

## Electricity supply-demand measures in summer time

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Electricity Supply-Demand Emergency Response Headquarters

### **Introduction**

Due to the effects of the Great East Japan Earthquake on March 11, there has been a significant reduction in the electricity supply capacities of Tokyo Electric Power Co. (TEPCO) and Tohoku Electric Power Co. (Tohoku EPCO). To cover the large supply-demand gap caused by this incident, the Government of Japan initiated the measure of imposing rolling blackouts as unavoidable emergency measures.

Thanks to the utmost cooperation and efforts to save electricity by the Japanese people and industry, the supply-demand balance was improved, and large-scale blackouts were avoided, though people were deeply concerned about it. On April 8, rolling blackouts were shifted from the state of “implemented in principle” to that of “not implemented in principle”.

However, the supply-demand balance is expected to become tighter again as the summer approaches. Without any fundamental measures for dealing with both supply and demand, it may not be possible to maintain the status of rolling blackouts as “not implemented in principle”, nor eliminate their adverse effects. In these circumstances, peoples’ daily lives and, in particular, industrial activity as the source of the nation’s vitality will be so hampered that reconstruction from the earthquake and the restart of Japan’s economy cannot be expected.

Based upon the “Framework of the Electricity Supply-Demand Measures in Summer Time” (hereinafter referred to as the “Framework”) approved on April 8, 2011, we have made efforts in taking specific measures to increase supply capacity as well as the measures to reduce demand, and prepared the report of the results as described below. In the future, in order to overcome these difficulties through creative measures taken by both the government and the private sector, we would like to request cooperation from people on all levels, using their common sense, ideas and understanding.

### **1. Basic concept of electricity supply-demand measures in this summer**

#### **(1) Basic perspective of examination**

- We should aim to minimize the impact on peoples’ living and economic activities so as to ensure that any reduction in the supply of power does not impair the recovery of Japan’s economy.

- Especially, it will be necessary to minimize the impact on the production and operation of industries which constitute the source of the nation's vitality and the foundation of recovery from the disaster. In this case, it will also be necessary for labor and management to proceed with preparations through adequate consultations on the specific measures to be taken.
- It will be necessary to pay the utmost consideration to the affected areas, principally the Tohoku region.
- To take specific measures, it will be necessary to deal with the future actions from the medium- and long-term viewpoints, including not only the measures to be taken this summer, but also actions such as strengthening renewable energy and energy conservation measures which contribute to ensuring the stable supply of energy and reducing the environmental load in Japan; and increasing and distributing shutdown days, holidays and vacations.

## **(2) Basic framework of electricity supply-demand measures**

- It will be necessary to set the demand reduction target in order to bridge the residual gap between the supply and demand of power after the supply increase as specified in the Framework has been maximized.
- To reduce demand, it will be necessary not only to reduce the maximum use of power (kW) as a basic requirement, but also to indicate the projected reduction rates in each peak period and each zone of peak hours. By doing so, prospective customers may draw up and implement their own plans to shift operation times and increase and redistribute (stagger) shutdown days and holidays by exerting their originality and ingenuity in order to set up the basic framework in which adverse affects on customers are minimized, and especially so on the productive and operational activities of enterprises as the source of the nation's vitality and the base of Japan's economic recovery.
- It will be necessary to take specific measures regarding reducing demand for each sector, including large customers, small customers or households and make them applicable to the attributes of each sector.
- The rolling blackouts should be taken so as to maintain the state of "not implemented in principle" by surely implementing the measures as specified in this report, and preparations should be made flawlessly to take action as a safety net and to respond to any emergency.
- It will be also necessary to take the supply and demand measures after the coming summer in order to eliminate the restriction in the supply and demand of electricity as soon as possible and contribute to the restoration of Japan from the earthquake and to restart the Japanese economy.

