Co-existence Scenarios of North East Asian Energy Consuming Countries♦

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INTRODUCTION

Amidst a growing demand for energy and an increasing dependence on imports, the need to enhance energy security in Northeast Asia has become a focus of discussion for energy policy planners and energy industry players in the region. While individual countries are seen to be taking steps in this direction, when considering today's close economic relations and interdependence in the energy market, "regional cooperation", through which consuming countries work collectively toward the resolution of common problems, will be vital to the development of a stable market in Northeast Asia. In particular, the demand for energy in China is an element that influences the entire balance of energy supply - demand in Asia and, further, the country's energy policies, overseas upstream investments, and pipeline projects could have a significant effect on energy supply - demand in the region and international relations. For these reasons, it is necessary to place central focus on China when consider the state of energy cooperation in the region. In addition, while oil prices have remained at a record high level, one of the factors to cause such historical price hikes is demand surge in Northeast Asia. In order to stabilize international oil market, therefore, regional cooperation, which includes promotion of energy efficient technologies and development of oil-stockpiling systems in preparation for a sudden supply cut, has increasingly become important.

Today, there is a growing and ever important awareness that as Japan evaluates its own energy strategies, the country must partner with energy producing nations as well as other consuming nations in order to achieve an "international energy system" that will allow for sustainable development and, further, that the country must improve its framework for cooperating with other Asian countries, which face many of the same issues regarding energy.

Based on this awareness, this report attempts to outline (1) the presumed demerits for Northeast Asian consuming countries (Japan, China, Korea) by working without partnerships and mutual cooperation, (2) the merits of partnerships and mutual cooperation, and then (3) analyze and examine sectors and policies for which cooperation is possible and a framework for the promotion of

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cooperation. Based on this analysis, this report introduces potential scenarios that will promote energy coexistence among consuming countries. Experts from Japan, China, and Korea held several meetings to develop the scenarios based on the scenario planning method. Such a trilateral joint work was, in fact, the first attempt in this type of research projects. It was a great achievement that experts with different nationalities and backgrounds could collectively work, have discussions, and share a high degree of common understandings regarding the Northeast Asia's energy coexistence, despite the recent difficult diplomatic conditions among the three countries.

Currently, the Northeast Asian countries (Japan, China, Korea) face many challenges along the path to realizing mutual energy coexistence. However, by adopting a long-term perspective and coordinating interests, the three countries can build an even stronger state of cooperative existence. It is our sincere hope that this report can make a contribution to those efforts.

The Institute of Energy Economics, Japan

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Chapter 1 Scenarios for the Coexistence of Energy Consuming Countries in Northeast Asia

1-1 Introduction

Major players in Northeast Asia, namely Japan, China and Korea, hold very important positions in international politics, global economy and world energy market. Reflecting the strong energy demand growth, Northeast Asia has increased its significance in the world energy market substantially in the past decades and it is expected to grow further. Thus, stability of the Northeast Asian energy market is important not only for its member countries but also for the whole world.

Under the circumstance, new challenges are emerging regarding stability of the Northeast Asian energy market. The challenges directly related to the energy market include:

A) Whether Northeast Asia could restrain growing energy demand in order to mitigate pressures on the energy supply side?
B) Whether Northeast Asia could secure energy supply to meet its growing energy requirement？
C) What will be the relation between Northeast Asia energy consuming countries and the external major energy suppliers (Russia and the Middle East)？
D) What will be the future of energy cooperation among the Northeast Asian countries?

In addition to the above, from a wider and macro perspective, the following factors are also influential for stability of the Northeast Asian energy market.

A) Political and diplomatic relations of Japan-China-Korea and the international politics
B) Economic relations of Japan-China-Korea and the global economy
C) Regional and global environmental issues and the initiatives to be taken by the Northeast Asian countries to mitigate the problems

Each of these factors mentioned above has impact on stability of the Northeast Asian energy market individually, and, at the same time, interaction between these factors also affects the market stability.

The Northeast Asian countries, whose importance in the global energy market has grown substantially, take a common position as significant energy consumers/importers. Thus it is important for the Northeast Asian countries to overcome the challenges and problems mentioned above in pursuit of coexistence and co-prosperity. The coexistence and co-prosperity is expected to contribute to stability of Japan, China and Korea, as well as stability in the regional and the global energy market.

With this recognition in mind, 12 energy experts from Japan, China and Korea gathered in Korea on November 7, 2005 to have brainstorming discussion on the long-term scenarios for energy coexistence in Northeast Asia[1].

Meanwhile, the scenario planning method employed here is a methodology to figure out plausible visions/images of uncertainties-studded future. When considering a future world/visions of any specific area at issue, we find various elements having impacts on its future development. By extracting above all important and uncertain factors among such elements, and based on differences due in unrolling such vital factors, this methodology allows us to describe different world/future images having totally different structures in logic. In this context, this is not "future forecasting" of simple status-quo extrapolation type nor resting on the business-as-usual concept, but designed for describing different scenarios/stories for any visions/images that can exist in the future. Thus, this methodology is expected to contribute to strategic decision-making, including responses/policies, in preparation for any possible different future.

There are several reasons to employ the method of scenario planning in this study. The method, first of all, could help us to develop several different futures of the Northeast Asia's energy coexistence. The method also facilitates to identify what kind of factors will become the diversion point of such different futures, and what types of actions are required to achieve desirable energy coexistence.

During the brainstorming discussion mentioned above, numbers of issues were identified as influential factors for the energy coexistence of Northeast Asia. However, the major conclusion of the discussion is that: (A) the most important and uncertain factor for the energy coexistence is "whether political and diplomatic relation between Japan and China would stabilize"; and that (B) this factor should be used as a branching point of the scenarios. Furthermore, the discussants also identified the "drivers" of the branching point (the major elements to affect the branching point). The drivers include: situation of political and diplomatic dialogue between Japan and China; opinion and sentiments of Japan and China (and Korea); situation of the international politics (particularly US and Russian policies towards the region); extent of economic interdependence of Northeast Asia; extent of the needs to call for stability of the relation between Japan and China, which would arise from energy and environmental problems.

[1] The target range of time span for the scenario is set at about up to 2010-2020.

Outline of the two scenarios for the Northeast Asia energy future compiled at the brainstorming meeting is summarized below. They are: (A) Political Stability and Coexistence Scenario and (B) Instability and Conflicts Scenario.

1-2 Overview of "Political Stability and Coexistence Scenario"

1-2-1 Factors and movements for political and diplomatic relationship between Japan and China

Today, Japan and China face various issues in their political and diplomatic relations. Major issues causing this in the background are history recognition issue, changing international power balance along with China's growing power and rivalry associated with it, rising nationalistic sentiment in public level in both countries and so on. In particular, Yasukuni Shrine issue, anti-Japan demonstrations in China, and, in the energy field, rivalry on natural gas developments in the East China Sea and Siberian crude oil pipeline are adding tension to the relations. Thus, problems are accumulating in the Japan-China political/diplomatic relations.

Under the "Political Stability and Coexistence Scenario", however, it is assumed that Japan-China political/diplomatic relationship avoids serious deterioration, and rather, it will move towards improvement. The major factor that supports this scenario is the deepening economic interdependence of Japan, Korea and China, simultaneously extending to Northeast Asia as a whole. Trading and investment relationship has been steadily enhancing among Japan, Korea and China, with China's increasing importance as the "factory of the world" as well as ever-expanding gigantic domestic market in recent years. As economic interdependence in Northeast Asia is strengthened more than ever and mutually dependent and mutually complementary relationship become more closely woven, economic logic and need become dominating driving forces that strongly demand political stability among these countries.

At the same time, increasing awareness of mutual necessity of each other in energy and environmental issues adds strength to the force demanding stability of political/diplomatic relations. Namely, under the circumstance where energy price remains high and the Middle East situation is anticipated to be instable, the importance of sharing common interests, being similar energy consuming and importing countries, will gain stronger recognition. Then, it will be understood that the competition for securing supply would result in even higher energy prices, giving advantages to

suppliers. This will lead to deeper recognition of the importance of energy conservation for demand control and technological cooperation for development of alternative energies. Further, importance of oil stockpiling for reinforcement of cooperative structure under emergency situations will be recognized. There will be mutual awareness of importance that Japan and Korea who possess advanced technology and knowledge should provide cooperation to China in these fields. In addition, as the energy demand increases, environmental issues such as air pollution and domestic environmental deterioration will become increasingly serious in China. In the long run, China will also face the necessity of implementing measures for global warming issues. Importance of technological cooperation relating to energy conservation and alternative energies will increase to cope with environmental issues. Under the circumstance where Russia's importance is recognized in diversifying the supply sources from the Middle East, Japan-China-Korea cooperation is desirable so as to effectively utilize Russia's energy resources. Excessive competition between consuming countries will be recognized as the path to losing their bargaining powers. On the other hand, combined efforts will make it possible to enjoy economics of scale and to mobilize greater implementing force. Thus, heightened awareness of mutual necessity will become a background factor that demands stability in Japan-China political and diplomatic relations.

