New Buyback Program for Photovoltaic Generation: Issues in the view of Electric Utilities Industry Policy

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Executive summary

This paper examines the background, the anticipated effects and the issues raised with regards to the New Buyback Program for Photovoltaic Generation, which was introduced based on the enactment of the "Bill on the Promotion of the Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Source Materials by Energy Suppliers" and "Bill to Amend the Act on the Promotion of the Development and Introduction of Alternative Energy"(passed in August 2009).

The New Buyback Program is a system whereby general electric power companies are required to purchase excess electric power generated by photovoltaic generating equipment installed mainly in domestic buildings for a period of 10 years at a fixed tariff. Reducing the cost of power generation is the key to achieve the widespread adoption of photovoltaic generation in Japan. This paper therefore pays attention to the acceleration of cost reductions accompanying the introduction of the new Program, and the subsequent anticipated increase in international competitiveness within related industries. It also touches upon a recent trend that the negative impact of the financial crisis may imply the perspective for the photovoltaic industry is not always positive.

Against this background, this paper seeks to consider, with regard to the introduction of the new Program, the problems arising from changes in policy focus from reducing dependence on oil and the liberalization of the utilities, to the climate change mitigations. It argues that the implementation of the new Program requires a well-defined policy coordination considering the compatibility with existing policies and frameworks. Namely, those issues such as the passing on of the cost of the buyback tariff against the liberalization policy as well as energy competition in ever increasing environmental pressures need to be reviewed in a wider picture of long-term utility policy that are to be build upon a balance between the three pillars of energy, economy and the environment.

Introduction

The Japanese government enacted the "Bill on the Promotion of the Use of Nonfossil Energy Sources and Effective Use of Fossil Energy Source Materials by Energy Suppliers" and "Bill to Amend the Act on the Promotion of the Development and Introduction of Alternative Energy" (2 Energy-related Laws) in August 2009, and the New Buyback Program for Photovoltaic Generation was introduced subsequent to this. The new Democratic government has established long-term targets for reducing greenhouse gas emissions, and is considering measures to significantly increase the scope of buyback of energy generated from renewable sources (the “Full buyback program”), leading to a revitalized debate about the promotion of renewable energy and the consideration of new strategies.

Against this background, the New Buyback Program for Photovoltaic Generation was launched in November 2009 with a high level of interest within society. The new Program uses the increased installation of photovoltaic generation systems in housing and aims to promote the use of Photovoltaic energy and countermeasures to greenhouse gas emissions, while at the same time aiming for benefits to the economy and employment, as well as improving the international competitiveness of Japan’s photovoltaic industry.

Alongside these expectations, however, there are some aspects to the effects of the Program that are not entirely positive. Since the Program requires subsidization by the public (in the form of an increase in electricity charges), there are effects both on electric power companies and consumers, and there are some outstanding issues that require comprehensive consideration from the perspective of energy policy. Japan’s electric utilities industry policy has pursued objectives such as liberalization, countermeasures to global warming and stable supply, which are not

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always easy to balance. Within this, there is a need to consider the significance of the introduction of this new system, and its position within electric utilities industry policy. When aiming for the introduction of future policies such as the full buyback program, these policies need to be positioned within long-term energy and environmental policies, and it is desirable that such considerations be implemented.

For this reason, this paper seeks to give a broad overview of Japan's policies relating to the large-scale introduction of photovoltaic generation, and the background to their introduction, focusing on the New Buyback Program for Photovoltaic Generation, as well as looking at the benefits being targeted by the Program, with the aim of clarifying the effects of introducing the Program and identifying future issues[1].

1. Japan's policies relating to the large-scale introduction of photovoltaic generation

1-1 Outline of the New Buyback Program for Photovoltaic Generation

The New Buyback Program for Photovoltaic Generation is a program according to which general electric power companies are required to buy excess electricity generated from photovoltaic generating equipment that meets certain conditions, at a fixed tariff over a period of 10 years. The cost of buying back this energy will be passed onto consumers' electricity costs as a "Solar Surcharge," which will be applied to all consumers (including industrial consumers) who access electric power from the grid. The buyback tariff per kWh is set for the first year at 48 yen for residential and 24 yen for non-residential buildings, double the autonomous purchase price[2] conventionally paid by electric power companies (24 yen for residential and 11-15 yen for non-residential buildings, when applied to photovoltaic-generated excess power)[3].

Table 1: Main components of New Buyback Program for Photovoltaic Generation

Outline of Program	
Buyback period	• 10 years
Buyback tariff during first year	• Residential buildings: 48 yen / kWh • Non-residential (factories, offices, etc.): 24 yen / kWh • Private generation equipment (double generation): 38 yen / kWh ➢ Photovoltaic generation implemented for the purpose of commercial generation (e.g. Mega-Photovoltaic) is not included in the scope of buyback.
Buyback tariff in second and subsequent years	• Reviewed each year. Expected to be 42 yen in 2nd year.
Cost burden of buyback	• To be added to consumer electricity charges, under the terms of "charges and other supply conditions" in the Electricity Business Act, as "Photovoltaic generation promotion charge" (commonly referred to as the "Solar Surcharge")
Termination date of Program	• Not specified
Definitions, and details of Program	

[1] See (Appendix 1) at the end of this document for information regarding the state of and trends in the introduction of new and renewable energy in Japan.

[2] See (Appendix 2) at the end of this document for information regarding the autonomous measures implemented by private companies relating to new and renewable energies.

[3] The Electric Utilities Industry Subgroup has established the "visualization" of costs relating to new energies, through measures relating to basic charges and corporate accounting. The costs incurred by the New Buyback Program for Photovoltaic Generation, however, are not included in the additional costs relating to the introduction of new energies, and there is at present no information available relating to standards for cost bearing within the system. (2nd Report (proposed) of the Electric Utilities Industry Subgroup, Advisory Committee on Energy and Natural Resources, June 2009)

Excess electric power	• The amount of electricity fed back into the grid by domestic generating equipment
Residential building	• A building used for residential purposes by a family or individual. May include residential buildings that are in dual use as shops or offices. • Scale of generation is max. 10kWh • Includes existing and new residential buildings, and collective housing
Non-residential buildings	• Factories, offices, etc. (government offices, hospitals, road facilities, stations, water utility facilities, schools, commercial buildings, disaster prevention facilities, etc.)
Commercial generation purposes	• 500kW or more output • Where, however, generation equipment is installed on a residential building with output greater than the contracted quantity for use by the building in question, interpretation of this regulation will be communicated by letter.
PPS	• Not included in requirement to buyback. Excess electricity generated by PPS consumers may be bought back by PPS in place of general electric utility companies.
Cost burden	• Of the 48-yen buyback price, 42 yen can be passed on, having subtracted the avoidable unit cost of 6 yen (average variable cost of all electric power sources). • Designed so that burden increases in proportion to volume of electric power used • Collected based on buyback cost results for general electric utility companies in each region
Passing on costs of buyback	• To begin in April 2010.

Other notes	
Voluntary buyback	・After completion of buyback period under new program (10 years), it is still not confirmed whether electric utility companies will engage in autonomous buyback or not.

(Source: Created from materials used in subcommittee considering buyback program within 37th meeting of New Energy Subgroup, 20th August 2009)

Fixed-cost buyback systems for alternative or renewable energy generation (known as "Feed-in Tariffs") have been widely introduced in Europe and other countries. The Japanese Program, however, has the following specific attributes.

1. It is designed to work mainly with small-scale (max. 10kW) generation equipment installed in general residential buildings, and the buyback is restricted to the excess electricity, which is left over after the household has consumed the power it requires. (In Germany, for example, all generated power can be bought back, and the program there includes the purchase of electricity generated by commercial bodies). Restricting buyback to excess electric power allows the cost burden of buyback to be kept to a relative minimum.
2. The New Buyback Program can be used in conjunction with the existing renewable energy introduction allocation system (RPS, Renewable Portfolio Standard) (for example, in the United Kingdom, which has placed RPS at the center of its policies, the government is currently considering limited fixed-fee tariff buyback systems applicable to small-scale photovoltaic generation).

1-2 Subsidy strategies for the introduction of photovoltaic generation systems

It is anticipated that most photovoltaic generation systems will be installed in residential buildings. The

government restarted[4] the subsidy system for domestic photovoltaic generation in January 2009, and under the terms of this, pays a grant of 70,000 yen per 1kW towards the installation of photovoltaic generation equipment with a total output of up to 10kW, and which costs a maximum of 700,000 yen/kW (Table 2).