## **2. Forecast of supply capacity in this summer and target of demand reduction**

### **(1) Forecast of supply capacity this summer**

- The supply capacities of TEPCO and Tohoku EPCO have been increased by taking measures such as restoring disaster-stricken thermal power plants, restarting thermal power plants shut down for a long period, introducing power sources such as gas turbines for installation in emergencies, increasing the purchase of power from private power generation facilities, and using pumped storage power generation power plants.
- By taking these measures, it is expected that the supply capacity will be increased by more than about 5 GW for TEPCO and by more than about 0.5 GW for Tohoku EPCO, as specified in the Framework.
- Furthermore, TEPCO and Tohoku EPCO plan to increase their supply capacities, and TEPCO decided to bridge the shortage of power supply by Tohoku EPCO as possible, considering the situation in the Tohoku Region containing many disaster-stricken areas.
- As a result, it is predicted that the supply capacity in the coming summer will reach 53.8 GW (at the end of July) for TEPCO and 13.7 GW (at the end of August) for Tohoku EPCO, and that the minimum demand reduction rate as required will be -10.3% for TEPCO and -7.4% for Tohoku EPCO. (Refer to the reference.)

<Comparison of supply-demand balance with electric power interchange at its maximum>

	TEPCO area	Tohoku EPCO area
Expected demand (with demand reduction)	60 GW	14.8 GW
Forecast of supply capacity (with electric power interchange)	<u>53.8 GW</u>	<u>13.7 GW</u>
Percentages of required demand reduction	<u>-10.3%</u>	<u>-7.4%</u>

(Note) The demand reduction target is represented the reduction rate of the expected demand as the reference for reduction. The reference demand is the estimated peak demand of 60 GW for TEPCO and 14.80 GW for Tohoku EPCO, at the same level as the previous year.

### **(2) Target of demand reduction**

- It is appropriate to set the demand reduction target which permits a certain level of allowance, but not the coincidence of supply and demand, considering the following risks:
  - The restoration of thermal power plants may be delayed by aftershocks, or thermal electricity plants may be damaged by aftershocks.

- Technical risks caused by the continuous 24-hour operation of obsolete thermal power plants or by the urgent restoration of disaster-stricken thermal power plants.
- Insufficient supply of power from one power plant to another.

- From these viewpoints, the target of the demand reduction rate is set at -15% in the areas covered by Tokyo and Tohoku EPCO Companies

(Note) It is more difficult to reduce the demand from people in disaster-stricken areas, and it is reasonable to set the demand reduction target with a significant allowance in the territory that Tohoku EPCO covers. In the territory covered by Tohoku EPCO, the demand reduction rate for the supply capacity equivalent to the demand is lower than in the territory covered by TEPCO. However, the target demand reduction rate is set at the same level as that for the territory covered by TEPCO.

- To attain this target, the target demand reduction rate in each sector of large customers, small customers or households is equally set at -15% under the policy that people and industries should make concerted efforts in attaining the same targets to get through potential difficulties posed by this coming summer.

(Note) The maximum use of electric power in each peak period and each zone of peak hours (9:00 to 20:00 on the business days in July to September) will be reduced in principle.

(Note) Potential customers include the national and local governments. This is true hereinafter.

### **3. Demand side measures**

#### **(1) Large customers (Contract electricity: 500kW or more)**

##### **1) Basic policy**

- Based on the demand reduction target of -15%, large customers should draw up and implement their plans to take specific measures for drastically reducing their demand, considering their needs and business activities. In this case, labor and management should make efforts to take measures while adequately consulting each other to minimize the impact on peoples' lives and economic activities and to facilitate restoration from the disaster and the restart of the Japanese economy.
- While respecting the voluntary actions implemented by these customers, the government will make necessary preparations for applying the Article 27, Electricity Business Act to take complementary measures to secure the effectiveness of demand reduction and equality between potential customers.
- The government will review the regulatory systems related to electricity supply-demand measures to help customers with implementing their measures smoothly.

- TEPCO and Tohoku EPCO should enlarge options of the forecast of supply-demand adjustment contract and promote its use positively to encourage customers to set and stagger summer holidays to cut the peak demands. By doing so, increase the rooms to apply supply-demand adjustment contract, when the supply and demand balance becomes tight.

