, the cumulative reduction amounts by the J-Credit system increased sharply in 2016.

The cumulative numbers of project registrations by the J-Credit system dropped sharply from the level of the domestic credit system, and thus, it seemed that the activities of the J-Credit system have not been always vital. However, judging from changes in the cumulative reduction amounts, the reduction amount size per project is considered to become larger compared with the case of domestic CDM system. Because of the ending of the first commitment period of Kyoto Protocol, it is worried that the activities of voluntary system may be reduced sharply. However, the changes in the cumulative reduction amounts of the project registrations by the J-Credit system shows that this fear would be groundless.



(Source) Made from data cited in references [1-4].

Fig. 2 Changes in the cumulative numbers of project registration and credit certifications by the voluntary system



(Source) Made from data cited in references [1-4].

Fig. 3 Changes in the cumulative reduction amount of project registrations and credit certifications by the voluntary system

3 － 4 Recent Movements on RE100 and its Influences

Because of the introduction of full-scale FIT system in 2012, the activities of green electricity certificate system fell down sharply. There were no new plant approvals additionally and the amounts of certification on green electricity changed from a level-off trend to a decreasing trend. We have to say that the compelling force played by the full-scale FIT system was too strong compared with that of the voluntary green electricity certificate system. The domestic CDM system was integrated to the J-Credit system, as already discussed. The reduction amounts approved by the J-Credit system increased but the number of projects approved by this system decreased unfortunately.

In such a recent circumstance, the approval of green electricity certificates is recovering to the previous level from 2016 in fact. The largest reason of this recovery is considered to be that the environmental target called as renewable energy 100 (RE100) was recently held up mainly by overseas companies[8]. Since the companies holding up this target could not achieve 100% renewable energy only by its own reduction measures, some amounts of credits which could offset GHGs emission were inevitably required. Because of these requirements, passionate gazes were focused also on the green electricity certificates recently.

It is expected that the needs and requirements by companies holding up renewable energy 100 (RE100) target will continue and expand from now on. This trend is also expected to have a good influence to the J-Credit system which number of projects decreased compared with that in the domestic CDM system. The

environmental-friendly activities of companies developed with holding up the RE100 target is the third issue I want to pay attention in this paper.

3－5　Introduction of Non-Fossil Fuels Value Market and its Problems

Based on the full-scale FIT system introduced in 2012, we can say that the expansion of renewable energies has promoted steadily. The largest problem of this system is the rapid increase of peoples' burden by the increase of surcharge. Also considering on reducing this burden problem, the Japanese Government has discussed about the establishment of non-fossil fuels values trading market in recent two or three years[9]. In this May, the non-fossil fuels value market specified only renewable energies started already. Standing on the viewpoints discussed in this paper, it is quite important how the final users who get certificates of non-fossil fuels value can utilize them as an environmental-friendly activity.

In Japan, the non-fossil fuels values market started recently, but I will discuss here two problems held by this new market. The issues are discussed from the viewpoints of final users of non-fossil fuels values certificates. According to the latest explanation of non-fossil fuels values trading market[9], the values of non-fossil fuels certificate are classified into the following three values: (1) non-fossil fuels value, (2) zero emission value and (3) environmental display value, as shown in Table1.

Table 1　Menu of certificates and environmental values possessed

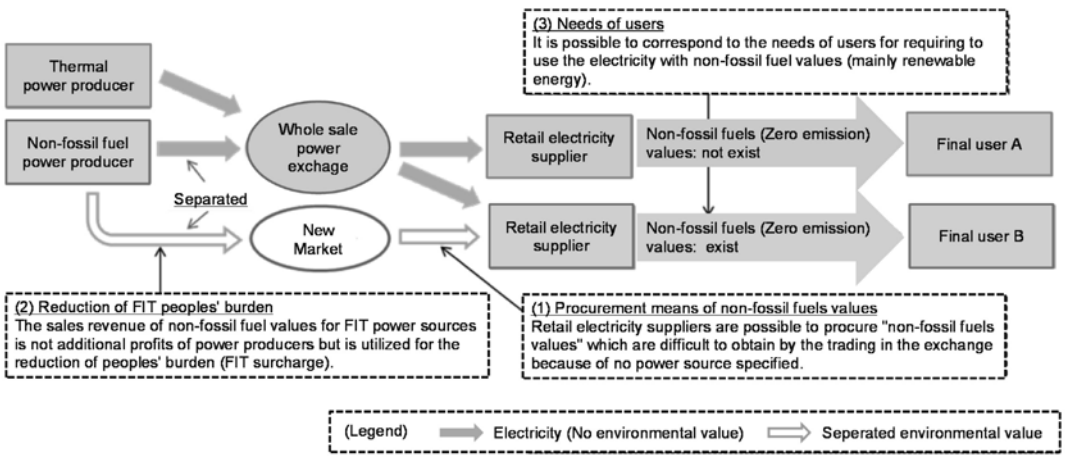
Value possessed \ Specified menu		Renewable energy specified (Including FIT)	No specified
(1)Non-fossil fuels value		Exist	Exist
(2)Zero emission value		0 kg-CO_2 / kWh	0 kg-CO_2 / kWh
(3) Environmental display value	Display on power source structure	Not affect (*)	Not affect
	Display on things other than power source structure	(1) Possible to show CO_2 emission coefficient as 0	(1) Possible to show CO_2 emission coefficient as 0
		(2) Possible to appeal the purchase of renewable energy certificates	(2) None
		Occur differences	

