Report of the Electricity System Reform Expert Subcommittee

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I. Why reform the electricity system?

1. Electricity system reforms in the past

Since World War II, Japan has come to secure large-scale power sources and power supplies to local communities under an electricity system which guarantees return on investment by means of fully distributed cost methods and regional monopolies through vertically integrated systems. The environment realized by these efforts, which makes it possible to “make high-quality electricity available as a matter of course,” has supported the development of people’s lives and economic growth as a basis for Japan’s national socioeconomic foundation. In addition, these systems have also contributed to the technological development of nuclear energy, high-efficiency thermal power generation and the technological development of power systems, all of which have acted to form the basis of the competitive advantages of Japan.

For the purpose of redressing electricity rates, which were on a higher level than the international standards under this regime, Japan has implemented electricity system reforms four times since 1995, introduced the principle of competition in the power generation sector, and liberalized a part of the retail sector; (refer to Reference Figure 1). Also, along with the partial liberalization of the retail market, efforts have been made to secure the equity and transparency of the transmission and distribution sectors by such methods as the introduction of accounting unbundling, the prohibition of discriminatory treatment, and the establishment of the Organization to Support Electricity Transmission and Distribution, etc. from the viewpoint of pursuing the equalization of competition conditions between General Electricity Utilities (hereinafter referred to as “GEUs”) and new entrants¹ concerning the system for using transmission and distribution lines (the wheeling service system). Owing to these reforms, choice of retailers and setting the electricity rates freely has been made possible in the case of large consumers, and diversification of power producers has progressed to some extent in the form of the participation of renewable energy utilities etc.

¹ Specified-Scale Electricity Utilities (hereinafter referred to as SSEU) referred to as “New Power Suppliers” (hereinafter referred to as NPS) and wholesale suppliers such as IPPs (Independent Power Producers,) etc.
Furthermore, the introduction of the principle of competition through a series of institutional reforms has produced certain results in terms of realizing low electricity rates. In the period after the first institutional reform of electricity market in 1995 until the Great East Japan Earthquake, electricity rates were continuously reduced (refer to Reference Figure 2), and the efforts of the parties concerned, stimulated by competition, has contributed to the reduction in electricity rates; for example, thermal power bidding, introduced in the same year, allowed for successful bids at the prices 10 to 30% lower than the price limit set by GEUs.

Reference Figure 2: Electricity prices after starting liberalization of the retail market in Japan

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2 Excluding FY2008 when the rate increased under the influence of fuel prices.
Even after a series of reforms, however, the market structure of de facto monopoly by GEUs has basically not changed, and competition is insufficient under the current partial liberalization. The share of new entrants in the retail market is small (3.6% of the liberalized demand in FY2011), and in some regions new entry has not been realized. Further, as can be seen from the fact that there has been only a single case where a GEU supplied electricity under a retail electricity sales contract to the area covered by another GEU, there is no direct competition among GEUs, either. Similarly with respect to the rate structure, although various rate menus have come to be offered after the partial liberalization, there have been few rate menus which would induce demand response by setting higher electricity rates at peak times (power use according to the situation of tight demand and supply) or which would be less susceptible to the influence of a variation in fuel costs.

As stated above, in spite of the successive system reforms including the partial liberalization of the retail market, no significant change has occurred in the market structure of the current electricity system.

2. Change of circumstances caused by the Great East Japan Earthquake

Inexpensive and stable electricity supply will continue to be required in Japan in the future. However, with the Fukushima Daiichi NPS accident and the subsequent tight demand and supply brought about by the Great East Japan Earthquake as a turning point, it has become clear that an inexpensive and stable electricity supply may not be secured only by simply maintaining the electricity supply system as in the past.

Firstly, the confidence in nuclear power, which had been regarded as the base load and the best source of energy from the viewpoint of energy independence, cost and reduction in greenhouse gas emissions etc., was significantly undermined. It is conceivable that the increase in related costs incurred by the reduction in the share of nuclear power in the energy mix, the fundamental enhancement of safety regulations and supply deficiencies etc., which were caused by the result of the undermined confidence in nuclear power, will become an upward pressure on electricity rates in the medium and long term.

Secondly, the tight demand and supply brought about at the same time as the earthquake disaster revealed the risk inherent in the conventional mechanism of securing supply by means of a large-scale power source under the concept of “supplying any amount of power according to
demand,” namely, the risk that the supply-demand adjustment fulfilled by the pricing mechanism, doesn’t work in a flexible manner. For this reason, efforts on the demand side such as power saving demand response and distributed generation, which were not necessarily sufficient in the past, have come to be depended on as the means to balance demand and supply.

Thirdly, the wider utilization of the supply capacity in each area for other areas had such limitations that electric power interchange wouldn’t work in responding to the tight demand and supply situation. As it was basically required to manage demand and supply in each service area of GEUs, there existed a deficiency in the supply-demand adjustment function on a national scale, and there also were limitations in the capacity of frequency conversion stations (hereinafter referred to as FCs) between the eastern and western part of Japan and a part of the interconnection lines among GEUs.

Fourthly, the earthquake disaster acted to raise awareness of the public to “choose electricity” and to increase the number of consumers who do not consider it natural to purchase electricity at the price determined by the GEU of the relevant areas. Additionally, through the implementation of power saving and preparation for planned outages, many consumers came to be aware of the considerable economic value of the restrictions on the use of electricity at peak times. Such a change in people’s attitudes is indispensable to forming a new electricity system based on competition in the market, which, for example, ensures competition in the retail market and pursues balanced demand and supply by the use of price signals.

Fifthly, utilization of diversified supply capacity including renewable energy has come to be called for more than ever, and it is required to convert to an electricity system functioning as premises for the utilization of diversified supply capacities. It will also be required to establish a high supply-demand adjustment capability and the transmission and distribution networks linking multiple regions, in order to promote further utilization of distributed generation such as renewable energy and cogeneration with revising the current energy mix.

3. The concept behind the electricity system reform

As is announced in the “Basic Policy on Electricity System Reform” (July 2012), Japan now faces the issue of a paradigm shift involving the “power supply,” prompted by the increased necessity for responding to global environmental issues, increased tightness in the global energy demand and supply situation, and change of circumstances brought about by the Great East
Japan Earthquake, etc.

Under such pressure, it is required to implement a comprehensive reform by considering the entire structure of the power supply in Japan as a system, including regional monopolies, through a vertically integrated system, investment-return guarantees based on fully distributed cost methods, ensuring a large-scale power sources and the security of supply to each area etc., in order to address the existing issue of insufficient competition and the policy issue revealed by the earthquake disaster. Electricity system reform is a method to materialize a “stable power supply,” which has in the past been pursued by means of tariff regulation and regional monopolies, by the ingenuity of utilities and consumers through “choice” and “competition,” under an electricity system open to the public.

It is a physical property of electricity that, as long as electricity is delivered through the same transmission and distribution network, its quality in terms of outage frequency and stability of frequency etc. is the same regardless of the utility it is purchased from. For this reason, the commodity that is electricity is completely replaceable, and, under normal circumstances, it is assumed that active competition is carried out on the basis of price. The main factors contributing to insufficient competition include restricted entry into the retail market for small consumers, the low liquidity in electricity trade in the wholesale market, and the doubtful guarantee for neutrality in providing access to the transmission and distribution networks. By eliminating these factors and creating a fair environment for competition, the merits of competition can be realized as much as possible. Competition in the power generation sector will contribute to the reduction in the wholesale price and improvement of the international competitiveness of the energy industry as a result of progress in the optimization of power generation by means of pursuing efficiency in fuel procurement and power plant construction as well as serialized use of electricity prioritizing the most competitive source (Merit Order). On the other hand, the merit of competition in the retail market will be produced in the form of providing new services/rate menus and offering inexpensive retail prices.

Additionally, in a free and vigorous electricity market created following electricity reform, new innovations will be generated through competition beyond the field of “electricity.” As a result

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3 If the number of power stations with troubles increases, the quality of the entire power system will be reduced. Therefore, it is important that every utility involved in the electricity business should be engaged in related projects with an awareness of the importance of a stable power supply.

4 Insufficient augmentation of the power sources of power utilities other than GEUs as well as the existence of regulations in the background which is related to power plant construction such as environmental impact assessment etc. may be additional factors contributing to insufficient competition.
of new entrants from other business sectors into the retail market and progress in the utilization of a variety of supply capacities such as distributed generation and demand response, which will be induced by the reforms, the fusion and borderlessness of various energy services such as electricity, gas, oil, etc. will be facilitated, and new needs will be created for services including the next-generation dispersion type system and demand management system, etc. It is expected that, owing to such changes in industrial structures and increased demand for new services, innovative technologies and services will be created in energy related sectors. And by means of these innovations robust energy businesses are expected to contribute not only to the stable supply of electricity in the country but also to bringing in the global trend of growth by way of overseas business activities.

Japan’s electricity system is now facing a structural change which involves increasing fuel costs due to the halting of operations of nuclear power plants, the risk of rising resource prices due to the rise in demand of emerging countries, and increases in the cost of introducing renewable energy, so that the cost of electricity charges is predicted to rise further in the future. In order to pursue both efficiency and stability in power supply under these conditions, in addition to securing competition, we should make a framework which will allow us to lever the change in public awareness of power supplier choice and power saving by creating an electricity system that will use price signals to curb demand. Thus a new power supply system is to be established, which will optimize the power supply on a nationwide merit order basis with various operators including power producer-and-suppliers (PPSs). Additionally, security of supply and reduction in supply costs will be realized by utilizing the capacity of individuals and businesses in the form of surplus supplying capacity generated by power saving and energy conservation activities (negawatt trade), reduction in power demand according to the tightness of demand and supply (demand response), etc. It is of great significance in the situation of tight demand and supply to enable flexible rate setting and to induce new efforts on the demand side through liberalization.

Should it be decided to preserve the current electricity system without initiating any reform, given the paradigm shift in power supply after the earthquake disaster, fully distributed cost methods alone are not enough to induce reconsideration of the high cost structure, and could fail in achieving a continuous reduction in electricity rates. Further, if the rate structure is left inflexible as it is now, there remains a concern about emergencies, power demand and supply at the time when emergency response measures are called for as in the case after a disastrous
earthquake. That is, maintaining the same mechanism as in the past doesn’t ensure the availability of any cheap and easy power supply. Though tariff regulation can be a factor in curbing the increase in electricity rates in the near term, regulation could in turn discourage the required investment from being made sufficiently in the medium- to long-term. In fact, experiences of foreign countries show that tariff regulation that aims to control near-term electricity rates can, combined with insufficient institutional design, lead directly to uncertain power supply. Under the various structural upward pressures for the cost as mentioned above, electricity system reform aims to curb the increase in electricity rates both in the near and long term as much as possible while at the same time securing stable supply.

On the basis of the concept as described above, when implementing electricity system reform, it is indispensable to pay serious attention to the accumulated technologies and human resources in our country, which enjoy the highest confidence in the world, as well as the call for stable supply. The technologies, infrastructures and human resources which have been developed must never be destroyed.

Based on rediscovering the fact that the electricity system reform can be built on the past experience and technologies of electricity utilities, it is important, after overcoming a multitude of challenges, to try to design a new, reliable electricity system, which will incorporate the results of technology innovation in the power generation and IT sectors, on the basis of the current electricity infrastructure system developed more than 60 years after World War II. Electricity utilities are expected to play the leading role in the electricity system reform processes and drive the innovation and regeneration of this country, making use of the accumulated know-how and on-site capabilities with a more sense of mission than ever.

5 For example, concerning the power crisis in the State of California, the U.S. in 2000, the California Public Utilities Commission (CPUC) and the Electricity Oversight Board pointed out that the reduced investment to new power sources due to the tariff regulation with a low incentive for power plant construction was one of the factors which contributed to the situation of tightened demand and supply.
II. Full liberalization of the electricity retail market and the electricity system reform required for this purpose

1. Full liberalization of entry to electricity retail business

The reform seeks to guarantee freedom in the “choice of electricity suppliers” to all people and to fully liberalize the entrance to electricity retail business, including small consumers such as general households, for the purpose of improving the efficiency in electricity businesses through competition in the retail market. When the liberalization is to be implemented, transitional measures accompanying the liberalization must be designed in a cautious and elaborate manner so that it won’t hinder the stable supply of electricity or confuse consumers. Additionally, all possible measures should be taken to secure consumer protection so that no problem such as supply disruption will occur.

In parallel with the full liberalization of the electricity retail market, active competition in the retail market will create an environment which will allow for optimization through the vitalization of the wholesale market, resulting in further neutralization of the transmission/distribution sectors and the enhancement as well as the reappraisal of inter-regional connection lines, etc.

(1) Abolishment of regional monopoly

The reform seeks to fully liberalize entrance into the small consumer sector such as households in the retail market which is now under the legal regional monopolies of GEUs in order to allow consumers to choose suppliers and power sources, and to encourage competition in the retail market. It seeks to abolish the current system of regional monopolies which has been granted to GEUs and, in principle, to make it possible for any utility to supply electricity to any demand in any area. Additionally, the monopolies granted to Specified Electricity Utilities (hereinafter referred to as “SEUs”) in specified service points in the past is to be abolished in the same manner accompanied with necessary transitional measures for the existing service points.

