

## **Merits and Demerits of Market Principles for 3Es**

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Discussions have started to revise Japan's Basic Energy Plan. The present plan was decided on by the Cabinet approval in April 2014, paving the way for the government to fix a FY2030 target energy mix in July 2015. The plan is set to be revised every three years. Based on various changes after the energy mix decision, the present discussions are dealing with key policy problems and challenges without changing the energy mix. Important for the discussions is the S+3Es principle to simultaneously attain or secure energy security, environmental protection and economic efficiency on the grand premise of safety.

The difficult or complicated problem regarding energy is that the 3Es occasionally have a trade-off relationship with each other. Given that there is no perfect energy source as every energy source has merits and demerits, or advantages and disadvantages, it is important for Japan to use all energy options in a balanced manner while taking advantage of each energy source's strengths and overcoming its weaknesses. In addition, attention must be paid to the abovementioned trade-off relationship between the 3Es. Japan fully liberalized retail sales for electricity in April 2016 and for gas in April 2017 to promote electricity and gas system reform. This report focuses on how liberalization and deregulation in the reform to increase energy market efficiency will influence the trade-off between the 3Es.

Behind the view that the government must regulate the energy market and industry is the fact that natural monopolies frequently emerge in the energy market including the electricity and gas sectors where economies of scale work frequently. Energy market developments at home and abroad have prompted people to think that energy is special and too important to be left for market forces only. Such belief has also been behind energy market regulations. However, a growing view is that market principles should be introduced with a competitive environment developed to improve the efficiency of the energy industry and companies and cut costs to the advantage of consumers. As is well known, the idea has led to the promotion of market deregulation and liberalization in the world including Japan. Japan's electricity and gas system reform started amid a comprehensive energy policy review after the Great East Japan Earthquake and the Fukushima nuclear power plant accident. Particularly, the electricity system has been being reformed in three steps toward the 2020s.

Japan's electricity and gas market liberalization is surely expected to increase Japanese energy market efficiency and consumer interests and make significant contributions to the Japanese economy. In this sense, it will remain significant and important for Japan to pursue economic efficiency through market liberalization and deregulation to promote competition.

At the same time, however, we must take note of the fact that the pursuit of market principles for economic efficiency leads to various challenges regarding the other two Es – energy

security and environmental protection. The basic point is that energy security and environmental protection are related to “externality” and cannot be achieved by market forces only. In this sense, political or strategic intervention is essentially required for the two Es.

If market principles fully work to promote thorough competition, market players may have no choice but to select the most cost-effective option (for the short-term) to survive competition. In a symbolic case, many coal power plant construction plans have emerged amid Japan’s electricity system reform. These plans represent an option for market players to survive competition. As a matter of course, the option affects environmental protection by increasing CO<sub>2</sub> emissions. In an old case, the most economically rational energy option for Japan through the 1960s had been importing oil from the Middle East. As a result, Japan became too dependent on oil and on the Middle East. The two oil crises in the 1970s indicated that the option threatened energy security, as is well known.

Nuclear energy is targeted to account for 20-22% of the FY2030 energy mix that will not be changed in the current basic energy plan revision as noted above. Nuclear energy, though having safety problems, is expected to make great contributions to the 3Es. In the electricity market where liberalization is making progress to promote competition, however, how to position nuclear power generation that features massive initial investment and long-term operation to recover costs and generate profit is not necessarily any easy problem. It is very difficult to depend on market principles alone for attaining the energy mix that is desirable for the 3Es, as indicated by British and other earlier market liberalization cases.

Another important problem is how to secure investment for stable energy supply and maintain and ensure sufficient supply capacity amid market liberalization. Liberalization and competition promotion are basically expected to reduce surpluses in the market and excessive capacity. This leads to greater efficiency. However, it is important for energy suppliers to seamlessly provide consumers with energy while responding to frequent changes in supply and demand. As well as the pursuit of greater efficiency, measures to maintain and secure appropriate stable supply are important.

In a competitive electricity wholesale market, however, prices may fail to be sufficient to secure investment or cost recovery. Existing power generation facilities may lose their economic efficiency and grow unprofitable, leading their owners to exit from the market. Investment in new electricity sources may disappear under such circumstances, both of which lead to the so-called “missing money problem”. In addition to the classic missing money problem, a modern missing money problem may emerge as electricity prices accelerate their fall on the massive entry into the wholesale market of renewable energy-generated electricity that has policy support with marginal costs close to zero. In many electricity markets plagued with the missing money problem, participants explore mechanisms to secure necessary supply capacity. In the current step-by-step electricity market reform, stakeholders are considering a capacity market and other measures to address the problem. A policy challenge to secure investment in electricity generation sources required for stable supply will have to be considered extensively and comprehensively for the grand purpose of attaining the 3Es simultaneously while detailed designs for individual markets are worked out. While there is no perfect energy source, no market or policies are necessarily perfect. It is hoped that energy policies will be revised through the current discussions to attain the ultimate goal of the “S+3Es” through mutually complementary measures.

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