## 2) Specific measures

- If large customers take measures to adjust and shift their operating times and business hours, and stagger holidays and summer holiday periods in cooperation with the related enterprises, they may minimize the impact on the Japanese economy without reducing production.
- The Japan Federation of Economic Organizations called on its member enterprises and organizations to formulate the “voluntary action plans on electricity”. As of the end of April, 637 companies (one joint action plan formulated by plural companies is counted as one plan by one company) are participating in this program. In addition, The Japan Federation of Economic Organizations and the Japan Trade Union Confederation have decided to jointly take demand reduction measures. ([Reference 1](#))

## 3) Application of Law, Article 27, the Electricity Business Act

- The necessary preparations for the restriction of electricity use under the Article 27 of the Electricity Business Act will be proceeded with based on the following framework:
  - Subjects
    - Large electricity customers (contracted supply is 500kW or more), who conclude electricity supply-demand contracts directly with Tokyo Electric Power Company, Tohoku EPCO, and Specified-Scale Electricity Utilities that supply electricity in the service areas of TEPCO and Tohoku EPCO.
    - The subjects shall be judged by the scale of contract with the electric utilities (or by the size of the business establishment).
  - Period and time
    - TEPCO service area: July 1 to September 22 (weekdays), 2011, 09:00 to 20:00
    - Tohoku EPCO service area: July 1 to September 9 (weekdays), 2011, 09:00 to 20:00
  - Specific information
    - In principle, the upper limit of power use shall be 15% reduced from “the maximum electricity use (per hour) for the above-mentioned period and time in 2010”.
    - If the figure is unknown or if there is a change in the contracted power, necessary supplementary measures will be taken.
  - Scheme to Jointly Reduction of Electricity Use
    - Business establishments of large electricity customers may introduce the scheme, which enables them to reduce the total amount of maximum use of electricity by endeavoring to reduce the maximum use of electricity jointly.

- If the total use of power can be reduced by 15% or more, business establishments of large and small electricity customers will be able to utilize the joint restriction scheme under certain conditions.

○Exemption from Application and Relaxation of the Restriction

- Specific contents including the treatment of the affected areas as well as the exemption from application and relaxation of the restriction to reduce the reduction rate (15%) will further be considered.
- When considering the exemption from application and relaxation of the restriction, it should be minimize by reflecting the actual status. If the customers are subject to the relaxation of the restriction, they will make utmost efforts to reduce their electricity use, and to achieve a 15% reduction as enterprises and business organizations.

#### **4) Review on the regulatory system for electricity supply-demand measures**

- In order to help large customers, etc. to implement drastic measures to restrict electricity demand, it is necessary to review temporary responses as well as the relevant regulatory systems. So the government should implement the measures which have been already reached conclusions ([see Appendix 1](#)), such as clarifying the application of the Antimonopoly Act, flexible implementation of regular periodical inspections on privately generating facilities, and informing local governments regarding the concept of the additional regulations about smoke emission standards by for privately generated facilities, as well as holding executive meetings of the Electricity Supply-Demand Emergency Response Headquarters when necessary. Conclusions will be drawn by the end of May.

### **(2) Small customers (contract electricity: less than 500kW)**

#### **1) Basic policy**

- Small customers will formulate and announce their voluntary plans suitable for their businesses regarding the specific targets to reduce their electricity use. Sufficient consultations between labor and management are needed when they proceed with the plans.
- To encourage small customers to implement their actions, the government will implement measures such as informing them of actions for saving electricity by using the “Standard Format of Action Plans for Electricity Saving.”

#### **2) Specific measures by small and medium enterprises**

- Small customers will announce their plans voluntarily (“action plans for electricity saving”) including saving lighting, air conditioning and other equipment use, reducing operating hours, as well as setting, extending, and staggering summer holidays, by posting them at conspicuous places in their offices or put them on the government’s website.