Table 2: Outline of subsidy systems for the introduction of photovoltaic generation, and preferential tax treatment

	Residential	Non-residential
Subsidy	・ For systems with output up to 10kW, and which cost less than 700,000 yen per kW, a subsidy of 70,000 yen per 1kW for photovoltaic generation equipment that meets certain conditions relating to quality assurance, etc.	・Local government, etc. Half cost of introduction ・Private sector 1/3 cost of introduction
Tax advantages	・Reduced tax on new-build loans ・Reduced tax on energy-saving reforms	・7% tax-free (for small and medium enterprises), or immediate amortization ・Special exemption from fixed asset tax

(Source: Created from Resources & Energy Agency materials)

1-3 Purpose of introducing photovoltaic generation

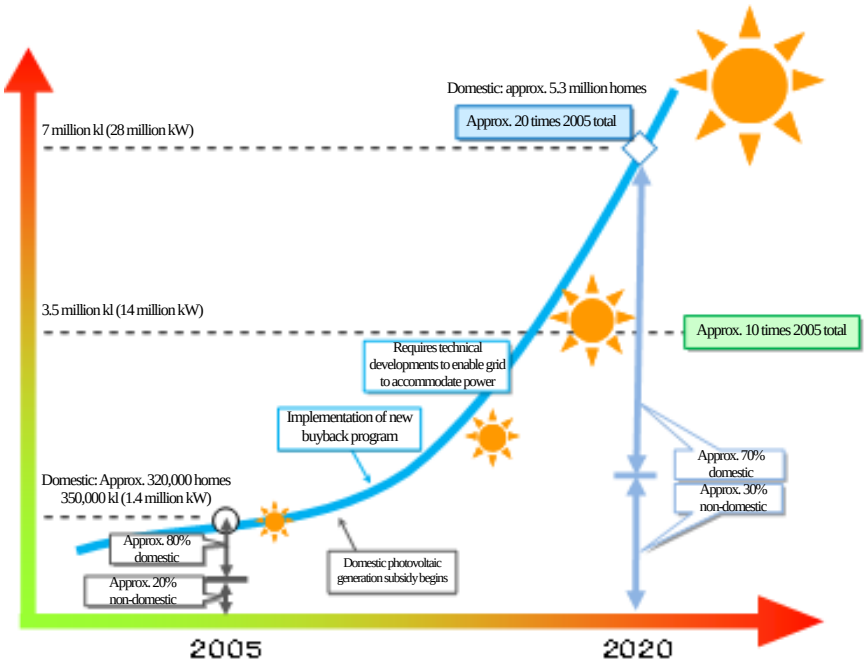
The New Buyback Program for Photovoltaic Generation was introduced as a major tool to promote the large-scale introduction of photovoltaic generation in Japan. The current target for introduction is to increase energy produced in this way by approximately 20 times by 2020 (to around 28 million kW)[5]. The Advisory Committee on Energy and Natural Resources' New Energy Subgroup has proposed that, compatible with this, an appropriate target for the proportion of final consumption energy derived from renewable sources should be 20% by around 2020[6].

The new government led by Prime Minister Hatoyama has expressed an intention to strengthen countermeasures against global warming, and has established greenhouse gas reduction targets (25% reduction against 1990 totals by 2020). Specific details regarding policies or the makeup of reductions towards these targets have not yet been given, but the wider utilization of renewable energy has been prioritized, and considerations have begun of a program of "total buyback of power generated under all methods."

[4] The government's subsidy program for domestic photovoltaic generation began in 1994 with the "Residential Monitoring Program", which continued until 2005 in the form of the "Residential Photovoltaic Generation Promotion Project". The subsidy per 1kW was 900,000 yen at the time of the project's inception, but was gradually reduced. In fiscal 2003, the subsidy was 90,000 yen, reducing to 45,000 yen in fiscal 2004, and dropping further to 20,000 yen in fiscal 2005. The program was stopped altogether at the end of fiscal 2005. Subsequently, the government began to prioritize photovoltaic generation in a range of policies beginning with the announcement of the "Fukuda Vision," and the subsidy system was restarted in January 2009. In November 2009, a project report stated that the system should be revised to buyback all power generated, and the decision was taken not to earmark any further budget for the subsidy system.

[5] Included in the Countermeasures to Economic Crisis, published by former Prime Minister Aso in April 2009. The Action Plan for Achieving a Low-Carbon Society, which was passed by the cabinet in 2008, contained the target of 53 million kW by 2030.

[6] Mid-term Report (proposed) from The Advisory Committee on Energy and Natural Resources' New Energy Subgroup, entitled "Towards the creation of an alternative energy society involving the participation of all citizens," issued 25th August 2009



Source: Resources & Energy Agency

Diagram 1: Introduction scenario for photovoltaic generation (trial calculations)

2. Background to introduction of Program and objectives

The origins of Japan's alternative and renewable energy policy lie in the former Ministry of International Trade and Industry, which implemented the "Sunshine Plan (1974)" as a state project, and the Law Concerning Promotion of the Development and Introduction of Alternative Energy, which was passed in 1980 in response to the oil shocks. Subsequently, the 1990s saw the passing of the Law Concerning Special Measures to Promote the Use of New Energy (New Energy Law) in 1997, and in 2003, the RPS Law (or the Law Concerning Special Measures to Promote the Use of New Energy by Electric Utility Companies) was passed.

In August 2009, the 2 Energy-Related Laws were defined[7] against a background of policy discussion with the aim of achieving both countermeasures to global warming and energy supply stability. Reforms were implemented to the Alternative Energy Law, which was by now 30 years old, and the framework of energy policy made a significant switch from seeking alternatives to oil over to seeking alternatives to fossil fuels (including the efficient utilization of fossil fuels).

While this was going on, a policy to establish the New Buyback Program for Photovoltaic Generation was announced on 25th February 2009 by Mr. Nikai, Minister of the Economy, Trade and Industry at the time. The purpose of introducing a buyback program was to create an opportunity for citizens to participate in countermeasures against global warming through the installation of photovoltaic generating systems on their houses, etc., while at the same time increasing the use of photovoltaic generation in the production of domestically sourced energy. Furthermore, in addition to the objectives of implementing countermeasures against global warming and increasing energy security, the project also sought to contribute to the development and actually increased the global competitiveness of Japan's photovoltaic industry, and to contribute to employment, thereby having significance in both economic and industrial policy. The reason for including

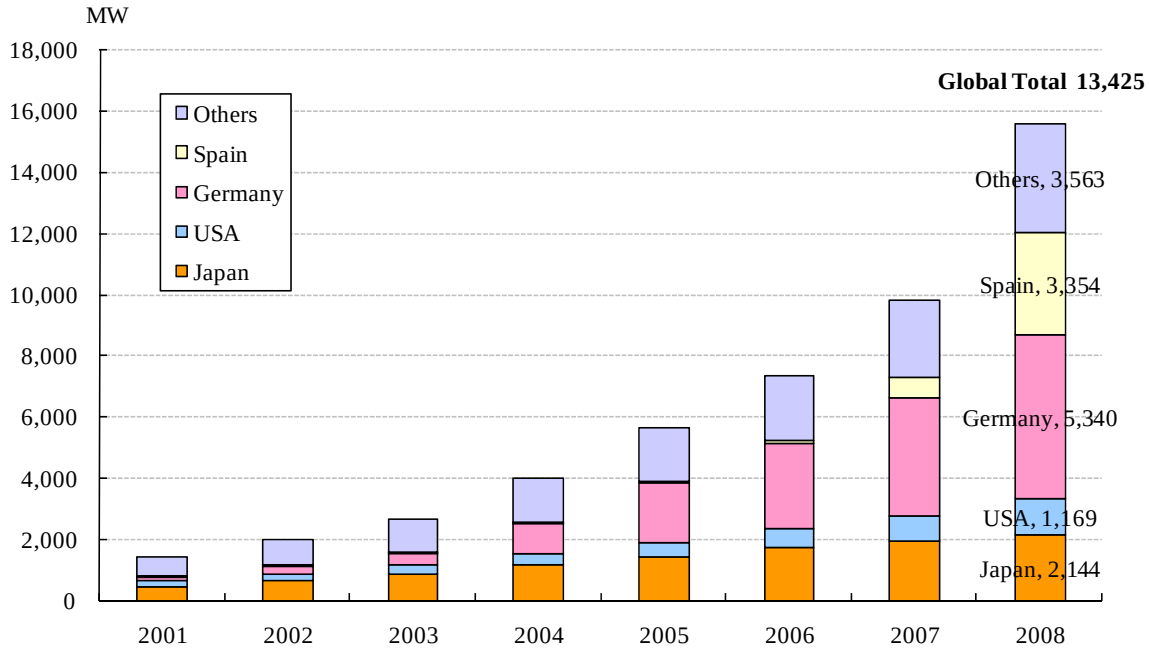
[7] The Act on the Promotion of Non-Fossil Energy Sources and the Efficient Use of Fossil Energy Sources by Energy Supply Utility Companies (Act on the Upgrading of Infrastructure for Energy Supply), which makes requirements not only of electric utilities companies but also of gas and oil companies with regard to the broad introduction of new and renewable energy sources, and the Partial Reforms to the Bill on the Promotion of the Development and Introduction of Alternative Energies (Bill on the Promotion of the use of Non-fossil Energy Sources), which promotes the use of non-oil energy. Enacted 28th August 2009. Please see (Appendix 3) at the end of this document for details on the scope of applicability to utilities companies.

industrial policy perspective here has to do with the position of Japanese manufacturers within the global photovoltaic cell market.

A look at global trends in the photovoltaic cell markets shows that Japan's installation capacity (cumulative) for photovoltaic cells was no. 1 in the world up until 2004, but in 2005, this was overtaken by Germany, which experienced sudden growth in domestic installation due to the introduction of a high-value fixed tariff buyback system that year (Diagram 2). Similarly, in terms of global share of photovoltaic cell production, Japan was the largest producer in the world until 2007, but was overtaken in 2008 by Germany (2nd) and China (1st) to fall to third position (Diagram 3).

