

I. ENERGY POLICY

1. Energy Policy Overview

(1) Basic Act on Energy Policy

Basic policy on energy supply and demand in Japan is determined under the Basic Act on Energy Policy, which entered into effect in June 2002. This act lays down the

overarching principles framing energy policy—namely, the securing of stable supply, environmental suitability, and utilization of market mechanisms—and specifies the responsibilities of central and local government and suppliers and the public’s “duty of effort” necessary to implement these principles (Table 1.1).

Table 1.1 Basic Act on Energy Policy (Excerpts)

Article	Key Points
Article 1: Purpose	The purpose of this Act is [...] to promote measures on energy supply and demand on a long-term, comprehensive and systematic basis by laying down the basic policy and clarifying the responsibilities of the State and local public entities with respect to measures on energy supply and demand and by prescribing matters that form the basis of measures on energy supply and demand, thereby contributing to the preservation of the local and global environment and to the sustainable development of the Japanese and global economy and society.
Article 2: Securing of stable supply	Measures shall be taken with the basic aim of diversifying energy supply sources, increasing energy self-sufficiency and achieving stability in the energy sector by undertaking such measures as reducing excessive dependence on specific geographic regions for the import of primary energy sources such as oil, promoting the development of energy resources [...], providing for energy transportation systems, promoting the stockpiling of energy and energy use efficiency, etc. and implementing appropriate crisis management concerning energy.
Article 3: Environmental suitability	Measures shall be promoted to realize [...] the prevention of global warming and the preservation of the local environment, as well as to contribute to the formation of a recycling society by improving energy consumption efficiency, by such measures as promoting the conversion to non-fossil-fuel energy use [...] and the efficient use of fossil fuels.
Article 4: Utilization of market mechanisms	Economic structural reforms concerning energy supply and demand [...] shall be promoted in a manner such that business operators can fully demonstrate their initiative and such that creativity and the interests of energy consumers are sufficiently secured, while giving due consideration to the policy objectives prescribed in the preceding two Articles.
Article 5: Responsibilities of the State	The State shall be responsible for comprehensively formulating and implementing measures on energy supply and demand in conformance with the basic policy on measures on energy supply and demand prescribed in Article 2 to the preceding Article inclusive (hereinafter referred to as the “Basic Policy”).
Article 7: Responsibilities of business operators	When conducting their business activities, business operators shall be responsible for endeavoring to use energy efficiently and to use energy in a manner that gives consideration to stable supply of energy and preservation of the local and global environment, by demonstrating their initiative and creativity, and for cooperating with the measures [...] implemented by the State and local public entities.
Article 12: Basic Energy Plan	The government shall formulate a basic plan on energy supply and demand (hereinafter referred to as the “Basic Energy Plan”) [...]. The Basic Energy Plan shall prescribe the following matters: <ul style="list-style-type: none"> • Basic policy on measures on energy supply and demand • Measures that should be taken in relation to energy supply and demand on a long-term, comprehensive and systematic basis • Technologies related to energy where intensive measures should be taken for their research and development in order to promote measures on energy supply and demand on a long-term, comprehensive and systematic basis, and measures that should be taken in connection with such technologies • In addition to what are listed in the preceding three items, any matters necessary for promoting measures on energy supply and demand on a long-term, comprehensive and systematic basis The government shall review the Basic Energy Plan at least once every three years by taking into consideration the changes in the situation concerning energy and based on an evaluation of the effects of measures concerning energy, and if it finds it necessary, make changes to the plan.

Source: Basic Act on Energy Policy (June 14, 2002)

The act also requires the establishment of a Basic Energy Plan by the government that provides for “basic policy on measures on energy supply and demand,” “measures that should be taken in relation to energy supply and demand on a long-term, comprehensive, and systematic basis,” and “technologies related to energy where intensive measures should be taken for their research and development” required to implement these measures. The government is charged with reviewing this plan at least every three years and amending it, if necessary, in light of changes in the energy environment.

