

Japan Policy Council

First Recommendations: Energy Creation

The Japan Policy Council aims to create a grand design for Japan with an eye to the world and Asia for the next 10 years to come. The Council is officially established with this announcement of its first recommendations on the urgent issue of *energy creation*.

The course of Japan cannot be found by merely looking at domestic issues. Japan must turn its eyes to the world, in which the rise of emerging countries and advances in information technology are transforming the political and economic landscape; Japan must adapt itself to this dynamic global trends. In order to flourish alongside the world, Japan must open its doors so it can assist other countries as well as to depend on them when needed: the country needs to stop working in isolation.

Today, the debate on energy policy faces a stalemate between the protestors and supporters of nuclear power generation. Our recommendations are intended to move the discussions forward by presenting the following two perspectives.

The first perspective is to expand the *space axis* by going beyond domestic issues. Since energy affects the foundation of a country and is closely tied to its industrial policies as well as diplomacy and national security, it must be examined from diverse angles, not only from the point of view of domestic power supply and disaster prevention. In particular, international coordination opens up many possibilities in expanding renewable energy.

The second perspective is to acquire the *time axis* to avoid reaching premature conclusions. A society based on renewable energy cannot be built in a day. Nuclear reactors must be managed for about 30 years even after their decommissioning, a challenging task since the technology must be retained for that duration. Trying to reach a conclusion in the presence of many such uncertainties is dangerous since it will limit our options in the future. Instead, we must continuously assess the situation and revise our plans.

As Japan rebuilds itself from the Great East Japan Earthquake and tsunami, the country must solve many issues that have been previously put off. In the next few years, the Japan Policy Council intends to address the issues of industry creation, job creation, and community creation.

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Hiroya Masuda
Chairman, Japan Policy Council

Creation of an Asia Pacific Power Grid and the establishment of Asia-Pacific partnership through energy coordination

Main recommendation: Japan should propose and lead the realization of an Asia Pacific Power Grid as part of its diplomatic strategy to establish a society based on renewable energy.

1. An international power grid should be established to promote renewable energy and to overcome its instability. Through an Asia-Pacific partnership in energy coordination, a mutually complementary framework should be created.
2. Japanese renewable energy technologies should be transferred to Asia to strengthen the power supply in the region and to secure a backup power supply for Japan, while contributing to the reduction of carbon dioxide emissions.
3. An international platform, Green Energy Grid Organization (name tentative), should be created to promote renewable energy and to establish the international power grid.
4. To prepare for connections with the international power grid, the domestic power grid unifying the entire nation should be established, with separation between the generation and distribution of electricity.
5. Research and development (R&D) efforts that will lead to discontinuous innovations, such as lithium-air batteries, should be intensified.

Addendum 1: To expand the use of renewable energy in the country, Japan should define an implementation target for introducing renewable energy, strengthen support, improve the stability of the supply system and invite investment from abroad.

1. A realistic target should be set for implementing renewable energy (as a percentage of total energy supply) in five-year intervals.
2. The private-sector R&D efforts should be supported for the generation, storage, and distribution of electricity with measures like feed-in tariff and tax exemptions. Support such as subsidies should be provided to households to promote renewable energy.
3. A system requiring producers of renewable energy to declare their projected electrical

power output¹ should be introduced to stabilize the power supply.

4. The function of the electricity market should be improved and the prices made visible according to the type of energy. Consumers should be able to choose renewable energy.
 5. The current ways of energy consumption should be reviewed to reduce the total energy consumption through the introduction of smart grid and other technologies.
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Addendum 2: In light of energy demand in and outside the country, Japan should retain nuclear power generation for the time being and promote the safe use of nuclear power in the world, including the sharing of the experience in Fukushima as a lesson to all humanity.

1. Targets should be set in 10-year intervals for reducing nuclear power generation by decommissioning old power plants according to the schedule, to be reviewed in close connection with the introduction of renewable energy. If understood and supported by the public and agreed to by the local residents, they should be replaced with nuclear power plants of the newest models.
2. The government's responsibility for nuclear power generation should be made explicit. The *safety agreements* with local governments should be reviewed in order to establish clear rules.
3. The crisis management system should be reviewed. In particular, the following points should be addressed: coordinating between local and national governments; creating a chain of command to integrate the police, firefighting, and the Self-Defense Force; cooperating with international organizations (e.g. IAEA); distributing information.
4. The location(s) for the final disposal of nuclear waste should be determined under the responsibility of the government. The responsibility for the nuclear waste should be made explicit. The present system in which local governments nominate themselves to become candidate sites should be revised.

¹ The projected amount of electricity generation is to be reported one day in advance. The system makes it possible to forecast the total power supply coming from renewable energy on a daily basis and make adjustments according to its variation. In Spain, a forerunner in implementing renewable energy, the reporting is required for electric power companies that generate more than 1 MW of electricity.