(2) A shift from supply obligation to the Last Resort service

So far, GEUs and SEUs have enjoyed a monopoly to serve the regulated demand from households etc., (demand from small consumers under the entry regulation or tariff regulation system) and in consideration of the economic aspect of monopoly and the characteristics of electricity as indispensable commodity for both economy and society, the so-called supply
obligation is imposed on these utilities, and by means of investment-return guarantee based on the fully distributed cost methods, it has been sought to ensure the power source which can sufficiently meet the regulated demand. 6

Along with the abolishment of supply monopoly of GEUs, etc. envisioned in this power system reform, the so-called supply obligation currently imposed on GEUs etc. will inevitably be abolished. On the other hand, given the characteristics of electricity which makes it an indispensable commodity for both economy and society, there must not be any power supply disruption even after the abolishment of the supply obligation. 7 Therefore, a framework to secure stable supply, is described below:

(i) Obligation of the Last Resort service to transmission and distribution companies,
(ii) Obligation to secure supply capacity to the retailers,
(iii) Obligation to maintain frequency to system operators (obligation to maintain power demand supply balance) and,
(iv) The Organization for Cross-regional Coordination of Transmission Operators (tentative title) (hereinafter referred to as “OCCTO”) establishes a capacity market and system to make every possible effort to ensure the power source when a long-term supply shortage is anticipated.

(3) Introduction of licensing system

After achieving the full liberalization of entry to electricity retail business, concepts such as “general demand” or “specified scale demand” will be unnecessary, and it becomes possible for any utility to supply electricity in response to any demand in any area and to be engaged in electricity retailing. Meanwhile, in order to secure both stable supply and the benefit of consumers, it is necessary to grant retailers a position in the electricity system, and to continue to impose certain obligations on them, as well as to regulate power generation and transmission/distribution utilities to a certain extent in a similar manner. In addition, although the current system treats every GEU in an integrated manner, it won’t be necessary to maintain this integrated system after the reform because of the abolishment of supply

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6 According to the interpretation and application of the Electricity Business Act, it is not required to ensure the power source to meet the liberalized demand, and in the case where there occurs a deficiency in the power source to meet the regulated demand, it is permitted under the current system to refrain from supplying power to meet the liberalized demand on the basis of the Last Resort service clause. Besides, the current law prohibits the State from ordering the utility to construct a power source.

7 However, there are cases where an outage cannot be avoided due to construction work, or where a planned outage is inevitable due to supply shortage, in which cases supply disruption may be implemented. (This is also true with the current system.)
obligation. For this reason, it will be sought to establish a new system which will grant new licenses to utilities categorized by the type of operation they’re engaged in, such as the retail sector, the transmission/distribution sector, and the power generation sector, and which can provide regulations according to the characteristics of each business sector.8

(4) Full liberalization of the electricity retail market in Okinawa

In the service area of the Okinawa Electric Power Company, Incorporated (OEPC), the range of liberalization was different in the past institutional reforms, in consideration of the situations peculiar to the Okinawa area, such as the fact that nationwide power transmission/distribution is practically impossible because of its system being independent of other systems in the main land, and it has relatively large demand in isolated islands compared with other power utilities etc.9 In addition, there has been no experience of new entry into the liberalized market in Okinawa.

It is true that in many fields a certain consideration needs to be given to the situations peculiar to the Okinawa area, but on the other hand the policy objectives of the Okinawa area, including an increase in the choices for consumers, introduction of a wide range of power sources, etc. are not different from those of other areas, and efforts are required to pursue reform with the goal of accomplishing the objectives. Therefore, it is adequate to pursue system reform in the Okinawa area basically in the same way as in other areas, on the basis of which certain exceptional measures should be provided in view of the peculiarity of the Okinawa area. Specifically, the full liberalization of the electricity retail market should be implemented as a principle, and activation of the wholesale market, expansion/neutralization of transmission/distribution sectors and other issues should be addressed in a system grounded on the particular characteristics of Okinawa.

2. Liberalization of retail electricity rates

By liberalizing the tariff regulation in the small consumer sector, diversification of services and more flexible settings of various rate menus responding to the status of demand and supply (such as the one which offers higher prices at the peak times of summer when demand and supply becomes tight, etc.) are expected. Thus, by adopting a mechanism which allows demand

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8 For example, the utility which aims to be engaged in multiple businesses such as both power generation and retail businesses will be permitted to offer these multiple businesses if it obtains the licenses of both power generation and retail businesses.

9 The initial range of liberalization was consumers more than 20,000 kW and more than 60,000 V. It was expanded to include special high-voltage consumers (basically more than 2,000 kW) in April 2004.
to be controlled by the elastic function of prices, stable supply is to be pursued even in the case of supply capacity shortage. Meanwhile, though it has been institutionally guaranteed to carry the cost incurred for electricity supply onto electricity bills under the tariff regulation based on the fully distributed cost methods, after abolishing this guarantee, the prices will be determined on market principles, and the mechanism will be shifted to one of enabling required investments and procurements in expectation of electricity charge revenue.

(1) The gradual phase out of tariff regulation

Until now, the tariff regulation based on the fully distributed cost methods has been imposed on the small consumer sector, and there have been no free setting of electricity rates. The main purpose of this tariff regulation was to ensure adequate investment-return while preventing undue rate setting practiced by taking advantage of monopolistic positions, but along with the full liberalization of the electricity retail market, namely the abolishment of regional monopoly, this tariff regulation will basically become unnecessary.

In order to offer various rate menus responding to the needs of consumers in association with the full liberalization of the electricity retail market, it seems adequate to allow GEUs to set electricity rates freely and let consumers choose among them. However, for some time after the full liberalization of the electricity retail market, it is adequate to deregulate electricity rates after a period of transitional measures for mitigating abrupt changes with a view of consumer protection. Additionally, as a minimum required system for consumer protection after transitional measures, it is appropriate to provide the Last Resort service, the Universal service and consumer protection measures as ex-post regulation described in Section 3 below.
Reference Figure 3: A diagram of the current scheme, transitional measures and the new scheme

(2) Tariff regulation during the period of transitional measures

During the period of transitional measures, in order to protect consumers, it is appropriate to obligate the current GEUs in the retail sector to supply power to small consumers including general households at the regulated rate. On the other hand, as it is expected that a new environment will soon be created where new rate menus will be offered by supplier’s ingenuity and consumers can choose among them, if consumers request, it will be possible to permit GEUs to supply power to them beyond the regulated rates even during the period of transitional measures.

From the viewpoint of consumer protection, transitional measures need to be maintained until various measures including further neutralization (non-discrimination) of transmission/distribution sector are implemented, the competitive environment is prepared by activating the wholesale market etc., and competition actually makes progress. Therefore, in lifting transitional measures (elimination of retail tariff regulation to GEUs), it is required to introduce smart meters, prepare various institutional measures, examine the situation of competition, and confirm the progress of competition.

3. Establishment of consumer protection measures etc. in response to liberalization

The supply obligation and the tariff regulation will be abolished by the full liberalization of the electricity retail sector, but this elimination must not lead to the situation where consumers are not provided with power supply from any retailer, or the electricity rates run unduly high.
Additionally, in order to make “liberalization to choose power suppliers” possible in a true sense, a setting will be required where consumers can choose power suppliers by their will on the basis of adequate information. For this purpose, the Last Resort service will be provided in addition to consumer protection measures needed for setting rates and providing information to consumers.

(1) Provision of the Last Resort service

Considering the importance of electricity for people’s lives and the national economy, even in the case where some retailers may go bankrupt/out of the market, or contract negotiation fails, some measure needs to be in place in order not to leave any consumers unsupplied with electricity. For this purpose, it is adequate to create a system of the Last Resort service, and to specify the supplier entity as well as the supply method at the final stage.

After full liberalization in retail sector, efforts will be made to obtain consumers through competition among retailers and the price will be determined basically in the market, while the Last Resort service will be placed as a safety net for responding to exceptional situations.

As for the provider of the Last Resort service, there may be two ideas, one of which argues that since electricity will be supplied under retail contracts, the service should be provided by retailers of no less than a certain scale, while the other argues that since the service will be provided in a regulated sector, it should be provided by transmission/distribution companies.

On this point, competition in the retail market should be promoted by ensuring a level playing field in the retail sector where free competition will be the principle, while at the same time the transmission/distribution companies of each area should provide this service, in consideration of the technical aspect of the electricity business where transmission/distribution companies must ultimately be responsible for the actual power supply. Meanwhile, the Last Resort service is nothing other than a safety net, and this system doesn’t expect consumers to constantly rely on the Last Resort service nor does it expect transmission/distribution companies to possess any power source for the Last Resort service. Because of this, it is necessary to design an appropriate system giving consideration so that the scope of responsibility and business of transmission/distribution companies will not be expanded infinitely (to make it possible to outsource the business to other efficient operators etc.)

(2) Equalization of electricity rates in isolated islands (the Universal service)

There is a chance that in isolated islands, which are not connected to the main grid and thus structurally where power supply costs inevitably become high, electricity rates may rise after
the abolishment of tariff regulation. For this reason, it is required to develop a mechanism (the Universal service) that allow electricity to be supplied in isolated islands at a rate level comparable to that in other areas by the use of financial compensation appropriately calculated on the basis of the charge on the entire consumer population as the source capital so that the rates in isolated islands won’t be deviated from the average level.

As for the provider of the Universal service, just as in the case of the Last Resort service, with an emphasis on the viewpoint that competition among retailers should be promoted by ensuring a level playing field in the sector where free competition will be the principle, the transmission/distribution company of each area should provide this service (This doesn’t mean to exclude the retailers which can supply electricity in a more efficient manner if such sellers exist.).

Additionally, as there are differences in the number of isolated islands in each area, it will be controversial whether the financial compensation to provide the Universal service should be borne by each area or by the entire consumer population, but in order to minimize the difference from the current rate level, the compensation amount should be calculated in each area, and collected in each area on top of the wheeling charge. This method still ensures neutrality in the competition among the retailers in each area, and causes no problem.

(3) Other consumer protection measures

After the current tariff regulation is abolished by the full liberalization of the electricity retail market, it becomes possible for consumers to choose utilities and rate menus among various kinds of choices, but it is conceivable that some consumers may conclude power supply contracts at high rates without understanding the contents well. Thus, in order to prevent such a situation from occurring, it may be adequate, from the standpoint of consumer protection, to impose code of conduct on retailers, which, for example, will obligate them to explain the supply conditions including the rates, etc. to their consumers.

Additionally, in order to be able to address significant issues such as in the case where the retailer sets the rate at an unduly high level, some general measures may be taken for consumer protection, which will allow, for example, the regulatory authority to issue a business improvement order in the case.

These measures required for the consumer protection should be taken in consideration of the legislative examples etc. in other business sectors.
Publicity/public relations to consumers

In order to achieve the objectives of the full liberalization of the electricity retail market including “liberalization to choose electricity suppliers” etc., adequate publicity on the contents of the new system needs to be given to consumers. And for this purpose, on the occasion of the full liberalization of the electricity retail market, it is necessary for the government and utilities, etc. to actively pursue publicity/public relations for consumers in general households etc. on the availability of choice among retailers and specific method of switching retailers.

Access to consumer information

When a retailer tries to win a contract with a new consumer, it carries out operating activities on the basis of information on the power usage of consumers such as the hourly status of the past power demand of individual consumers (load curve). Therefore, in order to actually allow consumers to choose power suppliers, it is required to develop a mechanism which will facilitate the acquisition of consumers and alteration of contracts by permitting each retailer to access the consumer information.

In establishing such a mechanism, it needs to be carried out on the assumption that the respective consumer information belongs to the relevant consumer and sufficient consideration should be given to personal information protection, consulting the relevant efforts overseas, etc. Further, it is conceivable that transmission/distribution companies manage the consumer information in an integrated fashion. Meanwhile, since the information on consumer distribution is important for retailers to actually perform sales and marketing activities, it is also required to examine the mechanism for providing information on “where and what kind of demand exists,” etc., while ensuring to make every possible effort to protect personal information.

 Establishment of the low-voltage wheeling service system

After the full liberalization of the electricity retail market, in addition to the high-voltage power demand liberalized in the past, a wheeling service system for low-voltage power demand such as households needs to be developed. The regulated rate structure of the current GEU uses two tariff schemes, i.e. a two-part tariff scheme and a minimum tariff scheme (refer to Reference Figure 4), but given the easiness in recovering fixed costs which account for more than half the wheeling cost, it will be appropriate to basically adopt a two-part tariff such as the low-voltage wheeling rate system. However, as it is difficult to set the amount of contract demand until smart
meters are introduced, the minimum tariff should be provisionally permitted. Meanwhile, in reviewing the wheeling service system, with a view to promoting an efficient use of transmission and distribution networks, streamlining of investments into transmission and distribution, optimization of power source located region, utilization of distributed generation etc., it will also be an issue how to incorporate tidal streams and proximity to demand areas into the wheeling rate system. These issues will need to be addressed in future by the government and OCCTO.

