

Discussion Points in Japan's Renewable Energy Promotion Policy

- Effect, Impact and Issues of the Japanese RPS -

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<Purpose of the Report>

A wide variety of measures have been taken in relation to renewable energies (number of new energies) according to their energy-security-based necessity as the alternative energy of oil. Moreover, in recent years, an increasing amount of attention has been focused on the role played by these energy sources as a global-warming policy, and policies are coming under review that are aimed at boosting the amounts of such energies introduced.

Under these circumstances, the Special Measures Law Concerning the Use of New Energy by Electric Utilities (known as Japanese RPS)" came into effect in April 2003, thus reinforcing renewable energy promotion measures. However, some points remain to be clarified in relation to system implementation. In addition, a number of issues require review in relation to their consistency with policies and measures to be reviewed in the future, including the electric-power market system and global-warming policy. According to the new system, necessary measures will be taken as appropriate three years after its introduction, in accordance with system trends. Therefore, issues and points of discussion anticipatable at present should be continuously extracted and reviewed.

This report provides analyses of the outline and implementation of the Japanese RPS and its consistency with various policies and measures, and raises questions concerning points of discussion to be reviewed in the future.

* RPS: Renewable Portfolio Standard – Legislation that sets a minimum percentage of electricity generated by renewable energies in terms of electricity sold, and presents target achievement options such as figure trade among electric utilities

* Renewable Energies: energy sources that do not use exhaustible fuels. Sources of renewable energy include wind, photovoltaic, biomass, geothermal, and hydropower constituting new energies. As for hydropower, the Japanese RPS is applicable only to small-scale hydropower (1,000 kW max.).

<Main Conclusions>

1. As a result of the national government's new-energy policy and private businesses' voluntary efforts, electricity derived from renewable energies in particular accounts for 1.8% ('2000) of the total power generation in Japan – a level that can be favorably compared with those of European nations and the U.S. (2% on average among IEA participants). Further, additional policies and measures aimed at accomplishing policy targets such as global-warming have recently come under review.
2. As a result of the minimum percentage of electricity to be generated by renewable energies established by the Japanese RPS that came into force on April 1, 2003, amounts of renewable energies equivalent to that percentage are expected to be introduced. On the other hand, utilities selling electricity will have to bear extra costs resulting, for example, from the introduction of additional power-generating facilities and the purchase of other utilities' figures to meet their targets, eventually requiring them to lighten their economic burdens as much as possible.
3. The RPS System provides achievement options designed to achieve renewable-energy introduction targets and minimize overall social costs. While the system's performance will become obvious in the future, the law prescribes that the system's details should be reviewed as necessary. Important considerations and requirements should be clarified in order to review future trends in terms of "system implementation" and "consistency with other policy measures."
4. The following are considerations to be reviewed in terms of system implementation:
 - (1) Establish implementation rules that will lead to sufficient market liquidity in order to achieve targets with economic efficiency.
 - (2) Ensure the proper functioning of banking and penalty rules as target achievement incentives for system participants.
 - (3) Establish rules for interconnection measures in response to the increased quantities of renewable energies introduced.
 - (4) Review the necessity of auto-generators' participation in the system, and the implementation methods to be used if they participate.
5. The following are the requirements to be met in terms of consistency with other policy measures:
 - (1) In the process of expansion of the scope of liberalization in the electric-power market, introduction targets that neither inhibit competition nor constitute electricity tariffs or access barriers for new entrants must be set, and implementation rules established.
 - (2) Japan should introduce means of achieving the objectives of the Kyoto Protocol with better economic efficiency in the review of global-warming policy measures scheduled for 2005 or later. In the review, Japan should be sufficiently flexible to maintain consistency between established proper targets for introduction of the RPS and anticipated global-warming policy measures (e.g., an emission trade system, environment tax).
 - (3) The RPS System is designed to turn the social costs borne by the national government's financial support into internal costs through target achievement and market trade. Therefore, of the existing new-energy support measures, socially significant ones for which the RPS System cannot provide solutions should be selected and policy-oriented support consolidated.
 - (4) The RPS System is targeted only for the supply side, and lacks policy-oriented appeal to the demand side. On the other hand, voluntary approaches targeted for the demand side by private businesses are under study in various ways, and are useful in determining energy and global-warming measures. Therefore, policies should be reviewed that can coexist with these demand-side-targeted efforts without adversely affecting them.
6. It will be important in the future to carefully and continuously examine the efficient functioning of the system based on the aforementioned requirements, and to flexibly change introduction targets and implementation rules as necessary.