- To contribute to implementing above measures, the Japan Chamber of Commerce and Industry, etc. are preparing guidelines for small customers to reduce their electricity demand by referring to the “Standard Format of Action Plans for Electricity Saving”.
- The Tokyo Association of Smaller Entrepreneurs (Tokyo Doyukai) also will prepare and publish the “Simplified Manual for Small and Medium Enterprises to save Electricity” to support small customers to help them formulate their action plans to save electricity.

### **3) Specific measures by the government**

- To support electricity customers to formulate their voluntarily plans, the government will prepare the “Standard Format of Action Plan for Electricity Saving” ([Reference 2](#)) for electricity customers whose electricity use is large and their usage patterns are unique. In addition, by using this measure, the government will provide customers information about specific measures and the effects of electricity saving.
- In addition to the commitments by individual customers, the relevant ministries and agencies will encourage customers to jointly make efforts to take measures applicable for their businesses with other customers, such as setting closing days in turn, joint actions by building owners and tenants, and joint actions by multiple customers.
- To help the electricity customers who prepare action plans, the government will establish websites on which customers are able to register their plans. The government will establish a mechanism to make websites to provide people with various actions and opportunities to evaluate, and improve the consciousness of electricity customers and consolidate the establishment of their actions.
- The government will strongly promote its educational activities such as providing necessary information to potential customers through the relevant ministries and agencies, industrial organizations, and local governments, etc. Experts will visit major small customers and provide them with information about the necessity of electricity saving by conducting door-to-door visits, informing them of specific actions to be taken, etc., and ask for their cooperation. In addition, it will hold explanatory meetings for small customers urge to them to take positive measures for electricity saving.
- Reduction of the amount of electricity supply contracts are effective for small customers to establish a basic energy saving consciousness, because it can help customers pay attention and get them to avoid using electricity exceeding the contract amount. So the government asks TEPCO and Tohoku EPCO to provide an improved forecast of electricity rate and appeal to customers to reduce their contract amounts by setting specific targets. Prompt responses are also required on consultations and requests from customers.

### **(3) Households**

#### **1) Basic policy**

- Households should consciously take specific actions to save electricity by using the forecast for electricity saving.
- To promote households' actions for electricity saving, the government will take actions to provide them with forecasts and education.

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#### **2) Specific measures taken by households**

- The government will prepare the “menu for households to save electricity” ([Reference 3](#)) that describes specific actions for electricity saving and publish them through various media such as leaflets, newspapers, television and the internet to diffuse the necessity of saving electricity as well as spreading knowledge about the specific actions.

(Note) In average households, air conditioners accounts for about 50% of the total use of electricity during the peak period in summer, followed by refrigerators, TV sets and lighting. To attain the 15% reduction of electricity use, actions such as lowering the temperature setting of air conditioners and switching off unnecessary lighting, or combinations of such actions, are requested.

- The government will inform municipal education boards, etc. about the necessity of electricity saving and encourage elementary and junior high schools to provide education to pupils and students about electricity saving in their summer vacation homework. In addition, they will dispatch energy saving experts to primary schools to offer education. In education, the importance of energy saving should be mentioned.
- The government will establish websites on which each household joins and declares targets and actions as a mechanism of promoting voluntary actions by each person. To promote and cultivate an awareness of electricity saving in households, the government will work to develop and spread applications for PCs and cellular phones by using data such as the electricity supply-demand information provided by electric utilities and the common PR contents by the government.
- As for the reduction of contracted amperes in households, it is effective because it can make customers pay attention and help prevent them from exceeding the contract amount. So the government asks TEPCO and Tohoku EPCO to respond quickly to consultations and requests from households so as not to be inconvenient excessively.