One factor that can be pointed to in Japan's losing its lead in the area of photovoltaic generation is the elimination of the subsidy system for photovoltaic generation (although it was subsequently reinstated, see 1-2 above). Japan's sales of photovoltaic cells have grown almost every year, but domestic sales began to decline in 2005 after the government subsidy was scrapped, and in 2008, domestic sales had dropped to only 20% of the overall figure (Diagram 4). Japan's exports of cells have continued to grow, although overseas manufacturers are increasingly making their presence felt in the global market as a whole (Diagram 5).

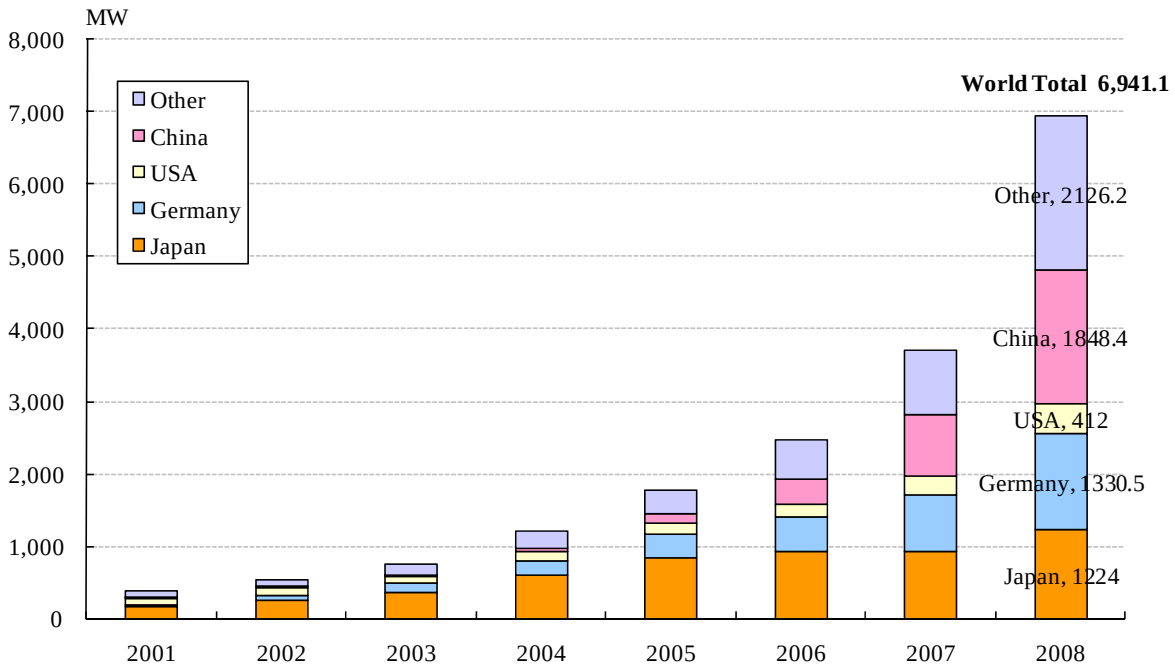
Against this industry background, the Japanese government has prioritized the strengthening of the international competitiveness of the photovoltaic industry as one of the objectives of the introduction of the new Program. Through stimulating domestic demand for photovoltaic generation, it aims to "reduce the cost of photovoltaic generating systems to around half its current level within three to five years."[8]



(Source: Photovoltaic Power Systems Programme (PVPS), IEA, 2009)

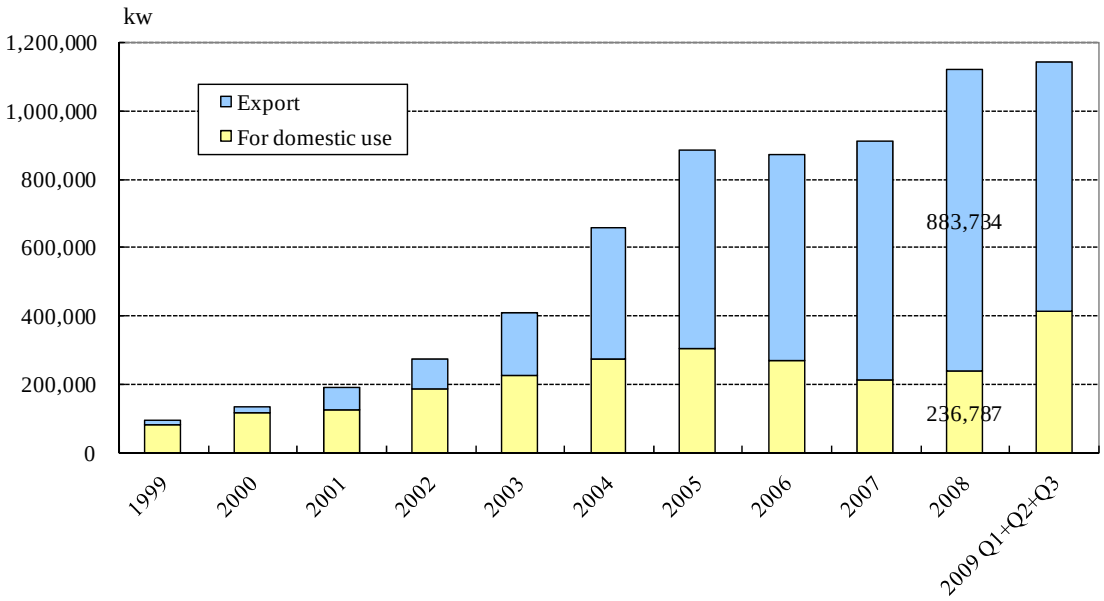
Diagram 2: Trends in cumulative introduction of photovoltaic cells in major countries

[8] See next page for cost of photovoltaic and other types of generation.



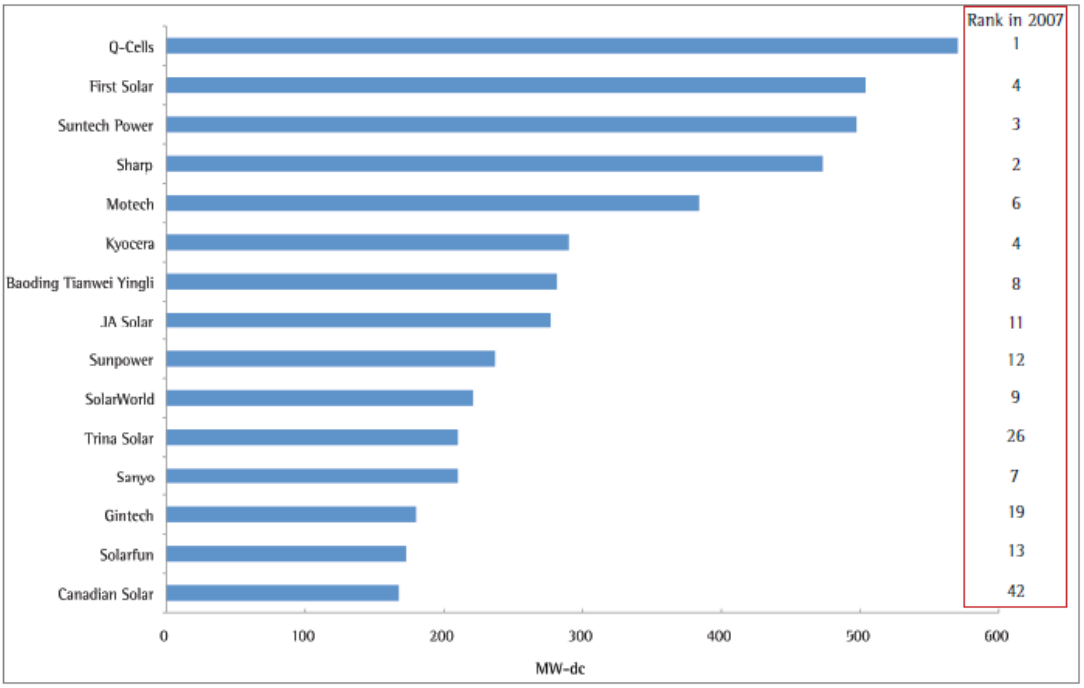
(Source: PV News, April 2009)

Diagram 3: Trends in manufacturing quantity of photovoltaic cells by major countries



(Source: Japan Photovoltaic Energy Association (JPEA))

Diagram 4: Trends in quantity of photovoltaic cells sold by Japan (kW)



(Source: PV News, April 2009)

Diagram 5: Global top 15 companies engaged in manufacturing photovoltaic cells (production quantity in 2008, MW)

3. Benefits sought by the New Program, and Current Prospects

3-1 Quantitative significance for energy supply

The "Long-Term Energy Supply and Demand Forecast (recalculated proposal)"[9] predicts that, with the maximum foreseeable introduction of photovoltaic generation based on the implementation of this Program, energy equivalent to 7 million kl of oil will be generated this way in 2020. This figure rises to 13 million kl in 2030, making it a significant, large-scale prospect in comparison with the introduction of other renewable energy generation systems (Table 3).