<Description>

1. Status quo of renewable-energy introduction in Europe, the U.S., and Japan

Japan is ranked third behind the U.S. and France in amounts of renewable energies introduced, according to the 2000 statistics of the IEA (International Energy Agency), but the percentage of such energies in primary energy supply is slightly lower than in other nations. As far as power generation is concerned, however, Japan tops all other developed nations with the exception of the U.S., and is roughly average among developed countries in terms of the percentage of renewable energies used in power generation. (Fig.1)

The breakdown of Japan's power generation by renewable energies highlights biomass and municipalities' waste power generation. This is due not only to the national government's support measures through NEDO and NEF, but also to power purchases by electric utilities through voluntary excess-power purchase menus. That is, the fourfold increase in power generation in the eight years since the 1992 introduction of the system contributed to this outcome. (Fig.2)

2. Considerations in expanding new-energy introduction

Various efforts have been made worldwide to expand the introduction of new energies (often classified in Europe and the U.S. as "renewable energies," which include hydropower and geothermal in addition to photovoltaic, wind, and biomass). (Table.1)

In particular, the "fixed-price purchase system" as used in Germany, Denmark, Spain, and other nations proved successful to a certain degree in its early stages. However, purchase at fixed prices is gradually shifting toward market-principle-oriented systems, typically the RPS System, as purchase at fixed prices gave rise to problems such as price rigidity and rather slow cost reductions driven by mass production, and due to increases in the financial burden on national governments.

In Japan, the report of the New Energy Division of the Advisory Committee for Natural Resources and Energy released in June 2001 called for a further expansion in the introduction of renewable energy in a bid to address global warming, and it was decided to introduce the RPS System as a means of achieving this goal, as the system holds the promise of improving economic efficiency through the use of the market principle, while taking renewable energy promotion targets as energy security.

3. Effect of introduction of the RPS System and its impact on electric utilities

The Japanese RPS (Fig.3), which came into effect in April, 2003, set utilities' obligatory supply amounts on the precondition that the 2010 introduction target of 12.2 billion kWh as formulated by the Advisory Committee for Natural Resources and Energy--the sum of the new-energy electricity amount (11.5 billion kWh) and power generation by medium-sized and small hydropower generation facilities and other power sources (0.7 billion kWh)--will be achieved, and it is expected that the corresponding amounts of renewable energies will be introduced in that year. Moreover, temporary measures are currently being taken in accordance with utility-by-utility new-energy utilization figures, to ensure fairness in the bearing of costs among utilities at early stages of the system. Further, economically efficient target achievement options are also available, including a "takeover" among utilities and the addition of generation figures for new-energy generators under no obligation to

achieve the target.

In any case, electric utilities under obligation must bear extra costs. Therefore, means for reducing the cost of achieving the target should be reviewed in the future.

4. Considerations in RPS System implementation in Japan, and issues to be reviewed

As for the Japanese RPS, Article 5 of the Additional Clause of the law specifies that “the national government must consider the enforcement status of the law’s provisions after three years from when it took effect, review the provisions if their review is recognized as necessary, and take necessary measures based on the results of the review”; therefore, changes should be made as necessary. A review of the issues related to the RPS implementation rules is probably among the primarily necessary measures in this case. On the other hand, a review of the RPS’s details as a result of changes to or the performance of other policies and measures may be included. Moreover, making changes to the details of existing policies and measures as a result of the introduction of the RPS, and reviewing policy measures for items that will be affected by the system’s introduction are also likely to be included in a broader sense. For this reason, while the system’s performance will become obvious over time, its requirements at present should be clarified and reviewed continuously.

(1) Considerations in system implementation (Tables.2 and 3)*

1) Ensuring market liquidity for achieving targets with economic efficiency

The Japanese RPS offers three options for electric utilities to fulfill their obligations: (1) generate power by renewable resources by themselves, (2) purchase new energies from others, and (3) have another utility take over their obligations. As for the takeover specified in (3) among these options, since electronic account openers are limited to new-energy generators and utilities, “trade” takes place only by shifting accounts between utilities under obligation, unless a purchase is made directly from a new-energy generator. To reduce social costs as a whole based on the market principle, while market liquidity realized through the participation of a wide range of participants is generally essential, it is still unclear whether the “takeover” system will evolve into a market trade system that allows true linkage between customers in a reasonable manner.

Further, figure transfer is limited to “year ends,” making the trade period extremely short and therefore not holding much promise for “market” liquidity. It is possible that futures and other forms of trade may be developed by brokers and others in the future. However, this may result in “takeover” trade-price surges (or vice versa), thus leaving considerable uncertainty as to whether efficiency can be ensured through the market.