Reference Figure 4: A conceptual diagram of a two-part tariff scheme and a minimum tariff scheme

Although many low-voltage consumers do not have a meter capable of measuring the amount of power used in each time period, such consumers need to be equipped with a meter capable of measuring the power usage per 30 minutes in order to calculate the quantity of imbalance. The objective to install smart meters capable of measuring power consumption per 30 minutes is stated in the “Immediate Supply-Demand Stabilization Measures” (the Energy and Environment Council, July 2011)\(^{10}\), and its introduction will be required to facilitate the liberalization in low-voltage demand.\(^{11}\) After full liberalization of the electricity retail market, it is appropriate to provide smart meters preferentially for low-voltage consumers who wish to change the power supplier, and to allow them to calculate the quantity of imbalance. However, since a case may be expected where the consumers who wish to change the power supplier are so many that there occurs a shortage in the number of installable smart meters, it will be adequate to permit the use

\(^{10}\) Immediate Supply-Demand Stabilization Measures (July 2011) lays out the objective of “measuring 80% of the current entire demand by smart meters within 5 years from now.”

\(^{11}\) Promotion of the introduction of smart meters is called for from the viewpoint of facilitating peak shift etc., setting of various rate menus, streamlining of business by means of remote meter reading etc., and enabling the capital investment control using actually measured values.
of profiling method (i.e. the method which regards the monthly power use amount as the amount used in each time period according to the assumed demand pattern. Refer to Reference Figure 5) as a time-limited short-cut method and use this method to calculate the quantity of imbalance.

Reference Figure 5: A conceptual diagram of calculating imbalance by using a profiling method

5. Introduction of the planned power balancing system

Under the current electricity system, NPSs are obligated to match the power generation amount with the demand of their consumers per unit of 30 minutes (referred to as “30-minute real power balancing”), and if these are not matched, the NPSs must pay the “imbalance fee” according to the unmatched amount. On the other hand, since GEUs supply electricity both according to the demand of their own consumers as retailers and for the purpose of maintaining the supply-demand balance within their control areas as system operators, the concept of imbalance in the case of NPSs is not applicable to GEUs, and the condition is not equally balanced between GEUs and PPSs.

Considering the call for a level playing field (equal footing) for these two types of utilities in the competitive market, it is appropriate to apply the system of planned power balancing to GEUs.

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12 The appropriate status of the balancing rule will be explored in the period until the separation is made, after the
so that the imbalance between the planned values and actual values of GEUs can be calculated as a difference between these values. On the other hand, based on the fact that a scheme responding to the 30-minute real power balancing system has already been introduced for NPSs, it is adequate to permit choosing either the 30-minute real power balancing or the planned power balancing system. In addition to the beneficial fact that planned power generation values and surplus power generation amount can be determined through the introduction of the planned power balancing system, another effect of promoting trade in the market can also be expected (similarly, regarding the demand side, it is expected that the reduced amount of demand can be traded as negawatts in the market).\textsuperscript{13}

Besides, as the power producer becomes the entity responsible for the balancing activity in power generation and the power producer is able to directly connect with the system operator without relying on any retailer as an intermediary when planned power balancing is chosen, the power producer can replace power sources more easily during plant problems etc., which is expected to contribute to promoting the entry of power producers.

Additionally, final determination on the demand planning is assumed to be basically made an hour before the actual demand occurs. Meanwhile, as GEUs do not manage frequency adjustment and in-house supply-demand adjustment separately under the current circumstances, and it will be difficult to measure the imbalance on the power generation side until the frequency adjustment of the control area is institutionally separated from the in-house power balancing system, as a temporary measure, it may be possible to regard, for example, the nationwide interchanged/received electricity amount during plant problems as the imbalance on the power generation side of the GEU. In relation to specific measures, other adequate measures will also be explored on an ongoing basis.

\textsuperscript{13} However, as utilities do not adjust their power generation amount according to the actual demand in the case of planned balancing, the burden (imbalance) on the system operator could be increased.
III. Utilization of the market function

1. Significance of activating the wholesale market

Activation of the wholesale market is important for the realization of both an economically rational power supply regime and a competitive market.

Through the utilization of the wholesale market, optimization of power generation by means of using the power source in the order of efficiency and price-competitiveness beyond the current framework of utilities and areas (nationwide merit order scheme). Further, it also makes it possible for each electricity utility to reduce the power source capacity maintained in preparation for periodic inspection, etc. and to procure power in the wholesale market flexibly according to their needs. Additionally, by diversifying the purchasers which have been restricted in their business to supplies for their own consumers and other consumers under long-term bilateral contracts, competition and streamlining in the power generation sector will be promoted. As a consequence of these actions, an economically rational power supply system will be established.

Reference Figure 6: Necessity for activating the wholesale market

In order to facilitate the participation of new entrants including NPSs, etc. in competition in the retail market, it is necessary to create an environment where required supply capacity can be
procured in the wholesale market in addition to in-house power sources, and thus activation of
the wholesale market is also important from this viewpoint. As the scale of the wholesale market
is expanded, suppliers for NPSs will be diversified, and the exchange traded price, which has
often shown sudden rises due to power faults etc., is expected to be stabilized. In addition, as the
expansion of the scale of the wholesale market will also contribute to the formulation of highly
transparent and objective power price indexes\(^{14}\), other effects such as the activation of power
trade and improvement of the visibility of investment-return in the power generation sector are
also expected.

In spite of the significance of the wholesale market, the market hasn’t been utilized considerably
in Japan. As shown in the amount of power traded through the wholesale power exchange
market being no more than 0.5% of the entire retail electricity sales\(^{15}\), the volume of the market
is not sufficient, and substantial price fluctuations are caused by high-volume orders due to plant
breakdown, etc. As for the trade among utilities, the ‘over the counter’ transaction consists
mainly of the transactions among GEUs, Wholesale Electricity Utilities (hereinafter referred to
as WEUs) and Wholesale Supplier (hereinafter referred to as WS), as well as among GEUs
themselves, but because a majority of these are long-term fixed trades (please refer to Reference
Figure 7)\(^{16}\), and many of these trades are carried out at the price determined on the basis of the
fully distributed cost methods prescribed by the wholesale regulation, the price mechanism is
not likely to work under these circumstances. In this way, the Japanese wholesale market has
seen the creation of the wholesale power exchange market and the increase in the number of
trade participants due to the progress of liberalization, but the liquidity of the market is still
insufficient.

\(^{14}\) Activation of the forward market, in particular, will contribute to the formulation of the price indexes of power
which will be transferred in future.

\(^{15}\) According to the performance in FY2011

\(^{16}\) 86% of the trade among GEUs, WEUs and WS is accounted for by long-term supply contracts over the period of
no less than 10 years.
Additionally, given the fact that the bulk of power generation and retail is accounted for by GEUs in Japan, GEUs have a strong influence in the wholesale market. Since the trades in the wholesale market are private transactions through both the wholesale power exchange market and the ‘over the counter’ in the private sector, responses to the market control power is primarily left to the practice of private operators and wholesale power exchange market, etc. Concerning this point, problems exist in terms of neutrality, etc. of the governance in the wholesale power exchange market, which are expected to be solved.

2. Further utilization of the wholesale power exchange market

(1) Offering power sales in the wholesale power exchange market and the concept of reserve margin on the occasion

As a first step toward the activation of the wholesale market, at the 9th Electricity System Reform Expert Subcommittee, 9 GEUs announced their voluntary efforts to utilize the wholesale market (refer to Reference Figure 8). The contents of the announcements included
offering a bid for both power sales and purchase contracts in the spot market of the wholesale power exchange market based on marginal costs, and offering a bid for power sales contracts with quantitative objectives through the wholesale power exchange market on the assumption of resolving the tight demand and supply situation, etc. The total of these quantitative objectives of the selling bids amounts to no less than 37 billion kWh. In parallel with these efforts, many of the GEUs presented their proposal to transfer their short-term bilateral power interchange practice, which has been carried out among GEUs, to the market, consider offering the power supplied by the WEUs (described in Section 5 below), and to actively offer buying bids, etc. as their voluntary efforts.

Reference Figure 8: Overview of the voluntary efforts presented by GEUs

<table>
<thead>
<tr>
<th>Company</th>
<th>Cross-trade (Spot)</th>
<th>Trade based on marginal cost (Spot)</th>
<th>Use of forward market (Transition to short-term bilateral interchange market)</th>
<th>Target values</th>
<th>Wholesale electricity utility (Electric Power Development Co., Ltd.) Offering of power source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hokkaido Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○ (Note1)</td>
<td>Selling bid amounting to no less than 2 billion kWh</td>
<td>(Power received from Electric Power Development Co. is only by hydroelectric power generation)</td>
</tr>
<tr>
<td>Tohoku Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○ (Note1)</td>
<td>Selling bid amounting to no less than 3 billion kWh</td>
<td>Power offering of 50,000 to 100,000 kW (Isogos)</td>
</tr>
<tr>
<td>Tokyo Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○ (Note1)</td>
<td>Selling bid amounting to no less than 10 billion kWh (including permanent backup and partial supply)</td>
<td>–</td>
</tr>
<tr>
<td>Chubu Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Input of surplus capacity to the market</td>
<td>Power offering within the range causing no hindrance to demand-supply control</td>
</tr>
<tr>
<td>Hokuriku Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Selling bid amounting to no less than 2 billion kWh</td>
<td>Offering of thermal power is to be considered</td>
</tr>
<tr>
<td>Kansai Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Selling bid amounting to no less than 10 billion kWh</td>
<td>350,000 kWh has been offered</td>
</tr>
<tr>
<td>Chugoku Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○ (Note1)</td>
<td>Offering amount of about 3 billion kWh (including permanent backup etc.)</td>
<td>To be considered soon</td>
</tr>
<tr>
<td>Shikoku Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Selling bid amounting to no less than 2 billion kWh (including permanent backup)</td>
<td>To be negotiated in future (Under consideration of offered power amount etc.)</td>
</tr>
<tr>
<td>Kyushu Electric Power Co.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>Selling bid amounting to about 5 billion kWh</td>
<td>To be negotiated in future</td>
</tr>
</tbody>
</table>

(Note1) as described in the material documents submitted by each company, ○ includes the heating result

When making power input (selling bids) into the wholesale power exchange market, a certain degree of surplus power supply capacity (reserved supply capacity) as compared with the assumed demand is required in order not to cause any disruption in stable supply even when a demand increase due to a change in temperature or a power fault occurs. In future, when a mechanism for operating nationwide power systems has been established on a national basis, and it can be operated flexibly and nationwide, the reserved supply capacity for the case of

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17 For some GEUs, permanent backup supply capacity is included.
temperature change and power faults, etc. will not be procured by the current unit of service area, but will be secured in a certain nationwide in consideration of the restrictions on connection lines etc. (In the first place, offering power sources to the wholesale market won’t lead to the reduction in the entire supply capacity.) On the other hand, in the transitional period to which the concept of the current Electricity Business Act is applied, which imposes a supply obligation for each service area, the reserved supply capacity will have to be procured in each area, but for the purpose of activating the wholesale market, it will be required to secure sufficient reserve margin needed from the viewpoint of stable supply, and at the same time to input a maximum amount of electric power to the market from the surplus above the reserve margin.

As for the amount of the reserved supply capacity for this purpose, considering the fact that the predictability is improved and the reserve margin needed to address the demand caused by the temperature change gradually declines as the acquired data is accumulated day by day until the time of actual use, after securing the reserve margin described below, it is adequate to input basically the entire amount to the wholesale power exchange market in consideration of the surplus capacity as against each demand-supply profile in each time period. 18 Furthermore, given the importance of buying bids for the purpose of activating the wholesale market, it is appropriate for GEUs to offer buying bids at a price based on their own marginal costs, and to purchase power in an active manner.

- Power supply reserve margin at the time of (one day before) input into the spot market
  Secure “basically 8% or the maximum-generation-unit-equivalent amount of” reserve margin, and input an amount of electric power which is at least equivalent to the surplus above the reserve margin to the market. Additionally, when a difference between the predicted value and the actual value is small as in the period when the climate is stable, etc., it is appropriate to accumulate the power source to be input to the market. Moreover, considering the fact that the required reserve margin declines as the time of actual demand and supply comes near, the utilities are asked to “input the power to the hour-ahead market” as described below.

- Power supply reserve margin at the time of (4 hours before) input into the hour-ahead

18 However, if there is a concern about the stable supply only with the relevant reserve margin considering the conditions such as season, weather, etc., required response measures should be taken.
market (main, secondary, third markets (only for that day)).
Secure “basically 3% to 5% or the maximum-generation-unit-equivalent amount of” reserve margin, and input an amount of electric power which is at least equivalent to the surplus above the reserve margin to the hour-ahead market.

It is aimed to start the above-mentioned power input operation in March 2013 as a trial, and to commence full-scale introduction by summer of the same year. If some points to be improved are found during the trial operation, the operation should be reconsidered as necessary. Additionally, the implementation status should be reviewed at appropriate stages.

(2) Activation of the forward market
In order to pursue the activation of the forward market, Japan Electric Power Exchange will change the delivery time of daytime forward traded products to the time matching the actual power demand (to be changed from 8:00-22:00 to 8:00-18:00), and will introduce “annual product contracts” under which utilities commit themselves to selling a certain amount of power on a continuous basis during the delivery period (one year). By means of this modification, it is also expected that the supply capacity as the alternative for base power source of NPSs will be converted from permanent backup supply to procurement in the wholesale market including the forward market, etc. in the medium and long term.

