

Implications of Japan's NPPs overseas expansion policy

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1. Introduction

The accident at the Fukushima Daiichi contributing to nuclear power's loss of acceptability in most developed countries however new nuclear market has been growing especially in developing countries. According to IAEA, it is estimated that the construction of 121 to 743 nuclear power plants (NPPs) by 2050 [2].

Japanese government reviewed national nuclear export strategy after Korea KEPCO consortium ordered for construction of the UAE Project in 2009 and Russia won a contract of the Vietnam 1st Nuclear Power Plant Project in 2010. Japan figured out that reasons of failed at UAE project were price competitiveness and lack of top-level's attention. Also Russia offered to Vietnam military cooperation which was diagnosed as a failure to Japan. In these circumstances Fukushima accident influenced attitudes towards and acceptance of nuclear power immediately compared to before the accident. Nevertheless, Japanese government decided to keep focusing on nuclear export.

We examine divided into internal and external factors of NPPs export policy switch in Japan, and derive policy implications for Korea.

2. Status of Japan

2.1 The Background of NPPs overseas expansion policy switch in Japan

Factors that facilitate the NPPs expansion in Japan can be divided in to internal and external factors. Table 1 explained about factors.

Table 1. Internal & external factors of NPPs expansion policy switch in Japan

Internal factors	External factors
<ul style="list-style-type: none"> - Fukushima accident & disaster recovery - Negative impact on acceptance of nuclear power - Market saturation - Increased uncertainty due to political confusion 	<ul style="list-style-type: none"> - Overseas expansion - Preserve the stability of world nuclear market - Non-Proliferation & Nuclear security strategy - Maintain nuclear latency

2.2 Japan's overseas market expansion strategy in Infrastructure industry

Japan diagnosed after failing order of UAE Project in 2009 two major issues in infrastructure industry. First of all, there was a lack of cooperation between stakeholders and second, business advance by general trading companies from Japan did not make direct impact to Japan.

Japan established 'the Industrial Structure Vision 2010' including NPPs overseas expansion plan in order to solve the economic recession.

Table 2. Overseas expansion plan of Infrastructure industry and NPPs from 'the Industrial Structure vision 2010'

Infrastructure Industry	Action plan for NPPs overseas expansion
<ul style="list-style-type: none"> - A virtuous cycle of domestic industry through export of system - Strengthen support of public fund - Cooperation and strategic alliances at stage in the planning in each country - An aid package & a top-level diplomacy - Action for international agreement - Establish government enforcement system 	<ul style="list-style-type: none"> - Reform of overseas expansion system - Strengthening of finance - Strengthening of assurance of nuclear fuel supply - Accelerating of nuclear cooperation agreement conclusion - Strengthening of an aid-package promotion - Enhanced technology with competitive price & safety - Enhanced supporting around the NPPs infrastructure maintenance using ODA

2.3 Japan's NPPs overseas expansion policy

Japan established the JINED(International Nuclear Energy Development of Japan Co., Ltd.) which is a consortium of companies with the purpose of 'proposal and research activities for NPPs project orders in emerging countries'.

Japanese government and the private sector together made a strategy to offer a whole package including NPPs construction, operation, maintenance, technical know-how, human resources, economic cooperation and financial support. Not only that, interest of top-level was the key to signed several nuclear deals with India, Vietnam, Turkey and East Europe. As a result, since 2011, international nuclear deals in Japan have been increasing rapidly.

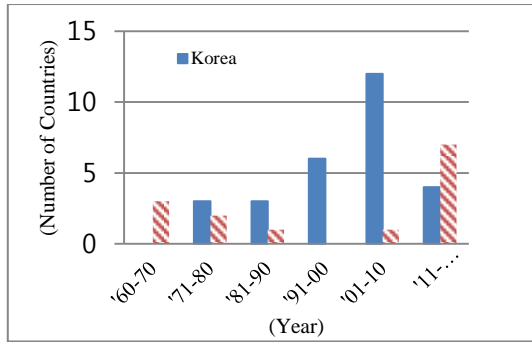


Fig. 2. Trend of nuclear deals with overseas in Korea and Japan

2.4 After set up the expansion policy in Japan

As Table 3 shows it, after set up the expansion policy, Japan had been succeeded in nuclear deals and export. However unlike Japan, Korea has not shown big performance since 2011.

Table 3. Nuclear agreements and export after 2009 in Korea and Japan

	Korea	Japan
2009	- UAE agreement (6)* - Jordan Research Reactor export(12) - UAE export(12)	
2010	- South Africa agreement (10) - Japan agreement (12)	- Vietnam export (1) - Korea agreement (12)
2011	- India agreement (7) - Soudi Arabia agreement (11)	- Kazakhstan agreement (5)
2012		- Vietnam agreement (1) - Jordan agreement (2) - USA export(2) - Russia agreement (5)
2013		- Turkey agreement (5) - Turkey export(5) - UAE agreement (5)

*() mean month for the year

Not only agreements and export, also Japan had summit talks with Thailand, Vietnam, Indonesia, Turkey and etc. successfully. These successes based on export policy they made and it derives policy implications for Korea.

3. Proposals for NPPs overseas expansion policy in Korea

Japanese aggressive expansion policy has important implications for Korea that still stick to short term strategy. As a late-comer, Korea should promote NPPs overseas expansion over the long-term plan to promote technical cooperation.

3.1 Challenges for promoting technical cooperation

Korea won a contract in Jordan nuclear research reactor in 2009, UAE NPPs in 2010 and Netherland research reactor in 2014 through short-term strategy that using high-level diplomatic sales.

From now on, Korea should gather the power of government, industry sectors and public functions such as R&D and security regulations in order to steady overseas expansion. Then analyze overseas market as well as monitoring the expansion policies of competitors and strengthen the competence of technology policy.

China has been developing a next-generation nuclear power technology with enormous capital in a short time and Russia has been executing nuclear energy diplomacy. In these situations, Korea should be in the position of equilibrium and establish a technical cooperation.

3.2 Proposal for policy

In this study, we suggest 5 policy proposals for effective technology cooperation.

First, national support and assurance of high-level are needed due to science and technology diplomacy is one of a key success factors. In addition, financial support such as effective financing by government and examine of assurance system are needed.

Second, expand the scope of technology cooperation that includes not only economy and industry, but also social and humanities side of partners. Increasing R&D cooperation with research institutions and pursue joint degree programs with other countries for innovation sharing.

Third, reform a system of technology cooperation promotion for effective export. Build 'Couple & de-Couple' strategy that pursue strategic cooperation in different stakeholders and also establish an organization for export like JINED in Japan.

Fourth, procure and cultivate expert who has experience in international trade field for nuclear deals, M&A, consortium and strategic alliance.

Finally, build an international nuclear network with partners in order to share R&D activity, predict results and support research resources.

4. Conclusions

After established 'the Industrial Structure Vision 2010' including NPPs overseas expansion plan, Japan made JINED which is an organization for NPPs export and have provided full support. Based on that, agreements and exports have increased since 2010. However Korea still does not have long-term strategy for expansion.

NPPs expansion strategy are expected to be built based on the long-term performance with full support by government. Especially Korea is not a first in line country in NPPs, so should make the long-term plan to

promote technical cooperation and establish an organization for export like JINED in Japan.

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