[9] The government published its mid-term objectives regarding reductions in greenhouse gases in June 2009, which aim to reduce emissions of greenhouse gases by 15% against 2005 levels by 2020 (an 8% reduction against 1990 levels). Based on this, forecasts published in May 2008 were recalculated. With the change of government, a full review of the mid-term objectives has also been undertaken.

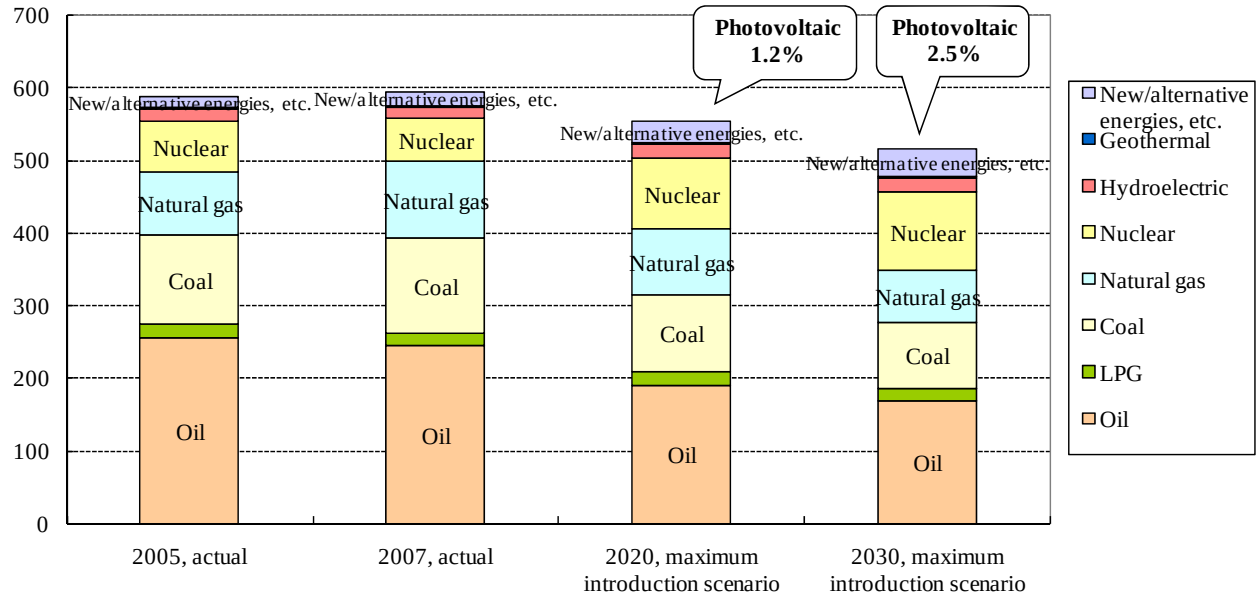
Table 3: Predictions of new and alternative energy introduction according to Long-Term Energy Supply and Demand Forecast (recalculated proposal)

Unit: ktoe (kilotons oil equivalent)

	Fiscal 2005	Fiscal 2020		Fiscal 2030	
	Actual	Fixed at current state / continuation of efforts scenario	Maximum introduction scenario	Fixed at current state / continuation of efforts scenario	Maximum introduction scenario
Photovoltaic generation	35	140	700	669	1,300
Wind-powered generation	44	164	200	243	269
Waste/biomass generation	252	364	408	435	494
Biomass thermal utilization	142	290	335	402	423
Other*	687	707	812	638	727
Total	1,160	1,665	2,455	2,387	3,213

*Other includes Photovoltaic heat utilization, waste-generated heat utilization, black liquor/waste wood, etc.

(Source: Long-Term Energy Supply and Demand Forecast (recalculated proposal), August 2009)



(Source: Long-Term Energy Supply and Demand Forecast (recalculated proposal), August 2009)

Diagram 6: Primary energy supply forecast (calculated in million kl of oil equivalent)

Despite this, however, the proportion of primary energy supply that can be provided by photovoltaic generation is 1.2% in 2020, and 2.5% in 2030 (Diagram 6). Even if photovoltaic generation is introduced in line with the significant growth objectives, the low level of utilization of the equipment (at present, this is around 12% in Japan) means that the quantitative contribution it can make to the total energy supply (and therefore to CO2 emissions reductions) is likely to be limited. The target for equipment capacity in 2020 (28 million kW) is equivalent to no more than 2.8% of the total current generation of Japan (approximately 1 trillion kW in 2007). The potential assessment of the International Energy Agency (IEA) forecasts Japan's photovoltaic generating capacity in 2020 as 26 billion kWh, which represents only around 2.6% of the total power generated (in 2007)[10].

[10] "Deploying Renewables: Principles for Effective Policies," IEA, 2008. Forecast for Japan is based on policy objectives, and envisages the installation of residential photovoltaic generation equipment in 5.3 million homes (with residential providing 70% of the total target installations). The IEA calculations indicate realizable potential, and include the installation of photovoltaic generating systems integrated with building materials, etc.

A comparison of the generating costs of the major forms of renewable energy shows that at present, photovoltaic generation is the most expensive (Table 4). If the increased introduction of photovoltaic generation is to be targeted on a scale that exceeds other renewable energy generation methods, the issue of reducing generating costs will be a highly important issue. As discussed in (4.) below, the large-scale introduction of renewable energy generation will involve costs in areas such as the stabilization of the grid, and care needs to be taken to understand this.

Table 4: Unit cost of renewable energy generation

Technology	Unit cost of generation (yen/kWh)
Photovoltaic	49
Wind	9-14
Biomass	7.8
Small-scale hydroelectric	7.2
Geothermal	16

(Note: Biomass and small-scale hydroelectric generation values are "RPS equivalent quantity + electricity" weighted average costs taken from the Ministry of Economy, Trade and Industry 2007 survey
(Source: Created from Mid-term Report (proposed) from The Advisory Committee on Energy and Natural Resources' New Energy Subgroup, entitled "Towards the creation of an alternative energy society involving the participation of all citizens," August 2009

3-2 Reducing the cost of photovoltaic generation

As stated above, reducing the cost of photovoltaic generation systems is one of the key elements in succeeding with the future wide-scale introduction of photovoltaic generation. According to the "Photovoltaic Generation Roadmap (PV2030+)" published by the New Energy and Industrial Technology Development Organization (NEDO), reducing the costs of the system will allow photovoltaic generation to gradually realize grid parity[11] (a pricing structure that is competitive with electric power from the grid: parity with domestic electricity by 2020 (23 yen/kWh), institutional electricity by 2030 (14 yen/kWh) and utility electricity by 2050 (7 yen/kWh)). In Europe, technical developments and an increased level of introduction of the technology has allowed cost reductions of 8% per year to be achieved, and some predictions forecast that costs will be halved within 8 years[12].

In response to these forecasts, the incentives offered by the current buyback program are designed to speed up the wider adoption of residential photovoltaic generation systems in Japan, and realize a halving of the cost of production of such systems through the effect of mass-production within 3 – 5 years. If this objective can be achieved, and the cost of photovoltaic generation can be brought to a level that is competitive with lighting costs (approx. 23 yen/kWh), there is a strong possibility that household photovoltaic generation installations will begin to accelerate sharply.

At the same time, there are some doubts about the ability to lower costs simply through the benefits of mass production[13]. Furthermore, if the buyback program is continued and costs are not reduced in line with objectives, there is likely to be resistance from consumers, who have to bear the burden in terms of additional charges for electricity. The government is monitoring price trends in the market with a view to setting future buyback prices, while bearing in mind cost reduction targets, and intends to gradually reduce these, but at present, a date for the completion of the program has not yet been set.

The buyback price is intended to ensure that people installing a system will recoup their expenditure within

[11] "Photovoltaic Generation Road Map (PV2030+) – Technical development strategy for photovoltaic generation, viewed up until 2050" (8th June 2009, NEDO)
[12] "SET for 2020," European Photovoltaic Industry Association, February 2009
[13] Minutes of meeting of Subcommittee considering buyback program, New Energy Subgroup

10 years, but the economic viability of the program for individual people installing a generation system will differ depending on the levels of subsidy available for initial costs from local authorities, the level of excess power they generate, the availability or otherwise of buyback once the program is completed and other conditions, creating significant differences in the level of viability. Since levels of awareness are also low regarding these issues, it is important that measures are taken to improve the reliability of the Program[14].

3-3 Trends in the photovoltaic cell market and related industries

The stimulation of domestic demand through the introduction of the Buyback Program is a good supportive base for Japan's photovoltaic cell industry, most of which is currently channeled into overseas exports. It is anticipated that this increased domestic demand will strengthen the business base of companies involved in the industry. According to the European PhotoVoltaic Industry Association (EPIA), reducing the cost of systems makes the photovoltaic cell industry gradually more competitive. The Association forecasts that by 2020, 76% of the electricity market in Europe will no longer require subsidy[15].

Behind this, however, lies the fact that the European market, which is the leading market in the world in this sector, has fallen into over-supply of photovoltaic cells, with some manufacturers reporting serious effects as a result. This situation has been caused by the effects of the global financial crisis[16], the fact that Spain, which was engaged in high-value fixed-fee tariffs, has changed its pricing and the scope of applicability of buyback[17], and also by the fact that China and other Asian manufacturers have increased competition[18], causing a drop in the cost of related products.