(3) Direct participation of consumers in the wholesale power exchange market of the wholesale market
Direct participation of consumers in the wholesale power exchange market will contribute to the building up of transaction volume through the power exchange, promotion of competition in the retail market, and increasing the choices for consumers. Nevertheless, given the fact that at present the Electricity Business Act restricts the subject entities of continuous supply contracts to the SEUs, the SSEUs and the GEUs, it is not permitted for consumers other than them to trade electricity through the wholesale power exchange market in order to procure electricity for their own use.
With a view of allowing consumers who meet a certain condition on ability, credit worthiness, etc. and utilities which are engaged in specified supply operations to procure power directly through the wholesale power exchange market or to sell/buy negawatt power, the following points will be considered to establish a required system.
Arrangements concerning the wheeling of power which consumers procured through the wholesale power exchange market

Arrangements concerning the classification of supply patterns of power which consumers procure through the wholesale power exchange market (whether to regard the supply pattern as retail or wholesale, etc.)

Requirements for the internal rules (provisions for trading members etc.) of Japan Electric Power Exchange (JEPX)

Arrangement of rules for consumers to be engaged in negawatt trade, where they sell or buy the power saved through the wholesale power exchange market.

(4) Demand response and utilization of negawatt power

In order to pursue an efficient power supply in the entire area of Japan, it is effective to incorporate the efforts on the demand side including demand response and negawatt power trade into the market trade on the basis of their characteristics. It is appropriate to pursue the introduction of these efforts on the demand side in the trades to procure supply capacity/reserved supply capacity not only through spot markets but also through the one hour-ahead market/real time market and capacity market as much as possible. In designing specific markets, it is necessary to examine such matters as the requirements to ensure actual load controlling methods such as load rejection, methods to ensure the implementation of requirements, requirements for wheeling contracts for the purpose of demand response or negawatt trades, definition of the relationship between retailers and the power balancing system, etc.

3. Activation of competition by responding to the shortage of the power capacity of new entrants

As a temporary measure until the wholesale market actually starts functioning, the permanent backup rate and supply amount will be reviewed from the standpoint of promoting competition. Additionally, it is also necessary to pursue the activation of the forward market as described Section 2. (2) in order to respond to the power shortage of new entrants. Further, as for the permanent backup and partial supply, these have been prescribed in the “Guidelines for Proper Electric Power Trade” concerning the supply restriction and rate setting, on the basis of

19 Further, as this measure has been approved by the 9th Electricity System Reform Expert Subcommittee as an institutional reform measure to be implemented antecedently to other measures, parts of this measure have already been implemented, or are being prepared to be implemented in future.
which power trades are expected to be carried out.

(1) Review of the rate and supply amount of permanent backup supply

For the time being, until the wholesale market actually starts functioning, GEUs will be asked to raise the basic rate of permanent backup supply and to lower the energy charge in order to contribute to its utilization as an alternative for base power. Specifically, by raising the cost recovery ratio of the basic rate, energy charges will be lowered to reduce the overall rate when utilizing the permanent backup supply at a high load factor as an alternative to base power. Also regarding the supply amount, as a temporary measure required from the viewpoint of creating an environment that will facilitate the consumer exploration of NPSs by means of utilizing the permanent backup supply as an alternative for base power, it will be adequate to require GEUs to give consideration so that a certain amount (about 30%) of the permanent backup will be secured when NPSs try to expand their demand base.\(^{20}\)

In this way, the measure to require utilities to supply a certain amount of permanent backup supply will be implemented as a transitional measure to address the base power shortage of new entrants with a background where GEUs have secured most of the power source and liquidity is lacking in the wholesale market. Therefore, when the wholesale market starts to function by means of the utilization of the forward market in future, this measure should be eliminated.

(2) Arrangement of environment for implementing partial supply

Partial power supply will not only contribute to increasing the choices among multiple supply methods for consumers but also lead to the promotion of the entry of NPSs into the market by making up for their deficient supply capacity with the supplies from GEUs. However, since no specific implementation methods have ever been established, actual partial power supply has been made only in a few cases. For this reason, it will be appropriate to establish an environment where utilities can jointly make partial power supplies by showing typical specific implementation examples in the guideline. For this purpose, the “Guideline for Partial Power Supply”\(^{21}\) has been developed to define the calculation method of contract demand and treatment of wheeling rates in partial power supplies. Concrete measures are expected in the future.

\(^{20}\) Excluding the part of demand supplied by partial power supplies.

\(^{21}\) Announced by the Agency for Natural Resources and Energy in December 2012
4. Elimination of the power wholesale business

As a mechanism to complement the supply obligation and tariff regulation schemes for GEUs, the wholesale regulation scheme (supply obligation and tariff regulation based on the fully distributed cost methods applied to WEUs and WSs when they supply power to GEUs) has been implemented, but it will be eliminated in association with the full liberalization of entry to the retail market. As some of the existing contracts are expected to remain for some time even after the elimination, the supply capacity of utilities which received power supplies according to the wholesale regulation will not likely to be considerably reduced, nor will any significant impact be caused on the retail electricity rates. Meanwhile, since deregulation will lead to the activation of the market in the power generation sector, it is not necessarily desirable to give an institutional position as transitional measures, etc. to the wholesale contracts to be concluded after the full liberalization of the retail market from the standpoint of urging the activation of the market. For this reason, wholesale regulation should be maintained until the full liberalization of the retail market is carried out, but wholesale regulation should be eliminated once the retail market has been fully liberalized, and new wholesale contracts concluded after the liberalization should be completely free contracts. However, the contracts concluded before the wholesale deregulation should also be reviewed among the parties concerned, especially from the viewpoint of diversifying the electric power buyers of WEUs.

5. Diversification of electric power buyers of the power capacity of Wholesale Electricity Utilities

In the past, almost the entire amount of power of WEUs has been supplied to GEUs under long-term bilateral contracts, while the entry of WEUs into the market will lead to the expansion of the wholesale market, and is needed to activate the wholesale market. Many of the voluntary efforts of GEUs announced in the 9th Electricity System Reform Expert Subcommittee referred to “negotiations/considerations,” and while some of them resulted in actual negotiations
between GEUs and WEUs, it is adequate to check the contents of their efforts by the regular monitoring activity of the wholesale market (described later in Section 6. (1)). Future negotiations and considerations can be expected to be carried out in consideration of the following procedures for implementation:

- Power supply will be implemented in the following two steps: offering of power by WEUs soon after deregulation, and offering of power before the full liberalization of the retail market.
- A part of the power generation capacity as well as the surplus power during low usage time is constantly (without specifying the time) traded through the wholesale market.
- The past power generation costs are to be regarded as recovered through the past payment of tariffs on the basis of the fully distributed cost methods. On the other hand, future power generation costs, including the future depreciation amount, will be recovered from the power sales revenue of the utilities which offered the power amount for sale.
- The contents of the conditions, method of determining the supply destination (bidding, marketing, etc.), and the supply conditions after the offering of power for sale, which are specified through the negotiations between GEUs and WEUs in association with the offering of power for sale, should be confirmed at the time of monitoring.

6. Method of pursuing the activation of the wholesale market

The activation of the wholesale market is indispensable to the promotion of new entry and competition in the retail market, and as this represents the other side of the same coin, i.e. “choices for consumers” themselves, this must be promoted with maximum effort possible before pursuing the full liberalization of the retail market. Additionally, the results need to be regularly monitored, and observed from an objective standpoint to check whether a truly competitive market is emerging or not.

(1) Implementation of monitoring

As adequate functioning of the wholesale market is required to ensure a competitive environment in the retail market, objective monitoring in the wholesale market must be carried out on a continuous basis. For this purpose, it is adequate to regularly monitor the status of the progress in voluntary efforts of GEUs, etc. and the competition in the wholesale market through the new regulatory organization (through the Experts Committee, etc. until the authority is transferred to the new regulatory authority) described later in VI.1., and publish
the results after giving consideration to the competitive position and other legitimate interests (refer to Reference Figure 10). Meanwhile, when GEUs offer bids for thermal power generation equipment simultaneously with the selling of power through the wholesale power exchange market or to NPSs in addition to their public offers, it is appropriate to evaluate the results as a part of their voluntary efforts during the monitoring activity.

Reference Figure 10: Monitoring of voluntary efforts/competition status

<table>
<thead>
<tr>
<th>Category</th>
<th>Examples of the matters to be monitored</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trade through the power exchange</td>
<td>Amount of selling/buying bid and execution amount, The spread between the selling bid and the buying bid in the case of cross-trade, Difference between the bidding price and the marginal cost, Status of utilizing the forward market (transition to the short-term bilateral interchange market etc.)</td>
<td>Monitor wholesale electricity utilities for the same matters</td>
</tr>
<tr>
<td>2. Power offering by wholesale electricity utilities etc.</td>
<td>Name of the power source offered in bilateral interchange, offered power amount (kW), Name of the utility which offered the power in bilateral interchange</td>
<td>Monitor wholesale electricity utilities for the same matters</td>
</tr>
<tr>
<td>3. Power supply to consumers located outside the coverage area</td>
<td>The number of power supply contracts under which general electricity utilities supply power to consumers located outside their own coverage areas, a total of contracted power amount (kW) and electric energy (kWh)</td>
<td></td>
</tr>
<tr>
<td>4. Permanent backup</td>
<td>Contracted power amount (kW), supplied electric energy (kWh), contract period, Load factor of the permanent backup, past unit price, Increased amount of demand for power producer-suppliers (*)</td>
<td>*As regards the increased amount of demand, related information will be collected from the reports by/hearings from power producer-suppliers</td>
</tr>
<tr>
<td>5. Partial supply</td>
<td>The number of partial supply contracts, supply pattern, contracted power amount (kW), supplied electric energy (kWh), contract period</td>
<td></td>
</tr>
</tbody>
</table>

(2) Consideration of measures for activating the wholesale market coupled with institutional measures

As the activation of the wholesale market is indispensable to the full liberalization of the retail market, especially the deregulation of electricity rates, in the cases where, as a result of monitoring, voluntary efforts including the utilization of the wholesale power exchange market, review of permanent backup, diversification of electric power buyers of WEUs, etc. haven’t made progress as was initially announced, or where sufficient development of the activation of the wholesale market cannot be expected only by voluntary efforts until the deregulation of electricity rates, measures for activating the wholesale market should be considered along with institutional measures.

7. Establishment of an electricity futures market

Since the current transaction amount of electricity through the wholesale market is small, the price fluctuation risk electricity utilities face when procuring electricity is limited (this is not applicable to NPSs with a high proportion of procurement from the wholesale power exchange
market). Meanwhile, as for the demand to which the fuel cost adjustment scheme is applied, this scheme provides a certain degree of hedge against the fluctuation risk of fuel prices. In future, when the electricity price reflecting the demand and supply situation is formulated and the wholesale transaction amount based on this price increases in association with the activation of the wholesale market, the needs for electricity futures transactions to hedge against the fluctuation risk of wholesale prices are expected to be generated. Moreover, once the full liberalization of the retail market and the deregulation of electricity rates, etc. have been made, the need for electricity futures transactions are expected to increase further. In order to establish an electricity futures market, it is required to add electricity to the subject items of the Commodity Derivatives Act, and to make it possible to be listed on the power exchange. Therefore, development of laws will be required to support electricity futures transactions in parallel with the electricity system reform.

8. Utilization of market functions in supply-demand adjustment

In order to establish an economically rational power supply system, a mechanism is needed to allow economical operation of power sources by means of utilizing the market function. From such a point of view, the market function is expected to be utilized as much as possible in the supply-demand adjustment immediately before actual demand and supply occur. In pursuing the electricity system reform, an efficient supply-demand adjustment system making use of the market function should be developed by building up the one hour-ahead market described later, the real-time market, and a mechanism for clearing imbalances.
IV. Expansion/neutralization of transmission and distribution sectors

1. Expansion of the nationwide system operation

(1) Necessity for nationwide system operation

Due to unevenly distributed reserved supply capacity and limitations on transmission capacity through FCs and the connection lines across multiple areas, etc., it was revealed that the backup system for emergency supply was insufficient at the time of tight demand and supply after the Great East Japan Earthquake. Although the current system already provides the framework to support operations including transmission and distribution, etc., the Electric Power System Council of Japan (hereinafter referred to as ESCJ), appointed on the basis of this framework, is no other than an agency to “support” the business activities of GEUs, such as wheeling supply, etc., and the responsibilities and authorities concerning demand and supply were granted only to GEUs. In the middle of the disastrous crisis of that time, the limited authority of ESCJ couldn’t provide a sufficient mechanism to carry out nationwide supply-demand adjustment.

In order to address the challenges for Japan’s electricity system, such as the necessity for enhancing supply-demand adjustment functions on a national level and for planning nationwide system, which became distinct during the crisis, it is required to pursue the establishment of a system for nationwide operation on the national level in parallel with the construction of transmission infrastructure. Additionally, pursuing the said nationwide operation of power systems will lead to the creation of a competitive environment where utilities engaged in power supply will make efforts in a state of rivalry on the national level, as well as contribute to the realization of nationwide merit order schemes.