Although Japan-China political/diplomatic dialogue is under severe tense currently, the above-mentioned factors will keep the opportunity open for dialogue. As a background for this, dialogue and opinion exchanges between people in economic and industrial sectors, where linkage, alliance and integration are progressing, and those between intellectuals and experts will be maintained and developed as the second and third tracks. These dialogues in the second and third tracks shall play a role to sustain the dialogue in the first track (political and diplomatic).

Although the United States that has large influence on both Japan and China exhibit great interests in China's rising power, it does not favor the serious deterioration of Japan-China relations from the viewpoint of stability in global politics and economy.

Political and diplomatic relations will move towards stability under such circumstances. Of course, it is highly possible that problems would arise from time to time. However, both countries will manage to solve problems with rational judgment and actions or avoid their deterioration with added consideration for domestic national sentiment and politics.

Along with the movement of Japan-China relations toward stability, the political/diplomatic relations of Northeast Asia as a whole will also take a turn toward stability. Thus, Japan, China, and Korea steadily build up the foundation for cooperation in political, economic and energy issues in

Northeast Asia and Asia as a whole.

1-2-2 Northeast Asia heading for Energy Coexistence

a. Advancing energy conservation cooperation

China's 11th 5-year Plan positions reinforcement of energy conservation as the highest priority issue. Energy conservation will bring multiple benefits such as reducing import-dependency by decreased energy demand, moderating environmental impact associated with energy consumption and development, and curbing industrial cost to bring increased competitiveness through reduction in energy use as an input for economic activities. On the other hand, comparison of energy intensity (energy consumption per unit GDP) based on the actual GDP indicates that China's energy intensity is approximately nine times that of Japan, suggesting a potential for large-scale energy conservation. China's energy conservation will also bring benefits for Japan such as alleviated pressure on international energy market, decreased seriousness in environmental issues in the region, and expanding business opportunities with energy conservation as its core. While economic interdependence progresses and political/diplomatic relations enjoy relative stability, cooperation of Japan, Korea, and China will develop towards the promotion of China's energy conservation as its core. Also, there is a great room for energy conservation not only in the advanced technological cooperation such as clean coal technology, but also in the technological cooperation in "regular and daily level" such as operation and maintenance technology for improved efficiencies at power plants and factories, and improved efficiency in automobiles and other energy consuming devices. Promoting energy conserving technological cooperation, China's energy efficiency shall steadily improve and, in the long run, energy demand increase will also be curbed gradually.

b. Advancing CDM as measures against environmental issues

Regarding the post-Kyoto Protocol issue, China and Korea will intensify international participations in the campaign for reduction of greenhouse gas emissions. This will increase interests in the flexible mechanism stated in the Kyoto Protocol, and discussion will be developed for full-scale implementation of CDM projects in China. Mutual benefits of such campaigns will be sufficiently recognized. Efforts will be enhanced for solving problems in implementing CDM projects so that establishment of institutional setting and market rules and dialogue and coordination among business sectors will be promoted. Coupled with progress in establishing international system for CDM, although there would be various problems in the early stage of CDM projects in China, the platform for stable project will be formed through trial and error, and CDM projects will steadily become

active. Thus, the cooperation of Japan, Korea, and China to deal with environmental issues will steadily advance mainly in China . As a result, these campaigns will succeed in the long run and environment impact will be alleviated over the whole region. This will contribute to achieving the international commitment to the emission control.

c. Advancing cooperation in Russia's energy development

As economic interdependence of Northeast Asia region progresses, importance of developing energy resources of Russia for utilization in Northeast Asia will be recognized strongly in various aspects such as diversifying energy supply sources (ex. promotion of natural gas use), diversifying import sources (ex. reducing the Middle East dependence), strengthening linkage of the regional energy market through construction of regional energy infrastructure. At the same time, energy policy makers and industry players of the three countries will recognize commonly that separate approaches of Japan, Korea, and China to Russia would not maximize the potential benefits. Because, economics of scale dominates considerably in implementing giant projects such as mentioned above. Technical and financial resources will be combinedly mobilized to produce greater implementing power. Thus, the dialogue among the three countries will be intensified to discuss focusing on how they should promote Russia's energy development as the region, which will enhance coordination of their awareness. In a case where a large-scale and high-risk investment is required such as development in East Siberia, joint proposals and approaches may be compiled. Addressing the energy development projects in East Siberia and Sakhalin through constructive and cooperative approach of Japan, Korea and China, its materialization will be enhanced. Oil and gas development in East Siberia and Sakhalin will mitigate the Middle East dependence and promote natural gas utilization. Also, development of these resources and establishment of energy infrastructure for transportation to the Northeast Asia region will lead to establishment of wide range energy network in the long run.

d. Strengthened bargaining power and stability of international energy market

Recognizing the importance of pursuing common benefits as the energy consuming countries, the three countries of Northeast Asia will emphasize cooperative approach in development and utilization of Russian resources. As a result, this will lead to a stronger bargaining power against Russia rather than separate approach by each country. Progress of development and utilization of Russian resources will lead to reduction in region's Middle East dependency. Thus, it will lead to a strengthened bargaining power of Northeast Asia as a whole against oil-producing countries in the Middle East. It will also contribute to mitigate and improve the "Asia Premium "(higher crude oil

price for Asian countries) issue.

Thus, those cooperative activities in Northeast Asia will also play vital roles for stabilization of international energy markets; such as curbing energy demand growth through energy conservation, reducing Middle East dependency through development of Russian resources, and building shared awareness on the importance of energy.

e. Building institutional setting for regional energy cooperation

As discussed above, process of study and investigation on possible regional campaign on the energy issues will progress. Recognition will develop on not only the importance of economic interdependence and dialogue at business and expert level that are progressing, but also the importance of having institutional settings for intergovernmental dialogue and discussion. Learning from the historical experience of energy cooperation in the EU, governments in the Northeast Asia will in the long run gradually proceed with establishment of a multi-national setting for promotion of regional energy cooperation. As seen in Europe, efforts under such system may face difficulties from time to time, however, efforts to overcome them will be made every time toward the grand objective of pursuing the common benefits.

f. Addressing the "energy poverty issue" of North Korea

As discussion and establishment of the institutional setting for energy cooperation in the Northeast Asia region progress, the necessity of measures against the notable lack of energy supply (energy poverty issue) in North Korea will be discussed. Region-wide approach will also be emphasized on this issue aiming at stabilization of North Korea and the Korean Peninsula, suppression of nuclear development and supply of alternative energy, and the stabilization of the overall Northeast Asia. Complete renunciation of nuclear weapon development paves the way for energy cooperation for North Korea. And then, energy cooperation for North Korea will be discussed and implemented; for example, such as construction of nuclear power plants that should not lead to development of nuclear weapons, establishment of infrastructures such as natural gas pipeline, and heavy fuel oil supply. Regarding the regional cooperation, multi-national coordination will be implemented among the parties, in addition to Northeast Asian countries, including the United States and Russia.

g. Activating energy investment and business in the region

As economic interdependence progresses and political and diplomatic relations become

stabilized, many projects in the energy sector will be proposed and examined in Northeast Asia engaging third party countries such as Russia. Establishment of the system for promoting regional energy cooperation will enable private sectors in each country to actively participate in various fields such as energy development, energy conservation and environmental improvement. During this process, number of joint implementation style energy projects will increase in which various firms from Japan, China and Korea will jointly participate.

h. Contribution for sustainable development, coexistence, and mutual prosperity

The above-mentioned campaign for energy issues will bring beneficial effects in the long run such as strengthened energy security, measures on environmental issues, and economic and social development in the Northeast Asia as a whole. In this context, contribution will be made to the sustainable development of the overall Northeast Asia, and these countries will strengthen the base for coexistence and mutual prosperity. As a result, economic interdependence in this region will be deepened further. This, in turn, will become a driving force that demands further stability in political/diplomatic relations, creating a desirable cycle, and resulting in development of "regional community". In a real world of international politics and economy, problems may occur associated with confrontations and tensions, but awareness of the importance of strengthened regional cooperation will work for overcoming such problems when a problem arises.

1-3 Overview of "Instability and Conflicts Scenario"

1-3-1 Growing political and diplomatic instability between Japan and China

Economic interdependence between Japan and China, or among the whole Northeast Asian countries, has already reached a significant level. Despite the fact, the current tension and confrontation in political/diplomatic relations will adversely affect the future progress of economic interdependence. The worsening political relationship and the growing anti-Japanese sentiment shall be thought as a serious business risk. Particularly, this trend will adversely affect large-scale investments. The economic interdependence of the region will lose pace and make little progress. This means that the economic interdependence, which should support the political/diplomatic stability as a feedback effect, would not be strengthened.