Japan Policy Council Action Plans

The Green Energy Grid Organization (name tentative) Concept

1. A “Green Energy Grid Organization”

An international platform, Green Energy Grid Organization (GEGO), should be established for the creation of an Asia Pacific Power Grid and for the promotion of renewable energy, with participation from governments, industries, universities, and research institutions. Its activities include the following:

- Develop the construction and budget plans for the international power grid
- Identify the technological challenges facing the construction and operation
- Study international electricity markets and the rules for trading electric power
- Review the renewable energy R&D and procedures for technology transfer
- Examine the legal, economic, and technological issues through pilot projects

2. Tohoku Green Energy Grid Project

A research organization as an R&D base for GEGO should be created, as a Japanese equivalent of the European Marine Energy Centre (EMEC), in the Tohoku region in order to capitalize on its renewable energy potential. The *reconstruction* from the March 11 disaster should lead to the *creation* of a new Japan.

As a **verification project of the renewable energy network**, the renewable energy sources (such as wind, wave, solar, biomass, and geothermal power) in the six Tohoku prefectures should be connected for the purpose of developing the *power output forecast system* and the *regional control system*, which are to be promoted in and outside of Japan.

Testing grounds should be designated to support **international research projects for the development of renewable energy technologies** that are still incomplete, such as offshore wind, wave, and tidal power. The Tohoku region will benefit from inviting investments from the country and abroad.

3. Schedule

2013	Establish the Green Energy Grid Organization (GEGO) Begin considering interconnections with neighboring countries Start the Tohoku Green Energy Grid Project
2020-2025	Install interconnections with neighboring countries
2050	Install interconnections with ASEAN countries and Australia

(Addendum) Basic Recognition

■ The most important role for the government in reconstruction from the March 11 disaster is to show the country's course and goals

We cannot see the country's course and goals. Despite various discussions on individual issues are taking place, it is unclear what sort of country Japan will become. People are concerned because they cannot see what lies ahead, unsure of the future they will face. It is the role of the government to define the country's course and goals. When the Democratic Party of Japan seized power, the people hoped that the new government would end the impasse of the Liberal Democratic Party era and show a new course for the country.

The most important role for the government in rebuilding from the March 11 disaster is to show the country's course and goals after the disaster. It is up to the individual affected areas to choose their reconstruction plan in accordance with the goals set by the government. The government should devote itself to listening to the opinions from the affected areas, creating an environment which will ease their reconstruction efforts, for instance by relaxing regulations, and providing such economic assistance as preferential tax treatment.

■ Three perspectives of energy policy: national security, competitiveness, and sustainability

Today's energy policy is missing a course and a goal which would depict how Japan will evolve. Energy policy is a fundamental issue for the government and is closely related to diplomacy, national security and needless to say, industrial policy. It should be considered from a wider standpoint than simply that of domestic electric power supply or disaster prevention.

Energy policy should be considered from three perspectives: national security, competitiveness and sustainability. National security depends on the securement of energy sources which is one of the most important issues for Japan which must acquire a large fraction of primary resources through imports. Competitiveness should be boosted in terms of quality, price and technology. This affects the global competition since the use of energy is the basis of all economic activity. A sustainable society should be realized. While it is inevitable to revise the 25% goal for reducing carbon dioxide emissions after the disaster, we must sustain our efforts to reduce it.

■ National strategy to build a country based on renewable energy

Renewable energy is superior in the following ways: (a) purely domestic energy derived from nature would contribute to national security; (b) expected worldwide to be a growing industry, taking part in it increases global competitiveness; (c) it does not emit carbon dioxide and thus contributes to sustainability. Japan should promote its R&D and its adoption, regarding it as a core energy source of the future, as part of national strategy to build a country based on renewable energy.

Since renewable energy is still under development, lacking in stability and economic viability, it will not immediately replace existing sources of energy. In addition, it can only be harnessed in geographically suitable places. Following the Fukushima nuclear accidents, the government has frozen nuclear power generation and indicated a switch to renewable energy. In pursuing this change, it will be necessary to define step-by-step goals in five-year intervals to introduce renewable energy, while securing the necessary energy sources in the interim.

■ Securing natural gas and clean coal as interim sources of energy

Excepting hydropower, renewable energy accounts for only 1% of the country's total power supply. It will thus take at least 10 years before it can become a core energy source. Meanwhile it is important to develop measures to secure stable, low-cost energy sources such as natural gas and clean coal (with low carbon dioxide emissions) domestically and abroad. Since ocean floor exploitation and international pipelines are closely tied to diplomatic and national security issues, the government should strengthen its efforts in this front.