2. Basic Energy Plan

(1) Evolution of the Basic Energy Plan

The first Basic Energy Plan was formulated pursuant to the Basic Act on Energy Policy in October 2003. This was followed by a second plan in March 2007 and a third in June 2010.

The third plan set the target of doubling both the energy self-sufficiency ratio¹ and the self-developed fossil fuel supply ratio², raising the energy independence ratio³ to about 70%, and raising the ratio of zero-emission sources (nuclear power and renewable energy) in the energy mix to about 70% by 2030.

Following formulation of the third plan, however, the energy environment was transformed, domestically and internationally, by the Great East Japan Earthquake and accident at Tokyo EPCo’s Fukushima Daiichi Nuclear Power Plant (Fukushima Daiichi Accident), which forced Japan to drastically rethink its energy policy.

The power generation mix returned to pre-first oil crisis levels of dependence on imported fossil fuels, and Japan’s energy security situation became critical. The situation also caused energy costs and emissions of greenhouse gases to rise, severely impacting economic and industrial activities and measures to combat global warming.

(2) Fourth Basic Energy Plan

The government responded by adopting a fourth Basic

Energy Plan in April 2014. Chapter 1 of this plan outlines the issues facing Japan, including the fundamental vulnerability of the energy supply system due to high dependence on overseas energy resources, public concern about the safety of nuclear power generation, the impact of rising electricity costs on the Japanese economy, and the increase in greenhouse gas emissions. Chapter 2 goes on to set the goal of creating a “multilayered and diversified flexible energy supply-demand structure.”

Regarding nuclear power generation, Chapter 2 states that “dependency shall be lowered to the extent possible by energy saving and introducing renewable energy as well as improving the efficiency of thermal power generation, etc.,” while affirming its importance as “an important base-load power source contributing to stability of energy supply-demand structure, on the major premise of ensuring of its safety.” On the subject of the use of renewable energy sources, meanwhile, it states that the government will pursue the introduction of higher levels of renewable energy than proposed under the previous Basic Energy Plans. Targets for the specific mix of these and other power generation sources are set in the Long-term Energy Supply and Demand Outlook announced in July 2015 and described below.

Chapter 3 outlines specific measures, including the pursuit of a comprehensive policy to ensure stable access to resources, creation of an advanced energy-saving society, acceleration of the introduction of renewable energy, re-establishment of Japan’s nuclear energy policy, and development of an environment to enable the stable and efficient use of fossil fuels. It further calls for the promotion of electricity and gas market reform, promotion of cogeneration and the introduction of storage batteries, formulation of a roadmap for the creation of a “hydrogen society” and leveraging of demand response.

a. Long-term Energy Supply and Demand Outlook

The government considered what future form a realistic and balanced energy supply-demand structure should take given the principles laid down in the Basic Energy Plan, and announced its Long-term Energy Supply and Demand Outlook in July 2015.

Taking as its overarching goal the development of a more diverse, multilayered supply-demand structure in order to ensure supply stability, the outlook seeks to improve Japan’s energy self-sufficiency rate beyond the level prior to the Great East Japan Earthquake (approximately 25%).

More specifically, it expects thoroughgoing energy (electric power) conservation efforts to bring electricity demand in fiscal 2030 down to close to what it was in fiscal 2013.

1. Energy self-sufficiency ratio: The proportion of domestic primary energy supply accounted for by domestic (renewable, etc.) and semi-domestic (nuclear) energy sources.

2. Self-developed fossil fuel supply ratio: The proportion of fossil fuels supplied in Japan (imported or produced domestically, currently accounting for approximately 80% of the domestic primary energy supply) sourced from projects in which Japanese firms have interests (independent development concessions), either in Japan or abroad.

3. Energy independence ratio: Calculated using the same denominator as the energy self-sufficiency ratio but adding fossil fuels sourced from projects in which Japanese firms have interests (independent development concessions) to the numerator.

Secondly, regarding renewable energy sources, the outlook forecasts nuclear power being replaced by geothermal, hydro, and biomass power sources which are capable of stable output regardless of natural conditions, as well as by solar and wind power.