As demonstrated by trends in the European markets, the current photovoltaic cell market is markedly affected by changes in the fixed-fee tariffs in buyback programs. This can also cause significant differences in the profits or losses made by manufacturers. Even if the cost of photovoltaic generation were to be reduced by half, it would still be expensive compared to the cost of generating electricity via other alternative and renewable energy sources. If the comparison is made on economic factors alone, it appears that it may be difficult for photovoltaic generation to ever reach a position of superiority. Strategic development of the photovoltaic cell industry must therefore be considered in the light of this.

4. Influence of the introduction of the New Buyback Program for Photovoltaic Generation, and issues for future consideration

The buyback fee offered as part of the New Buyback Program for Photovoltaic Generation is designed to be "fully participatory" and paid for by all consumers using electricity from the grid (including industrial users). The current system, which requires general electric utilities companies to pass on the cost to consumers in their electricity charges, includes some important issues not only for consumers of electricity but also for energy utilities companies. The following section discusses the effects of the introduction of the Program, and issues for consideration based on the processes involved in electric utilities policy to date.

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[14] There have been complaints that the explanations given by the government regarding the subsidy and buyback systems as part of its promotion of photovoltaic generation system sales, etc., differ from reality. The Ministry of Economy, Trade and Industry has set up a helpdesk to respond to these enquiries. "Regarding measures taken to protect consumers installing photovoltaic generation equipment," Ministry of Economy, Trade and Industry, 8th October 2009.

[15] "SET for 2020," European Photovoltaic Industry Association, February 2009

[16] PV News, Vol.28, Number 2, February 2009 reports financial difficulties among photovoltaic cell manufacturers as a result of the global financial crisis, with many manufacturers apparently putting off the construction of new plants or restructuring staff. In addition, according to "Global Trends in Sustainable Energy Investment 2009" (UNEP, 2009), while the renewable energy industry grew at a double-figure rate until 2007, it shrank by 5% in 2008 due to reduced capital markets.

[17] Implementing frequent (quarterly) reviews of fixed-fee tariffs (for example, reducing the price for power generated by residential photovoltaic systems from 41-44 cent/kWh to 34 cent/kWh), and the upper limits of applicability (reducing the overall capacity of applicable equipment to 500MW), etc.

[18] FT (19th August 2009), Reuters (29th June 2009), etc. The Nikkei Shinbun (12th September 2009) reported that the results of photovoltaic cell companies were worsening, and that during the period April – June 2009, business results for domestic major manufacturers were expected to fall into negative figures.

4-1 Fair burden on consumers

Trial calculations by the government indicate that the cost of buyback incurred as a result of the introduction of the program will be on average 0.1 yen/kWh for a standard household in the first year, and that even if the Program expands in the future, the cost burden will be between 10 and 100 yen per month. In fact, however, it is thought that there will be a significant disparity in levels of introduction between areas that are more and less suited to photovoltaic generation, and it is anticipated that the additional charges imposed by electric power companies will vary depending between areas.

In the industrial sector, the same trial calculations show a monthly cost burden across the entire industrial sector of around 3 billion yen at the start of the Program, of which the cost burden to be born by large-scale consumer industries would be 2.35 billion yen per month (Diagram 7).

For a company that does not include photovoltaic related products within its strategic portfolio, this cost burden is thought to effectively offer a relative advantage to other sectors or even to competitor manufacturers. The system is designed to support changes to industrial structure through sharing the burden appropriately according to demand for electrical power, but the scale of the burden and the appropriateness of industrial development strategies need to be proceeded with only after agreement with wider society. The operation of future projects, and reforms or revisions, need to be promoted through policies that realize cost reductions in the generation of renewable energy, and it will be important that planning is done in the wider context of social debate, so that excessive policies such as the requirement to buyback power, and the passing on of cost burdens in the form of electricity charges, can be "graduated" from as soon as possible.

	At introduction	5th – 10th year
Total value of buyback (yen/year)	80 – 90 billion yen	180-300 billion yen
Cost of buyback per kWh (yen/kWh)	Approx. 0.1	Approx. 0.15-0.30
Cost to standard household (yen/month)	Approx. 30	Approx. 45-90
	Approx. 300	Approx. 300
Total cost to industry (yen/month)	Approx. 3 billion	Approx. 4.5-9 billion
Proportion of above consumed by large-scale consumer industries (yen/month)	Approx. 2.35 billion	Approx. 3.50 – 7 billion
E.g. Machinery	Approx. 600 million	Approx. 900 million – 1.8 billion
E.g. Steel	Approx. 300 million	Approx. 450 million – 900 million
E.g. Chemical	Approx. 250 million	Approx. 380 million – 750 million
Total electricity consumption of industry as a whole (kWh/month)	Approx. 30 billion	Approx. 30 billion
Proportion of above consumed by large-scale consumer industries (kWh/month)	Approx. 23.5 billion	Approx. 23.5 billion
E.g. Machinery	Approx. 6 billion	Approx. 6 billion
E.g. Steel	Approx. 3 billion	Approx. 3 billion
E.g. Chemical	Approx. 2.5 billion	Approx. 2.5 billion

- Standard household and large-scale consumer industry both calculated based on current consumption figures
- From Federation of Electric Power Companies' fiscal 2008 electricity consumption demand figures (report) 30th April 2009

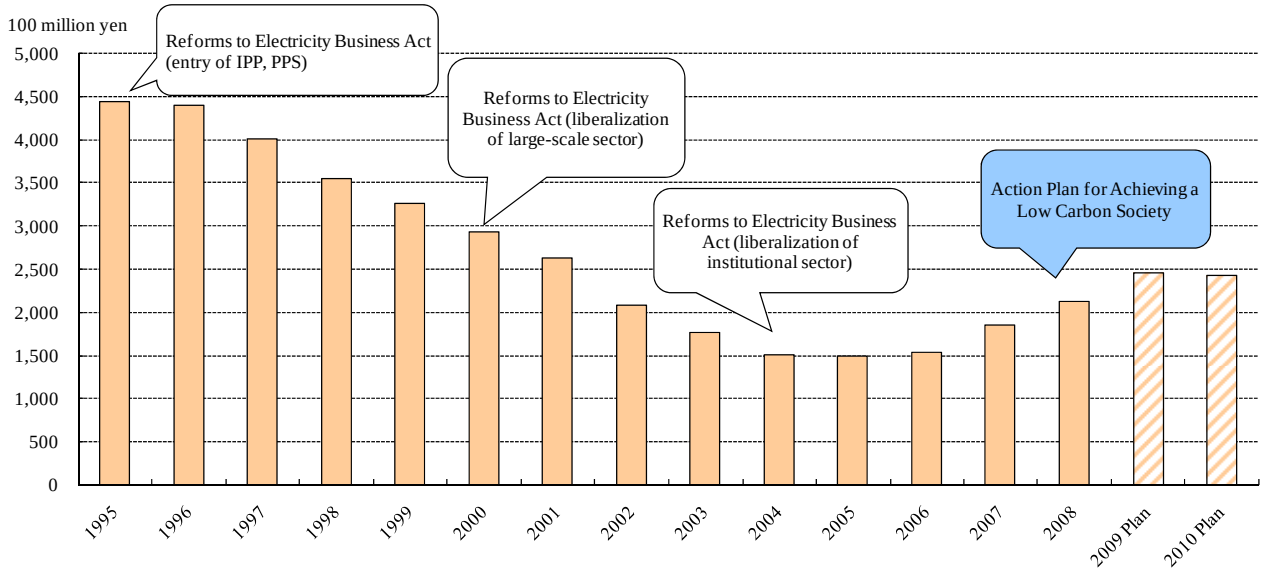
(Source: "Detailed Planning of Buyback Program (Proposal)," New Energy Subgroup, 25th August 2009

Diagram 7: Cost burden on consumers as a result of the introduction of the New Buyback Program for Photovoltaic Generation (trial calculations)

4-2 Passing on of charges, and changes in policy priority

Another severe problem is the fact that any rise in electricity charges resulting from passing on the cost of buyback is an obstacle to fair competition among electric utility companies.

The liberalization of Japan's electric power sector began in the early 1990s with a policy created with the intention of increasing the efficiency of the energy supply system and increasing flexibility, based on market principles. Subsequent reforms to the Electricity Business Act in 1995 allowed designated independent power producers (IPP) and designated scale power producer & suppliers (PPS) to enter the electric power market. Since 2000, there have been increasing numbers of calls for a review of liberalization promotion policy, and complete liberalization of the domestic and retail sectors has been put on hold, but the execution of policy in regard to the relaxing of regulations has resulted in 60% of Japan's electric utilities sectors being liberalized. Within this policy framework, electric utilities companies must aim for profitability while competing to provide services to customers, and their strategic responses mean that facilities investment has been limited, as companies work to ensure they have the resources to lower electricity charges (Diagram 8).



(Source: 1995-2008: The Electric Utilities Manual, 2009-2010 (plans) taken from various companies' materials.