(2) Foundation of OCCTO

It is envisioned to establish OCCTO, which will carry out the planning of nationwide power systems and supply-demand adjustment processes on the basis of strong authorities for gathering information and adjusting. In association with this measure, the current framework to support transmission and distribution operations, etc., which now supports the business activities of GEUs, such as wheeling supply will be abolished. As for the duties currently carried out by ESCJ, e.g. liaison and coordination work related to the operation of interconnection lines, handling of complaints from/settlement of disputes with power supply utilities, and information providing work, considering the fact that smooth implementation of these activities is a prerequisite for nationwide operation of power systems, these duties will...
be taken over by OCCTO, and its competence should be reinforced so that the benefit from utilities’ access to the power grid will be enhanced uniformly throughout the country. The ‘Rules of ESCJ’, the overview of which is laid out by ESCJ, should be developed and operated in the newly founded OCCTO after the review for matters to be determined by utilities as well as the relationship between the OCCTO and utilities, in consideration of the prospect that OCCTO will carry out nationwide system planning, nationwide supply-demand adjustment, and other duties concerning access to the systems as described below.

As it is an urgent issue to establish OCCTO, and neutral institutional design is strongly required, it is appropriate to initiate practical considerations for the foundation of OCCTO immediately, and carefully examine the requirements for OCCTO as well as various rules for using the power systems in an objective and transparent manner. In addition, as for the facility expansion/reinforcement and operational review of interconnection lines between areas etc. in the future, it is desirable for OCCTO to proactively formulate the proposals for the expansion/reinforcement and operational review, and to provide instructions on the implementation of the proposals. For this purpose, in developing concrete measures for the above activities\(^{22}\), along with the examination on the requirements for OCCTO, it needs to be pursued in an objective and transparent manner. Further, from the standpoint of the government which strongly promotes the expansion/reinforcement of interconnection lines between areas, etc. in a unified fashion, it is also required to consider the establishment of a scheme under which the government will designate the particular transmission lines to be reinforced, and required adjustment etc., and will be carried out by the government ministries and agencies concerned.

(3) Duties carried out by OCCTO

The main duties of OCCTO may include the following. When OCCTO performs these duties, the government will have a hand in the form of accepting demand-supply plans, supervising the transmission operating work, and issuing load-dispatch instructions at the time of tight demand and supply.

Among these activities, it has been pointed out that there is some doubt about the neutrality in

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22 Concerning the reinforcement of interconnection lines in particular, (i) the capacity of FCs is planned to be enhanced by 900,000 kW (from 1,200,000 kW to 2,100,000 kW) by the target fiscal year of 2020. Additionally, as early as possible after that, the capacity of FCs should be enhanced to 3,000,000 kW while paying attention to the cost effectiveness and on the basis of policies, (ii) the capacity of the Hokkaido-Honshu interconnection lines should be enhanced by 300,000 kW (from 600,000 kW to 900,000 kW) as has already been determined from the standpoint of stable supply at an early stage.
the activities concerning the transmission access, adjustment of work suspension plans related to the interconnection lines/trunk transmission power system, and measures at the time of emergency in a tight demand-supply situation, but by assigning these duties to OCCTO, it can be expected that a certain degree of neutrality and impartiality will be improved.

(i) Supply-demand planning business/electrical grid planning business
After making required adjustments based on the power source development plans for the respective areas formulated by the transmission operators of those areas and the plans on distribution facilities etc., a supply-demand plan will be formulated for the entire areas of Japan for the period of around 1 to 10 years ahead coupled with the plans for interconnection lines between areas and the trunk transmission power system, and all of these plans will then be submitted to the government. (It is also envisioned that the government may request changes as necessary.)

(ii) Businesses such as management of reserve margin to ensure long-term supply capacity
The supply-demand plans and the plans on distribution facilities will be used to create a long-term prospect for supply capacity and distribution facilities, and if any deficiency is foreseen, constructors of power generation plants will be chosen through public bidding as the final means to prevent future deficiency in power supply capacity.

(iii) Demand-supply status and nationwide system operation
When plans are to be formulated for the short- to long-term (monthly, weekly or daily) operation of power systems in response to the status of demand and supply, power supply plans will be formulated after adjusting the work suspension plans for transmission and power generation facilities required from the viewpoint of nationwide power supply. In the meantime, concerning the actual demand-supply profile, along with the increase in the necessity for nationwide supply-demand adjustment and frequency adjustment due to increased variation in power sources such as renewable energy, in response to which the flow of electric power through interconnection lines and the trunk transmission power systems should be managed in a flexible manner, supply-demand adjustment/frequency adjustment should be carried out in collaboration with the transmission operators of the respective areas.

(iv) Measures at the time of emergency in a tight demand-supply situation
At the time of emergency in a tight demand-supply situation (for example, a situation
where some deficiency in power supply capacity is foreseen even after using the market function in the period of time until immediately (basically an hour) before the actual demand and supply occurs), instructions on the higher utilization of power generation facilities and/or the release of reserve margin, etc. should be given as necessary.

(v) Businesses concerning power system access
In response to the requests from electric power system users, accept applications for the examination on line connection, notification on the examination results to the utility concerned, etc. (excluding power distribution systems).

(vi) Publication of information on power systems
Publish the information on power systems (if the contents of the information is insufficient, it is conceivable that the government will issue recommendations and instructions etc.)

(vii) Evaluation of the reliability of power systems
Evaluate whether adequate reliability is ensured for the demand in the period of around 1 to 10 years ahead, and submit the results to the government.

(4) Formulation of rules on the nationwide system operation
A series of rules will be required for OCCTO to carry out the above-mentioned duties, including the operation of interconnection lines, access to the grid, publication of information on power systems, responses during an emergency in a tight demand and supply situation, etc. In developing the rules, in consideration of the characteristics of transmission and distribution networks as the public infrastructure, it is appropriate, after the government has laid down basic guidelines on the use of the power grid, to allow OCCTO to review and determine the provisions prescribed by the ‘Rules of ESCJ’ on the basis of the guidelines, and to obligate the government to confirm the adequacy of the contents.

Although the publication rules of information on transmission are currently laid out in ESCJ rules, many requests on grid access and actual operation have been submitted by power plant operators, etc. For this reason, “The Basic Idea on the Publication of Information on Power Systems” was announced in December 2012 as a guideline on the provision of information, etc. by the transmission and distribution sectors of GEUs, which is verifiable for power plant operators, expansion of the scope of information to be publicized, and these contents should be reflected in the rules of ESCJ and applied accurately (by OCCTO after its establishment). Additionally, rules and their operation should be reviewed on a timely basis according to the
progress in the electricity system reform.

(5) Relationship between the transmission operators/electric power system users in the respective areas and OCCTO
When OCCTO performs its duties, it is required that the transmission operators and electric power system users of the respective areas submit various plans to OCCTO and OCCTO conducts nationwide adjustments among the transmission operators and electric power system users in the respective areas. Therefore, in designing the institution featuring OCCTO, a framework should be developed to allow the transmission operators and electric power system users in the respective areas to participate in related activities and to comply with the rules laid down by OCCTO. Further, it is required to ensure the adequate implementation of the activities needed to operate nationwide power systems by imposing an obligation to submit various plans on them.

2. Necessity for securing neutrality in the transmission and distribution sectors
The Japanese government introduced the system of “accounting unbundling” to secure neutrality, as one of the categorized means for the separation of electrical power production from power distribution and transmission at the time of the legislative revision in 2003, as well as prohibiting the discriminatory treatment and unintended use of information. However, up to the present time when about 10 years have passed since the legislative revision, there are constant indications that neutrality has yet to have been sufficiently secured in transmission and distribution sectors. Moreover, from the standpoint of promoting distributed generation such as renewable energy, cogeneration, and private power generation, many voices are heard calling for further securing of neutrality in the transmission and distribution sectors.

In future, as the reforms are implemented including the full liberalization of the retail market, etc., it becomes necessary, for the following reasons, to take institutional measures for further neutralization (non-discrimination) in the transmission and distribution sectors without assuming the measures for securing neutrality taken in the vertically integrated system and the past transmission and distribution sectors.

(1) Securing “impartiality and neutrality” in response to the diversity in electric power system users
Given the characteristics of electricity, it is inevitable that the demand-supply management of the entire transmission and distribution network has to be carried out by a single operator, and
this business will have to be addressed by regional monopoly. In addition, as for the construction and maintenance of transmission and distribution network equipment, which is strongly characterized by a natural monopoly and its public nature, it is necessary to arrange a mechanism which will allow all utilities to participate in the related business activities while preventing overlapping investments by means of total management in contrast to the competition promotion measures even if they are taken in the power generation and retail electricity sales sectors. Therefore, even if full liberalization is realized in the power generation and retail electricity sales sectors, considering the likelihood of continued regional monopolies in the transmission and distribution sectors, tariff regulation will need to be put in place, such as the fully distributed cost method and a license system. As a result, the guarantee for investment return in the transmission and distribution sectors will be institutionally positioned more expressly than in the past. Meanwhile, as tariff regulation will remain in the transmission and distribution sectors, it will become possible to add the institutionally approved surcharges including the costs for the Last Resort service and the Universal service in isolated islands to the transmission and distribution fees.

As stated above, in order to diversify and liberalize the power generation and retail electricity sales sectors while maintaining the current schemes such as regional monopoly in the transmission and distribution sectors, the transmission and distribution network will need to be operated in an unbiased manner so that various utilities can use the transmission and distribution network. When the introduction and expansion of the renewable energy is pursued, in particular, it is important to further enhance the impartiality and transparency of the transmission and distribution sectors so that diverse power producers will be treated impartially in the publication of information on power systems required to connect to the transmission grid and the application of system access rules. Up to now, despite the phased liberalization of the retail market, there has been only a single case where power supply was made across multiple areas by a GEU. In order to stimulate competition across multiple areas in the retail electricity sales sector, in addition to competitive prices and efforts to obtain consumers, guaranteeing impartial access to the transmission and distribution network is important.
(2) **Arrangement of a competitive environment toward the full liberalization of the retail market**

In order to facilitate adequate price formation in the retail market, it is indispensable that active competition occurs among retailers. As the current tariff regulation will be abolished after the full liberalization of the retail market including the household sector with weak price negotiation ability, the importance of the said competitive possibility will further increase. Based on the recognition that competition has not progressed during the past 10 years or so when partial liberalization has been pursued, it is indispensable to make maximum efforts to secure neutrality in the transmission and distribution sectors so that substantial competition will be facilitated.

(3) **Utilization of diverse power sources in supply-demand adjustment**

By means of the further neutralization in the transmission and distribution sectors, supply-demand adjustment of the entire power system will be carried out in a neutralized manner without discriminating power source holders in consideration of the characteristics of each power source, such as adjustment speed, etc. This will allow not only the power sources of GEUs but also those of other utilities including PPSs and IPPs\(^\text{23}\) to be operated efficiently in reference to the merit order, and is also expected to increase the adjustment capability of the entire system. Considering the possibility that diverse power sources will be utilized and the competition among power producers will go forward, it is necessary to establish a mechanism which will allow neutralized operation of the entire power system without discriminating power source holders in place of the current scheme where specified GEUs “maintain the power demand-supply balance in the entire power system on the basis of their own power

\(^\text{23}\) IPPs (Independent Power Producers)
3. Methods for securing neutrality in the transmission and distribution sectors

The neutralization measures for the transmission and distribution sectors are classified into four main categories, which range from accounting unbundling adopted in Japan to complete separation of ownership in the transmission and distribution sectors (refer to Reference Figure 12). As stated above, the past accounting unbundling method is insufficient as a neutralization measure after the reform, and further neutralization of the transmission and distribution sectors will be required by means of legal unbundling or functional unbundling method, both of which were evaluated from various aspects as described below. Meanwhile, although ownership unbundling could be the plainest form of means for realizing neutrality, this will be an issue for future consideration if the effect of the reform proves insufficient.

Additionally, collaboration (in terms of load-dispatch instructions, etc.) in the power generation, transmission and distribution sectors will be important for any of these methods. On this point, as a broad range of power producers including operators of IPPs and distributed generation as well as the power generation division of GEUs will need to collaborate with the transmission and distribution utilities which issue load-dispatch instructions once diverse power producers have entered the market, in designing the schemes, adequate consideration needs to be given to this point, and it is necessary to make absolutely sure of stable supply including the response measures during disasters.

Reference Figure 12: Types of unbundling to neutralize the transmission and distribution sectors
(1) Distinct independence of the transmission and distribution sectors

Legal unbundling seeks to spin off the transmission and distribution divisions into separate companies, by which means the activities, accounting, employees of the respective business divisions can be distinctly allocated into each subsidiary. Therefore, this scheme makes it possible to easily grasp the independence of the transmission and distribution divisions in an objective manner.

Functional unbundling seeks to transfer the functions of operation and order-issuance of the transmission and distribution divisions to separate organizations (local offices of OCCTO and ISOs (Independent System Operators)), and it is difficult to make out specific methods including the delineation between operation/instruction-issuance and the other duties of the transmission and distribution divisions. For this reason, rules and high expertise of the regulatory authority are required to enable external verification.

For instance, though the disclosure of the information on the arrangement of the transmission and distribution networks, etc. needs to be carried out in an impartial and neutral manner, since, different from the case of functional unbundling, independent transmission and distribution companies equipped with transmission and distribution facilities will carry out the disclosure of the information in the case of legal unbundling, it is conceivable that external verification on impartiality and impartiality can be relatively distinctly and easily conducted by means of utilizing OCCTO and enforcing a code of conduct.

(2) Presence/absence of capital ties among the divisions in charge of operation and instruction-issuance functions

In the case of legal unbundling where capital ties exist within each corporate group, an incentive also exists to treat the power generation/retail electricity sales companies within each group. Therefore, it is necessary to take adequate measures for code of conduct which is also applicable to parent companies (holding companies or power generation/retail electricity sales companies) (detailed in Section 5.).