At first, concerning the fulfillment of obligations, it was unclear except the “takeover” system. But as the implementation rule was formed in detail, it turned out that it is possible to purchase through the year the “Applicable Amount of New Energy Electricity” that has been recorded in the account to other generators and retailers.

2) Providing incentives to participants

To put more teeth into the RPS, the provision of proper incentives to participants in the system is essential. This includes not only granting target achievement incentives to parties under obligation, but also granting to generators incentives for generating more than their obligatory quota. As for the former, while regulatory methods such as fines and the public disclosure of generators’ names are

common in most cases, the provision of positive incentives to those fulfilling their obligations, as is done in the U.K, is among the possible options. As for the latter, on the other hand, approving a carry-over to the next target period through banking may be possible. Banking, among others, is likely to be effective in consideration of renewable energies' characteristics--lead time to construct a generating facility, climate dependency, and others.

3) Establishing rules for interconnection measures, including how costs should be borne

While wind-power generation, for instance, tends to be distributed to a greater extent in regions having favorable wind conditions, such as Hokkaido and Tohoku, such power supplies are prone to varying output depending on wind conditions--one of their problems. As a result, if they are interconnected to the transmission grid, extra costs arise for the existing grid side for the purposes of stabilization and reinforcement, in order to suppress frequency variations.

According to the New Energy Division of the Advisory Committee for Natural Resources and Energy's report released in June 2001, such costs are expected to amount to 220 to 550 billion yen. Rules should be quickly established not only concerning how these costs should be borne, but also how the transmission network should be improved and maintained.

4) Reviewing the necessity of auto-generators' participation in the system

The law exempts self-generators from their obligations, as they have less freedom of choice than utilities, and because monitoring of self-consumption is not effective. However, in view of one of the law's objectives of "addressing global warming," consistency with the law's objective should be summed up in light of the fact that most auto-generators use fossil fuels as raw materials.

(2) Requirements concerning consistency with other policies and measures (see Fig.4)

1) The electric-power market

The electric-power market is expected to face expansion in its scope of liberalization, and an increase in new entrants as a result of such expansion implemented in an attempt to achieve Japan's goal of enhancing its competitive edge. Under such circumstances, the Japanese RPS is a framework leading to higher supply costs for many generators, as a result of which access opportunities for new entrants may be reduced, eventually resulting in diminished effect of electricity tariff reductions as a result of market expansion.

Let's suppose, for instance, that new entrants will purchase all their RPS target amounts from the market in the future. While the additional costs beyond the actual generation cost are low at roughly 0.15 yen/kWh (premised on the RPS portion's upper limit of 11 yen/kWh and future RPS target of 1.35%), a demand/supply environment--an environment in which enough RPS portions are available on the market for purchase--and market liquidity that allows trade are essential in maintaining the aforementioned price level. In constructing an electric-power market in the future, therefore, RPS introduction targets and implementation rules applicable to fair competition among electric utilities should be reviewed in order to diminish negative impacts to the extent possible.

2) Addressing global warming

As for domestic global-warming policy measures, a final policy measures will be introduced in

2005 or later in accordance with the “step-by-step” procedure specified in the Guidelines for Measures to Prevent Global Warming. In reviewing final policies and measures, a system primarily targeted at enabling Japan to achieve the Kyoto Protocol’s target with economic efficiency will likely be reviewed. While the expansion of renewable energy introduction amounts contributes volume-wise to the achievement of the Protocol’s objectives, proper introduction targets and implementation rules should be reviewed through comparison with other global-warming countermeasures (e.g., energy saving, utilization of the Kyoto Mechanism) in terms of cost-effectiveness.

Let’s suppose, for example, that a system (e.g., an emissions trading or environment tax) widely utilizing the Kyoto Mechanism and the market is adopted as the domestic system. If the RPS’s cap on renewable energy supply costs exceeded the anticipated reduction-cost cap, it would be difficult to say that an economically efficient global warming policy had been chosen. (Fig.5) Therefore, it is probably important to change the RPS as appropriate in terms of how Japan should achieve the Kyoto Protocol’s target with economic efficiency, while considering the details of a review of domestic global warming policy measures, on which more specific discussions will be held in the future.