And thirdly, regarding thermal power generation, the outlook calls for a two-pronged strategy of reducing thermal power's environmental impact while raising the efficiency of coal and LNG (Liquified Natural Gas) power generation.

As a result, nuclear power's share of the electric power supply-demand structure in fiscal 2030 will be significantly reduced to around 20%-22%, while renewable energy's share will increase to around 22%-24%. The proportion of base-load power generated by hydro, coal, and nuclear, etc. will be in the region of 57% (Figure 1.1).

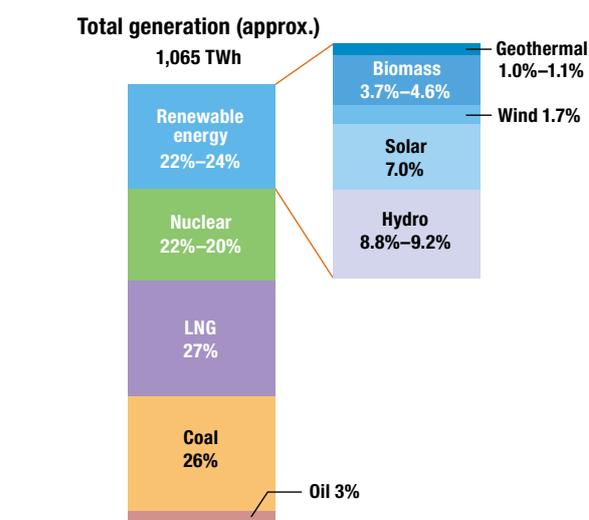
b. Estimated Power Costs by Power Source

The government estimated the cost of power generation by source to serve as a reference when producing the above vision of Japan's long-term energy supply-demand structure, and reported its findings on costs and related factors in May 2015 (Table 1.2).

(3) Fifth Basic Energy Plan

Under the Basic Act on Energy Policy the Basic Energy Plan is to be revised at least once every three years. The year 2017 was the year of the next scheduled revision of the fifth Basic Energy Plan by March 2018. In August 2017 the Ministry of Economy, Trade and Industry (METI) convened the Strategic Policy Committee of the Advisory Committee for Natural Resources and Energy to commence discussion of revisions to the plan. At the first meeting, the government identified issues with the present plan and outlined progress as of 2016 on the five

Figure 1.1 Power Generation Mix in Fiscal 2030



Source: METI, "Long-term Energy Supply and Demand Outlook 2015."

indicators set forth in the previously described Long-term Energy Supply and Demand Outlook (Table 1.3).

At this first meeting, the government identified (1) and (2) as being particularly high priority targets. Regarding (1), the increase in installed renewable capacity in recent years and the restarting of several nuclear reactors have raised the figure to 17%. However, this still remains far below the 44% target. In contrast, steady progress is being made toward achieving the target for (2), as Japanese industry becomes more energy efficient.

Regarding (4), the recent fall in the international price of oil has suppressed the cost of electricity. However, it is quite possible that electricity costs could rise again in future should, for example, oil prices or FIT purchases increase.

Action on these indicators was further discussed with special reference to the restoration of Fukushima and the following six issues.

Table 1.2 Summary of Estimates for Model Plants in 2030

Power source	Nuclear	Coal	LNG	Wind (onshore)	Wind (offshore)	Geothermal	Conventional hydro	Oil	Solar (farms)	Solar (residential)
Capacity factor	70%	70%	70%	20–23%	30%	83%	45%	30, 10%	12%	12%
Service life	40 years	40 years	40 years	20 years	20 years	40 years	40 years	40 years	30 years	30 years
Generation cost (yen/kWh)	10.3–	12.9	13.4	13.6–21.5	30.3–34.7	16.8	11.0	28.9–41.7	12.7–15.6	12.5–16.4

Source: Generation Cost Investigation Working Group, "An Investigation of Generation Costs and Other Factors for the Long-term Energy Supply and Demand Outlook Subcommittee (2015)"