### **(4) Measures to promote a national movement**

## 1) Public relations and education ([Appendix 2](#))

- Since it is indispensable to obtain the utmost understanding and cooperation from people on all levels and related business operators, the government will positively conduct educational activities. Toward the coming peak period this summer, the government will 1) inform the people of basic policies focused on the necessity of electricity saving and actions taken by business operators and households, and 2) promote a national movement to save electricity, especially by focusing on the electricity supply-demand forecast and appealing to people to take specific actions as the summer approaches. The following points should be taken into consideration:
  - A national movement to save electricity should be roused.
  - Easily understandable explanation and feed back. (Effects of saving should be clearly indicated).
  - Educational activities carried out step by step. (It is necessary to make people understand the necessity of electricity based on the characteristics of their needs, and indicate specific actions that should be taken.)
  - Consideration of economic and social activities and peoples' health. (Reduction of the burdens on economy and society as well as avoidance of preventable illnesses such as heatstroke).
  - Continuous, not transient energy saving activities. (Enhancing the long-term energy supply-demand structure and realization of lifestyles in which work and life are well harmonized.)
  - Partnerships with local governments.
- Specifically, it is necessary to appeal to peoples' easy understanding of the necessity of electricity saving any time widely through various media such as newspapers, television, the internet, posters and pamphlets, and also to prepare a common logo and basic messages for people. The government will establish a comprehensive portal website ([setsuden.go.jp](http://setsuden.go.jp)), set up the idea box to collect various ideas for electricity saving from the people as well as call on people to wear casual clothes or clothes made of high-functionality textile fibers.
- It is effective to “visualize” the supply-demand electricity and expected demand on the website in order to motivate people to make efforts to save electricity. The government asks TEPCO and Tohoku EPCO to provide information about the status of electricity supply-demand and expected demand, as well as to cooperate with private business operators (such as cellular phone service providers and internet operators) to provide a wide range of information.
- In spite of efforts to save electricity by people and business operators, when the supply-demand balance tightens and possibility of the need to implement rolling blackouts becomes high, the government may request the implementation of emergency electricity saving as the “tight supply-demand balance alert” (provisional name) to prevent the implementation of rolling blackouts or publicize the possibility of the implementation of rolling blackouts in case of an emergency.

## **2) Consideration in holding big events**

- When big events are held, the relevant ministries will request the organizers to consider the possibility of not holding such events during the peak periods and times, taking energy saving actions at the events, and to appeal to participants to save electricity.
- As for broadcasting the events, the relevant ministries will appeal to the broadcasting station to consider about the peak periods and times.

## **3) Staggering and increasing closing days, holidays and vacations in summer, and encouraging households to travel / go out of home ([Reference 4](#))**

- Staggering and increasing closing days, holidays and vacations are effective ways to save electricity and minimize the impact on economic activities. However, these measures may lead to harder working conditions, so it is necessary for labor and management to make adequate consultations on such issues.
- Going away from home or traveling are also effective ways to save electricity in households, whatever the destination is. It is expected to further enhance the effects if families have more opportunities to go out, accompanied by staggering and increasing business closing days, holidays and vacations, in addition to the easing of congestion on sightseeing areas. The promotion of travel including long-stay travel will be helpful for the tourist industry, which has been affected by widespread self-restraint. Since traveling to affected areas may also contribute to the restoration of the local economy, it is expected that promotion of travel will lead to the realization of lifestyles in which work and life are well harmonized by not making this just a temporary action in the coming summer.

## **(5) Governmental measures to save electricity**

- Based on the “Basic Policy to Implement Electricity Saving by the Government” ([Appendix 3](#)), each ministry will formulate action plans for taking measures to save electricity to reduce the maximum use of electricity at least by 15%, as well as take actions positively to reduce electricity use during the peak periods and times, not only to restrict the maximum use of electricity.
- As for independent administrative institutions and nonprofit foundations, the ministries and agencies that have jurisdiction over them request them to formulate their electricity saving plans by referring to the “Basic Policy to Implement Electricity Saving by the Government” as well as the action plans by the ministries.

## **(6) Rolling blackouts as a safety net ([Appendix 4](#))**

- The status of rolling blackouts has shifted to “not implemented in principle”, but when it is inevitable to implement them in an emergency in the future, they should be improved after the improvement in operation. Specifically, implementation of blackouts should be avoided becoming several times a day, as well as being shortened the length from the present 3 hours to 2 hours.
- Additionally, as for medical institutions, since service interruptions may directly and immediately affect lives, measures should be taken such as improving the operation of electricity substations, deploying generator-mounted vehicles as backups in emergencies, renting small private generators to patients who use artificial respirators in their houses, as well as providing information on preventive measures against heatstroke.