3) Creating a new budget for new energies

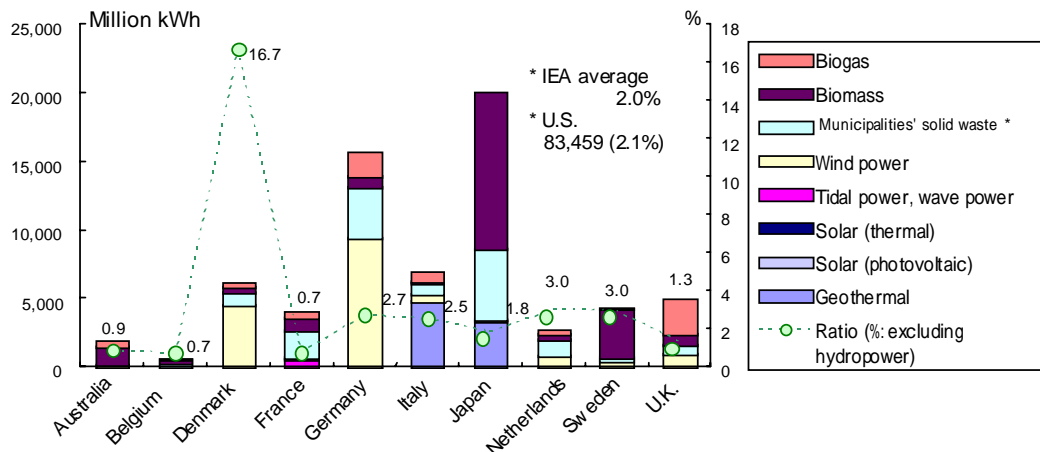
In the case of new energy policies traditionally carried out by the policy makers, primary emphasis has been placed on financial support measures for the construction of facilities that appropriate the government’s funds for the cost gap between new energies and conventional power generation using fossil fuels and others. The RPS introduced under such circumstances is intended to turn the cost borne by the national government’s financial support into an internal cost through generators’ target setting (including penalties) and target achievement by market trade. Therefore, the diversion of financial support for other purposes, its stoppage, or other measures should be taken if it is determined that any existing new –energy’s policy measure need no longer remain under the government’s control through the RPS , and can be turned into an internal cost. On the other hand, while the RPS is designed to allow generators to make electricity purchases at lower costs in order to achieve the RPS targets, it adversely affects the introduction of photovoltaic power generation or technically immature renewable energies. For this reason, technologies driven away from such a new market should be reassessed in terms of their future social usefulness, so that policy-oriented support can be consolidated for the required technologies.

4) Approaches toward electricity users (generators’ voluntary efforts) and the RPS

The RPS System, by its nature, stops at the “supply side,” and approaches toward electricity users are “diluted” by electricity tariffs, making the system unappealing. On the other hand, recent years have seen the development of products focusing on renewable energies’ “environmental value” and other efforts by private operators--voluntary approaches toward consumers, including green-power-certificate trading, green-power fund, and the establishment of green power businesses by civic groups. These approaches toward consumers are likely to be very effective in view of energy and global warming policy measures. Taking the social impact of these systems into account, policies should be reviewed that will ensure that these activities are not restricted as a result of the introduction of the RPS.

It will be important in the future to carefully and continuously examine the efficient functioning of the system based on the aforementioned requirements, and to flexibly change introduction targets and implementation rules as necessary.

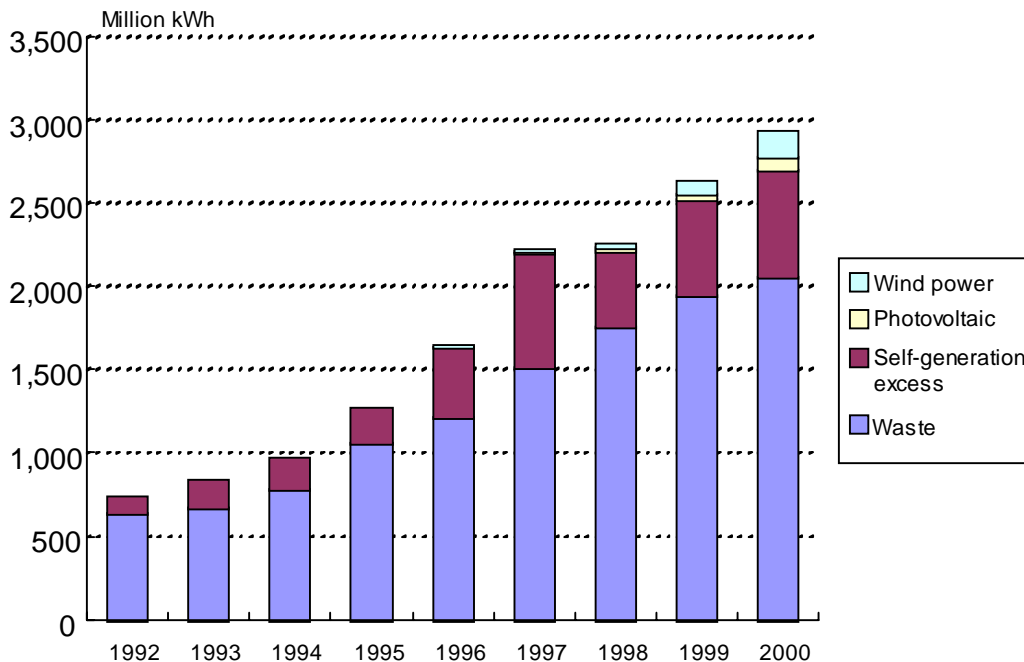
Fig.1: Comparison of Power Generation by Renewable Energies by Country (2000)