In the meantime, the growing Chinese economy will substantially push up its energy demand. China will depend more on the import to meet its energy demand, resulting in tightening

supply-demand balance and higher energy prices in the international market. Faced with the rising import dependency and higher energy prices, China will desperately try to reinforce its energy security. However, to enhance energy security, China will be more likely eager to put emphasis on supply side measures to deal with immediate needs, but place a low priority in the efforts in demand side. Particularly, cooperation among energy-consuming countries would not be much emphasized. As the result, the immediate needs caused by energy related problems would not lead to a stronger call for the force to stabilize political/diplomatic relationship. Rather, as China focuses more on securing procurement and acquisition of energy supply, political/diplomatic tension will heighten between Japan and China, or among the whole Northeast Asia region.

In the situation where no confidence-building effort is seen between the two countries, stable and smooth progress could not be expected in large-scale investments, technology transfers, or technology cooperation. It is very hard to make a break-through to a path to political/diplomatic stability, while there is little progress in cooperation/collaboration in the private sector as well. Although business people and specialists may continue their dialogues, its effect will be dispersed giving only limited impact but not accelerating the governmental level dialogues.

On the aspects of international relation, there would not be international efforts to mediate or conciliate the political and diplomatic tension between Japan and China based on serious recognition of the problem. Russia, satisfied with higher energy prices, sees that the improved relationship and cooperation between Japan and China in the political/diplomatic levels is not necessarily beneficial for the interest of the country.

With these reasons, there would be no momentum to activate a force to stabilize the political/diplomatic relationship of Japan and China. Rather, potential or existing problems may suddenly become very serious from time to time. Given the occasional heightening of issues such as history recognition problems or natural gas development in the East China Sea, tension between the two countries may reach forward to a serious level. There may be more anti-Japanese movements, strikes and demonstrations of a radical nature. They, in turn, will adversely affect the economic interdependence of the two countries.

During the process, nationalistic sentiment will grow in the two countries (or in the whole of the Northeast Asia). Due to the growing dislike against each other, non-emotional problem-solving efforts and calm discussions will become more difficult. “Room for compromising” for stable relationship will become smaller for both governments and the quest for improvement will become difficult.

Since the economic interdependence is stagnant in the Northeast Asia and the efforts to improve or strengthen the relationships are scarce, the political/diplomatic relationship of Japan and China, as well as that in the whole Northeast Asia, will remain unstable for the long time. Under the circumstance, foundation of co-existence in the energy field would not be established.

1-3-2 Energy market of Northeast Asia characterized by tension, confrontation and instability

a. Stagnant cooperation in energy-conservation technologies

When each country strives to reinforce the energy security independently, much of attention will be given to increase and ensuring of energy supply for domestic market. This situation makes energy-conservation projects tend to delay. In the Northeast Asia, cooperation for energy saving efforts would be sluggish due to unstable political relationship, although significant benefits could be expected on both sides from energy conservation cooperation. Since the governmental level relationships do not improve, energy conservation projects in the private sector, which require technology cooperation, do not progress but remain stagnant. This is a side effect of general lack of mutual trust between the countries. Rather than they recognize the need for cooperation, they feel more about the risk for investment. Therefore, each country will individually tackle with energy conservation. Of course, such individual efforts would bring achievement to a certain extent. However, compared to the case where technology cooperation exists, progress of energy conservation will be slow. As the result, there will be increased demand for energy in China as well as in the Northeast Asia, and this will become one of the primary causes of tight international energy market.

b. Delay in cooperation of environmental issues and worsening of environment

As energy-conservation cooperation does not progress with China, as mentioned above, energy demand will grow significantly producing greater burden on the environment. China may take stronger measures for domestic environmental problems such as air pollution. However, China will not put a priority in international commitment for global warming and may insist that the industrialized counties should first take measures to lower the effects. China may not take a positive posture for progress of flexible mechanisms such as CDM. Establishing the rules and institutions necessary to move the projects forward will be delayed. The combined effect of delayed formation of rules for these projects, growing tension in the political/diplomatic relationship,

and stagnant economic interdependence is quite unfortunate. It will delay progress of CDM, while much is expected for its effects for environmental measures and technology transfers. As the result, combined with the increased energy demand, there would not be notable reduction in the environmental burdens in Northeast Asia. Further, as each country will take domestic measures individually, they will incur higher costs inevitably compared to the case where flexible mechanism is utilized.

c. Approaches to Russia individually proceed

While supply-side issues are more focused to ensure energy security, the energy supply from Russia is thought to be of utmost importance. However, rather than recognizing the development and use of the Russian energy resources as the common "asset" for the whole Northeast Asia, each nation thinks it more important to secure them for its own needs independently. Japan, China and Korea will approach and negotiate with Russia individually. As each country wants to start the project under its initiative to ensure own supply, they compete with each other by putting up better conditions than others. Each country may try to lock-in the Russian energy resources only for its own use in fierce competition, creating seller's market for Russia. Furthermore, excess competition will cause disorder in the international energy market.

As individual approaches are made toward energy development projects in East Siberia and Sakhalin, economics of scale would not be exercised while each country bids-up conditions in competition. Development cost would become prohibitingly high for giant projects such as cross-border pipelines. In addition, as the infrastructure for energy supply is conceived on an individual basis, a large-scale infrastructure that covers the entire region will not become the subject of foremost importance.

d. Stagnation continues in reinforcing bargaining power and impact on the international energy market

As individual approaches dominate in attempts to develop and utilize Russian energy resources, bargaining power as energy consuming nations would be dispersed but not be integrated nor strengthened. As competition between Japan, China and Korea in this area becomes intense, bargaining power will be disintegrated and offset each other. As a result, position of Russia as energy producing nation will be strengthened. While energy demand increases significantly, the foregoing problem associated with the energy development in Russia will make it difficult to reduce the Middle East dependency of energy supply. As a result, bargaining power against oil producing nations in the Middle East will remain vulnerable, and the common interests as energy consuming

and importing nations will be impaired.

Intensified competition for energy resources and energy supply in the midst of substantial increase of demand for energy and under increased dependency on the Middle East will enhance the trend of sellers' market in international energy market. Conflict in politics and diplomacy and competition to ensure energy supply in the tightening trend of energy supply-demand balance will become factors to bring instability to the international energy market.

e. Stagnant progress of dialogue and framework setting for energy sector cooperation

Since economic integration remains stagnant and political/diplomatic relations unstable, impetus toward regional cooperation on energy security and environmental issues would not work among nations in Northeast Asia. In an attempt to solve such issues, initiatives by individual nation alone will be considered important, which is apt to produce negative effect by decreasing economic efficiency or bringing up new conflicting factors in political/diplomatic relations. Although dialogues will continue at business level or expert level owing to efforts of related parties, these would not effectively promote government level conversation nor bring improvement in overall relations. While bilateral dialogue between governments may be held occasionally as in the past, it will continue in "low-key" reflecting the unstable political and diplomatic relations. Efforts to develop the bilateral dialogue to multilateral level would be rarely considered and establishment of institutional setting for multilateral framework would not be promoted.

f. Unstable North Korea issue

Under the circumstance, initiative to strengthen the effort on the North Korean issue by the Northeast Asia region as a whole will be also stagnant. As a result, actions to cope with energy poverty in North Korea will be delayed. Trends in politics and economy of North Korea facing extremely scarce energy supply and associated plague in domestic economy will emerge as a factor of instability in the Korean Peninsula or also in the entire Northeast Asia. However, cooperation on the North Korean issue among Japan, Korea and China, including U.S. and Russia, will not progress well, while the issue will become a significant factor of instability within the entire region.

g. Increasing risk of energy sector investment in Northeast Asia

While demand for energy (and the scale of the market) will increase, investment by Japanese

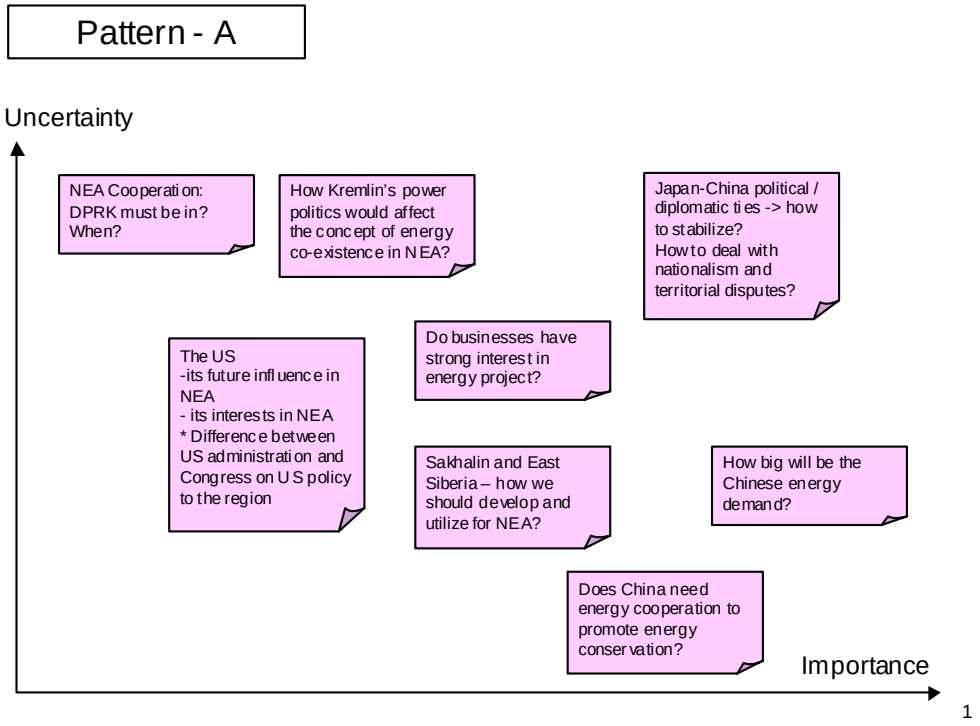
businesses in China in energy sector will not expand under unstable political relations and lack of progress in creating mutual trust. Because energy security policy will be pursued more and more independently by individual nations, cooperation for energy sector investment (for example, joint development) in China or a third party country like Russia would not be promoted. Overall, private sector continues to deem energy sector investment in other countries of the region as highly risky and least attractive.

