Tasks for Japan after the summer of 2012

-- Concerns about a winter supply and demand crunch and pass-through costs problem --

Yu Nagatomi*

Summary

With nuclear reactors successively falling under periodic inspection, by May of 2012 all reactors had come to a halt. Once more, Japan was faced with overcoming a severe energy situation for the summer of 2012 through electricity conservation measures and measures to secure supply capacity. In April 2012, the government set up an Energy Supply and Demand Verification Committee, to verify the supply and demand of electricity and to analyze the harsh realities in terms of both supply and demand issues. As a result, conservation targets and countermeasures were formulated, and a prime ministerial decision was made to reactivate the Unit 3 and Unit 4 Nuclear Reactors at Ohi Nuclear Power Plant for the Kansai Electric Power Company (KEPCO) service area, an area deemed to have an especially severe supply and demand issue. The electricity conservation periods ended on September 7th or 14th, and the government is now carrying out a review of the electricity supply and demand situation for the summer just past. Based on this analysis, this report sets out to provide an overview of the energy supply and demand situation from this summer and provide a projection for the energy situation in the coming winter.

While this summer saw the fortunate convergence of many uncertain factors, working to the benefit of a loosened supply and demand situation, viewing these uncertain factors in a harsher light, without the Ohi Power Plant, there was the possibility of reserve capacity falling under 3%, not only for the KEPCO's service area, but for the entire Central and Western Japan Regions. The supply and demand situation in Hokkaido for this winter, even under an ideal assumption of full performance on the supply side, carries the risk of an energy supply deficiency of 3% at peak times in terms of kW, while electricity generation, measured in kWh, may fall short by approximately 4%. In these circumstances, with no prospect of reactivating any nuclear power plants within the service area of Hokkaido Electric Power Company (HEPCO), austere electricity conservation measures will be required to fill the supply and demand gap, as well as to prepare for many other risks, including equipment failures at power plants and transmission stations and changes in temperatures. Particularly in Hokkaido in winter, electricity is used not only for heating but also for melting snow, and reductions in kWh as well as kW are required, posing new and different challenges from the countermeasures laid out for the summer.

Also, we have analyzed the cost issue from the viewpoint of a dramatic increase in fossil fuel import costs and in pass-through costs to the consumers. There is a possible 1.9 trillion yen increase in costs to be passed through due to fuel increases, which amounts to 2.1 yen/kWh by unit price, but the current price increase has been held at 0.28 yen/kWh in industry and related uses, resulting in only a partial pass-through. While prospects of nuclear power plant reactivation remain uncertain, constant review of energy supply and demand stabilization and cost analyses will be required.

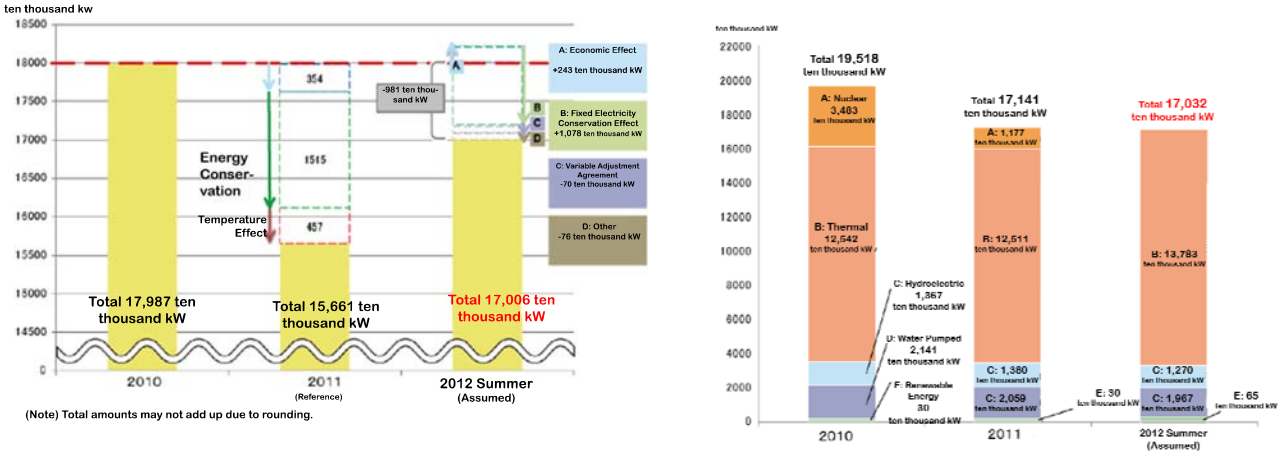
1. The Outlook for Summer Electricity Supply and Demand laid out in the Supply and Demand Verification Committee Report

The Supply and Demand Verification Committee was established in April 2012 to verify from an objective viewpoint the supply and demand situation in the summer of 2012 for nine electric power company service areas, excluding the Okinawa Electric Power Company. The Committee sorted through reports from each electric company on the supply and demand situation and summarized their analysis in a report on the prospect of electricity supply and demand in Japan for the summer of 2012.

* Researcher, The Energy Data and Modeling Center, Institute for Energy and Economics, Japan.

According to the report, while supply capacity will decrease as nuclear power plants are successively put under periodic inspection with no prospect of reactivation, utilization of emergency generator units and reactivation of thermal generators under long-term suspension would make it possible to secure enough capacity to make up for the shortfall. Despite the upturn in the economy from 2011 being an increase factor for demand, the report projected a significant restraint in demand based on the effect of relatively mild national electricity conservation measures. The resulting projection for supply reserve capacity, which indicates excess supply capacity of electric power, was at 0.1%. This would in fact be a 2.9% deficiency when considering the minimum requirement for power system operation is a reserve capacity of 3%, and the report suggested that the supply and demand situation would be quite severe.