In the case of functional unbundling where capital ties do not exist between ISOs, which have been separated from GEUs and assume operation and instruction-issuance functions, and existing GEUs engaged in the other transmission and distribution businesses, no incentive exists to treat other companies within the group favorably with a background of capital relations.
(3) Influence of separation of transmission and distribution businesses on stable supply

In the case of legal unbundling where transmission and distribution companies carry out the development, maintenance and operation of the transmission and distribution facilities in an integrated manner as in the past, it is possible to apply the current rules for exact operation of these facilities and for linking the players in transmission and distribution businesses to these activities.

In the case of functional unbundling where the players of transmission and distribution businesses are divided into ISOs and the owners of transmission and distribution facilities, it will be an issue how to delineate the transmission and distribution businesses from the viewpoint of securing neutrality and how the delineation will influence stable supply. On this point, if ISOs and OCCTO assume the duties which require neutrality such as the determination on the operation and suspension of transmission and distribution facilities, issuance of instructions to the owners of the transmission and distribution facilities, and the development of work suspension plans, while the owners of such facilities assume the physical operation and manipulation of transmission and distribution facilities/equipment on the basis of the instructions from ISOs and OCCTO, concerns over the stable supply of electricity will be resolved by formulating more detailed rules for operation and the division of roles than in the case of legal unbundling.

It will be technically possible to secure both neutrality and stable supply in either of the above methods, but rules and an institution are required to allow transmission operators and electric power system users to cooperate with each other under the respective responsibilities.

(4) Supervision over the status of secured neutrality and flexibility in securing neutrality

As it is expected that the measures to secure neutrality will have to be supervised/monitored for their performance and the strength of those measures may need to be changed in response to the result of the monitoring activity, it will be an issue whether such supervision/monitoring and ex-post change can be made easily.

On this point, the supervision/monitoring of the status of secured neutrality in the case of the legal unbundling will be carried out to confirm the compliance status with the code of conduct on the management of information, personnel affairs and accounting, etc. (including the regulations on the relationship between parent companies and their transmission and distribution subsidiaries) and the adequacy of the level of the code of conduct. In the case of legal unbundling, as the entire transmission and distribution sectors are to be externally separated into distinct organizations, it is easy to grasp the status of secured neutrality.
Additionally, by strengthening the code of conduct, etc., it is relatively easy to change the strength of measures to secure neutrality in an ex-post manner. The supervision/monitoring of the status of secured neutrality in the case of functional unbundling will be carried out to confirm whether any intervention beyond the scope of “delineation” between ISOs and the owners of transmission and distribution facilities is made or not, and whether the delineating position is appropriate or not. Further, supervision/monitoring is also needed to confirm the status of accounting unbundling and information blockade, etc. required between the regulated sector of transmission and distribution facility owners and power generation/retail sectors. In the case of functional unbundling, because of (i) the high expertise required in transmission operation and (ii) the prospect that the opening/closing operation/manipulation, etc. of individual components will continue to be carried out by the owners of transmission and distribution facilities, it won’t be easy to externally verify the secured status of neutrality. In addition, when the strength of the measures to secure neutrality is to be changed, the cost for changing the systems related to the transmission operation will become relatively higher.

(5) Nationwide system operation

As the same organizational structure exists in both the national organization of OCCTO and its local offices in the case of functional unbundling, adjustment among multiple areas can be easily conducted through interconnection lines. Additionally, when local units (control areas) for frequency adjustment are to be integrated in future for reasons such as to expand the potential for introducing renewable energy, it may be relatively easily realized. In contrast, such an advantage isn’t particularly available in the case of legal unbundling.

(6) Elimination of interests across the transmission and distribution sectors and securement of investment to transmission and distribution

In the case of legal unbundling, as the risk factors of earnings volatility in the power generation sector have no direct influence on the financial accounting of transmission and distribution companies, compared with the case of the current vertical integration type of corporation and the case of functional unbundling, the risk of the bankruptcy of transmission and distribution companies will be relatively small. Moreover, as in this case transmission and distribution companies will maintain or make independent investments into transmission and distribution facilities, it will also contribute to the continuation of adequate investments into transmission and distribution facilities without depending on the earnings performance of the
power generation and retail electricity sales divisions, etc.
Meanwhile, in the case of legal unbundling, it will be easier than in the past to pursue the streamlining of businesses based on the competitive principle in the sense that it won’t be bound by the regulations on the transmission and distribution sectors, in addition to the outlook for the expansion of the sphere for the imaginative and original capability of each company, which are expected to result in improved management of the power generation/retail electricity sales divisions and business development, including increased commitment to consumer services and advance into overseas markets, etc.

(7) Cost and time required for the institutional transition
In evaluating these unbundling measures, the time and cost incurred for the institutional transition also need to be considered.
Without regard to which unbundling measure will be adopted, it is desirable that, along with the liberalization and diversification of the retail and power generation sectors, further neutralization of the transmission and distribution sectors be effected as early as possible, so that new entrants and renewable energy utilities, etc. can use the transmission and distribution networks without discrimination.
For purposes of changing the demand-supply imbalance control system, splitting of organization/business activities, measures to respond to code of conduct (shutdown of information system) etc., corresponding costs and time will be required to overcome the technical challenges involved in ensuring convenience for consumers and stable power supply in either of these measures. Moreover, in the case of legal unbundling, the cost involved in splitting the organization, etc. is expected to be additionally required as compared with the case of functional unbundling.
As corresponding cost will be required in either of the legal unbundling or functional unbundling, some contrivance will be needed for the future institutional design to reduce the transitional cost in order to bring down the burden on the consumers.

(8) Concern about financing
As for financing activities, in either case of functional unbundling or legal unbundling, it is necessary not to hinder the financing required for the stable supply of electricity while ensuring the sound development of the electric power industry.
In either of the measures, consideration to the financing environment will be required as a prerequisite for further neutralization of the transmission and distribution sectors.
(9) Consideration of various factors including detailed institutional design and technical development

As stated above, there are still issues to be resolved such as formulation of detailed rules, reduction in transitional costs, etc. in order to pursue further neutralization of the transmission and distribution sectors, and the degree of difficulty in resolving these issues depends on various factors including the detailed institutional design such as the details of code of conduct levels and technologies concerning transmission and distribution. In addition, the degree of difficulty in resolving these issues may change in future due to the change in the situations around the mechanism of transmission and distribution.

4. Implementation of legal unbundling

Neutrality in the transmission and distribution sectors will be pursued under the premise of the legal unbundling measure.

In order to pursue neutralization further in the transmission and distribution sectors in future, an enormous amount of specific work will be required, including the formulation of detailed rules, establishment of a new demand-supply imbalance control system, review of implementation schedule, etc. As described above, by establishing rules and an institution which will allow system operators and power producers to cooperate with one another under the respective responsibilities, it is technically possible to take either of these measures without any problem in terms of stable power supply, and in order to advance related work promptly, it is necessary to clearly express the policy on which of the functional unbundling or legal unbundling measure will be adopted.

As described in Section 3., either measure has its own advantages and disadvantages in each aspect, but in promoting further neutralization in the transmission and distribution sectors, taking into account the viewpoint of distinct independence of the transmission and distribution sectors, preparations should be made for implementing the legal unbundling. Should it become clear that a major problem is going to take place in this process, the functional unbundling measure could be reconsidered, but the primary efforts should be made on the assumption of implementing the legal unbundling.

It is a common practice for a company to spin off some of its business sectors into separate companies, and the aim is to reinforce transparency in its corporate performance and accounting, as well as to urge autonomous behavior. In the case of legal unbundling, due to the unbundling of the transmission and distribution sectors as subsidiaries, a sense of interest in and affinity
with the power generation sector gradually fades away, urging independent actions based on the awareness as a public infrastructure, which is expected to lead to enhanced coverage and neutrality over time.

5. Code of conduct required for securing neutrality
In order to secure the neutrality and independence of the transmission and distribution sectors, rules to regulate each utility (codes of conduct) are required. The level of the code of conduct needs to be determined on the basis of the actual status in Japan in reference to the precedents in the EU, etc. Specifically, the contents of the regulations described below will be mainly used as a base, and then the specific subjects of regulation and the level should be determined later. On that occasion, consideration should be given to the rise in cost and deterioration in services.

(1) Code of conduct to secure the neutrality and independence of the transmission and distribution sectors
In order to secure the neutrality and independence of the transmission and distribution sectors, the requirements for the code of conduct on the transmission and distribution sectors will be as follows:

<Examples of the requirements for the code of conduct for securing neutrality in the transmission and distribution sectors>
(i) Prohibition of using information out of transmission and distribution businesses
(ii) Prohibition of holding concurrent positions in power generation and retail electricity sales business sectors
(iii) Strict management of documents, data, etc. concerning the business activities related to transmission and distribution (encoding of information, restriction on access, etc.)
(iv) Ensuring the independence of accounting in each sector
(v) Prohibition of discriminatory treatment

(2) Code of conduct required between the parent company (holding company or power generation/retail company) and its subsidiaries (transmission and distribution companies)
In the case of legal unbundling, transmission and distribution companies are permitted to have a capital relationship with power generation/retail companies. Therefore, in order to eliminate the exercise of influence by the parent company (holding company or power generation/retail
(company) on its transmission and distribution subsidiaries and to ensure the independence of such transmission and distribution subsidiaries, it is indispensable to securing neutrality in the transmission and distribution sectors to implement adequate code of conduct on the relationship between transmission and distribution subsidiaries and the parent company. In addition, in order to ensure equal footing with other businesses in competitive sectors such as power generation/retail sectors, it is appropriate to implement a certain degree of code of conduct on the use of management resources of transmission and distribution subsidiaries by power generation/retail companies. For this purpose, the following points will be required of the code of conduct on the relationship between the parent company and its transmission and distribution subsidiaries.

<Examples of code of conduct to ensure independence from the parent company>

(i) Independent decision-making of transmission and distribution subsidiaries
   A certain degree of regulation should be introduced on the exercise of influence on the decision-making of transmission and distribution subsidiaries by the parent company, and on the top management of transmission and distribution subsidiaries.

(ii) Restriction on the personnel transfer to transmission and distribution subsidiaries
   It should be prohibited to hold concurrent positions in the parent company and its transmission and distribution subsidiaries, and a certain degree of restriction should be imposed on the personnel transfer/temporary assignment from the parent company to the transmission and distribution subsidiaries.

<An example of a code of conduct to ensure equal competitive conditions in competitive sectors>

Impose a certain restriction on the contents of the business activities which can be consigned by the parent company to its transmission and distribution subsidiaries, and require the conditions to be non-discriminatory as compared with the case where such activities are to be consigned from another retailer or power producer. In addition, impose a certain restriction on the joint advertisement, etc. of the parent company and the transmission and distribution subsidiaries.

Meanwhile, among the activities of the parent company, the following activities may be excluded from the subject of restriction.

(i) Activities as a stockholder of transmission and distribution subsidiaries
Voting as a stockholder within the scope of the above-mentioned regulation for ensuring the independence of transmission and distribution subsidiaries, and receipt of dividends from transmission and distribution subsidiaries

(ii) Activities which are intended to pursue scale merit and which will not have an impact on the measures to ensure the independence of transmission and distribution subsidiaries or to ensure equal competitive conditions in competitive sectors
Lump-sum financing by the parent company, which will not have an impact on the measures to ensure equal competitive conditions in competitive sectors loans to transmission and distribution subsidiaries, and bulk purchase of materials, etc.
V. Measures to secure the supply for stable supply of electricity

1. New system to secure supply capacity

Supply and reserve margin has been secured by GEUs that have obligation to supply. As retail electricity is fully liberalized, the obligation of GEUs to supply is to be abolished. Therefore, there is a need for a new system to secure reliable supply capacity in order to prevent electricity supply disruption in the future.

In the new system, the framework of GEUs that have previously supplied electricity in a stable manner will disappear and securing supply capacity and reserve margin can only be achieved by related businesses fulfilling their responsibilities. Retailers procure necessary supply capacity for their clients, power generation companies secure fuels and stably generate electricity based on the agreement with other companies and requests from their retail sector and system operators conduct final supply and demand adjustment. It is required that all these companies relating to electricity business play a certain role with stable supply in mind and develop a new electricity system.

As measures to develop a new system, it is necessary to obligate retailers to secure supply capacity and system operators in the area and OCCTO to maintain frequency (obligation to maintain balance between supply and demand in the whole power system). Furthermore, a new system to secure supply capacity should be developed, such as the development of a system in which OCCTO secure electricity even if insufficient supply is expected in future.

(1) Obligation to secure reserve margin

In order to supply electricity in a stable manner, it is necessary to systematically secure supply capacity under demand estimates with stable accuracy and a certain reserve margin in case of an abrupt change in climate condition, electric source trouble, etc. As for securing a necessary reserve margin, it is desirable to design a system that can use the advantage of improving efficiency by competition. The reserve margin should not be procured all by transmission operators, but at least part of it should be procured by retailers in a competitive environment. Therefore, it is necessary to obligate system operators to supply electricity in a stable manner in the form of maintaining frequency, and retailers who are directly responsible for consumers to secure reserve margin that is necessary for the demand.