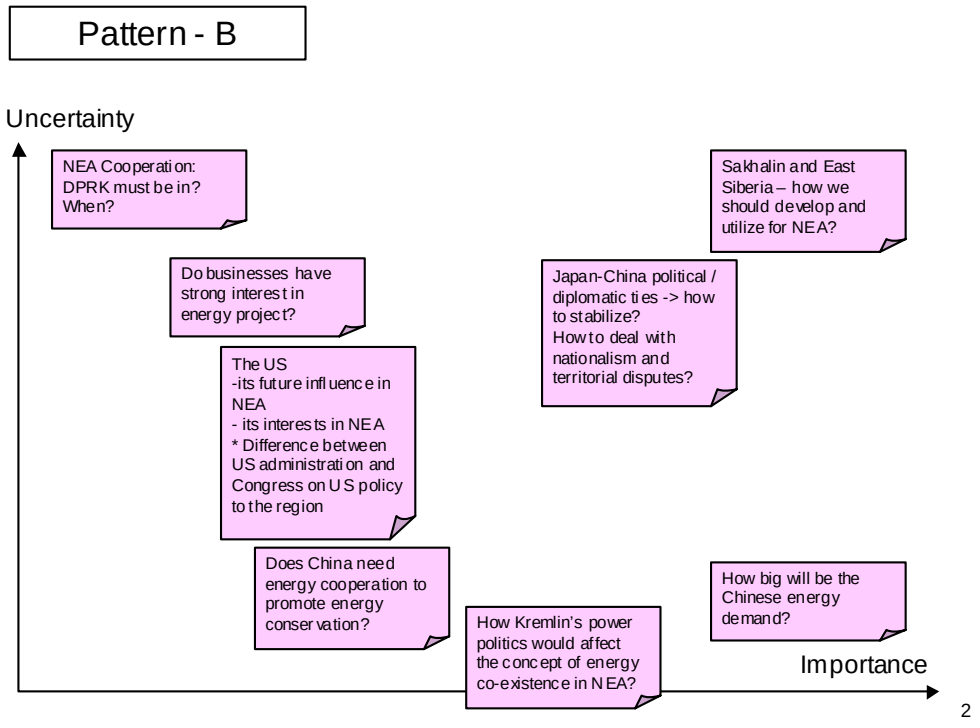
h. Unstable energy market in Northeast Asia

Increasing import dependency due to substantial increase of energy demand in Northeast Asia and intensifying competition to secure energy supply will become affirmative factors to raise energy prices or reduce stability in the international energy market. Additionally, ever expanding energy demand under slow progress of cooperation for energy conservation technologies and the delay of regional cooperation to solve environmental issues will become factors to impede improvement of the environmental issues in this region. Thus, the Northeast Asian region will be troubled by the issues of 3E, i.e., Energy Security, Environment Protection and Economic Growth, and sustainable growth of the region will be hampered.

Under the circumstance, cooperation in energy sector would not progress. Rather, energy sector itself will become a factor to create tension and conflict. In the context, economic integration in the Northeast Asian region remains stagnant and supporting functions to strengthen political/diplomatic relations will diminish. As a whole, it will become difficult to find a path to improved relations in politics, economy and energy sector in the Northeast Asian region and this region will be characterized by continuing instability, tension and conflict. In addition, reflecting the region's importance in international politics, world economy and international energy market, the instability of the Northeast Asian region itself will become a factor to create instability in the international society.

Mapping Diagrams to Identify the "scenario driver"





Note: Mapping diagram

In the process of scenario planning, two different future scenarios are developed. Before developing such two scenarios, the factor that becomes the diversion point of the two different futures has to be identified. Mapping is the procedure to determine this most important factor (called as “scenario driver” in the scenario planning method).

In the mapping diagram, the vertical axis shows the degree of uncertainty while the horizontal axis shows the degree of importance. Subject to their degrees of uncertainties and importance, several candidate factors are placed in the diagram and are clarified their relative positions. The factor that lies in the upper right is picked up as the scenario driver because it has a higher uncertainty as well as a higher importance than the others. The mapping diagrams in the previous page are the result of the mapping procedures taken in the Scenario Working Group meeting in Seoul.

1-4 Conclusion: Meanings of scenario planning

As discussed above, on the coexistence of energy-consuming countries in North East Asia, two totally different world/future images can be described with a branching point of "if or not Japan-China political and diplomatic relations can be stabilized." Yet, as mentioned at the beginning, this scenario does not provide a future forecast that predicts actual developments over energy coexistence might follow the exact path described in either of these two scenarios. Though repetitious, it must be noted that scenario planning just enables us to describe completely-different-structured shapes of the future/world in logic by unrolling a set of selected important uncertainties on which future shapes depend. That is, scenario planning, which allows us to draw out different implications from the so-described different future/world stories (scenarios), is a tool of strategic decision-making for considering/developing response measures and/or policies in preparation for the world/future envisaged in respective scenarios.

On energy coexistence in North East Asia, the realities are mixed. There are both contributors to coexistence (incl. deepening reciprocal relations at economic dimension, a moderately brewed common recognition of energy issues, possibility of reciprocity) and constraints on the moves to facilitate coexistence (incl. intensifying political relations stemming from political/social background, conflicting interests over energy issues). On this account, a strong likelihood is that future developments of the real world should prove more intricate than described in a single scenario, or in-and-out between the two scenarios.

Namely, despite the presence of tense political relations, which can intensify upon the breakout of various political events, the existence of reciprocal ties at economic dimension, among others, is respected and any critical ruptures and extremely sharpened conflicts can be avoided. As a result, it appears fairly possible to expect the formation of a world where the status quo continues.

However, the objective of scenario analysis, as explained before, is not a mere future forecasting but to develop response measures and/or strategies in preparation for any future shapes that are plausible in logic. What is more, scenario analysis is designed to consider strategies that can help realize a desirable future shape, if any envisaged from normative standpoints. In this context, to analyze the two scenarios described so far can provide those who are concerned in this region, notably policymakers and energy experts, with an opportunity of very significant exercise on considering how to stabilize the North East Asian and world energy markets.

Chapter 2 Implications and Analyses of the Scenarios

2-1 Implications of the Two Scenarios

In the preceding section, given a branching point of "what would be stability of Japan-China political and diplomatic relations," two scenarios (Political Stability and Coexistence Scenario and Instability and Conflicts Scenario) were developed, of which major descriptions were outlined. The stories of the future shapes laid out in respective scenarios already contain statements of the scenarios' impacts on various dimensions as well as those of their implications, which can fairly be readable. Yet, focusing on the implications of respective scenarios, they are organized/analyzed below by item, such as the implications for the world economy, the global energy market, oil-producing countries and the North East Asian energy market.

2-1-1 Implications of the World Economy

<Political Stability and Coexistence Scenario>

The political/economic relations in the North East Asian region, the prime mover of the world economic growth, head toward stability and eliminate uncertain/unstable factors of the world economic development ahead, thus forming a positive factor of substantial magnitude. Also, coordinated approaches taken in and outside the region constitute an important factor that bolsters stabilization efforts even in the event of sundry problems and issues at the dimensions of the world economy and international politics. However, without parallel progress made in technological cooperation in energy conservation fields, among others, as discussed later, a stronger economy can accelerate energy demand growth. Meanwhile, coordination at economic and political dimensions should highlight the issue of adjustment among individual countries of their originality and sovereignty when developing their policies.

< Instability and Conflicts Scenario>

Because the North East Asian countries all are likely to sustain their economic growth at a certain pace, this scenario also assumes the world economy itself would keep growing. Yet, the seeds of instability indwelling in North East Asia, the important region for the world economy, pose a downward risk factor for the world economy. If the risk of instability of North East Asia not only becomes real but also aggravates, stability of the world economy and international politics can be threatened. In that case, or in case such a situation is worried, regional instability should escalate into a problem of the international community overall that

can require mediation/intervention by external powers, typically the United States.