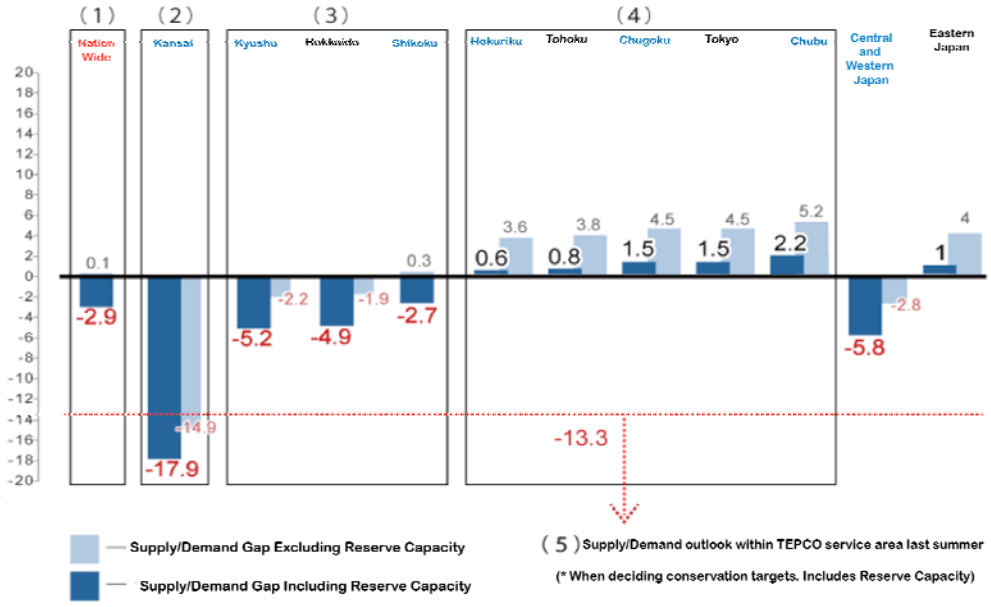
Figure 1-1 Electricity Supply and Demand Projections by the Supply and Demand Verification Committee.
(Graph on Left: Demand, Graph on Right: Supply)



(Source) Supply and Demand Verification Committee

By region, the Kansai, Kyushu, Hokkaido and Shikoku Electric Power Companies, which have a higher ratio of nuclear power, were projected to have a negative reserve capacity. Especially in the case of KEPCO, the supply and demand gap, inclusive of the reserve capacity, was 18%, making some sort of additional countermeasures essential. Prime Minister Noda thus decided on the reactivation of KEPCO's Ohi Unit 3 and Unit 4 reactors, which came into full operation by the 9th and 25th of July, respectively, and contributed greatly to improving the supply and demand gap in the KEPCO service area.

Figure 1-2 The Supply and Demand Gap within Each Service Area,
as Projected by the Supply and Demand Verification Committee



(Source) Supply and Demand Verification Committee

2. Verifying Electricity Supply and Demand for this Summer

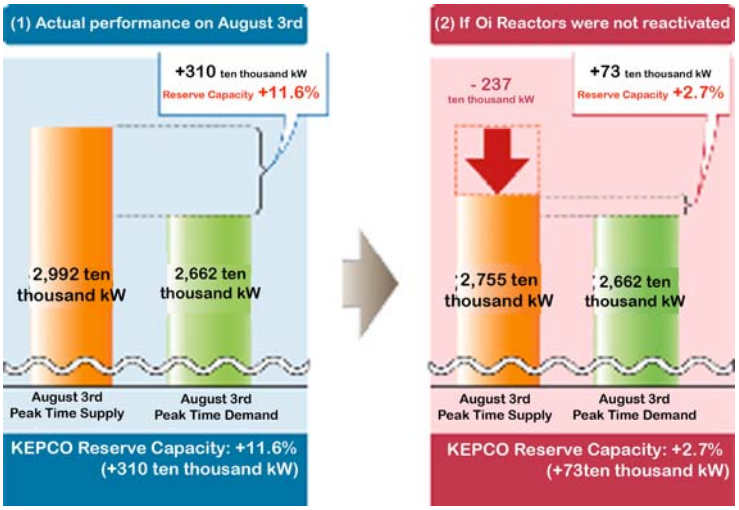
Electricity conservation targets had been set for each electric company starting with KEPCO based on arguments presented by the Supply and Demand Verification Committee, but targets for the electric companies especially for central and western Japan region were reset on July 26th after the decision to reactivate the Ohi Unit 3 and Unit 4 reactors. The new conservation targets were 10% for Kansai, 5% for Shikoku, and 10% for Kyushu, with electricity conservation measures requested accordingly, for the period from July 26th to September 7th.

As described above, efforts made by all parties to ease the supply and demand crunch, including conservation efforts by consumers and the reactivation of the Ohi Power Plant, allowed Japan to elude a large-scale power shortage and planned blackouts for this summer. This chapter will review the results of electricity supply and demand verification for this summer resulting from the electricity supply and demand countermeasures laid out based on these targets.

2-1 Within the KEPCO Service Area

Within the KEPCO service area, the situation remained severe despite the reactivation of the Ohi Nuclear Power Plant, and preparations had been made for scheduled blackouts. Although no scheduled blackouts were actually carried out, there had been concerns about a supply and demand crunch occurring at certain junctures. The most notable was Friday, August 3rd, when maximum demand level was recorded (with a maximum temperature of 36.7 degrees Centigrade). While the reserve capacity was +11.6% owing to the reactivation of the Ohi Nuclear Power Plant, without the supply capacity of the reactivated Ohi Unit 3 and Unit 4 reactors (2,370 MW), the calculations would have been grim, portraying a reserve capacity at +2.7%, running below the 3% standard required for operation[1].

