

Key Points on Future Course of Germany's Nuclear Phase-out Policy

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The Great East Japan Earthquake and the subsequent accident at the Fukushima Daiichi Nuclear Power Plant have exerted a great impact on Japan's energy supply and demand, as well as on its energy policy. Furthermore, the impact has spilled throughout the world. One symbolic effect may be Germany's enhancement of its nuclear phase-out policy.

Before the 3/11 disaster, Germany had 17 nuclear reactors with total capacity at 21.52 million kilowatts. Germany has had national discussions over a number of years on how nuclear power generation should be positioned. In 2001, the then coalition government between the Social Democratic Party and the Green Party established a nuclear phase-out law including a ban on the construction of new nuclear reactors and a cap on the cumulative power output of existing reactors. After the law took effect in 2002, the Christian Democratic Union took over the reins of government with its leader Angela Merkel becoming chancellor. In September 2010, the second Merkel administration decided on a 14-year extension of operations for ten nuclear reactors built in or after 1980. The Fukushima accident led Germany to reverse the plan and adopt a new plan to phase out all nuclear reactors by 2022, including eight units that had already been offline.

The decision that Germany as a sovereign state made on its own for various reasons must naturally be respected. Since Germany has rights and responsibility to make its choices for the future, other countries or outsiders should not raise any objections to the nuclear phase-out decision. I am interested in how Germany would implement the decision and what the relevant challenges would be. On these points, I have recently had an opportunity to exchange opinions with European energy experts. I have been impressed by the very interesting points cited by them about the future course of German nuclear phase-out.

The first point involves renewable energy that is well expected to replace nuclear energy for power generation. Germany has promoted the expansion of wind, solar and other renewable energy power generation to cover the loss of nuclear power generation, aiming to raise renewable energy power generation's share of total electricity output from 19% at present to 35% in 2020 and 50% in 2030. Germany will implement various policy support measures to achieve these targets. Backed by the German people's support and high hopes for renewable energy, the share may expand dramatically. The question is how and when the share would expand. In this respect, I am interested in the feed-in tariff system introduced to promote renewable energy, particularly solar energy.

Germany introduced the FIT system under its 2000 renewable energy law and revised the system in response to such developments as solar panel market overheating and growth in solar panel imports. After policy experiments and market-based adjustment efforts, Germany's *Der Spiegel* magazine in January 2012 carried a report noting that the German FIT system has various problems and limitations and would be scaled down. The system's future course is attracting attention.

As for wind power generation that is expected to substantially expand to play a leading role in renewable energy power generation in Germany, the enhancement of electric grid networks, as well as the expansion of capacity, has been cited as a challenge. While wind and other natural conditions are expected to lead wind power generation to expand mainly in the northern part of Germany, the center of electricity demand is located in the southern part that is losing nuclear power generation. Therefore, a 3,600-kilometer high-voltage transmission grid between the north and south may have to be constructed. But grid construction is now expected to take more time than earlier planned, bringing about a key constraint on the attainment of the renewable energy target share for 2020.

Under such conditions, energy conservation measures have been given some priority. In a realistic approach, however, Germany is likely to expand natural gas and coal thermal power generation. It may use domestic brown coal resources. Non-nuclear thermal power generation can play an important role as a realistic means, as indicated in the case of Japan after the earthquake disaster. But it may cause various problems. They may include energy security problems. Germany's expansion of natural gas consumption for power generation may have various implications on its relations with Russia. Germany and Russia are closely interdependent in gas trade. In this sense, Germany may have to enhance its relationship with Russia, diversify gas supply sources and consider emergency measures. The expansion of fossil power generation will naturally lead to an increase in greenhouse gas emissions. A macroeconomic problem is that renewable energy-based power generation's rising share of total power output, the need for grid construction and the expansion of fossil power generation could boost electricity costs to affect the German economy. But this problem's impact may change depending on cost cuts through technological breakthroughs and fuel price fluctuations. It is not easy to predict the future course of the problem.

The last interesting point is that Germany can consider its energy supply and demand in view of its links to European electricity and gas networks. Before Germany shut down seven nuclear reactors in response to the Fukushima accident, it had logged net electricity exports on a monthly basis. From last April, Germany expanded fossil and renewable energy power generation to make up for some of the loss on the nuclear reactor shutdown. From last May to September, however, Germany saw its net electricity imports expanding. Such supply and demand adjustments depend on the Europe-wide grid networks. If Germany were to steadily proceed with its nuclear phase out policy, electricity imports would be an option, if and when there is some constraints over progress in other options including energy conservation, renewable energy and fossil fuels.

The abovementioned points may be important for Germany to realize the nuclear phase

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-out policy it has chosen on its own. How will Germany address the abovementioned problems? Can Germany overcome them? Its future actions may serve as a useful reference for Japan. Based on full understanding about the similarities and differences between Germany and Japan, we may have to accurately analyze the realities.

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