2-1-2 Implications for Stability of the Global Energy Market

Recent high price in international crude oil market has become a significant concern in a global sphere. International crude oil prices hit the historical record, and a number of public and private organizations are forced to raise their forecasts of crude oil prices. In this context, stabilization of international crude oil market, or enhancement of energy security, is now a common target for global communities including those in Northeast Asia. Several factors are pointed out as causes of the recent oil price rises. Among such factors as insufficient spare capacities of global oil production, increasing geopolitical risks in Middle East, and inflows of speculative money, factors originating in Northeast Asia, such as oil demand surge in the region, are also considered as major causes to provoke the recent high oil prices. The Chinese oil demand will surely experience a steady increase, and, such demand increase will tighten the conditions of international oil market in the mid- to long-term. Excessive competitions for hydrocarbon resources under such tight conditions may amplify instabilities of market. In this context, significant tasks to achieve stable international oil markets will include, from a short-term perspective, cooperation to develop oil stock-piling systems in preparation for a unexpected supply cut, and, from a long-term perspective, further energy conservation and diversification of energy supply sources. How Northeast Asia can co-exist regarding these short-term and long-term issues indeed will have a significant influence on the stability of international oil market.

< Political Stability and Coexistence Scenario>

In demand side, thanks to enhanced cooperation in energy-saving technologies amid the constant economic growth, growing energy demand is curbed, of which pressures on energy supply side can be eased in the long run. Also, with a newly brewed recognition of common benefits region-wide, an overly fierce strife for energy resources can be calmed and coordination in stockpiling to strengthen emergency preparedness can advance as well. As a result, the global energy market is likely to head toward stability. A problem is that energy conservation effects are hardly visible in the short run or in an instant. In supply side, taking of collective approaches and refraining of excessive competitions for energy supply sources will strengthen the region's bargaining power towards oil producing countries. Cooperative actions to expand energy supply capacities in the long-term are also expected to contribute to stabilities of international energy markets. In the short/medium terms, there are few choices but to expect

the energy market to increase its stability primarily through trust-brewing mechanisms and the like.

< Instability and Conflicts Scenario>

In North East Asia, amid the continuing economic growth, particularly in China, energy demand keeps growing as an underlying trend. Although individual governments endeavor for energy conservation, little progress is likely in driving full-scale technological cooperation forward, which means energy conservation has a rather limited effect in dampening an energy demand growth. Instead, the governments are likely to respect supply security more, which means fiercer strife for supplies on the global energy market. In this way, a negative factor works on the stability of the global energy market. Also, due to scant advance made in cooperation in building up emergency preparedness through such vehicles as stockpiling, market confusions and instability can be amplified in the event of any mishaps that can cause market instability. In other words, in the midst of mounting fears for unstable world energy market, individual governments are prone to take a unilateral stance, or take response measures of their own. This move, in some cases, can worsen market instability.

2-1-3 Implications for Middle East Producing Countries

< Political Stability and Coexistence Scenario>

Advance in the Russian oil/gas development, discussed later, demonstrates a certain effect in curbing a rise in the Middle East dependence of the region. Likewise, partly because consuming/importing countries on their part fortify a cooperative stance among them, a certain positive effect can be expected in solving the Asian Premium issue. However, under this scenario, it remains unchanged that the mainstream of oil imports originates from the Middle East. While respecting mutual dependence with the Mideast producing countries, how to strengthen the relations between North East Asia and the Mideast producing countries constitutes an issue of vital importance. Excessive efforts for organizing a counter force to Mideast producers, if made by the North East Asian countries on the buyer side, can provoke a rebuff among Mideast producing countries on the seller side and lead to tense relations with them.

< Instability and Conflicts Scenario>

Amid considerably growing oil demand, relatively little progress is made in the Russian resources development and its supplies to North East Asia, which results in sharply rising oil imports from the Middle East. Given their rising Mideast reliance, the North East Asian

governments make unilateral efforts for securing supplies, thus failing to unite their efforts to strengthen their bargaining power as consumers against Mideast producers. As a consequence, the Asian Premium is solved little. In the meantime, given the sharp growth of its demand/imports, China endeavors to establish a more amicable relation with the Mideast in hopes to ensure supply security. This move, if successfully unfolded and elevating China's influence on major Mideast producers, notably Saudi Arabia and Iran, can arouse the U.S. concerns and alert.

2-1-4 Implications for Russia

< Political Stability and Coexistence Scenario>

The tripartite of Japan, China and Korea responds to Russia with a coordinated approach, thus avoiding splits among them and fortifying their bargaining power as buyers. Likewise, a coordinated approach taken for Russian development in such frontiers as East Siberia, which involves so huge investments and high risks that should carefully be considered, among others, is expected to have a positive effect in promoting development efforts there. However, in regard to specific development projects, a solid fact is Japan, China and Korea have various conflicting interests among them, which means to hammer out a coordinated approach is not easy at all at specific levels. Also, a coordinated approach among the three of Japan, China and Korea, if overly underpinned from the standpoint of forming a counter force to Russia, can provoke a rebuff and frictions on the Russian side.

< Instability and Conflicts Scenario>

With each of Japan, China and Korea approaching Russia unilaterally, their bargaining power as buyers/consumers could never be cemented. Rather, fiercer competitions among consumers allow Russia, or the supplier, to reap maximum gains. Compared with the coordinated-approach case, economy of scale hardly works on and how to deal with huge investment risks, among others, is left unsolved, which all in all can undermine the Russian oil/gas development, meaning that large-scale utilization of Russian oil/gas itself can hardly be in progress. This should pose a constraint on supply diversification, which contributes to further increasing Mideast dependence and shifts to domestic coal use, the latter due to delays in Russian oil/gas availability.

2-1-5 Implications for Stability of the North East Asian Economy

< Political Stability and Coexistence Scenario>

Under this scenario, which assumes deepening reciprocal ties at economic dimension help stabilize the political relations, a favorable cycle is formed with a stable energy market included, and stepped-up development of the regional economy is facilitated. In addition, regional economic development further prompts deepening of economic ties. By the way, in this process, China, whose economy grows fastest in this region, further increases its importance in the North East Asian economy.

< Instability and Conflicts Scenario>

Growing instability of political relations hinders further deepening of the reciprocal economic relationship, which, along with increasing instability on energy market, poses a risk factor for the North East Asian economy. The economic growth itself is sustained with China as the centerpiece. But, fears for instability that stems from a mounting magnitude of China's presence can form a vicious cycle of stagnated economic ties and resultant deterioration in the function to bolster political/diplomatic relations.

2-1-6 Implications for Stability of the North East Asian Energy Market

< Political Stability and Coexistence Scenario>

Coordinated commitments are made at various dimensions, which include cooperation in curbing China's growing energy demand, a united approach to producing countries (the Middle East and Russia), cooperation in emergency preparedness and responses to environmental problems. Under such circumstances, a force works on strongly toward stability of the North East Asian energy market as an underlining trend. Stability of the energy market, along with closer-ever economic ties and stabilized political/diplomatic relations, provides an important basis for stability and co-prosperity of this region.

< Instability and Conflicts Scenario>

Rising import dependence due to ballooning energy demand, the energy-security-first policy pursued not on demand side but mainly on supply side and resultant fiercer strife for energy supplies constitute a factor that causes tightening supply and demand as well as price hikes on the global energy market. Worse, with scant progress made in strengthening emergency preparedness, the North East Asian market as a whole is exposed to growing risks of instability.

2-1-7 Implications for North Korean (Energy Poverty) Issues

< Political Stability and Coexistence Scenario>

A unified approach respected at regional level is counted as a positive factor that can have massive effects on stabilization of North Korea as well as the Korean Peninsula, deterrence of nuclear development paired with alternative energy supply, and stabilization of North East Asia regionwide. On energy cooperation offered to North Korea, the major premise is North Korea's complete commitments to abandon its nuclear weapon development. Only after such commitments made, aids to North Korea in such fields as infrastructure construction, which includes nuclear power plants not leading to nuclear weapon development and natural gas pipelines, and fuel supplies can play a vital role. In the meantime, in regard to this particular regional cooperation, what's at stake is the destination of North Korea itself, to which the key is the outcome of the six-party talks.

< Instability and Conflicts Scenario>

To North Korean issues few coordinated commitments are made at regionwide level, which causes delays in responding to short energy supplies in North Korea. In the event of political/economic destabilization in North Korea, North East Asia regionwide is exposed to additional uncertainties, which can pose a serious factor to disturb the whole region as well as the U.S., Russia and other countries concerned.