Source: IEA, ENERGY BALANCES OF OECD COUNTRIES, 2002

Note*: Excluding industrial waste and municipalities' waste derived from fossil fuels

Fig.2: Statistics on Japan's Excess-Power Purchase Menus



Source: Advisory Committee for Natural Resources and Energy, New Energy Division Documentation – Ministry of Economy, Trade, and Industry, September 2001

Note: Year-on-year data. The auto-generation excess includes fuel-cell and industrial-waste power generation.

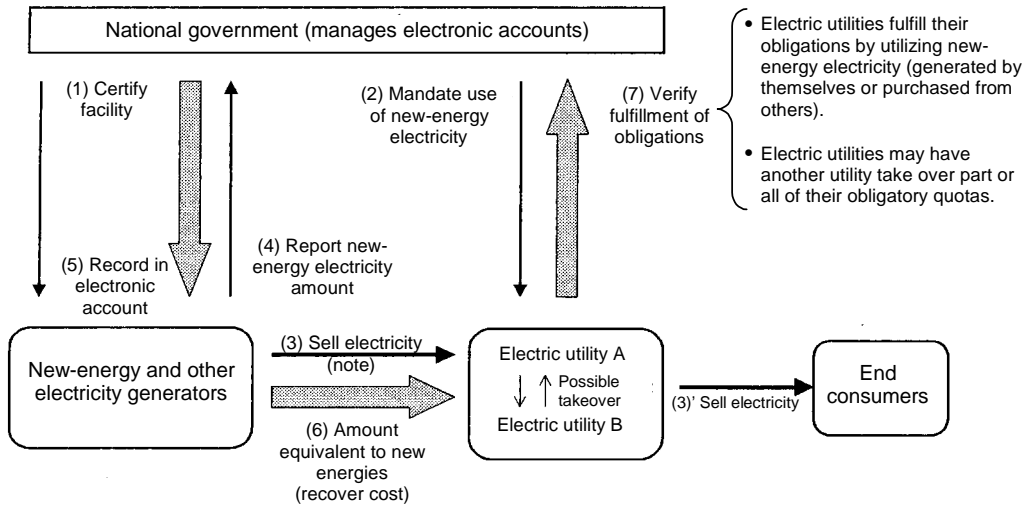
**Table.1: Classification of Support Measures for
New Energy Proliferation in Various Countries**

Classification	Specific measure	Description	Examples in various nations	Examples in Japan
Initial cost support	Subsidy (investment support)	Subsidizes part or all of the cost required for the purchase or installation of facilities	U.K., Germany, Netherlands, Italy, Belgium, Sweden, etc.	Home-use photovoltaic power generation by NEF (New Energy Foundation), NEDO's support for new-energy power-generation projects by local municipalities, REPP's and electric utilities' support for the installation of photovoltaic power-generation facilities
	Financing incentive	Preferentially finances the cost of the purchase or installation of facilities	Germany, Denmark, Netherlands, etc.	Low-interest-rate financing system by policy rate using fiscal investments and loans, preferential interest-rate measures for photovoltaic-generator-equipped homes through a home-builder/financial-institution tie-up
	Tax break	Grants tax breaks (e.g., accelerated depreciation) for the cost required for the purchase or installation of facilities, exempts electricity users purchasing renewable power from environment, energy, and other taxes, or grants tax reductions	Exemption, reduction, and refund of environment, carbon, investment and other taxes. Widespread in Europe and the U.S.	7% deduction (national tax) from the reference acquisition amount at the time of new-energy facility introduction, lot-tax easing measure for local-energy-utilizing facilities (local tax)
Sale/purchase support	Fixed-price purchase	Local electric utility purchases electricity generated by renewable energies at fixed prices	Germany, Denmark, Sweden, Spain, U.S., Italy, France, Netherlands, etc.	No purchase made to date as an obligation
	Quota + certificate trade (RPS)	Mandates that electricity distributors, suppliers, and others generate or purchase at least a certain amount of electricity generated by renewable energies. Often used together with certificate trade.	U.K., Sweden, Italy, Netherlands, Australia, some states in the U.S., etc.	"Special Law on the Use of New Types of Energy by Electric Utility Companies (Japanese RPS Law)"
Financial support	Levy on other fuels	Imposes taxes on fossil and other fuels, and appropriates part of tax revenues for renewable-energy proliferation	U.K., Germany	Power-supply special account (power-supply diversification account) Oil special account (account for energy demand-structure advancement)