Diagram 8: Trends in and plans for facilities investment by 10 electric utilities companies

During this period, the focus of policy surrounding electric power utilities has changed to reflect the recent concern with the creation of a low-carbon society, and energy safety guarantees. Against this background, the New Buyback Project for Photovoltaic Energy was agreed, including the issue of passing on the cost burden in electricity charges, leading to a strengthening of the sense that electric power companies are once again acting as public utilities.

Many specialists with knowledge of electric utility policy and political decision-making agree with the principle of introducing the new Program, but also point to a significant need for a long-term view to be taken in the promotion of policy frameworks in regard to the consequences of liberalization policy, and competition between energy utilities companies in the future (including environmental countermeasures)[19]. As political and economic changes take place, even if policy priorities change, utilities companies continue to exist in an environment and within systems created by previous policy, and are impacted by those factors. PPS companies, for example, entered the electric utilities market as suppliers of a particularly cost-competitive type of electricity (mainly from coal-fired generation) during the process of the easing of regulations, but the requirement to introduce new and renewable energy in order to implement countermeasures to global warming means that utilities companies now have to operate under an entirely different set of competitive conditions than those they are used to. Rather than requiring all companies to implement the same set of environmental countermeasures, many people now think that it would be

[19] Minutes of the 37th Electric Utilities Subgroup

better to divide up the responsibility in line with the type of service being offered, and the scale of the company in question[20].

As can be seen from these examples, the current electric utilities policy requires a more coordinated approach, since it is currently in a process where its focus is changing and it is starting to diversify. When looking at policies to expand the introduction of renewable energy, cost burden is going to be an even more significant factor in the future. In order, however, to ensure that a broad objective is established that includes a balance between environmental, energy and economic factors, it will be important to ensure consistency and coordination in energy utility policy, based upon which the issues of cost burden and passing on costs as electricity charges can be discussed.

4-3 The issue of competition between energy types, including environmental countermeasures

The issue of how to maintain competition between energy utilities companies, while at the same time promoting environmental countermeasures by companies, is an important one in policymaking, and with the introduction of the new Program, it is important to ensure that obstacles are not created to implementing the required incentives. For example, when considering the current Program, the issue of "double generation" (excess power being produced by residential or other buildings implementing both home generation and photovoltaic generation together) led to discussions around competition between types of energy, which has been caused by the introduction of the new Program. The issue of how to position "Eco-generation[21]" (home fuel cells and other new technologies other than photovoltaic) within the Program divided interested parties significantly. In the end it was decided that as an exception, a discounted buyback price should be implemented (39 yen/kWh for homes with photovoltaic and other kinds of generation, as opposed to 48 yen/kWh for those with photovoltaic only)[22].

This results in a situation whereby electric power companies are required to reflect in their electricity charges the buyback cost of excess electric power generated as a result of work done by their competitors (gas or oil companies) in installing home fuel cells, etc., while on the other hand, customers of gas and electricity companies who have taken the decision to install what are currently costly environmental measures find that, if their generation methods are counted together with photovoltaic generation, the buyback price for their excess power is discounted.

The interests of all parties can never be equally reflected in the introduction of a new system, and the case of double generation is just one example of a problem that came to light in the consideration of the new system. In future policy considerations, however, importance must be placed on integrated technical evaluation and program design from the perspective of broadly promoting the development of new technologies that will contribute to the achievement of a low-carbon society.

4-4 Measures taken in the grid, in preparation for the broad introduction of decentralized generation

The introduction target for photovoltaic generation (28 million kW by 2020) is set at a level that far exceeds the current feed-in capacity of utilities companies utilizing the grid, and has opened up the possibility of significant changes being required to existing electrical infrastructure. In Europe, where the introduction of new and renewable energies has progressed at high speeds, the problem of insufficient grid capacity has already been identified in survey results as growing more serious[23]. In the future, before new and renewable energies, including photovoltaic generation, can be introduced on a large scale, it will be vital to ensure that measures are

[20] An example is the Onahama Coal-fired Generating Plant (owned jointly by Nihon Kasei and Diamond Power). Construction plans were the subject of disagreements between the Ministry of the Environment, which refused approval on the grounds of CO2 emissions, and the Ministry of Economy, Trade and Industry, which felt the entry of new utilities companies to the coal-fired generating industry was required in order to achieve a stable energy supply. (Press release from the Ministry of Economy, Trade and Industry, 28th May 2009).

[21] The Ministry of Economy, Trade and Industry has implemented a subsidy system for the cost of purchasing home fuel cells, in order to promote their adoption, as of fiscal 2009. Subsidy = (Equipment cost – standard cost of conventional boiler) x 0.5 + half the cost of installation (max. subsidy 1.4 million yen).

[22] Estimates place the additional benefit of home generation equipment on excess generation as approximately 10-20%. This was the reasoning behind agreeing to discount the buyback price by around the same level, to 39 yen/kWh.

[23] "Report on European Field Study of measures taken to ensure Grid Stability in the event of Large-Scale Introduction of Alternative Energy"

taken to stabilize the grid.

In Japan, trial calculations based on the assumption that photovoltaic generation is introduced on a large scale (53 million kW by 2030) have resulted in predictions of an additional 4.6 – 6.7 trillion yen investment required to meet the need for storage cells and regulated power supplies[24] (cf. the 2.1242 trillion yen planned for facilities investment by 10 electric power companies in fiscal 2008, see Diagram 8). Measures that could be taken to upgrade the grid include improvements to the grid, measures relating to decentralized power sources, and various combinations of the two[25], but whatever the way forward, the cost of implementation is not included in the buyback costs of the current Project, and the issue of how this will be specifically funded has been left for future consideration[26].

The introduction of smart technology for power distribution ("smart grid" or the use of smart meters) is one of the options under consideration in relation to the upgrading of the electric grid before the widespread introduction of decentralized generation[27]. The definition of "smart" differs from country to country, but in Japan, as in other places, upgrades to the grid are a pressing issue in relation to the widespread introduction of new and renewable energies, both on a technical and a systematic level. At the same time, developments in energy saving and new or renewable energies (decentralized power sources), and the effects of smart measures introduced to the power transportation network are expected to cause a decline in demand for electric power, and bring about other significant changes to the economic and social environment that will impact electric utility companies. Given this, the issues of how to ensure the required investment, how to promote measures being taken, and the future state of electric utilities companies and social infrastructure all need to be considered.

4-5 Compatibility with existing policies

To date, promotion strategies in Japan for new and renewable energies have focused on the introduction of renewable energy by electric utilities companies (RPS). For this reason, the introduction of the New Buyback Program was considered in the light of its relationship to the RPS Law[28]. As a result of this, it was decided that residential photovoltaic generation, which is the focus of the New Buyback Program, would not be included when calculating electric utilities companies' RPS supply. In response to this, the RPS requirement was revised to exclude the quantity of power expected to be acquired through the buyback of power from residential photovoltaic generation[29].

In this way, RPS, which specifies the purpose of use of renewable energy and leaves the price up to the market, and the fixed-tariff Buyback Program, which fixes the price but allows alterations in the quantity of power taken in, have been segregated to a certain extent. In the future, however, if there is to be a greater and more systematic uptake of new or renewable energy, there will need to be facilities investment to ensure the strengthening and stabilization of the grid, facilitating increased buyback, and investment in smart technology, etc., and it has been

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(April 2009)

[24] Calculations based on current prices in 2008. "Towards the creation of a supply system for low-carbon electricity" Report of the Committee Researching Supply Systems for Low-Carbon Electricity, July 2009.

[25] According to some interpretations, a survey contained in the document "Policy proposal for the rollout of renewable energy with the aim of achieving a low carbon society," issued by the Ministry of the Environment, shows that existing systems and practice assume an excessively exact standard of electric power, which may act as an economic barrier to the generation of renewable energy. According to this view, consideration should be given to relaxation of standards relating to electric power quality, and to optional measures on the consumer side (home generation and storage cell installation, etc.) for the utilities companies who are affected by this. (From the Ministry of the Environment website).

[26] "Proposal relating to measures to stabilize the grid and ideal cost burden scenarios required by the widespread future introduction of new energy" (9th January 2009), Advisory Committee on Low-Carbon Electricity Supply Systems/Working Group considering measures to stabilize the grid and cost burden measures for the widespread future introduction of new energy. The Resources & Energy Agency has formed an Advisory Committee on Next-Generation Power Distribution Networks, which is creating process documents for measures to stabilize the grid for inclusion in the 28 million kW photovoltaic generation target in the supply plans (for 2020) to be submitted by electric utilities companies in March 2011 to the Ministry of Economy, Trade and Industry.

[27] Consideration of technical issues and cost analysis expected to be implemented by the Advisory Committee on Next-Generation Power Distribution Networks, (see note 26 above).

[28] Advisory Committee on Energy and Natural Resources, New Energy Subgroup, RPS Law Working Group

[29] Please see (Appendix 4) at the end of this document for the current state of the RPS law and revisions.

suggested that measures to promote these things should be incorporated into, and counted as included in, the obligations of RPS. If the new government goes ahead with the introduction of a full buyback program, there is the possibility that the continuation of the RPS system may be reviewed, but in any case, the consecutive implementation of multiple systems requires design to ensure compatibility between systems.