Figure 2-1 Verification of Electricity Supply and Demand in the KEPCO Service Area this Summer



(Source) "On Electricity Supply and Demand for this Summer" from the website of the Office of the Prime Minister

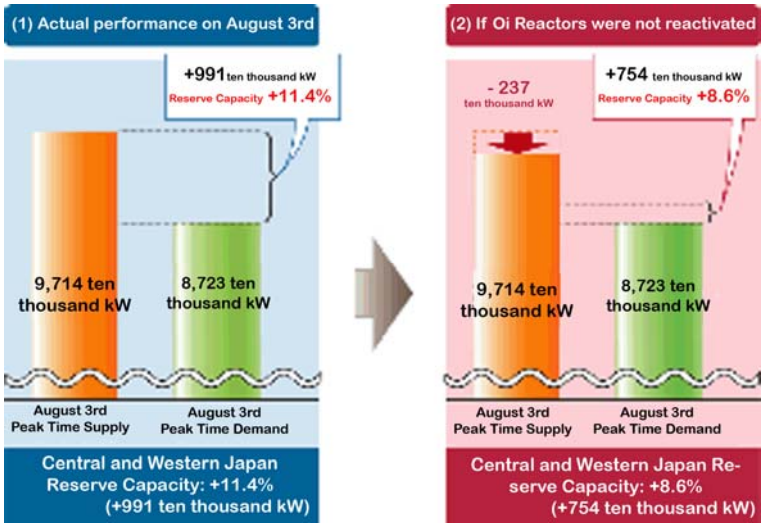
2-2 The Central and Western Japan Regions Overall

As mentioned in the previous section, while the KEPCO service area had concerns regarding its own supply and demand crunch were it not for the reactivation of the Ohi Nuclear Power Plant, on the other hand, expansion of electricity interchange with other electric utilities could be expected during a period of supply and demand crunch. As the reserve capacity for the

[1] In actuality, as the Ohi Unit 3 and Unit 4 Nuclear Reactors probably increased the working capacity of pumped-storage generation, the reserve capacity would have dropped to a lower value if we were to accurately account for the supply capacity for these portions.

entire Central and Western Japan regions on August 3rd was +11.4%, the supply and demand situation within the KEPCO service area could have been improved by support from other service areas. Further, even if the Ohi Unit 3 and Unit 4 nuclear reactors were not reactivated, at the exact moment when the maximum electricity demand in the KEPCO service area was recorded this summer, a snapshot of the entire Central and Western Japan Regions shows a reserve capacity of +8.6%. This was simply because supply capacity increase and demand reduction had progressed beyond the levels assumed by the Supply and Demand Verification Committee[2].

Figure 2-2 Verification of Electricity Supply and Demand in the KEPCO Service Area this Summer



(Source) "On Electricity Supply and Demand for this Summer" from the website of the Office of the Prime Minister

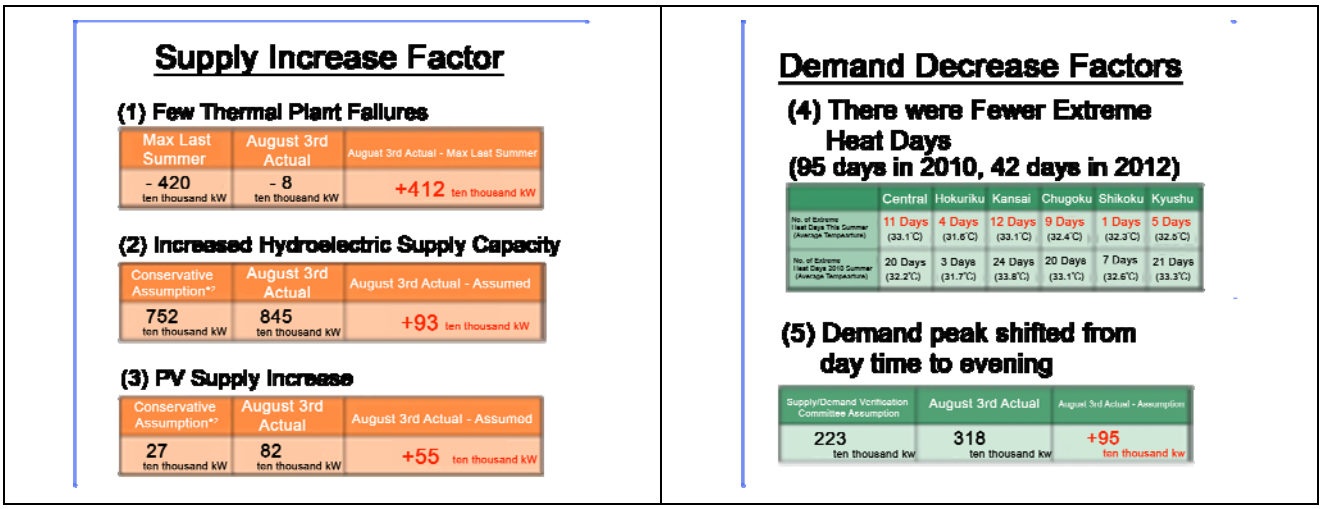
2-3 Analysis of Factors Relating to the Difference Between Actual and Assumed Supply and Demand Values in the Central and Western Japan Regions

The factors for the easement of supply and demand in actuality, compared to the situation projected by the Supply and Demand Verification Committee, are summarized for the supply side and demand side as follows.

As for the demand side, one factor was that the assumption laid out for the summer of 2012 by the Committee included many more extreme heat days based on the situation in 2010, compared to what actually happened in 2012, leading to a decrease in demand. Also, due to efforts by consumers, peak shifts progressed via planned adjustment agreements, lowering the energy demand at peak times. These efforts and countermeasures had a greater effect than expected, contributing to the decrease in demand. On the supply side, last summer saw supply capacity decrease by 4,200 MW due to failures, but the utilities made efforts this summer, and as of August 3rd, these resulted in an actual decrease due to faults of 80 MW. In effect, compared to the maximum last summer and this summer, the supply capacity was increased by 4,120 MW (about 5% in terms of reserve capacity) compared to the assumed values. (Corresponding to (1) in Figure 2-3.) The reduction in generator faults due to efforts by the utilities contributed greatly to securing reserve capacity. Furthermore, supply capacity increased for hydroelectric generation (corresponding to (2) in Figure 2-3) and photovoltaic (PV) generation at peak times saw an increase (corresponding to (3) in Figure 2-3) backed by the Feed-in Tariff (FIT) system. Due to these factors, for supply capacity alone, the increase was 5,600 MW, surpassing the capacity of the Ohi Unit 3 and Unit 4 Nuclear Reactors, showing a significant contribution to the easement of supply and demand adding to the effects of electricity conservation measures and the temperature.