Voluntary efforts	Voluntary and preferential purchase	Voluntary and preferential purchase of new and renewable energies by electricity distributors, suppliers, and others, regardless of whether purchase is mandated		Excess-power (e.g., photovoltaic, wind, waste power generation) purchase by 10 utilities
	Green fund	Contribution-based: Establishes funds using contributions from consumers, ordinary citizens, and others for the support of renewable-energy projects Investment-based: Finances promising projects at the preferred rate from funds established by investors. Investors receive returns in the form of dividends.	Netherlands (investment-based)	Green-power funds (e.g., GIAC) in 10 regions across the nation (contribution-based)
	Green Pricing	Electricity suppliers make available a wide variety of menus in accordance with new- and renewable-energy percentages and types, while customers select favorite menus and pay higher-than-normal tariffs	U.S., Germany, Netherlands, U.K., Sweden	No example in Japan
	Green power certificate	Establishes a link between customers wishing to purchase new- and renewable-energy electricity and electricity generators, and regards customers' environment premium payments as green-power purchases	RECS in Europe, U.S.	Green-power certificate system by private businesses

Source: “Fumiki Akari: EU Committee Report on Treatment of Renewable Energies in the EU Power Electricity Market” – Overseas Electric Power (4/1999)
 “Kimihito Ise and Fumiki Akisato: Renewable Energy Support Systems in EU Members (Volume I)” – Overseas Electric Power (5/1999), Advisory Committee for New Energy Division Documentation – Ministry of Economy, Trade and Industry (2001, 2001)
 “Toshihisa Fujii: Renewable Energy Utilization Promotion Measures in U.S.,” “Renewable Energy Policies in State of Texas” – Overseas Electric Power (4/2002)
 Hiroyuki Ishida: 15th Basic Energy Course “New Energies: Outline and Future Prospects” (9/2002)

Fig.3: Outline of the Japanese RPS System



Source: Documentation – Ministry of Economy, Trade and Industry

Table.2: Considerations in Implementation of the Japanese RPS System

Item	Requirement	Specific measure to meet requirement specified at left (example in Europe & the U.S.)	Status quo Consideration	Consideration
Economically efficient achievement of targets	Market liquidity	Participation of a wide spectrum of parties concerned – not only renewable-energy generators and suppliers but also traders and large-volume electricity users – in the market	Only new-energy generators and electric utilities are allowed to open electronic accounts for direct credit transactions (25 firms in 2003).	Sufficient number of participants to ensure market liquidity?
		Established certificate market (using the electric-power market and financial transaction market)	Governmental certificate market not established Obligatory quota "takeover" system among electric utilities	Reasonable link between participants?
		Flexibly set certificate registration timing and trade period	Quarterly certificate registration. Takeover is allowed only from year-end to June. (Purchasing an "Applicable Amount of New Energy Electricity" is possible whenever new energy-based electricity has been recorded in the account to other generators and retailers.)	"takeover" system and purchasing an "Applicable Amount of New Energy Electricity" smoothly take place ?
Presence/absence of target achievement incentives for system participants	Banking, penalty rules, and other functions	Granted certificate banking to generators and parties under obligation	Banking and borrowing guaranteed under the system	Proper functioning of the system for both generators and parties under obligation?
		Penalties to parties not fulfilling their obligations	1 million yen penalty if the obligation is not fulfilled without "legitimate reason"	Sufficient to encourage parties under obligation to achieve their targets?
Interconnection measures for the expansion of new-energy introduction amounts	Interconnection rules	(Reference) German Renewable Energy Law's load-leveling mechanism (cost borne evenly by electricity distributors and suppliers across the nation)	First 3-year obligatory quotas set to require no special interconnection countermeasures, in order to review how costs should be borne and how the network should be operated	Under review
Necessity of self-generators' participation	Feasibility of self-generator monitoring	-	Law not applicable to self-generators	Review of whether the law should be applicable to self-generators' self-consumption in terms of global-warming policies