2-1-8 Implications for Energy Business in North East Asia

< Political Stability and Coexistence Scenario>

Closer economic ties and stable political relations constitute a big positive factor for energy business, particularly those involving huge investments. Given an expanding market size and widening energy business opportunities of various types, the energy industries in this region are provided with a big chance. Among promising business fields are expanding energy trades particularly on the Chinese market, investments in oil/gas upstream sectors, and those in the downstream sector with secondary-capacity upgrading as the centerpiece. What is more, big potential business chances are found in relation to energy-saving/energy-efficient utilization technologies and environmental measures. Focusing on environment-related fields, CDM projects enshrine so big potentials that can assure an increasing number of Win-Win-based business developments.

< Instability and Conflicts Scenario>

Without stable political relations established, large-scale and long-term investments in the North East Asian energy sector are undermined by rising risks to a formidable level. Although the market size itself expands in reflection to growing demand, a sense of forbidden risks and fears for destabilization of political/economic relations discourage overseas energy investments in North East Asia (as well as Russia and elsewhere). Particularly, businesses related to energy conservation and environmental measures, which are in a great need otherwise, get stagnated too, thus leaving thin chances for mitigation of energy/environmental problems.

2-1-9 Implications for Environmental Problems

< Political Stability and Coexistence Scenario>

Cooperation offered to China in such fields as energy-saving technologies, energy-efficient utilization technologies, promotion of clean coal technologies and so on, as mentioned before, helps slash mounting environmental burdens resulting from growing energy consumption. Also, advance in large-scale energy infrastructure construction, like pipelines from Russia, if made by virtue of enhanced regionwide cooperation, results in greater natural gas consumption, which can alleviate environmental burdens. In this way, successful efforts are made to mitigate global environmental problems, typically air pollution in China. Among others, curbed energy consumption growth and efficient coal use alike reduce incremental CO_2 emissions, thus helping solve global warming problems. In addition, cooperation in such fields as environmental technologies, if implemented in the form of CDM projects, is expected to enable Japan to achieve part of the specified GHG reduction target by taking advantage of the Kyoto Mechanism. Meanwhile, in this scenario, the vital role fulfilled by Japan's commitments to regional cooperation through her technological capability is particularly highlighted.

< Instability and Conflicts Scenario>

Particularly due to sluggish activities to help increasingly energy-intensive China become more conservation-conscious, no control works on growing energy demand, which leads to heavier environmental burdens. Besides, little progress in wide-area pipeline projects under regional cooperation, combined with shifts to domestic coal use activated by unilateral responses to energy market destabilization, among others, causes the energy mix itself to head for the direction that results in heavier environmental burdens. Given scant advance in cooperation in energy-saving and environmental technologies, as well as flagging CDM projects, individual governments are required to make unilateral efforts for combating environmental problems.

As a result, compared with the case the Kyoto Mechanism is in use, much greater environmental cost is required, which negatively works on competitiveness of the North East Asian economy/industry. This works strong particularly on the countries obliged to attain GHG reductions (Japan alone as of now).

2-2 Consideration of Promising Areas / Measures for Desirable Cooperation by Consuming Countries

In the preceding sections, two different scenarios for coexistence of the North East Asian consuming countries were developed with a branching point of "what would be Japan-China political/diplomatic stability," of which major descriptions and implications were organized as well.

Of course, as a matter of fact, each scenario has its own challenges and difficulties. Yet, generally speaking, it is quite obvious that the Political Stability and Coexistence Scenario offers a desirable future shape for Japan, China and Korea, which constitute North East Asia. It is because the scenario assumes stability of Japan-China relationship at political/diplomatic dimensions leads to deepening reciprocal ties at economic dimension, regionwide stability and stable energy markets, among others, in the form of a favorable cycle. Conversely speaking, while the Instability and Conflicts Scenario assumes instability of Japan-China political relationship poses a constraint on the evolution of reciprocal economic ties and causes a vicious cycle that can lead to destabilization of the energy market, we always have to take a possibility of this scenario into account. Then, while considering what's to be done in the event of such a vicious cycle, if any, we are required first to figure out what measures permit us to avoid the bleak scenario becoming real.

Given actual political environment, few are allowed to have such a simple optimistic view that the Political Stability and Coexistence Scenario evolves faithfully to its story in the real world. However, it is also certain that drivers of the favorable cycle for not only North East Asia but also the international community overall are budding and observed in various areas. Therefore, based on the results of a workshop held in Korea for drafting the scenarios as well as those of a subsequent workshop[2] organized in Beijing for comments and opinion exchanges on the drafted scenarios, promising areas and measures for desirable cooperation by the consuming countries are considered below.

[2] As mentioned before, the workshop in Korea was held November 7, 2005, while the workshop organized for comments and opinion exchanges on the drafted scenarios was hosted by the China Institute of International Studies (Beijing) on January 24, 2006.

2-2-1 Brewing and Deepening of Common Recognition Is the Key to Cooperation

The most essential factor that determines the future course of cooperation among the North East Asian energy-consuming countries is tripartite efforts among Japan, China and Korea to brew, confirm and deepen their common recognition of the importance of cooperation anew at all levels, from governments, industries, experts to general citizens. Such efforts just provide the foundation for propelling regional cooperation and mark a starting point. Of course, as a matter of fact, the importance of such a common recognition has been discussed and pointed out in various ways on many occasions. Yet, given today's political/economic environment, what happens in the real world still highlights the need for reconfirming the importance of brewing and deepening the common recognition.

In regard to this point, many experts who cooperated in scenario making made clear-cut indications to emphasize the importance of the common recognition mentioned above both during the scenario drafting process and through opinion exchanges after the scenarios were drafted. Above all, many called for the needs to encourage far-reaching efforts for brewing the common recognition and, particularly, underline the importance of the common recognition to be brewed among the classes responsible for core policy making and implementation, opinion leaders, as well as the public at large[3].

Meanwhile, in relation to this point, though to confirm the common recognition toward cooperation is essential, it is also important to understand different interests and positions inherent to different parties by taking the realities into account. Countries differ in various domains, such as political regime, state of economic development, energy supply/demand and resources availability, and structure/system of energy industries, based on which different countries have different interests. It must be noted, without these differences in interests given careful consideration, taking a straight thinking or approach in "all-or-nothing" style should never bring about constructive cooperation[4]. This point is likely to become a focal point particularly in the process of discussing/implementing specific measures/projects after a general agreement is made on energy cooperation.

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[3] On this arguing point, the following point is also important; That is, despite smooth China-Japan exchanges under way at business and/or academic levels, recognition gaps between the top (politics) and the bottom (the masses) impede improvement of overall relations between the two countries. On this account, it is essential to endeavor to reflect opinions held by many people of rational thinking on policy-making.

[4] This is a point also indicated by the experts participating in this research work.

2-2-2 Identification of the Areas Where Common Benefits (Win-Win Relations) Can be Realized

If brewing and deepening the common recognition toward cooperation is the first phase, the next step to be taken by the countries concerned is to drive their cooperation forward based on the recognition. By doing so, they have to seek promising areas/domains where they all can reciprocally enjoy and maximize their interests/benefits, then make necessary agreements for that end. Namely, what's important is to identify the areas where all countries (or parties) concerned can reap gains and thus establish Win-Win relations through energy cooperation.

By the way, in an effort to realize such common benefits, it is imperative to fully understand specifics of individual countries, such as what are their top priorities on energy issues and what are their "strengths" in energy areas. In other words, to build up reciprocal relations by matching needs and comparative advantages among them is essential.

In regard to this point, many experts argued its importance as outlined below.

- On energy cooperation in North East Asia, what's to be done first is to organize what are common benefits to the three countries. Despite repeated discussions about energy cooperation in North East Asia so far, scant progress has been made in unfolding actual cooperative activities. This is attributable to lack of careful organization of what benefits are common to the three countries.
- Energy cooperation in North East Asia must be directed toward a system that permits Win-Win relations built on comparative advantages of respective countries.
- There had been few common interests over energy to the three of Japan, China and Korea in the past. But, now that China became an importer of energy resources like Japan and Korea, the Chinese came to have common interests to the Japanese and Koreans.
- Clearly, to advance cooperation provides all of the three countries with fully justifiable merits. From now on, it is important to identify in what points the three countries can cooperate with each other, to begin with.

If so, what are promising areas/domains where mutual cooperation can realize Win-Win relations? On this issue, first in regard to its direction, it appears we could gain a self-evident answer if back to the basics and reviewing the international and energy situations where the North East Asian countries stand.

First, all of the North East Asian countries hold important positions in the international community, equally receive benefits from the world politics/economy, and not only maintain close ties with the global energy market but also act as important players there. These mean they could enjoy common benefits through tripartite energy cooperation if stability of the global energy market is attained.

Second, given stability of the global energy market as a goal, the three of Japan, China and Korea share a common point from the perspectives of major energy consumers/importers. In this context, they can expect to reap common benefits if their cooperation, under way in the capacity of consumers/importers, enables them to bolster their bargaining power against the countries/parties on supply side.

Third, on the responses to environmental problems, which these years have attracted growing concerns worldwide, not limited to this region, considerable benefits could be enjoyed if tripartite cooperation in this region could mitigate environmental problems. Thus, in their response to so-called "externality" involved in market stability (security of supply), environmental problems and so on, the three countries are hopefully required to deal with the matter effectively through a coordinated approach.