[2] See footnote 1.

Figure 2-3 Verification and Factor Analysis of Electricity Supply and Demand in Central and Western Japan this Summer



(Source) "On Electricity Supply and Demand for this Summer" drafted from the website of the Office of the Prime Minister

As described above, there were aspects of both the supply and demand sides that differed between assumed and actual values. Where actual values deviate from the assumption, the key point of debate is whether these factors occurred by chance or not.

For example, in the case of PV supply capacity, some increase can be expected in the future through the efforts of the utilities and aggressive installation of equipment by users. Still, whether additional equipment will contribute to increased supply capacity is uncertain[3]. The key to peak shifting is to build systems and rules that allow continued implementation, both for the user and for the utilities. On the other hand, faults in thermal generators can be reduced through a certain amount of effort, but to a certain extent this factor is still ruled by chance. Further, hydroelectric supply capacity and extreme heat days are significantly affected by weather factors such as rainfall and temperature. While it is important to strive for better accuracy in predicting these circumstances, from the perspective of securing a stable supply of electric power, it is not advisable to assume an optimistic view with regard to the factors.

Taking the above arguments, if we were to assume that the increase factors (1) and (2) in Figure 2-3 moved in a more critical direction, and that Ohi had not been activated, even if additional capacity from PV were to be included in the calculations, supply capacity at the peak time could have decreased significantly from the actual value this summer of 97,140 MW to about 89,700 MW, bringing the reserve capacity to 2.9%, a critical level, and below the 3% standard[4]. Considering these risks, one cannot simply argue that the supply and demand countermeasures taken this summer were excessive. Even if 3% were secured in the larger region, in the event of additional accidents, due to a lack of support capacity, the area with the accident would be highly likely to face scheduled blackouts. In reality, global assessments do not view 3% as a reasonable standard for the greater region outside of an utility's service area.

3. Electricity Supply for this Winter

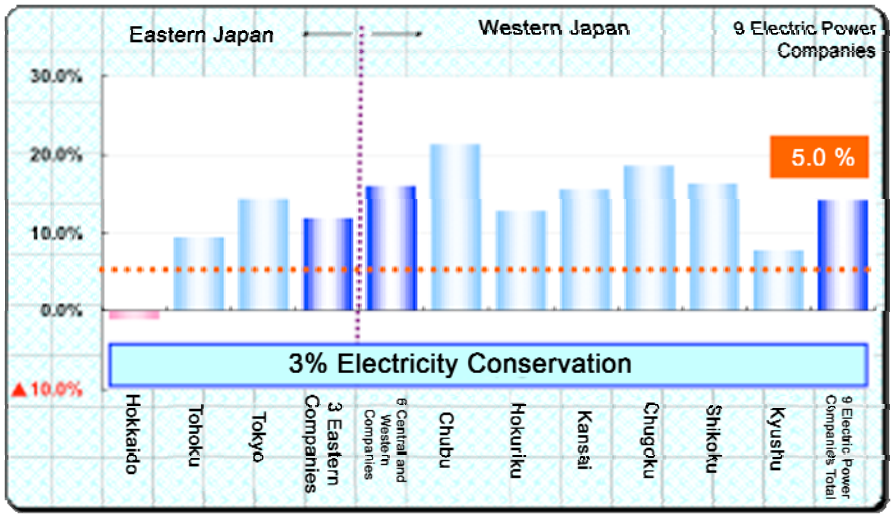
For the summer of 2012, increase in supply capacity and a bigger effect gained from conservation measures than assumed by the Supply and Demand Committee meant that planned blackouts and other significant impacts were avoided for the season. Meanwhile, on September 19, the Nuclear Regulation Authority (NRA) was established, creating a new regime for assessing safety standards towards reactivation. Still, actual reactivation of nuclear reactors remains uncertain. However, if we can

[3] At The Supply and Demand Verification Committee, supply capacity is assumed at a maximum of 10% of facility capacity based on "Weather Data from the Summer Season in the Past 20 Years, etc." as a figure that can be solidly predicted.

[4] See footnote 1.

assume a maximum supply capacity for this winter at levels similar to this summer, electricity supply and demand for each electric utility is expected to be more or less stable.

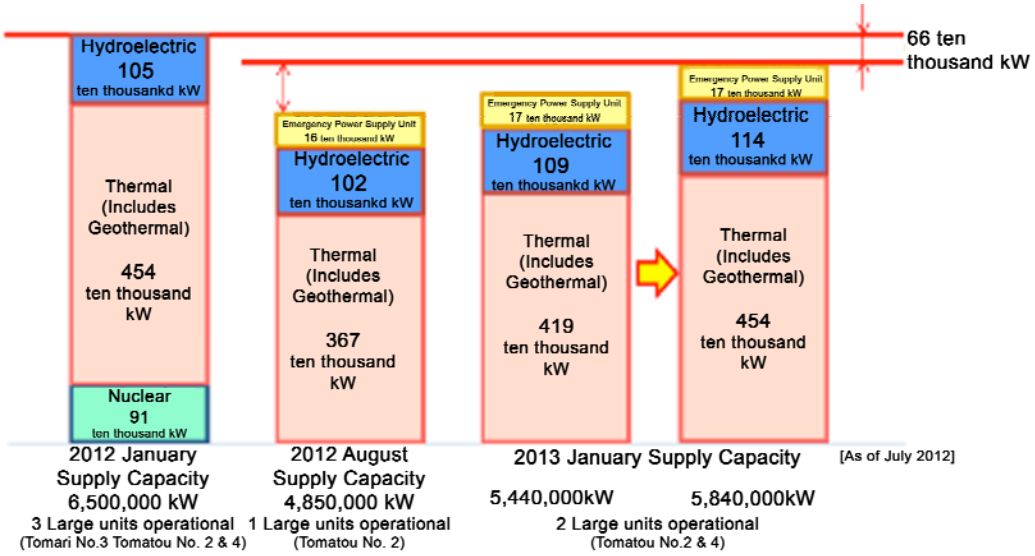
Figure 3-1 A Calculation of Electricity Supply and Demand for this Winter