(Note) The difference between FIT power source and non-FIT power source is reflected continuously by the difference of display on power source structure.

(Source) Made from the table cited in reference[9].

The non-fossil fuels value is defined as the value countable when checking the ratio of non-fossil fuels under the Energy Supply Structure Advancement Law and is positioned as a major part of non-fossil fuels certificate. The zero emission value is defined as the value deductible CO_2 emission calculated by nationwide average coefficient from the actual emission and the environmental display value is defined as the right for retail electricity suppliers to display or insist their added values. The latter two values are positioned as an additional one. In the case that non-fossil fuel value which is positioned as a major part was already utilized, it is quite doubtful what kinds of environmental values is still remaining for final users getting non-fossil fuel certificates to exercise their right. Accordingly, if we consider the utilization of environmental values of non-fossil fuels certificates, it is also doubtful whether this treatment of no-fossil fuels values is suitable or not.

The structure of non-fossil fuels values trading market is shown in Fig. 4. Though the FIT power sources is recognized from the beginning, it is substantially worried whether does the double count problem between the user's utilization of non-fossil fuels values and the special treatment of FIT power source occur or not when the non-fossil fuels certificates are purchased from the separated market. As for GHGs emissions, as FIT power source is assigned the average emission coefficient, the problem would not seem to occur from this viewpoint. But, the insistence such as the electricity generated by renewable energy seems to remain some doubt because FIT power is clearly shown in the composition of power sources.



(Source) Made from the figure in reference[9].

Fig. 4 Structure of non-fossil fuels values trading market

The cost burden of environmental values possessed by renewable energies would be covered by the purchasers of non-fossil fuels certificates (final users) at last. Considering this point, the non-fossil fuels values trading market would not become attractive and vital unless the environmental values of non-fossil

fuels certificates are transferred to final users by remaining a virgin state. In the system design of non-fossil fuels certificates, it is doubtful whether are such problems discussed thoroughly or not. It is somewhat worried whether the existence of potential cost burdened by players are suitably considered or not.

Recently, in Japan, the companies who hold up RE100 target are increasing. Since these companies cannot achieve 100% renewable energy only by its own reduction measures, some amounts of credits which can offset GHGs emission will be inevitably required. In anticipation of such behavior changes in the user side, the design and establishment of attractive non-fossil fuels values trading market should be pursued. To bring on large movements of environmental-friendly activities in the user side like this can become a new compelling power for promoting international efforts of Paris Agreement undoubtedly.

4. Concluding remarks

First, the vital developments of unique activities made by final users of environmental value in the green certificate system and the existence of strong potentials to environmental-friendly activities shown by many diverse players in the domestic CDM system suggest a new compelling power required for advancing Paris Agreement.

Second, the voluntary emission reduction systems such as J-Ver and domestic CDM started from 2008. Especially the expansion of domestic CDM system was remarkable up to 2012 which was the end of Kyoto Protocol due to the needs for the voluntary action program by large size companies.

Third, the activities of J-Credit system integrated from two preceding systems was worried to drop sharply due to the end of Kyoto Protocol. However, the cumulative reduction amounts of the project registrations by the J-Credit system shows that this fear would not be suitable.

Fourth, the cumulative reduction amounts by the J-Credit system increased drastically in 2016. The recent movements of RE100 (100% renewable energy) is possible to influence to this increase. The similar movement was also observed in the activities of green electricity certification in Japan and these facts would be quite crucial.

Fifth, Japan just started non-fossil fuels value trading market. However, this market would not become attractive and vital unless the environmental values of non-fossil fuels certificates are transferred to final users by remaining a virgin state. The design and establishment of non-fossil fuels values trading market should be pursued in anticipation of behavior changes in the user side.

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