5. Conclusions

This paper gives an overview of the contents of the New Buyback Program for Photovoltaic Generation and its anticipated effects, and tries to view the issues arising from the introduction of the system against electric utilities industry policy to date.

As global environmental measures and the diversification of energy supply are increasingly required, it is undeniable that the widespread introduction of photovoltaic generation is an important policy issue. The introduction of this buyback program has uncertain benefits, but the increased utilization of renewable energy generation systems is widely anticipated to be a policy that will bring about both environmental and economic benefits.

The promotion of not only photovoltaic generation but also other new and renewable energy sources is anticipated to have increased importance and influence in future policy. Given this, it will be important in the introduction of specific policies to ensure that these balance the extreme objectives of both energy and environmental policy overall (in other words, realizing an optimized balance between the three “E”s – economy, environment and energy -) with the policy vision relating to future ideals for the energy industry. Additionally, the New Buyback Program for Photovoltaic Generation not only has aspects that relate to energy and environmental policy, but also those that relate to economic and industrial strategy, and was introduced in a form that encompasses a wide range of elements. Issues include forecasting future cost burdens, competition conditions within the electric utilities industry, cost burdens associated with the stabilization of the grid in line with the expansion of intake from decentralized power sources, etc. Systematic consideration of these issues is expected of the new government.

In the future, issues such as optimum mixes of electricity with thermal utilization and the introduction of smart technology to the energy network as a whole will arise, and the perspective of overall optimization will become more important. The new government is considering further measures to strengthen renewable energy promotion policies, but in order to attain the extreme targets of energy and environmental policy, they will be required to define a future ideal for the energy industry overall, including electric utilities, and to create consistent policy that promotes the execution of long-term strategies by utilities companies.

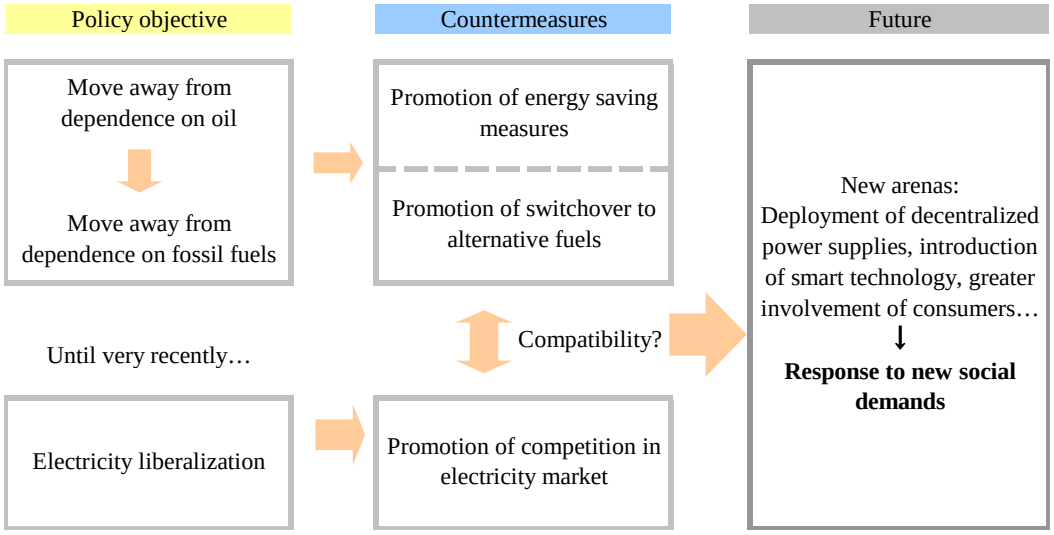
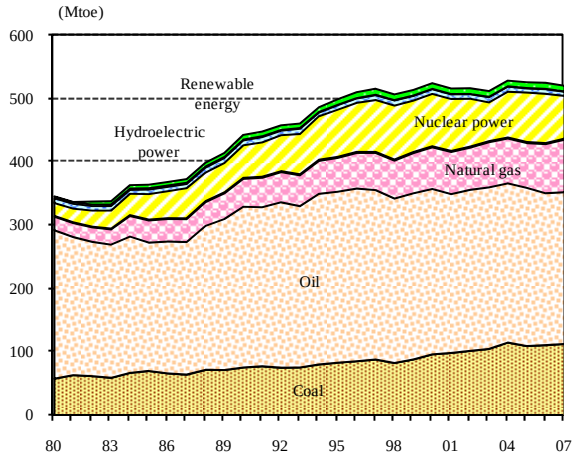


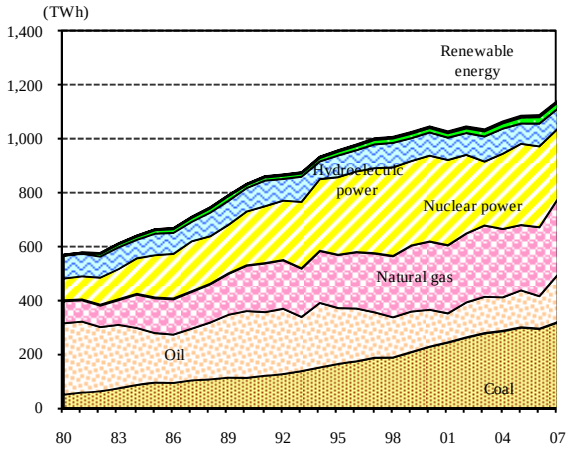
Diagram 9: The process of policy surrounding electric utilities up until now, and forecast for the future

Appendix 1: Results of and trends in Japan's new and renewable energy introduction



(Source: Energy Balance of OECD, IEA, 2009)

Diagram: Trends in Japan's primary energy supply



(Source: Energy Balance of OECD, IEA, 2009)

Diagram: Trends in volume of electric power generated in Japan

Table: Japan's primary energy supply and volume of electric power generated (2007)

	Primary energy integrated supply		Volume of electric power generated	
	Kiloton of oil equivalent (ktoe)	Percentage (%)	Million kWh (GWh)	Percentage (%)
Coal	114,573	22.3%	310,796	27.7%
Oil	229,818	44.8%	156,275	13.9%
Natural gas	83,046	16.2%	289,880	25.8%
Nuclear power	68,756	13.4%	263,832	23.5%
Renewable energy	**16,340**	**3.2%**	**98,859**	**8.8%**
Hydroelectric power	6,365	1.2%	74,009	6.6%
Non-hydroelectric renewables	9,975	1.9%	24,850	2.2%
Biomass	6,388	1.24%	19,175	1.71%
Solid (wood)	*5,548*	*1.08%*	*15,757*	*1.40%*
Biogas	*141*	*0.03%*	*0*	*0.00%*
Biogasoline	*0*	*0.00%*	*0*	*0.00%*
Biodiesel	*0*	*0.00%*	*0*	*0.00%*
Other liquid biofuels	*0*	*0.00%*	*0*	*0.00%*
Renewable waste	*699*	*0.14%*	*3,418*	*0.30%*
Charcoal	*0*	*0.00%*	*0*	*0.00%*
Wind power	*226*	*0.04%*	*2,624*	*0.23%*
Photovoltaic	1	0.00%	8	0.00%
Solar thermal	539	0.10%	0	0.00%
Geothermal	2,821	0.55%	3,043	0.27%
Ocean	0	0.00%	0	0.00%
Waste, etc.	987	0.2%	3,844	0.3%
Other (electricity and heat import, etc.)	-1	0.0%	0	0.0%
Total	513,519	100%	1,123,486	100%

(Source: Created from Energy Balance of OECD and Extended Energy Balance of OECD, IEA, 2009)

Appendix 2: Voluntary measures implemented by private utility companies in relation to new and renewable energy

Date introduced	Measure
April 1992	**Excess power purchasing menu** Defines a menu for electric utilities companies to autonomously purchase excess electricity from new energy decentralized power sources. Excess Photovoltaic and wind generated energy purchased at retail electricity price.
April 1998	**Long-term purchasing menu for industrial wind power** Purchasing menu offers 15-year or 17-year contract terms to purchase electric power from wind generation companies. Purchasing price around 11 yen per kWh.
2000	**Green Electricity Fund** Donations recruited from the public, and electric utilities companies who made a donation equivalent to the total donations recruited received subsidies for the installation of new energy generation equipment.
November 2001	**Green Electricity Certification (Now: Green Energy Certification)** The added environmental value of electricity generated from natural energy is certified by a third-party agency (the Green Energy Certification Center), allowing the utility company to issue "Green Electricity Certificates" which can be traded.

Appendix 3: Businesses subject to the Act on the Upgrading of Infrastructure for Energy Supply

The specific details of the system proposed in the Act on the Upgrading of Infrastructure for Energy Supply are to be discussed within the next 2 years[30]. Up until now, the definition of companies subject to the act was those companies for whom the use of non-fossil energy sources was both technically and economically possible, and in particular IPP[31] and PPS[32] companies, who particularly need this development. Companies who meet certain criteria within this are required to submit plans for the introduction of non-fossil energy sources or high-level utilization of fossil energy. In the electric power industry, this applies to companies supplying more than 500 million kWh (0.05% of the total amount of electricity supplied domestically) in the previous business year, which is expected to include 10 general electric utilities companies and 6 PPS companies.