Table.3: Features of RPS Systems in Various Countries

Nation	Sweden	U.K.	Australia	Belgium ^{*1}	Netherlands	Italy
Year introduced	May 2003	April 2002	April 2001	Jan 2002	July 2001 –	Jan 2002
Target power supply	Wind power, photovoltaic, geothermal, wave power, tidal power, biomass, hydropower (existing hydropower of less than 1.5 MW or hydropower that started operation in July 2002 or later)	Reclaimed gas, sewage sludge, small-scale hydropower, photovoltaic, biomass, energy crops, tidal power, wave power, geothermal, waste (only those derived from non-fossil fuels), hydropower that started operation in 1990 or later	Wind power, photovoltaic, biomass, sewage sludge, reclaimed gas, hydropower, wave power, tidal power, geothermal, energy crops, black liquor, municipalities' solid waste (only those derived from non-fossil fuels)	Photovoltaic, wind power, small-scale hydropower, wave power, tidal power, geothermal, biomass, biogas, sewage sludge, some waste	Wind power, small-scale hydropower (15 MW max.), biomass power generation, biogas, photovoltaic – including imported electricity	Photovoltaic, wind power, geothermal, hydropower (regardless of scale, but not pumped-storage power generation), tidal power, wave power, biomass, waste derived from non-fossil fuels, mixed-combustion power generation
Parties under obligation	End consumers (not manufacturers)	Electricity suppliers	Electricity wholesalers (nearly the same as retailers)	Electricity distributors Electricity suppliers	Electricity suppliers having no obligatory quota	Electricity generators (including self-generators) Electricity importers
Introduction target amount	Additional 10 TWh of generation from 2003 to 2010 (equivalent to an increase from 7.4% to 16.9%)	2002 target: 3% 2010 target: 10.4%	1997 figure: 10.7% 2010 target: 12.7% (an additional 9.5 billion kWh)	2002: 1.4% 2010: 5.0%	1.5% currently 2010 target: 5% 2020 target: 10%	2002: 2% Expanded to 24.7 million kW from 2008 to 2012 (equivalent to a 7% (kWh base))
Scheme for ensuring market liquidity	In addition to renewable-energy generators and electricity suppliers, transmission grid operators, traders, and large-volume electricity users can open accounts. A tie-up with RECS (the European voluntary certificate system) is also envisioned.	In addition to renewable-energy generators and electricity suppliers, traders can open accounts. Allowed to sell ROCs to the emissions trade market (but not vice-versa)	Can register certificates at any time In addition to the establishment of the certificate trade market (REM), the certificate trade is thriving through the nationwide integrated electric-power market (NEM).	Limited locally due to portioning between the federal government and three regions	In addition to electric power, certificates are issued for other energy usages in consideration of the effect of reductions in CO2 emissions by conversion into the equivalent figure in electric power. Certificates are also applicable to imported electric power.	Issuance of an 8-year certificate following the start of facility operation guaranteed As for domestic plants, certificates are issued to planned plants based on estimated amounts of power generation for the year concerned and the following year. Certificates are also applicable to imported electric power.
Incentives for generators	Guaranteed minimum price from 2003 to 2008 (60 SEK/MWh in 2003 and sequentially reduced)	Maintenance of the system guaranteed until 2027	Preferential connection of renewable energies to the transmission grid	Guaranteed minimum price by power-supply type (terrestrial wind power, small-scale hydropower: 5 euro cents/kWh; biomass: 2 euro cents/kWh; photovoltaic: 15 euro cents/kWh)	Electricity distributors mandated to purchase at the guaranteed minimum price	Obligation of power generation Guaranteed minimum price by transmission grid operators Investment support measures for comparatively expensive power supplies and small-scale power Grid access priority for renewable energies
Incentives for parties fulfilling their obligations	Tax breaks (e.g., electricity consumption-tax exemption) Penalty (150% of the average certificate price or 175 SEK/kWh)	Issuance of a climate-change levy (CCL) exemption certificate Buy-out recycling penalty (3 pence/kWh)	Penalty (40 Australian dollars/MWh), but carryover to the following year allowed if the non-fulfillment is 10% or less Penalty reimbursed if the obligation is fulfilled within 3 years	High-level penalty (10 euro cents/kWh)	Tax breaks (e.g., carbon tax exemption) No penalty	Penalty Access limitation to the electric-power market for parties not fulfilling their obligations

Source: Prepared by The Institute of Energy Economics, Japan based on the documentation from the respective countries

Note: *1: Flanders region

Fig.4: Relationship between the RPS System and Other Policy Issues and Related Issues