(Source) Institute of Energy Economics, Japan. "Short Term Outlook on Electricity Supply and Demand -- Electricity Supply and Demand Predictions for FY 2012". July 3, 2012.
(Source) Estimate by the Institute of Energy Economics, Japan based on Supply and Demand Verification Committee data, Energy and Environment Council data.
(Note) For some electric utilities, supply capacity increase measures limited to supply and demand crunch times in the summer are incorporated.
(Note) Electricity conservation of 3% is assumed in every region.

However, in Hokkaido, where electricity demand is greater in winter than in summer, even with a certain rate of electricity conservation projections, electricity supply and demand for 2012 is predicted to be extremely tight, requiring further securing of supply capacity and consideration of electricity conservation measures. Based on Figure 3-3, in order to secure a 3% reserve capacity, a minimum of 3% electricity conservation is required for February. The graph assumes an ideal situation with no faults at the power plants, and nearly optimal power supply performance, including pumped storage generation. In order to incorporate some risk hedging and excess for electricity system operation, in reality electricity conservation needs to be pursued at a level higher than 3%. Winter in Hokkaido is especially noted for its electricity usage, not only for heating but also for snow melting, posing new and different challenges from the countermeasures laid out for the summer.

Figure 3-2 Outlook for Securing Supply Capacity within HEPCO's Service Area



(Source) Hokkaido Electric Power Company. "On the Electricity Supply and Demand Situation for this winter". July 31, 2012.

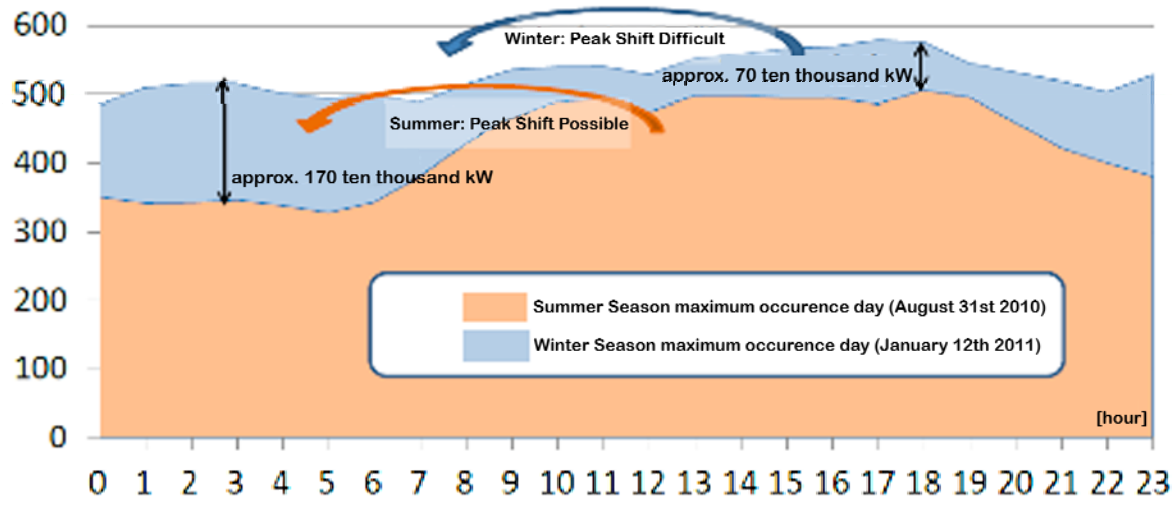
Figure 3-3 This Winter's Supply and Demand Outlook within HEPCO's Service Area

	December	January	February	March
Maximum Daily Electric Power	579	579	579	545
Supply Capacity[1]	590	584	580	564
Supply Reserve Capacity	11	6	1	19
Supply Reserve Ratio (%)	1.9	1.0	0.2	3.4

(Source) Hokkaido Electric Power Company. "The Electricity Supply and Demand Situation for this winter". July 31, 2012.
(Note) Maximum daily power, supply capacity and supply reserve capacity are all in ten MWs

As a measure to increase supply capacity, the Agency for Natural Resources and Energy (ANRE) is considering expanding its support program for in-house generator installation, but given that a significant increase in supply capacity will be difficult, demand reduction and electricity conservation will be expected to play a more significant role towards these efforts. Electricity conservation measures for this summer, utilizing experience from last summer, have yielded satisfactory results. However, especially in the HEPCO service area, winter electricity conservation will require not only peak cut levels reached in the summertime, but also possible energy demand reduction all day long because of a high level of demand throughout the day, as seen in Figure 3-4.

Figure 3-4 Winter Electricity Demand Trends within the HEPCO Service Area



(Source) Hokkaido Electric Power Company. "On the Electricity Supply and Demand Situation for this winter". July 31, 2012.
(Note) Units for values in the graph are in ten thousand kW.

Further, in addition to securing supply and demand balance in kilowatts via peak-cutting, there is another big issue of securing kWh or electricity volume. Since this service area sees continually high demand throughout the entire 24-hour period each day, hydroelectric and thermal plants needed to compensate for these needs may be limited by fuel supply or environmental restrictions, thus raising concerns about scarcity of electric energy supply from January through February. Arguments are beginning to be raised for a reduction in total volume of electric energy usage[5]

Figure 3-5 Supply and Demand Outlook within HEPCO's Service Area (based on kWh)

	December	January	February	March
Daily Electric Energy Demand (100 million kWh)	34.9	36.5	32.7	33.8
Electric Energy Supply (100 million kWh)	35.5	35.0	31.6	34.3
Excess Electric Energy Supply (100 million kWh)	0.6	-1.5	-1.1	0.6
Deficiency Ratio (%)	2	-4	-3	2

(Source) Hokkaido Electric Power Company. "On the Electricity Supply and Demand Situation for this winter". July 31, 2012.