#### **4. Electricity supply-demand measures after this summer**

##### **(1) Basic policy**

- It is necessary to continue taking measures on both electricity supply and demand after the coming summer, so that Japan can escape from the restrictions of electricity supply and demand as soon as possible and contribute to recovery from the disaster and restart Japan’s economy.
- As for the future direction of electricity supply-demand measures, it may depend on the progress of discussions on the future of Japan’s energy policy. We are aiming at improving the situation beyond this summer by taking all possible measures for nuclear power safety as well as measures described below. ([Appendix 5](#)).

(Note) It is possible to start some of these measures from this summer.

##### **(2) Specific measures**

- By continuous efforts to restore and restart existing thermal power plants, installing new emergency energy sources, utilizing privately generated facilities, as well as moving up construction of additional thermal power plants, supply capacities of thermal power plants will be strengthened.
- As for the existing frequency conversion (FC) stations, while aiming to realize an early increase and enhancement of FC capacities as well as the strengthening of linked facilities between regions all over the country including the further reinforcement of FC stations, the interchange of electricity will be enhanced.
- Further efforts are needed to introduce dispersed power sources and renewable energy (such as photovoltaic, wind and geothermal energy).

- As for the demand side, while realizing the optimizing of the utilization of energy by introducing smart meters, discussing the introduction of systematic techniques to promote electricity saving, and promoting the introduction of equipment contributing to electricity saving, further promotion of energy conservation and gas utilization are needed.

### **Conclusion**

The supply capacity increase this time was realized at full capacity but was accomplished with attendant technical risks such as the utilization of decrepit thermal power plants and the urgent reconstruction of affected thermal plants. So it goes without saying that it is indispensable for people on all levels to make every effort to save electricity. In the future, such a situation must be absolutely avoided that the rolling blackouts which are now in the state of “not implemented in principle” will be implemented due to the easing of tension towards electricity saving.

Therefore, the government will request people on all levels to understand and cooperate with the demand restriction measures as described above as much as possible.

Since the supply capacity and forecast of electricity demand are expected to change in the future, we should understand the situation well and review the contents compiled in this report on request.

**(Reference)**

Forecast supply capacity in this summer

(1) Forecast of supply capacities of TEPCO and Tohoku EPCO

Forecast supply capacity of TEPCO

Forecast on which the Framework was based:			Forecast on April 15		Forecast on May 13
End of July	46.50 GW	→	52.00 GW	→	<b>55.20 GW</b>
End of August	44.60 GW	→	50.70 GW	→	<b>56.20 GW</b>

Forecast supply capacity of Tohoku EPCO

Forecast on which the Framework was based:			Forecast on April 15		Forecast on May 13
End of July	12.00 GW	→	12.60 GW	→	<b>12.80 GW</b>
End of August	11.50 GW	→	12.10 GW	→	<b>12.30 GW</b>

(2) Comparison of supply-demand balance between TEPCO and Tohoku EPCO

	TEPCO	Tohoku EPCO
Forecast of supply capacity	55.20 GW	12.30 GW
Expected demand	60.00 GW	14.80 GW
(with demand reduction)		
Percentages of required demand reduction (Note)	<b>-8.0%</b>	<b>-16.9%</b>

(Note) The demand reduction target was set in the form of the reduction percentage of the estimated demand as reference. The estimated peak demand used is as almost same as in last year. It is 60.00 GW for TEPCO and 14.80 GW for Tohoku EPCO.

(3) Comparison of supply-demand balance with electric power interchanges at its maximum

	TEPCO	Tohoku EPCO
Interchange	-1.4 GW	+1.4 GW
Supply capacity after interchange	<b>53.80 GW</b>	<b>13.70 GW</b>
Percentages of required demand reduction	<b>-10.3%</b>	<b>-7.4%</b>