This system is expected to provide related people with institutional assistance to share efforts for securing reserve margin, and secure an economically-rational reserve margin through a certain amount of procurement by retailers who are facing a competitive market. As for
specific obligations of the reserve margin, taking into account the fact that GEUs have most supply capacity, it is necessary to pay constant attention not to limit new businesses and the expansion of renewable energy use too much. However, there is a need to design a balanced system in which all businesses play a certain role in providing stable supply.

(2) Securing medium- to long-term reserve margin

As mentioned above, it is expected that reserve margin for estimated demand is secured just before supply/demand by obligating retailers to secure reserve margin. However, it is difficult for retailers to create accurate demand estimations for medium- to long-term reserve margins, as the actual supply/demand will appear in a few months to a few years. It is therefore necessary to develop a system that predicts the reserve margin required throughout the nation from the viewpoint of Japan’s overall supply and demand.

Creating estimation for medium- to long-term reserve margins is considered a duty of OCCTO. It is appropriate to develop a system to secure supply capacity required in future based on this estimation, using capacity market (explained in later part) or the final power source bidding system by OCCTO.

Reference diagram 13: Idea of securing supply capacity

2. Establishment of an “Hour-ahead market” and a “Real-time market”

In the current electricity utility system, GEUs adjust supply and demand using power generation facilities within the area. This reform aims to optimize (nationwide merit order) power
generation throughout the country as electricity companies and retailers use the newly-established Hour-ahead market until just before supply/demand. Moreover, after further neutralization of the transmission and distribution sectors, an electricity supply command function that adjusts supply and demand will be separated from the power generation sector. For system operators, this eliminates the idea of a “company’s own power generation facilities” and creates a system to adjust supply and demand by sourcing the most efficient power from the Real-time market. Using these systems, we will try to develop an economically rational electricity supply system and reduce supply costs while securing stable supply.

(1) Establishment of an “Hour-ahead market”

As a system for entities such as retailers to implement economical supply/demand adjustment based on merit order and minimize imbalance by matching supply and demand as much as possible, we will establish an “Hour-ahead market” that can be used until just before Gate Close. As described hereinafter, if the price of the Hour-ahead market is used in imbalance clearing, the market requires nationwide operation that can create prices that reflect nationwide supply and demand status and the mobility of transactions. In order to secure price formation with high neutrality and reliability, constant involvement of public sector, such as monitoring transactions in the market and making it a rule to input all the excess power source of the previous day, is considered necessary.

(2) Establishment of a “Real-time market”

As transmission and distribution sectors become more neutralized, supply and demand adjustment of the whole power system, which has been conducted by GEUs, will be separated from the power generation sector. The power system will be operated in a neutral way without any distinction of power owners. This enables power sources of GEUs and other power producers to compete on an equal footing even in the final supply and demand adjustment after one-hour prior Gate Close, which leads to an operation with better efficiency. It is expected that the overall adjustment capacity will increase by the involvement of power sources from other power producers.

It is appropriate that, as a specific system to achieve this, transmission operators secure supply capacity by obtaining from the market or bidding, and based on the price introduce a mechanism (a Real-time market) that is used for the adjustment of real-time supply/demand.

24 Deadline for the supply and demand plan transferred from power producers and retailers to system operators.
and frequency. When designing the Real-time market, there is a need to meet such requirements as securing neutrality of the market operation and transparency of prices, realization of efficient supply/demand adjustment using market mechanism and stable procurement of necessary adjusting capacity. This means that it is necessary to realize this includes the disclosure of Real-time market prices, power generation by merit order, use of new electricity sources, demand response and a system in which power sources (for frequency adjustment) with adjustment flexibility are evaluated.

In order to make the Real-time market function, it is necessary to clearly sort agreements and commands related to power operation to avoid confusion of power operated by transmission operators for the adjustment of supply/demand and frequency of the whole power system with power operated by power producers using their management judgment. This requires some environmental arrangement such as the progress in the neutralization of transmission and distribution sectors, and the development of a system that enables system operators to send commands to power sources of power producers other than GEUs. It is necessary to arrange such an environment as soon as possible for the introduction of the Real-time market.

3. Imbalance clearing system linked to the market

Characteristically, even if products (electricity) that meet the amount of sales cannot be procured, electricity will never be out of stock (in outage) as long as supply and demand are balanced in the whole system and it can be supplied by its consumers. If sufficient supply capacity cannot be obtained or capacity to supply obtained exceeds demand, retailers create imbalances and there will be clearing between system operators and retailers.\(^{25}\) From the viewpoint of power system stability, imbalance outside the plan is not desirable and it is appropriate to make the system have an incentive that limits the occurrence imbalance clearance between system operators.

In the future when the Real-time market functions, the price is considered to reflect costs for supply and demand adjustment and it is rational to use it for imbalance clearance. However, as previously described, there is a need for a certain period of time until the Real-time market can function. If the Real-time market is operated in each area, GEUs in each area may make the market oligopolistic. When using the prices of the Real-time market in imbalance clearance, it is necessary to carefully assess the actual situation regarding the exercising of market power and the fluctuation of market prices.

\(^{25}\) In the case of the planned power balancing system, if power supply differs from the amount planned due to trouble with generators, imbalance occurs in the power operator side as is the case with retailers.
Until then, there may be a way in which prices of the Hour-ahead market are used for imbalance clearance after a full survey by regulatory authorities, as the second-best way. There is a concern, however, that some entities might try to foresee the clearance price and take an advantageous position for themselves just before the Gate Close. Careful market and product design and monitoring of the Hour-ahead market prices and transactions are important.

As an immediate measure, until the planned power balancing system of the planned volume linked with the Hour-ahead market starts, it is necessary to consider gradual improvement in the planned power balancing system with a view to the new system, implementing those that are feasible first.

It is necessary to conduct further reviews about a detailed system such as incentives that limit imbalances, including the analysis of preceding overseas cases. When introducing a system, it is appropriate to use a flexible one that can be modified as needed by verifying the effects.

4. Medium- to long-term measures to secure supply capacity

In order to secure supply capacity needed in a medium- to long-term perspective in the new framework in which there are no GEUs, various functions as described in (1) are necessary. We need to establish a capacity market and final power source bidding system as a system to realize this.

(1) Functions necessary for medium- to long-term measures to secure supply capacity

As a precondition to secure supply capacity, a medium- to long-term vision of supply and demand situation is necessary. As described in IV. 1. (3), OCCTO will be responsible for this function by creating medium- to long-term supply and demand prospect based on the plan on distribution facilities and the supply-demand plan.

This reform will obligate retailers to secure supply capacity and the function that enables retailers to secure future supply capacity in the market from the early stage is important. When power producers plan power source investment, it is desirable that a function that formulates a price index that reflects on the view of market participants about future supply and demand. Moreover, from the standpoint of promoting investment in electric power supply by reducing the risk of long-term investment in the power supply, there is a need for a function that enables return on part of investment costs in the stage before actual supply and demand.

By creating a system that plays such roles in an appropriate manner, it is expected that medium- to long-term supply capacity is secured through economic activities of businesses based on the market. In case of a long-term supply shortage due to no investment in power
source development for some reason, a function to eventually secure power source construction is also necessary.

(2) Establishment of a “Capacity market”
As previously stated, as well as a function that enables securing future supply capacity in the market at an early stage, there is a need for a function to formulate a price index, and a function that enables the return on investment cost before actual supply and demand. As a system to realize them, it is appropriate to establish a “Capacity market” in which transmission operators and retailers trade capacity to generate electricity in the future. In the capacity market, prices are formulated for future power generation capacity. It is expected that this will stimulate investment in power generation facilities and enable operators to flexibly adjust future power generation capacity needed through the market. A capacity market should be designed on the assumption that there are many fluctuating factors such as the possibility of consumers’ changing their supplier (retailer) and changes in economic situation. In addition, it should be noted that there is a lead time in power source constructions.

(3) Establishment of final power bidding system
If future supply is expected to be absolutely insufficient, prices in the capacity market will rise. If the market functions appropriately, it is considered that investment in power development will be stimulated through the price mechanism. However, in case that no investment is made in power development for some reason, we will establish a system in which OCCTO opens a bid for the public offering of power source builders to prevent insufficiency in supply capability in future. When there is a cost that cannot expect a return on investment, payment will be evenly spread to all consumers by surcharging for power supply. In the current Electricity Business Act, there is no system that gives command of constructing power sources to electric utilities, and the actual bidding system in which power sources will eventually be constructed even in the liberalized power market is a system that is especially focused on making sure of stable supply. When designing the system, it is necessary to note that necessary amount of supply capacity required in the medium- to long-term may change with fluctuating factors such as future changes in the economic situation.

26 A “forward market,” in which electricity for future supply is traded in advance, is similar to a capacity market in that future electricity supply is traded in advance. However, the actual amount of electricity generated in future is traded in the forward market, while electricity generation capacity in the future is traded in the capacity market. They are different in that operators cannot receive actual electricity generated in the capacity market.
VI. Other System Reforms

1. Improvement of independence and expertise of regulatory authority (shift to new regulatory authority)

With the introduction of full retail choice and the activation of a wholesale market through this reform, it is expected that market players will be diversified and the market structure more complicated. In a time of change, it is essential that monitoring of the transaction, reviewing the status of competition and the rule making based on the results will be encouraged. Moreover, as securing the neutralization of transmission sector will become more important than ever before, it is vital that the efficacy of new code of conduct be secured in addition to the wheeling regulations. Furthermore, stable power supply should be realized with matching the electricity system which will be reformed newly with the experience by the Great East Japan Earthquake. As mentioned above, in a series of the reform, for the government to implement the tasks such as supervisory appropriately, it is necessary that the regulatory authority on electricity business will be reviewed to make it equipped with independence and advanced expertise. From the perspective of securing high professionalism, creation of a mechanism to recruit human resources from outside actively would be required.

As a specific modality of the regulatory authority, missions, tasks, and authority as described in below are considered as the pillars. However, it is important to review carefully the contents of the tasks and necessary items such as authority, number of staffs and organizational structure based on the situation of Japan, with referring to the examples in other countries.

<Major missions>

- Realization of a stable power supply
- Creation of an environment in which competition amongst market participants would be promoted
- Guarantee for all nationals of choosing a power company of their choice, and securing of consumer benefits

<Major tasks and authority>

- Monitoring of transactions and reviewing competition situations in the liberalized wholesale and retail markets and making rules on the transaction in the electricity market
- Regulations on the transmission and distribution sectors such as regulation on the wheeling tariffs and various codes of conduct
• Tasks on stable power supply such as dispatching at emergency and implementing appropriately during planned power outages

2. Institutionalization of Self-Wheeling
Consumers who own independent home power generators in the factory and so on are compelled to use the power grids owned by GEUs when the consumers want to use the power generated by the generators in other places such as their other factories. GEUs currently provide a service (Self-Wheeling) of transmitting electricity via their power lines as a voluntary scheme with no regulatory framework. However, there are some restrictions; Self-Wheeling that covers two or more supply districts is not permitted, only consumers that have access to the special high-voltage power grids are eligible for this service, and a power provider and a power receiver must be the same person.

The institutionalization of Self-Wheeling would be contributive to assuring fairness in network usage and Self-Wheeling to areas where the supply-demand situation is tight would mitigate the tight situation. Therefore, it would be appropriate to institutionalize Self-Wheeling, such as defining the area allowing Self-Wheeling as cases such as recognizing a certain relationship between a provider and a receiver, imposing the tariff regulation or wheeling service obligations on the GEUs and to take certain measures to alleviate the balancing obligation.

3. Institutionalization of power supply via independent power lines
In view of averting risks of depending solely on large-scale power generation and realizing a diversified power supply system, the power supply via independent power lines shall be systematically positioned as described in below, while considering the freedom of directly supplying power to consumers by making the most of the dispersed generators.

(1) Exemption of independent power lines from applicable open access duty
With respect to the so-called independent power lines, in which power is directly distributed to consumers by setting up independent power lines, separately from the power grid networks of GEUs or for special supply, the open access duty wouldn’t be imposed, in principle, on the power grid network, similarly to the independent power supply currently in use for the Specified-Scale Electricity Business. Under such circumstances, if a consumer who has been receiving power via an independent power line chose to get power from another retailer, the consumer would get the power via the power grid network of a GEU. In this case, if the power line of a GEU had not been established, the transmission/distribution sectors in the GEU shall
build new power lines in principle.

(2) Handling at emergency
When it is utterly inappropriate to build new power lines or at the time of emergency or disaster, open access shall prevail disregarding the basic principle mentioned in (1). Under such circumstances, although the conditions of using those independent lines are basically to be settled amongst the parties concerned, the regulatory authority shall set out arbitrary measures in case the parties were unable to reach an agreement.

(3) Granting the public privileges
It would be proper that the entities engaged in the independent power lines be granted certain public privileges because they bear the responsibility of open access under certain circumstances as mentioned in (2).

4. Handling of “Specified Electricity Business” and “Specified Supply” after the full retail choice
(1) Specified Electricity Business
As the concept of “General Electricity Business” would be reviewed through introducing full retail choice and acquisition of the retailing license will make it possible to tap into the retail market in all regions or locations, the system of “Specified Electricity Business” would be abolished because the necessity would be lost. However, in regions where the “Specified Electricity Business” has been actually in operation, transitional arrangements shall be made as necessary.