Furthermore, the interconnection between Honshu and Hokkaido is limited to 600 MW, placing a cap on prospects of a large-scale electricity interchange with other electric utilities[6]. "The Research Subcommittee for a Master Plan to Enhance the Interconnection between Regions and Related Issues" of the Coordination Subcommittee for the Advisory Committee for

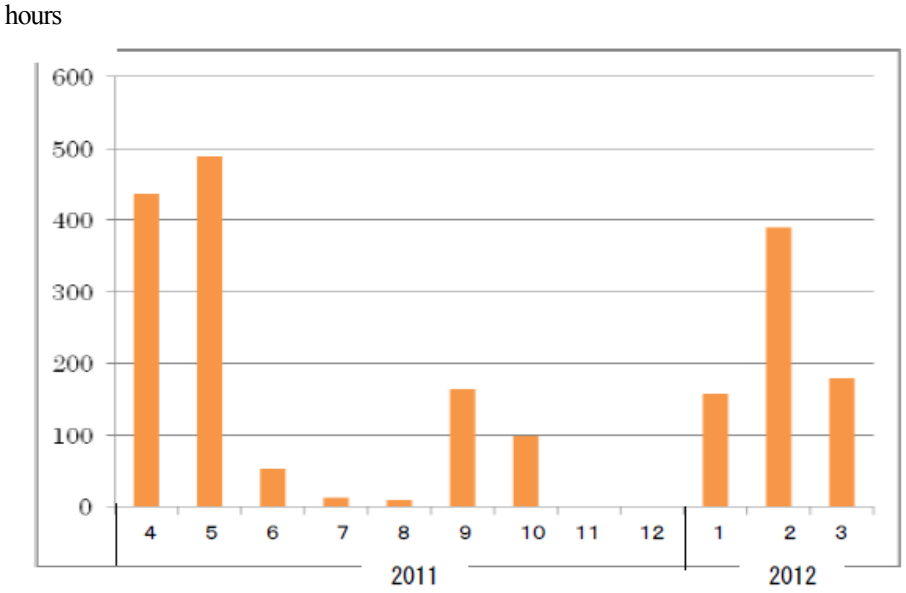
[5] The Denki Shimbun, August 16th, 2012. http://www.shimbun.denki.or.jp/news/main/20120816_01.html

[6] The Hokkaido-Honshu HVDC Link needs to reserve interchange quantities set aside for large-scale power supply drop-outs in the case of thermal plant faults.
Also, the Hokkaido-Honshu HVDC Link has risks of unscheduled service suspensions similar to other power generation facilities.
In FY 2011, there were seven suspensions under 300 MW and one suspension at the 600 MW level, with a total duration of 78 days in suspension.
In light of such interconnection facility risks, reserve supply capacity should be as large as feasible.

Natural Resources and Energy has commented on the Hokkaido-Honshu HVDC Link enhancement: "The current enhancement plan (from the current 600 MW to 900 MW) must be achieved as early as possible." Still, the plan will not be achieved in time for this winter[7]. Further, interconnections also have risks of faults, as seen in Figure 3-6.

In addition to an analysis of how much additional supply capacity can be secured by HEPCO without nuclear power and to what extent electricity can be conserved, realistic measures must also be considered that take into account a worst-case scenario of converging risks, including faults at various facilities, etc.

Figure 3-6 History of Actual Market Separation at the Hokkaido-Honshu HVDC Link

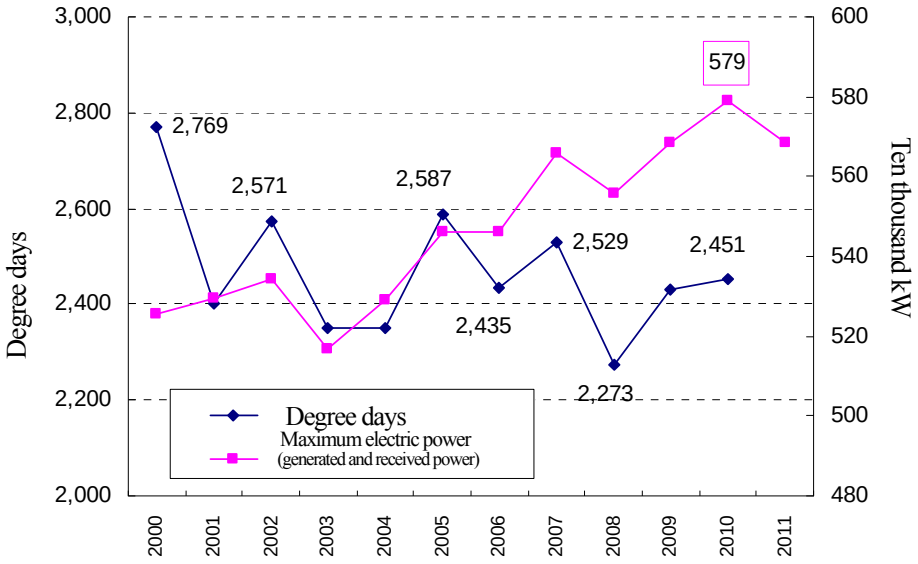


(Source) The Coordinating Subcommittee of the Advisory Committee for Natural Resources and Energy. "Research Subcommittee for a Master Plan to Enhance the Interconnection between Regions and Related Issues." April 2012.