Meanwhile, in an attempt to realize the Win-Win relation, there is an additional point of vital importance. That is, whatever measures are involved in the effort to realize the Win-Win relation, it is industries and/or firms that act as the primary entities in carrying out such measures. Governments construct a framework and implement specific policies within the framework, while actual players are industries/firms. What is more, many of such measures must be implemented in the form of "investment" by an industry and/or a firm. On these accounts, in order to realize the Win-Win relation, it becomes important to build up environment and secure policy consistency so that necessary investments can be made without disturbed by policy changes and the like.

Based on the discussions so far, more specific considerations are made below about promising areas/measures for desirable cooperation.

2-2-3 Specific Areas / Measures of Cooperation

The preceding section shows, if all of the three North East Asian countries hope to get Win-Win relations, their cooperation needs to direct toward three goals, that is, stability of the global energy market, establishment of a stronger position as consuming countries, and mitigation of

environmental problems. Hence, first organized below are promising areas of cooperation that can help facilitate market stability.

a. Cooperation in the Promotion of Energy Conservation

In regard to possible impacts on stability of the global energy market, the most worrisome concern in North East Asia is what will be the magnitude/pace of growing energy demand in China. Given the strong economic growth projected ahead, China's rapid energy demand growth seems inevitable and, depending on its magnitude/pace, this China factor is worried to pose one of the causes to tighten supply and demand on the global energy market. On top of it, in case massive expansion of energy demand urges China to boost its imports, instability of the global market can be caused as a result of excessively fiercer race for supply security.

In this context, cooperation in energy conservation to curb growing energy demand and prompt efficient energy use is expected to play a key role in preventing supply/demand squeeze on the global market and thus stabilizing the market. Moreover, benefits of energy conservation is not limited to market stability through demand control. As discussed later, energy conservation demonstrates a wide range of benefits from slashing environmental burdens to increasing competitiveness of industry thanks to lesser energy input, among others.

While China is projected to mark considerable energy demand increases ahead, the actual state of its energy use today unveils that China's energy-consuming structure can never be counted as efficient. Particularly compared in macro indicator terms (such as energy intensity), China's energy efficiency ranks as low as around one ninth of Japan's. Conversely speaking, China is considered to have ample room for improving efficiency of its energy use. Meanwhile, from the aspect of needs, it is noteworthy that China puts energy conservation among top priorities of its energy policy, or respecting it most. For example, under the 11th five-year plan covering the years to 2010, China intends to increase its energy efficiency by 20%, thus hammering out the promotion of energy conservation as a center pillar of energy policy.

On the other hand, in Japan and Korea, development/introduction of advanced energy-saving technologies have been under way in individual energy sectors with industrial consumers as the centerpiece. Particularly Japan, of which energy efficiency in macro terms reaches the world top level, is positioned as an advanced country in energy conservation.

Accordingly, conservation-related technology cooperation offered to China by Japan and Korea no

doubt is very significant, judging from such angles as matching of needs and comparative advantages and the magnitude of expected benefits. From now on, in the process of further economic development in China, there will be plenty chances for equipment replacement in all of the industrial, commercial/residential and transport sectors. If conservation-related cooperation bears fruits on such occasions, a strong likelihood is that introduction of energy-efficient equipment could be advanced.

b. Cooperation in Alternative Energy Development

On the global energy market today, it is the issues related to the oil market that attract particular attention from the aspect of market stability. While crude oil price spikes and unstable Middle East situations, among others, are highlighted from the aspect of market instability, alternative energy development is now attached a greater importance by many countries in and outside the region. Above all, it is noteworthy that coal-rich China heads toward the direction to underline the promotion of indigenous coal development/utilization. The importance of coal is also confirmed by the direction stated in the 11th five-year plan, whereby to use coal more efficiently and in a friendly manner to environment is called for. To that end, vital roles can be fulfilled through cooperation in the provision of efficient and clean coal burning technologies as well as cooperation related to advanced technologies, notably Clean Coal Technologies.

As for the development of any alternative energy sources other than coal, the possibility of nuclear power generation-related cooperation is noteworthy. In an effort to expand electricity supply, China has a very active nuclear power introduction plan under way. On the other hand, Japan and Korea are ahead of China in nuclear power generation, and capable of offering nuclear cooperation to China through the best utilization of nuclear power generation technologies, safety management, appliances/equipment related to nuclear power generation, etc. Also, on the promotion of development/utilization of natural gas, which produces least environmental burdens among fossil fuels, cooperation is possible in relation to upstream gas and infrastructure development, as discussed later. Among others, given that China is expected to expand its city gas projects from now on, cooperation of Japan and Korea in related experience, know-how and technologies can be valuable. Cooperation in improving flexibility of LNG procurement through swap arrangements, already agreed and in practice between Japan and Korea, can be extended to China as well.

c. Joint Commitments to Boosting Supply Capacity

In addition to demand control and promotion of alternative energy (diversification of energy sources),

to boost supply capacity itself fulfills a vital role in making the global energy market stable. In this context, though case-by-case, it can be significant if joint commitments are made to oil/gas upstream development when there exists a shared common interest between the related parties. Particularly in such cases as development involves high-risk investments or any resources significant for North East Asia regionwide are to be developed, this type of cooperation can be highly evaluated. Moreover, implementation of joint commitments in a specific project, even in a small scale project, is likely to have such additional effects as building up the ground for further development of cooperative relations.

In this context, judging from the relations among the countries today, it appears hard to evolve cooperation in large-scale plans/projects in the very near future. Yet, from a longer perspective, resources development in Russia (incl. East Siberia and Sakhalin) and joint development in the currently disputed waters/territories between Japan and China (as well as Korea), among others, can be counted as possible areas for highly significant cooperation.

From the aspect of boosting energy supply capacity, cooperation in the oil-refining sector (supply capacity of petroleum products) is also possible. Now that not only oil demand is growing but also growing share of lighter oil product demand (declining share of heavy fuel oil) and upgrading of quality specifications (cleaner qualities demanded) are simultaneously in progress, cooperation in the oil downstream sector can fulfill an important role. In this regard, first, effective utilization of surplus oil product supply capacities (excess refining capacities) held by Japan and Korea is important in terms of optimal use of oil product supply capacity within the region. This also appears practical because such activities are already under way as a business. In the longer run, regional technological cooperation in such areas as upgrading of secondary capacity and quality upgrading can play an essential role.

d. Cooperation in Emergency Preparedness, Particularly Oil Stockpiling

In an effort to keep the energy market stable, to strengthen the system of cooperation in the event of emergencies, typically a supply disruption, is a matter of crucial importance. Given the status quo of the global oil market where mounting geopolitical risks are concerned, cooperation among Japan, China and Korea in this area can have an important significance.

Under its 10th five-year plan, China hammered out a plan to build up a national stockpiling system, of which construction is just under way now. Along with boosting oil demand/imports ahead, China will be required to expand/strengthen its stockpiling system. Then, it will be very significant

for market stability if Japan and Korea, advanced in stockpiling system as IEA members, help China build up a sufficient stockpiling system through the best utilization of their technologies, know-how, knowledge and experience. Also, in regard to the subsequent agenda, or the use (drawdown) of stockpiles, it appears necessary to deepen discussions to grope for a coherent approach and consider what actions can jointly be taken as a measure good for market stability. Among others, amid sharply rising oil imports from the Middle East, there are commonly growing concerns over the security of oil transport route (sea lane) from the Middle East to North East Asia. Particularly, to secure safe traffics in the Strait of Malacca, the choke point of traffic, is a common challenge to oil-importing countries in North East Asia. To tackle this challenge first requires to open talks to grope for possible areas for cooperation.

By the way, a vital requirement for emergency preparedness is rational and accurate judgments and actions in the event of emergency. Both unnecessary overreactions and panic-driven behaviors must strictly be inhibited because they should just accelerate market instability, intensify confusions and produce adverse effects equally on all market players. To this end, on top of construction and effective use of stockpiling system, which certainly fulfills a critical role, it is very important that accurate and timely information are available in the event of emergency, based on which objective judgments are commonly made among the concerned. In this context, to bolster the system of cooperation in improving information sharing within the region (as well as across the world) appears imperative.

e. Cooperation in Helping Energy Poverty in North Korea

The future of the North Korean issue poses a grave factor of disturbance not limited to energy issues but when considering stability of North East Asia regionwide. In this context, as one of the measures to prevent instability of North Korea, implementation of some measures to solve the serious energy shortage (energy poverty problem) in North Korea needs to be paid attention as part of regional cooperation. Of course, energy-related aids to North Korea as regionwide cooperation depend on the major premise that North Korea drops its nuclear development completely and, in this light, involve adjustment of the relation to the six-party talks on North Korean issues. Only after these are cleared, North East Asian regional cooperation can be considered in such areas as nuclear power generation not leading to nuclear development, natural gas supplies from Russia (East Siberia, Sakhalin, etc.) and fuel oil supplies, particularly residual oil.

