

# Steeled for Innovation

To date, Japan has achieved milestones in the development of energy sources and improved energy efficiency through advancements in science and technology. The Japan Journal's Osamu Sawaji spoke with **Dr. Naoki Okumura**, a former vice president of Nippon Steel Corporation who has been involved in the research and development of iron and steel for many years and is currently an executive member of Japan's Council for Science and Technology Policy, on how Japan should go about developing science and technology to deal with the energy problems which have emerged as an issue in the wake of the Great East Japan Earthquake.



Dr. Naoki Okumura,  
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## How will Japan's energy supply change due to the Great East Japan Earthquake?

**Dr. Naoki Okumura:** As an overarching trend, the renewable energies which don't generate CO<sub>2</sub> at the time of generation such as solar and wind power will account for an increasing proportion. However, the downside to renewable energies is that their generating capacity is affected by weather. With current technologies, we cannot cover all of Japan's power needs with the use of renewable energy. Japan is an island nation, and this means that unlike European nations, we are unable to use power transmission lines to import any shortfall in electricity from other countries. Consequently, for the meantime we will continue to use oil and coal-fired power generation as well as nuclear power generation.

When considering power problems, the three Es, namely Energy security, Environmental protection and Economic sustainability are important. Taking these aspects into account and securing the year-round, stable supply of electric power required by the country as a whole is crucial to Japan's economy.

## What are your thoughts on nuclear power generation?

Ways to generate electricity that do not generate CO<sub>2</sub> at the time of generation and can supply a definite amount of electricity in a stable manner are currently limited to the likes of only nuclear power generation and geothermal power generation. It is highly likely that the accident at TEPCO's Fukushima Daiichi Nuclear Power Plant was caused by the loss of cooling functions in the nuclear reactor due to the tsunami. Of course, it's logical to verify the safety of nuclear power generation, but the accident at TEPCO's Fukushima Daiichi Nuclear Power Plant and the safety of nuclear power generation overall need to be considered separately.

With regard to the accident at TEPCO's Fukushima Daiichi Nuclear Power Plant, the government is making progress in the disclosure of information and in investigating the cause, and I think this course of action is quite correct. Since nuclear power generation is being implemented in many countries, we have an obligation to share the lessons learned from the accident with the rest of the world.

**To date, Japan has developed various energy-saving technologies. As someone who has spent many years involved in research and development in the field of iron and steel, what are the energy-saving technologies with which you feel Japan has made significant contributions in the field?**

Since the oil shock had occurred when I joined Nippon Steel Corporation in the 1970s, on a daily basis we had to think of energy-saving technologies regarding how to produce steel with limited energy. At the same time, we had to produce better quality steel and achieve improved productivity. Since the oil shock, every Japanese company in the steel industry has faced that kind of trilemma. It is under these circumstances that Japanese companies have developed products such as “high-tension steel,” which features a lighter weight and improved strength. By making cars lighter, this made a significant contribution to improved fuel efficiency. In addition, magnetic steel sheets, an iron-core material used in the motors of electric vehicles and hybrid vehicles have also been developed by Japanese companies. These developments have enabled high output from motors.

In terms of energy-saving technologies, I think Japan possesses a high level of competitiveness in “behind-the-scenes” fields that receive little attention, such as the development of these materials.

**What kinds of things can we expect to see in response to the earthquake**

**in the Fourth Science and Technology Basic Plan currently being prepared?**

We had initially planned to obtain cabinet approval for the Fourth Science and Technology Basic Plan in March this year, but due to the earthquake we are currently undertaking a review of the plan, which I think will be approved by the cabinet in August. While this is still under consideration, “a nation achieving recovery and revitalization from the earthquake disaster, realizing sustainable growth and social development for the future” has been advanced as one of the principles of the Basic Plan.

In the area of energy, there is a focus on the research and development of science and technology aimed at the stable supply of energy. In concrete terms, this is not limited to renewable energies and also cites technologies such as high-efficiency thermal power plants and storage batteries. Additionally, the idea of making progress in improvements to the safety of nuclear power generation is also dealt with.

The earthquake was a tragic event, but it could also be said that it thrust the issues facing Japan into stark relief. If we share an awareness of what challenges we face and tackle solutions to these problems, the Japanese people will be able to achieve innovation. Since innovation could also take place through an accumulation of many small changes, it takes time. But from my experience working in the private sector, I am convinced that amid myriad restrictions such as cost and quality, that the Japanese people possess the capacity to solve these issues through the power of teamwork. 