Further, data released by the HEPCO assumes FY 2010 levels of maximum electric power for the daily maximum electric power demand for this winter, but as seen in the figure below, 2010 was not an extremely harsh winter when seen in terms of heating degree days. Looking at heating degree days from the past 10 years, the likelihood of this winter being harsher than 2010 in terms of temperature fluctuation risk is not low, and should a harsh winter on the scale of 2000 returns, the maximum electric power demand may rise higher than 5,790 MW. Temperature risks should be taken into account in addition to the supply side risks listed above.

[7] The Research Subcommittee has calculated the cost for enhancing three routes x 600 MW for the Hokkaido-Honshu HVDC Link to be roughly 500 billion yen. Based on these figures, a simple calculation draws a cost of 80 billion yen at the 300 MW level.

Figure 3-7 Monthly Maximum Electric Power and Heating Degree Days[8]



(Source) Drafted from the Handbook of Energy & Economic Statistics and Survey of Electric Power Statistics.

4. Future Pass-Through Costs and Concerns about Increases in Electricity Rates

Although Japan was able to overcome electricity supply and demand issues for the summer of 2012, grim realities are expected for electricity supply and demand this winter, especially for the HEPCO. While furthering electricity conservation measures, Japan is increasing thermal power generation in place of nuclear power to secure supply capacity, but overall cost assessments of the supply and demand aspects and the electricity charge pass-through have not progressed. In actuality, those electric utilities increasing their use of expensive thermal power generation are all showing increased deficits in their bleak quarterly financial reports. Household usage and other regulated sectors have not seen rates increase except for the special case of the Tokyo Electric Power Company (TEPCO), and even in the deregulated sectors, it is uncertain how much of the costs have been passed through via their electricity rates. This chapter deals with our survey of the actual increase in electricity rates and additional costs that may arise, which have been divided into fuel cost factors and other factors. We then deducted fuel cost adjustments and other price factors from the electricity rate increase to deduce how much of the cost factors for fuel increases have already been passed through.

Under the current electricity business system, exclusive of the deregulated sector which is mostly handled by negotiated deal electricity rate increases require approval of the Minister of Economy, Trade and Industry. In calculating electricity rates, an review is conducted of both the assumed and the actual cost, which is derived primarily from fuel costs. In particular, the actual cost portion, which is adjusted using the fuel cost adjustment system, is passed through systematically, reflecting shifts in such factors as exchange rates and crude oil prices. The assumed costs other than fuel costs requires electric utilities to request that the Minister of Economy, Trade and Industry conduct a review, and must go through an approval process carried out by the Minister. In actuality, electricity rates have steadily decreased since 1996 due to management rationalization by the electric utilities.

[8] Heating degree days is an indicator for measuring temperature trends, and is drawn from daily average temperatures. The sum of the daily difference between the average temperature and 14 degrees Centigrade is calculated for days lower than 14 degrees; the larger the value, the harsher the winter.

If we follow the basic principles of electricity rate revisions, the mechanism of retrieving the cost burden of rising fuel costs by revising electricity rates differs from the current situation in which fuel usage at thermal power plants is increasing to substitute for nuclear power plants, and the rising costs due to this situation. Fuel imports for thermal power generation have already increased significantly in FY 2011, but the fuel cost adjustment system alone cannot accommodate the additional costs. For this reason, how costs are passed through for cost-related expenses that do not come under fuel costs becomes a significant issue for the electric utilities and users alike.

IEEJ has released a Short Term Outlook on Electricity Supply and Demand in July 2012, in which fossil fuel costs to the electric utilities in FY 2012 were calculated to increase by 3.1 trillion yen compared to FY 2010. Factors for this cost increase can be decomposed into the following categories.

Fuel increase: 1.9 trillion yen changes in fuel prices: 1.2 trillion yen. Exchanges in rate: -0.3 trillion yen. Confounding factor[9]: 0.3 trillion yen.

Of these factors, factors that can be attributed to the fuel cost adjustment system are changes in fuel prices and exchange rate. If we divide this value by the FY 2012 projection for electricity generated (897.7 TWh), we get 1.00 yen/kWh, a value we can consider the unit price for fuel cost adjustments to be passed through. In addition, cost increase factors incurred by increased thermal generation to substitute for nuclear plants is the fuel increase portion, and divided by the FY 2012 projection for electricity generated (897.7 TWh), we get a value of 2.1 yen/kWh.

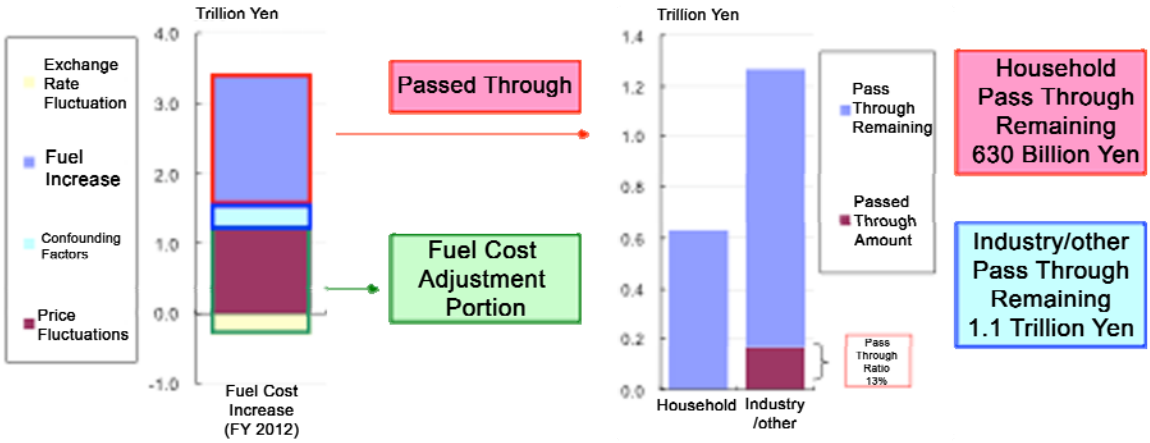
On the other hand, actual electricity prices estimated from the consumer price index (CPI) and other data are 23.1 yen /kWh for household use and 12.6 yen/kWh for industry and other uses as of July, 2012. When compared to FY 2010 average prices these have increased, respectively, by 1.70 yen/kWh and 1.89 yen/kWh, suggesting some price increase has been occurring using the fuel cost adjustment system or some other method. For the increased portion, additional FIT surcharge portions, and the Photovoltaic Power Promotion Surcharge (PV surcharge) are also included. With these factors in mind, we deduct the fuel cost adjustment portion, the FIT portion and the PV surcharge portion from the electricity rate increase to understand how much of the cost increases have been already passed through. This is demonstrated in the calculation below.