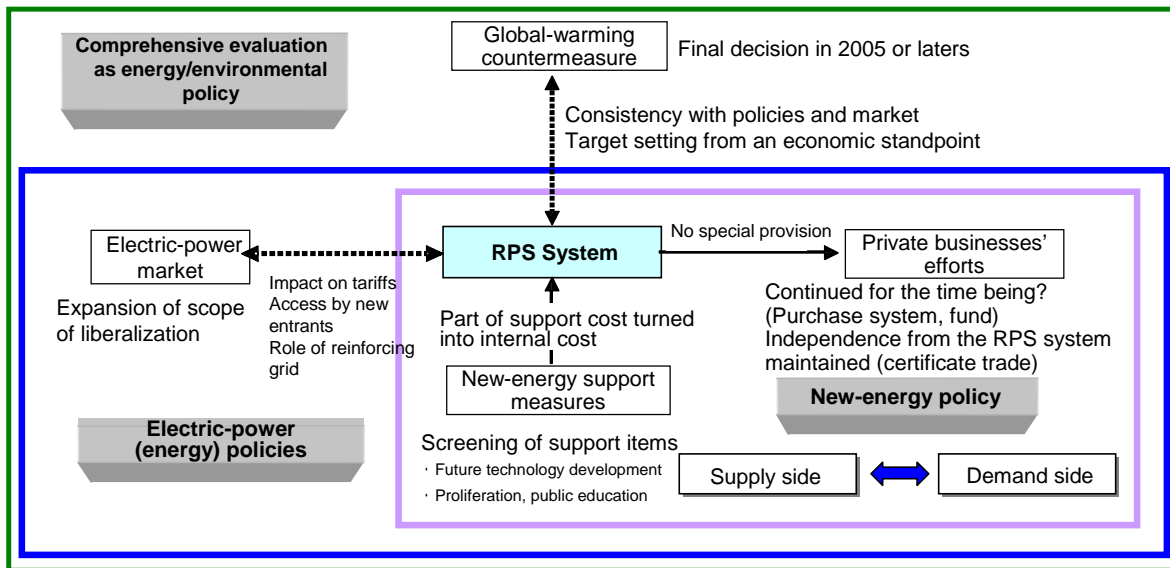
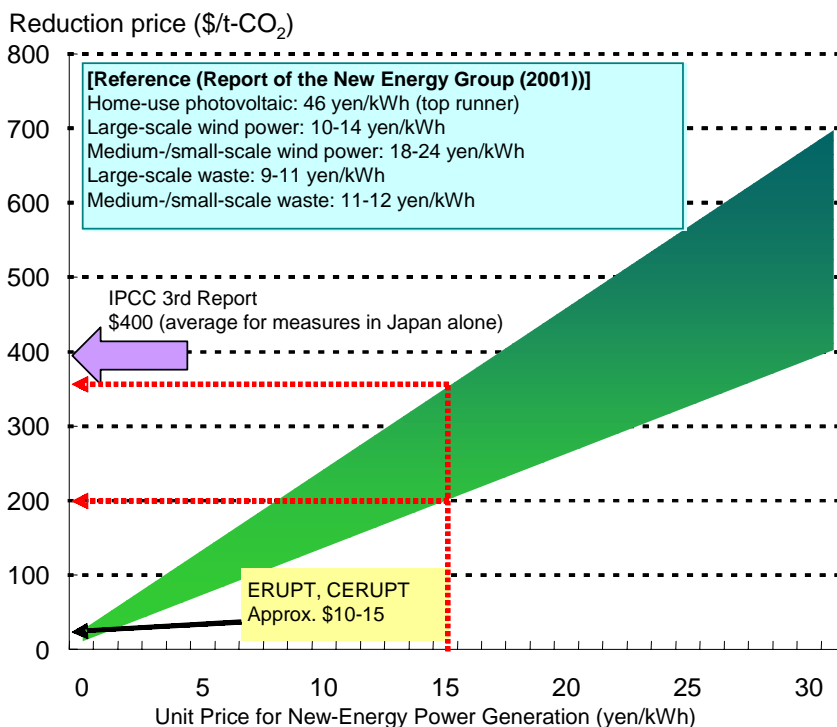


Fig. 5: New-Energy Supply Cost and GHG's Reduction Cost



Source: Prepared based on various documentation

Notes 1. A certain amount of latitude is allowed in new-energy supply costs, depending on the characteristics of each project, in consideration of whether the project is an alternative to thermal power generation (average CO₂-emission unit of thermal/all power supplies). Exchange rate: 120 yen/dollar.

Notes 2. ERUPT (Emission Reduction Unit Procurement Tender), CERUPT (Certified Emission Reduction Unit Procurement Tender): System used by the Netherlands government for the acquisition of GHG credits through JI/CDM projects

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