■ Proposal of an Asia Pacific Power Grid as diplomatic strategy

A major issue in a full-scale introduction of renewable energy is coping with the instability, or variation in power output, of natural energy. As countermeasures, the development of (a) energy storage technology, and (b) backup system through wide-area power grids are urgently needed. Research efforts on energy storage technology that could bring discontinuous innovations should be strengthened; for example, lithium-air batteries have a large potential for improvement despite its risks. Regarding wide-area power grids, Asia is lagging behind Europe, which has already started international grid projects² that will link the entire region

² In Europe, the European super grid, which will ultimately interconnect countries in the region with ocean wind, tidal and pumped-up power in the North Sea coastal area, has started, primarily in Britain and the Netherlands. Another project, Desertec, has also begun to connect the Mediterranean coastal region with solar power in the Sahara Desert. The latter project attempts to provide 15% of electricity supply for the European Union by 2050.

to renewable energy sources such as solar power, wind power and pumped storage. Japan should play a leading role in promoting similar projects in the Asia-Pacific region.

Japan should propose the creation of an Asia Pacific Power Grid to connect the renewable energy sources of the region as a diplomatic strategy and to take a leading role in its realization. Japan could contribute to the international grid by transferring renewable energy technologies and by generating electricity from offshore wind power, geothermal power, and tidal and wave power. The Asia-Pacific region is blessed with abundant sources of renewable energy such as geothermal power in Indonesia and solar light and heat in the Australian deserts. Through an Asia-Pacific partnership based on energy coordination, Japan should contribute to both energy security and anti-global warming efforts in the region.

■ Separation of power generation and distribution, and establishment of a unified national power supply management system as part of global strategy

As prerequisites to building and participating in an international power grid, Japan needs to separate the power generation and distribution and establish a unified power supply management system covering the entire country. It will also be necessary to unify the frequencies between the eastern and western regions of Japan. These steps are inevitable in order to face the new challenges for Japan and must be considered not only as a domestic issue but also as part of global strategy.

Japan should reduce the price of electricity to become competitive internationally. The electricity rates in Japan are calculated on the basis of overall power use, which makes the individual price from each power source unclear. The pricing mechanism of the power market is not functioning due to the regional monopoly of the electric companies.³ The power market needs to function properly in order to make the price of each power source transparent.⁴

If the retail electricity sales to households, which account for 30% of the total power demand, are liberalized, businesses could sell their own electricity products with mixed energy sources, in a way similar to green investments. This makes it possible to promote renewable energy by consumer choice.

³ The amount of trading in the Japan Electric Power Exchange, which opened in 2004, accounts for less than 1% of the total nation-wide power supply. Most of the trading is done between electric power companies and power generation businesses in bulk. The issue for now is to change the system so that the price-setting mechanism through market trading will function properly.

⁴ To prevent instability in electricity supply as a result of power liberalization, it will be effective to create a unified electricity supply management system in the country and adjust supply and demand in accordance with market movements.

■ Energy demand in and outside Japan and nuclear power generation as interim power

Until the supply of renewable energy expands and becomes stable enough to meet the energy demand, it is necessary to continue nuclear power generation. The renewable energy sector should be closely monitored in order to review the amount of nuclear power generation as needed. The sequential decommissioning of nuclear reactors that have reached the design lifetime leads to aging reactors operating past the design lifetime, which raises questions about safety. It is necessary to set goals in 10 year intervals to reduce nuclear power generation and to systematically dismantle nuclear reactors. We should consider the possibility of replacing old nuclear reactors with new reactors equipped with the latest technologies if understood and supported by the public and agreed to by the local residents.

In order to continue with nuclear power generation for the time being, the role of the government and its responsibilities in nuclear power generation need to be clearly defined. While safety measures should obviously be strengthened to prevent accidents, the emergency response systems and countermeasures should also be established. The location(s) for the final disposal of high-level radioactive waste, which is yet to be determined, needs to be quickly addressed as well. The present system in which local governments nominate themselves to offer such locations resulted in zero progress to date. The existing high-level radioactive waste amounts to an equivalent of 24,000 cylinders, an issue that needs to be promptly solved regardless of the continuation of nuclear power generation. It is necessary to revise the present system that depends on the will of local governments and to proceed by defining the responsibility of the government.

Taking into account the expected future growth in demand for nuclear power generation in Asia, Japan should contribute to establishing safe nuclear power generation in the world, by making use of the nuclear disaster experience, and improving the technology for nuclear power generation. Japan does not carry nuclear weapons; it is the only country to have suffered atomic bombs; and it has been developing and accumulating nuclear technologies solely for peaceful purposes. We must not forget our place in the world. The difficulty in controlling nuclear power must be overcome by refining the technologies and by sharing them as collective *wisdom* of all humanity. We should manage its *power* through enhancing international cooperation and creation of a transparent system.

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Jiro Ushio	Chairman and Ushio Group Representative, Ushio Inc.
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Yoshio Higuchi	Professor, Ph.D. Keio University
Mitoji Yabunaka	Former Vice-Minister for Foreign Affairs Professor, Ritsumeikan University

Director

Shuya Nomura	Professor, Chuo Law School
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