Industry and other uses, pass-through cost: 0.28 yen/kWh = 1.89 yen/kWh (increase) − 1.00 yen/kWh (fuel adjustment) − 0.06 yen/kWh (PV surcharge) − 0.22 yen/kWh (Renewable Energy Power Promotion Surcharge (FIT Surcharge)) − 0.33 yen/kWh (Confounding factor)

The costs that may be passed through due to the fuel increase are seen to be 2.1 yen/kWh, but currently the unit price has been held at 0.28 yen/kWh for industrial and related uses, resulting in a partial pass-through at a certain level. One factor behind this is rate increases by the TEPCO in the deregulated sectors. the TEPCO announced an electricity rate increase in the deregulated sector on January 17th, 2012. From April 1st, rate increases have been carried out sequentially based on negotiations with users, and contract renewal based on new rates is likely progressing even at this moment.

[9] Confounding factors are fluctuations due to concurrent fluctuations in multiple factors.

Figure 4-1 Estimated Pass-Through of Costs to Electricity Rates from Increases in Fossil Fuel Importation



(Source) Created by the author based on "Short-Term Electricity Supply and Demand Outlook -- Electricity Supply and Demand Outlook for FY 2012" (IEEJ, July 3, 2012) and the Ministry of the Interior statistics..

The 1.9 trillion yen in costs incurred by the fuel increase will either be borne by the consumer or by the electric utilities. If the FY 2012 projections for household electricity demand (approx. 300 TWh) and industry and other electricity demand (600 TWh) from the "Short-term Outlook on Electricity Supply and Demand" were used to prorate the assumed burden from the fuel increase of 1.9 trillion yen, households will bear 630 billion yen and industry and others will bear 1,270 billion yen. In the household sector, following the electricity rate revisions made by the TEPCO in September 2012, further pass-through costs are likely to follow. In the industry and other sector, based on the above calculations, there have been an estimated 0.28 yen/kWh of pass-through costs incurred so far, but there remain an estimated 1.1 trillion yen out of 1.27 trillion yen yet to be passed through. The portions not passed through are borne by the electric utilities as a deficit for the time being. In the future, there is a concern that further pass-through costs will mean electricity costs will continue to increase for the consumer.

5. Conclusion

The Summer of 2012 did not have as many extreme heat days, and through conservation and peak shift measures, plus successful efforts in the energy industry to prevent power plant failures, as well as increased supply capacity for hydroelectric plants and increased PV generation backed by FIT, all came together in a fortunate convergence of uncertain factors, easing the supply and demand situation, and allowing Japan to get through the summer without any serious power shortages. Meanwhile, we are now facing winter, and in the HEPCO service area supply and demand measures for the coming winter, with more severe supply and demand conditions than the summertime crunch, leave little room for error. Solutions that take into consideration power plant and electricity system facility failure risks, temperature risks, lackluster conservation efforts, and various other risks are needed. Not only do we need to prepare serious countermeasures for winter peak time usage, new challenges in overall restrictions on electric demand stand in the way between Japan and this winter's energy situation. In terms of weather impacts and other factors that are largely decided by chance, these factors are assessed as having contributed favorably to the supply increase and demand decrease situation. It is difficult to decide how far to factor in these chance-based factors, but to avoid large scale power outages, it is necessary to stay on the safe side, so the severe assumptions laid out by the Supply and Demand Verification Committee can be understood as a result of factoring in these risks.

Further, in addition to responding to future challenges in electricity supply and demand, it is necessary to prioritize discussions on how to respond to electricity costs. This analysis pointed to the possibility that the increases in fossil fuel import costs are not being adequately passed through to the consumer. These contained costs may be passed through in the future as

electricity rate increases, and the impact on the future Japanese economy, industrial competitiveness and citizen lifestyles needs to be monitored. As of September 20th, media reports indicated that Kansai and Kyushu Electric Power Companies were considering electricity rate increase requests for households and other regulated sectors. Suspending nuclear reactors has had a grave impact on both electricity supply and demand and costs, while further impacts in both areas are expected to surface going forward. In the future, the impact on both electricity supply and demand as well as cost will require further analysis and appropriate countermeasures.

6. References

(1) National Policy Unit, Supply and Demand Verification Committee, various resources.
(2) "On Electricity Supply and Demand for this Summer" from the Prime Minister and His Cabinet website
(3) HEPCO. "On the Electricity Supply and Demand Situation for this winter". July 31, 2012.
(4) HEPCO. "On the electricity supply and demand situation this summer, and the progress of electricity supply and demand countermeasures for this winter." September 5th, 2012.
(5) The Coordinating Subcommittee of the Advisory Committee for Natural Resources and Energy. "Research Subcommittee for a master plan to enhance interconnection between regions and related issues." April 2012.
(6) The Federation of Electric Power Companies of Japan. "An overview of electricity charges and amendments to charges." October 24th, 2008.
(7) IEEJ. "Short-Term Electricity Supply and Demand Outlook -- Electricity Supply and Demand Outlook for FY 2012". July 3rd, 2012.
(8) Statistics Bureau of the Ministry of Internal Affairs and Communication
(9) TEPCO. "On electricity charge increases for customers in the deregulated sector." January 17th, 2012.
(10) TEPCO. "On the approval of electricity charge increase." July 25th, 2012.

Contact: report@tky.ieej.or.jp