



15 February 2018

Recommendation

## **Transitioning Energy Policies for a Decarbonized Society: Redirecting Discussions on the Basic Energy Plan and Long-term Low Emission Development Strategies**

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### <Summary>

#### **Introduction**

Over the past several years, we have witnessed rapid capacity expansion and drastic price decline of renewable electricity around the world. It is fair to say that the world has gained low-cost renewable electricity as another powerful tool to create a decarbonized society in addition to energy efficiency.

To realize a decarbonized society, also in Japan, the government should develop strategies focusing on the utilization of renewable electricity, and further pursue decarbonization of all energy including heat and fuels.

#### **Three basic policies to achieve decarbonization**

##### **Basic policy 1: Achieving 100% renewable electricity by 2050**

In 2017, wind power and solar PV achieved record low prices of 1.77 cents/kWh and 1.79 cents/kWh, respectively. Renewable energy has become the cheapest power source in many countries and areas, and its massive deployment is rapidly advancing. Japan should also realize low-cost renewable energy, and aim for transition to 100% renewables, first with electricity.

- **Higher renewable energy deployment target in the Basic Energy Plan**

Deployment of solar PV and wind power is expanding at a pace that can exceed the national target of 22-24% by 2030. Therefore, the current target does not serve as an incentive to continuous increase of private investments. As the deployment targets of other countries are set to around 40% by 2030, Japan should raise the target drastically to attract investments from home and abroad.

- **Elimination of human-caused obstacles to cost reduction**

To reduce renewable energy costs in Japan, human-caused obstacles need to be eliminated. These obstacles include the system that allows incumbent utilities to reject grid connection and impose unlimited curtailment without compensation, as well as the rigid regulations that make it difficult to build wind farms and other renewable facilities on agricultural land.

- **Expansion of grid connection and improvement of electricity system flexibility**

In Japan, the installed capacity of variable renewable energy such as solar PV and wind power accounts for only 4.8%, which is still below the level that could cause technical problems in grid operation. In leading examples in Europe and the United States, the share of variable power sources incorporated into the grid has already reached 20-40% by implementing measures such as forecast of power generation based on weather forecast, flexible operation of highly dispatchable thermal power plants, inter-regional transmission operation, and utilization of demand management. Stable incorporation of a large amount of variable power sources into the grid is absolutely possible.

Therefore, the roles of renewable energy in power supply shouldn't be limited because of its variability.

### **Basic policy 2: Immediate phase-out of coal-fired power plants**

While many countries in the world adopt policies to withdraw from coal-fired power plants, projects to construct 43 new coal-fired power plants have been in progress in Japan after 2011. This massive deployment will not only make it difficult to achieve the national target of GHG emission reduction but also lower the capacity factor of thermal power plants and increase business risk. Even with the most advanced generation facilities, coal-fired power plants emit more than twice as much CO<sub>2</sub> as conventional LNG-fired power plants. We must say that Japan's policy to expand such coal-fired power plants at home and abroad would spoil global measures for climate change, damage the international reputation of Japan, and even worsen the images of Japanese companies.

The government should position the phase-out of coal-fired power plants as one of the basic energy policies, and take measures such as early introduction of carbon pricing and implementation of emission factor regulations for new thermal power plants.

### **Basic policy 3: Energy efficiency as the first fuel**

Some point out that energy savings and efficiency measures are highly developed in Japan and there is little room for improvement. However, Japan's energy productivity increased only slightly in the 1980s-90s, and has been overtaken by the UK and Germany since the late 90s. Also, as the 2030 emission targets set in the current Energy Basic Plan allow the industrial sector to increase emissions, higher targets need to be set.

In the building sector, mandatory compliance with energy performance standards has just been started. Therefore, the regulation has not yet covered many houses and buildings, and little improvement has been made in existing buildings. Enhanced measures should be implemented for both new and existing buildings.

Also, measures for the transport sector are not sufficiently specified in the current plan. In particular, policies for electric vehicles are necessary to keep up with the global trend and accelerate the dissemination.

### **Other issues – Is the utilization of nuclear power and CCS realistic?**

Since its peak in 2006, global nuclear power generation has decreased by 7% by 2016. Also, the number of nuclear reactor construction projects launched has considerably decreased since the 1990s. The biggest cause of this trend is soaring construction costs. In Japan, it is claimed that generation costs of nuclear power are lower than those of thermal and renewable power. However, the construction costs used in this cost estimation are less than half the costs of construction projects actually in progress in Europe and the United States.

Meanwhile, carbon capture and storage (CCS) has been said to be necessary for CO<sub>2</sub> emission reductions in thermal power plants and factories. However, there are only 17 large-scale CCS projects currently in operation in the world, and only two of them store emissions from thermal power plants.

CCS may be usable in industries where electrification is difficult. However, now that generation costs of renewable energy are lowered, we must say that CCS's role as a means of low-carbon power supply is almost lost.

### **Conclusion**

The basic concepts of Japan's energy policies have been referred to as "3E+S" (Energy Security, Economic Efficiency, Environment and Safety). In addition to being safe and environmentally compatible, renewable energy has become more competitive than other energy sources in terms of economic efficiency and energy security thanks to dramatic price decline and massive deployment over the past several years.

As there are no nuclear fuel sources and little fossil fuel sources in Japan, it is more rational for Japan than Europe and the United States to promote withdrawal from fossil fuels and nuclear power. Blessed with various natural

features in each season, Japan is never a resource-poor country in terms of renewable energy such as solar PV, wind power, hydropower, geothermal heat, and biomass. Actually, it is a rich country endowed with abundant sustainable energy sources.

The utilization of potential of renewable energy is the best solution for departure from dependence on imported energy sources and establishment of energy security.