Appendix 4: Outline of renewable energy introduction allocation (RPS system), and revisions as a result of the introduction of the New Buyback Program for Photovoltaic Generation

RPS is a system[33] that requires electric utilities companies (electric power companies, IPP and PPS companies) to use electricity obtained by the use of new energy. The proportion of energy to be obtained in this way must meet a minimum standard, which depends on the company's total electric power sales volume. Targets for utilization of all new energy-sourced electricity are set for eight years, every four years. Target setting has so far been done in fiscal 2003 and fiscal 2007, with targets being set up until 2014. Targets for fiscal 2009 are as follows.

[30] Considerations being implemented by the Supply Infrastructure Upgrade Working Group, Integrated Subgroup, Advisory Committee on Energy and Natural Resources

[31] General electric utilities companies, designated scale electric utilities companies, general gas utilities companies, gas pipeline companies, large-scale gas utilities companies, oil product manufacturers and suppliers

[32] General gas utilities companies, gas pipeline companies, large-scale gas utilities companies, oil product manufacturers and suppliers

[33] Electric utilities companies may select one of the following methods of achieving this obligation: (1) self-generation, (2) purchase new energy-generated electricity from another company, (3) purchase the equivalent electric amount of new energy from another company. Applicable energy sources are Photovoltaic, wind, biomass, geothermal, hydroelectric (under 1,000kW output, water channel type).

Table: Standardized utilization amounts, after adjustment, by each electric utility company under the RPS Law (fiscal 2009)

Category	No. of applicable companies	Total utilization required (kWh)
General electric utilities companies	10	9,280,178,000
IPP	5	2,582,000
PPS	27	158,467,000
Total		9,441,227,000

Note: The required amount is recorded only for 15 companies of the applicable PPS companies.

(Source: Created from materials from Resources & Energy Agency and RPS website)

The renewable electric power supplied under the terms of the RPS law made up a total of 0.68% of Japan's total electricity supply in fiscal 2007. The required amount[34] for fiscal 2008 is approximately 7.47 billion kWh, in regard to which 7.92 billion kWh was in fact supplied. RPS results to date show that target supply amounts have in fact been exceeded every year since the system was established in fiscal 2003, and the excess amount has been banked[35] until the subsequent year. In fiscal 2006 and 2007, the amount of energy banked exceeded the level of the required amount. In fiscal 2008, 7.04 billion kWh was banked, meaning that an amount almost equivalent to the required amount was carried over to the next year, but at the same time, compared with trends up to this point, the disparity between the required amount and the actual supply (the excess achieved) actually shrank. The target amount for fiscal 2009 is 9.44 billion kWh, an increase of 26% over the previous year, but based on the state of facilities approval in May 2009, the capacity of renewable energy generation facilities has grown by only 3% (16.12 million kW), making it quite likely that supply may fall below the target.

Table: Trends in new energy electric power supply

(Unit: 100 million kWh)

Fiscal year	Wind	Photovoltaic	Hydroelectric	Biomass	Other	Total supply	Required amount	Banking
2003	9.9	2.0	8.4	20.4	0.0	40.6	32.8	7.6
2004	14.4	3.5	9.1	22.1	0.0	49.1	36.0	20.6
2005	19.1	4.6	7.0	25.0	0.1	55.8	38.3	37.8
2006	21.4	5.4	9.4	28.6	0.1	65.1	44.4	56.6
2007	27.4	6.6	8.5	31.7	0.1	74.3	60.7	67.6
2008	30.6	7.6	9.6	31.3	0.1	79.2	74.7	70.4

(Note: Required amount for fiscal 2004 includes supplementary amount to cover borrowing during fiscal 2003)

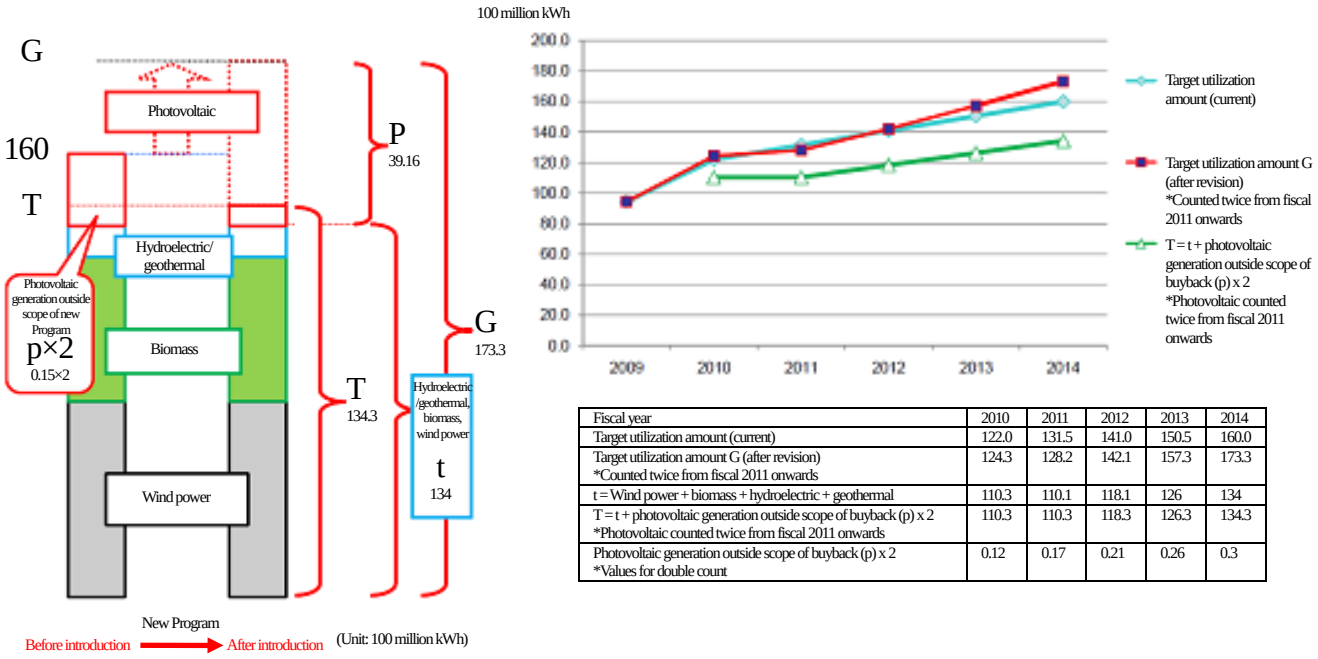
(Source: Created from materials from Resources & Energy Agency and RPS website)

The Advisory Committee on Energy and Natural Resources' New Energy Subgroup RPS Law Working Group implemented a review of overall utilization targets for alternative energies subsequent to the introduction of the New Buyback Program for Photovoltaic Generation. As a result of this, the overall target for fiscal 2014 not including photovoltaic generation (13.4 billion kWh), which was set in 2007, was revised to include the additional 3.915 billion kWh of photovoltaic generation included in the Buyback Program, bringing the target to 17.32 billion kWh. Since the increase in photovoltaic generation as a result of the Buyback Program, however, is categorized not as a requirement

[34] For 7 years after the enactment of the law (until fiscal 2009), utilization target amounts were set each year based on each utility company's results. Values after adjustment (basic utilization amounts) were set as the required amount for utility companies.

[35] If electricity generated from new energy is supplied over and above the required target for the fiscal year in question, the excess amount can be carried over and counted toward the requirement for the following year, or the utility company using new energy to generate electricity can hold over an equivalent amount of electricity generated from new energy into the following year. In addition, a proportion of the required amount for the year (max. 20%) can be borrowed from subsequent years.

of the electric utilities companies but as an objective as part of the government's policy, it was agreed that the target for RPS-applicable companies should remain at 13.43[36] billion kWh, and not include the buyback element. The overall target (17.32 billion kWh) has been set not only for achievement through utilities companies' RPS, but also by the nation as a whole, through the New Buyback Program and other subsidies, etc.



Fiscal year	2010	2011	2012	2013	2014
Target utilization amount (current)	122.0	131.5	141.0	150.5	160.0
Target utilization amount G (after revision) *Counted twice from fiscal 2011 onwards	124.3	128.2	142.1	157.3	173.3
t = Wind power + biomass + hydroelectric + geothermal	110.3	110.1	118.1	126	134
T = t + photovoltaic generation outside scope of buyback (p) x 2 *Photovoltaic counted twice from fiscal 2011 onwards	110.3	110.3	118.3	126.3	134.3
Photovoltaic generation outside scope of buyback (p) x 2 *Values for double count	0.12	0.17	0.21	0.26	0.3

(Note: Values for fiscal 2009 differ due to period of implementation of new Program).
(Source: Materials from Advisory Committee on Energy and Natural Resources' New Energy Subgroup, 10th Meeting of RPS Law Working Group)

Diagram: Alternative energy utilization targets (fiscal 2014), taking into account the New Buyback Program for Photovoltaic Generation

Contact: report@tky.ieej.or.jp

[36] The target value set in fiscal 2007 for fiscal 2014, which does not include photovoltaic (13.4 billion kWh) plus photovoltaic generation not included in the Buyback Program (15 million kWh, which is counted twice as a result of measures implemented in March 2007, and therefore totals 30 million kWh)