(2) Specified Supply
The “Specified Supply” refers to an extension of the system that entities consume the electricity independently which they generate independently, which hasn’t been regarded as an “electricity business.” Therefore, specific consumer protection is not deemed as necessary after the full retail choice. The current “Specified Supply” system shall be therefore maintained, and power supply shall be permitted without yielding to regulations as an electricity retailing business.
5. Provisions of various systems related on the reform

(1) Revision of applicable laws and regulations related on the changes of business concept, concept of entities and systems

After realizing the full retail choice, the conventional concepts of business or entities, such as the “General Electricity Business” or “GEUs” will be reviewed and licensed entities such as retailers, transmission/distribution companies, and power generation companies will fulfill their share of responsibilities in compliance with the new framework, such as the duty to secure supply capacity in order for the existing system to transform into a new system to achieve stable power supply, as described in II 1. (3). Regarding the review of these concepts, laws and regulations such as the taxation system or public privileges and the measures to secure neutrality on taxation for the further neutralization of transmission/distribution sectors would be changed or established.

(2) Relationship with financing environment for GEUs

The financing environment for GEUs which is based on a vertically integrated structure and the tariff regulation adopting fully distributed cost methods will be significantly changed due to the electricity system reform. Thus, attention must be paid to the impact on the entire financial market caused by the change in handling of the corporate bonds issued by GEUs, taking into account the facts that the amount of bonds issued by the GEUs account for approximately 20% of overall corporate bonds in Japan on a stock base, and that the electricity business requires an immense amount of capital investment. Moreover, it is also necessary to take note that GEU’s balance of payments and financing environment have worsened due to factors such as the suspension of operation of nuclear power stations. Therefore, when implementing the further securing of neutrality of transmission and distribution sectors, necessary measures (e.g. transitional measures) will be taken to prevent difficulties in their funding required for stable power supply, regarding the handling of financial liability including secured bonds in addition to a code of conduct after considering future circumstances of the financial market. In this regards, securing the healthy development of the electricity business by means such as creating a fair competitive environment for electricity companies should be considered.

(3) Relationship with other policies

To secure efficiency and stability of electricity supply under the structural changes that the electricity system is facing, some other policy measures may be required in addition to the
electricity system reform. In this context, from the viewpoint of promoting active competition in the electricity market after liberalization, the necessity and content of other policy measures will be examined in cases where significant detriment emerges in competitive conditions due to any policy changes, including energy policies such as nuclear safety policy and nuclear power policy.

(4) Gas market system reform

With the entry from other industries through the liberalization of the electricity retail market and with the active use of diversified power generating capacity through the renewable energy or distributed energy supply systems, the fence between the electricity and other commodities/services would become relatively lower. The concept underlying the electric system reform should also be applicable to the gas business, another energy supply system. A competitive environment must also be created for the gas market through various measures such as the full retail choice, an open access to network, securing neutralization of network usage, activation of the market to enable the mutual entry of energy services and the establishment of nationwide network.
VII. Approach to the Reform

The electricity system reform involves massive changes in the business system and requires a cautious approach to its implementation by making sufficient preparation, including the framing of pertinent laws or regulations. The reform shall be undertaken in accordance with three stages from (1) to (3), by conducting an examination stage by stage based on the Roadmap on page 66. With respect to the areas which require swift reform such as the establishment of OCCTO and full liberalization of the electricity retail market, the reform shall be launched wherever areas are set ready for the reform.

For unbundling the transmission and distribution sectors legally, it is vital to be very well prepared to preparation for unbundling, handling of the dispatching system and so on. Furthermore, the elimination of the tariff regulation must be carried out on the precondition of the permeation of competition. Therefore, quite a long time period must be required before the reform shall be implemented, considering the business environment and so on.

(1) Stage 1: Establishment of the OCCTO

Considering the power supply-demand situation in the aftermath of the Great East Japan Earthquake, the expansion of the operation of a nationwide system is an urgent issue, and must be addressed as soon as possible. Therefore, the detailed design of the OCCTO must be promptly studied, then examined in an open and objective forum. Then, the OCCTO shall be established in two years (in about 2015), so as to proceed proactively with the drawing up of a plan of the nationwide system and the reinforcement of supply-demand adjustment function as soon as the necessary rules will have been formulated and IT system will have been prepared.

(2) Stage 2: Full liberalization of entry to electricity retail business

For realizing the “full retail choice,” it is appropriate to implement the full liberalization of entry to the electricity retail business as soon as possible. However, because the creation of essential systems such as the low-voltage wheeling system is critical for the realization, it is appropriate to establish those applicable systems as soon as possible. In addition, for securing neutrality for competition in small-scale segments such as households, the environment for securing fairness and transparency of the low-voltage transmission sector must be set, including the handling of consumer information system shared with sales sectors, and at least the minimum requirement for competition must be addressed by the time of full liberalization of entry. Therefore, after the system examination or environmental arrangement made in
advance, the full liberalization of entry to electricity retail business shall be targeted for three years later (in about 2016).

For the full liberalization of entry to electricity retail business, a certain time period shall be taken for transitional arrangement in order to address consumer protection. Furthermore, because enhancement of the public functions for monitoring transactions in the market and reviewing competition status are indispensable, systematic handling shall be required for improving the independence and expertise of regulatory authority (transition to the new regulatory authority) prior to the full liberalization of entry to the electricity retail business.

In addition, it is also required to activate the wholesale market as part of creating a competitive environment to make new participants ensuring power source more easily. Although it is desirable to abolish the wholesale regulations early in view of activating the wholesale market, a certain consideration must also be taken into the transitional period. Hence, the wholesale regulation shall be abolished at the same time of realizing the full liberalization of entry to electricity retail business, while the contracts that will have been sealed by the time under the existing wholesale regulations shall be kept unchanged unless otherwise agreed by the parties concerned.

Also, because the supply duty shall also be abolished upon full liberalization of entry to the electricity retail business (except for the Last resort service and the Universal service), the duty to secure the power generating capacity or final power source bidding system must be launched as a new mechanism of securing power generating capacity simultaneously. (However, the duty of securing the power generating capacity would be imposed fully after the afore-mentioned period of transitional arrangement for consumer protection will finish.)

(3) Stage 3: Further securing neutrality of transmission/distribution sectors and full liberalization of retail electricity rates

It is essential to be very well prepared to neutralize the transmission and distribution sectors in order to abolish the tariff regulation including household, which are deemed as the requirements for terminating the period of transitional arrangements. Although the early implementation of the neutralization is desirable, the reorganization of dispatching system, which is the linchpin of stable supply, is necessary for the further neutralization of the transmission and distribution sectors. For that, rough rules must be swiftly established and then preparations such as for the system development, personnel training and reviewing must be made cautiously. Moreover, it is necessary that the GEUs make preparations such as the adjustment of labor relations and allocation of their assets and the government review the
taxation measures, and both of which are expected to take quite a long period of time. All things considered, we anticipate the transmission and distribution sectors will be legally unbundled in five to seven years (by about 2018 to 2020)\textsuperscript{27}. Meanwhile, it must be noted that the implementation of further neutralization of transmission and distribution sectors through the legal unbundling shall not interfere with the financing required for stable power supply. After realizing the full liberalization of entry to the electricity retail business, because the tariff regulation shall be abolished by closely observing the progress of competition, it is necessary to take a certain period for transitional arrangement from the viewpoint of consumer protection. The transitional arrangement will be lifted after various systems such as the further neutralization of transmission and distribution sectors will have been implemented, while checking that the competition environment including the introduction of smart meters has been set and that competition has actually made progress. The situation of market competition shall be strictly monitored by the regulatory authority (the existing regulatory office before transforming to a new regulatory authority), and if necessary, additional measures for urging competition shall be made before terminating the period of transitional arrangement.

For the abolishment of the tariff regulation, the timing of its implementation may be reassessed depending on the progress of the market competition, the change of the market structure and the conditions of business environment, and so on at the time of determining the system reform for the full liberalization of entry to the electricity retail business.

\textsuperscript{27} Because the framework of “GEUs” preconditioned on the assumption that vertical integration will be done away with after the full liberalization of entry to the electricity retail business, it is possible to voluntarily unbundle the transmission and distribution departments by “anticipating” the execution of legal unbundling, even before 2018 to 2020.
The Roster

The Members of the Expert Subcommittee on Electricity System Reform

Chairperson
Motoshige Ito
Professor at Graduate school of Economics, The University of Tokyo

Deputy Chairperson
Junji Annen
Professor at Law School Academy, Chuo University

Members
Toshinori Ito
Representative Director and analyst at Ito Research and Advisory Co., Ltd.

Hiroko Ohta
Professor, National Graduate Institute for Policy Studies

Junichi Ogasawara
Chief Research fellow and Manager at The Institute of Energy Economics, Japan, Electric Power Group

Takao Kashiwagi
Specially appointed professor at Tokyo Institute of Technology

Hiroshi Takahashi
Chief researcher at Fujitsu Research Institute of Economics Co., Ltd.

Kikuko Tatsumi
Regular adviser, Public Corporation, Nippon Association of Consumer Specialists

Tatsuo Hatta
Special visiting professor, Gakushuin University

Toshihiro Matsumura
Professor at The Institute of Social Science, The University of Tokyo

Akihiko Yokoyama
Professor at Graduate School of Frontier Sciences, The University of Tokyo
The Past Meetings of
The Expert Subcommittee on Electricity System Reform

2012

Session 1 (February 2) On the task force of “Arrangement of Issues” regarding the electricity system reform
Session 2 (March 6) On the approaches for the demand side
Session 3 (April 3) On the diversification of power supply
Session 4 (April 25) Promotion and introduction of competition into wider area
Session 5 (May 18) Comprehensive examination (1) Full liberalization of the electricity retail market, nationwide application and neutralization of transmission/distribution sectors
Session 6 (May 31) Comprehensive examination (2) The nationwide application and neutralization of transmission/distribution sectors, Activation of wholesale electricity market, etc.
Session 7 (June 21) Comprehensive examination (3) The nationwide application and neutralization of transmission/distribution sectors, Activation of wholesale electricity market, etc.
Session 8 (July 13) Comprehensive examination (4) Proposals on the basic policy for the electricity system reform
Session 9 (November 7) Examination of detailed design (1) The nationwide application and neutralization of transmission/distribution sectors, Activation of wholesale electricity market, etc.
Session 10 (December 6) Examination of detailed design (2) Full liberalization of the electricity retail market, the wheeling system, securing of power generating capacity, regulatory authorities, etc.
2013

Session 11 (January 21)  Examination of detailed design (3) formula for the further neutralization of transmission/distribution sectors, etc.

Session 12 (February 8)  Examination for summary
**Roadmap for Electricity System Reform**

1. As the electricity system reform is associated with a drastic change of business systems, it is necessary to promote the reform in a cautious manner based on full preparation. Therefore, the reform will be divided into three stages and will be carried out with conducting a full study at each stage.

2. Reforms for which an early implementation is required, such as the establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO) or thorough liberalization of retail entry shall be carried out as swiftly as possible.

3. For the power transmission/distribution departments to be legally separated, it is essential to double check the process of preparation, from the preparation for the separation to the handling of the power supply instruction system, etc. The abolition of tariff regulation shall be postponed for as much as possible. Therefore, the legal unbundling and the abolition of tariff regulation will be implemented after a long period of time with careful consideration for the business environment.

(Note 1) Implementation of legal unbundling of transmission/distribution sector shall not interfere with financing required for stable power supply.

(Note 2) At stage 3, the tariff regulation shall be abolished simultaneously when or after the power transmission/distribution departments will have been legally spun off.

(Note 3) Timing of abolition of the tariff regulation may be reassessed depending on the progress of the market competition, the change of the market structure and the condition of the business environment when decision on the full retail choice is made.

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**Stage 1**

- (Setting up of OCCTO) At around 2015
- Preparing for creation of wide-area institutions
- Creation authorization
- Establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO)
- Preparation of environment for thorough liberalization of retailing
- Detailed design of new authority
- Transition to new regulatory authority
- Vitalization of wholesale electricity market
- Preparation for the creation of a new mechanism of ensuring power generating capacity
- Preparing for the creation of a one-hour ago market

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**Stage 2**

- Liberalization of retail entry At around 2016
- Full retail choice (liberalization of entry)
- Period of transitional arrangement for rate schedule
- Households and other small-scale users can freely pick electric power company or rates setting of their choice
- Abolition of tariff regulation (termination of transitional arrangements)
- Formulate systems necessary for user protection (ultimate guarantee service, universal service, etc.)
- Reviewing of competition status

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**Stage 3**

- Neutralization of power transmission, abolition of rate schedule At around 2018 through 2020
- Abolition of wholesale regulations
- Market monitoring
- Full-scale implementation
- Creation of a one-hour ago market
- Wide area supply-demand adjustment will be enabled until immediately before the supply and demand are actually traded by making the most of the market
- Creation of a one-hour ago market
- Legal unbundling of transmission and distribution departments
- Realization of competitive market environment

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**Decisions on the Reform Policy of the Electric Power System**

- Examination, making, and effect of rules on which the further neutralization of power transmission departments will be based
- Examination and handling of stable power supply policy such as the countermeasures at emergency, coordination between the maintenance and management of power transmission facilities, and ensuring the power generating capacity, etc.
- Implementation of preparatory steps for organizational transition one by one.