Discussed so far are the areas where tripartite regional cooperation by Japan, China and Korea is expected to increase stability of the global energy market. Now organized below are promising

areas for cooperation where the three countries can strengthen their positions as major consuming/net-importing countries.

f. Cooperation in Russian Relations

Energy development projects that the three of Japan, China and Korea are currently under consideration or involved include crude oil pipelines from East Siberia, natural gas pipelines from East Siberia and oil/gas development in Sakhalin, which all involve staggering investments. The particulars so far show none of Japan, China and Korea has favored a coherent approach to these projects. Rather, taking the East Siberian crude oil pipeline construction as an example, there were not a few scenes of competition between Japan and China.

Yet, in principle, these oil/gas resources in Russia can be counted as important "assets" common to North East Asia overall, which can help curb the region's rising Middle East reliance and prompt diversification of energy supply sources. Today Russia takes an increasingly stringent stance toward foreign capital introduction in general while tightening the state control of energy sectors. Also, the Russian areas subject to development are frontiers that can involve huge capital outlays and high investment risks. Given these situations, among others, to compete with each other appears irrational for the North East Asian countries, or the buyers, because such behaviors just worsen their conditions of investment, development and procurement. Rather, Japan, China and Korea have to try to strengthen their bargaining power against Russians by taking a coordinated approach or at least showing a stance toward coherence. Also, a coordinated approach, if taken, promises market-size expansion, whereby participants of any development project can enjoy benefits of improved economy of scale.

g. Cooperation in Middle East Relations

The Middle East is the most important source of oil supply for the three of Japan, China and Korea. In order to share the position as buyers/importers, how to secure stable oil imports from the Middle East at reasonable prices is a major concern common to the three countries. On this account, the three countries are required to avoid as much as possible any behaviors that can intensify their contest for supplies. Rather, at least as a stance of crucial importance, they are recommended to take a coordinated approach among them. For example, just showing a stance that they will take a coherent approach in carrying out oil/gas development in Russia as a means to curb their Middle East dependence can have significant implications for the Middle East producing countries.

Also, among other concerns common to them as buyers is the so-called Asian Premium problem. This is a problem that Asia-bound Middle East crude oils are priced higher than US/Europe-bound ones, which, in turn, causes such problems as excess income transfer and higher energy costs to Asian buyers. For these reasons, this problem is recognized as a common concern to be tackled. Since the 1990s, there has been a premium (extra charge) of around $1.1~1.2/bbl on average. As a leading oil-importing region in the world, North East Asia needs to face this problem with a coordinated stance. It also appears a viable idea to grope for a coherent response with other major Asian importers suffering the same problem (notably India).

Next, in regard to much-needed responses to environmental problems (both global warming and regional pollution) over which there have been mounting concerns across North East Asia as in the rest of the world these years, possible areas/measures of cooperation are organized below.

h. Cooperation in Energy Conservation to Mitigate Environmental Burdens

The importance of energy conservation as an area of cooperation good for market stability is already discussed. Indeed, cooperation in energy conservation proves to be a means of extreme importance for the three of Japan, China and Korea in their combating environmental problems. Particularly an importance should be attached to Japanese and Korean cooperation to China where growing energy demand directly results in mounting environmental burdens. Due to its rapidly growing energy demand attributable to the strong economic growth, combined with an indigenous-coal-dominated energy mix, China is exposed to aggravating pollution problems, particularly air pollution, and the government puts pollution abatement among top priorities under its 11th five-year plan. Although currently China is not obliged to take global warming abatement measures (to reduce greenhouse gas emissions) under the Kyoto protocol, to trim GHG emissions from China's ballooning energy consumption appears imperative in the longer terms. Given the presence of China's needs for the promotion of energy conservation, both Japan and Korea have acquired advanced energy-saving technologies, which, through cooperation in Chinese conservation efforts, can contribute to alleviating environmental problems not only in China but also across the region. Improvement of environment can produce benefits common to Japan, Korea and China. As for global environmental problems, conservation-related cooperation, if carried out through the Kyoto Mechanisms, typically CDM, as discussed later, could bring about such benefits as GHG reductions in Japan. Thus, a strong likelihood is that conservation-related cooperation as a means to combat environmental problems can prove to be the most important area of tripartite cooperation from the aspect of matching needs and strengths held by Japan, China and Korea.

i. Cooperation in "Clean" Energy Supply, Typically through Clean Coal Technologies

As already mentioned, it is important to unfold cooperation oriented toward reducing environmental burdens by dampening the strong energy demand growth. On the other hand, on supply side, to facilitate the development/utilization of "Clean" energy sources can be an important area of regional cooperation. In specific terms, in response to expanding coal use in China, to help China introduce clean burning technologies designed to cut SOx, NOx and particulate emissions, among others, as well as very advanced technologies capable of upgrading coal use (Clean Coal Technologies) can be viable cooperation.

As for air pollution problems, to improve petroleum product qualities is also important as a measure to reduce emissions from mobile sources (road vehicles). In this context, the Japanese oil industry has completed necessary responses for meeting one of the most stringent specifications in the world (such as introduction of "sulfur-free" gasoline), and, by virtue of such advanced technologies, Japan can offer effective cooperation in creating better environment. Among others, in the areas of new/renewable energies, reportedly producing less environmental burdens, and of nuclear power generation, which is virtually free from CO_2 emissions, cooperation among Japan, China and Korea is possible in technological terms.

j. Cooperation in Implementation of CDM Projects and the Like

As discussed above, cooperation in energy conservation and clean energy introduction can be cited as promising areas for tripartite cooperation among Japan, China and Korea for environmental reasons. While cooperation in these areas can be implemented in various forms, one of specific measures is to carry out projects by taking advantage of clean development mechanism (CDM). CDM is a mechanism authorized under the Kyoto protocol, which was devised by focusing on varying marginal costs of GHG reductions among countries. Thus, CDM is an economical instrument that enables some countries to attain GHG reductions with a lower total cost than making reduction efforts at home alone. The entities responsible for carrying out CDM projects are the firms and others of the countries grouped as ANNEX-I parties under the protocol (only Japan so-classified among the three). Non-ANNEX-I parties (developing countries, as well as Korea and China among the three) are positioned as host countries for such investments. For host countries the effects are twofold, that is, introduction of advanced technologies and actually reduced environmental burdens in their homeland. In case of investing countries, they are allowed to count GHG reductions attained through CDM projects as credit of GHG reductions (as the Certified Emission Reduction: CER), thus enabling them to lower total cost of GHG reductions compared

with specific response measures in practice only at home. With these benefits gained by the both sides, CDM is expected to be a measure leading to the Win-Win relations.

At present, with necessary institutional arrangement gradually under way for the promotion of CDM projects, there are a growing number of CDM projects authorized by the CDM Board of Directors. Problems to be solved still remain, which include adjustment of project details between investing and host countries and efficiency of CDM operation. Yet, effective utilization of CDM as well as expansion of its use is entertained great expectations as a measure of cooperation effective in solving environmental problems in North East Asia ahead.

So far discussed were a wide variety of promising areas/measures for tripartite cooperation among Japan, China and Korea. All of them seem to promise effective benefits common to the three countries through energy cooperation, and enshrine sufficient potentials toward implementation. On the other hand, however, due to a host of problems to be solved before implementation, cooperation in these promising areas is not necessarily in progress in a visible way. To stimulate cooperation in these areas requires various ideas and efforts. In this context, one thing that is noteworthy is that cooperation projects tend to be so large-scaled that can make their progress hard partly due to formidable risks resulting from staggering investment and uncertainties of political/economic environment. Therefore, it appears worthy to consider an approach of starting first with projects more easily carried out than big ones, or smaller-scale projects, then accumulating achievements of such projects, which can be bridged over bigger-scale cooperation.

So far, discussed were the three of (A) brewing of common recognition toward energy cooperation, (B) identification of the areas leading to Win-Win relations, and (C) consideration/implementation of more specific areas/measures of cooperation. All of these are imperative for Japan, China and Korea to implement their tripartite energy cooperation. Then, it is the function of institutional frameworks to bolster energy cooperation in this region that plays the role of crucial importance in meeting these requirements. The institutional frameworks are considered below.

2-3 Consideration of Frameworks for the Promotion of Cooperation: Towards the foundation of Northeast Asia Energy Forum (provisional)

In propelling energy cooperation among the North East Asian consuming countries, the presence of institutional frameworks as well as their functions are above all imperative. It is because institutional frameworks are embedded with the functions to produce debates/dialogues, as well as

subsequent efforts for making adjustments/agreements and the like, in order to meet the three vital requirements. That is, brewing of common recognition toward energy cooperation, identification of the areas that lead to Win-Win relations, and more specific examinations of areas/measures of cooperation, including their detailed contents, supporting measures, and environment-building. In the following section, first provided is a brief review on the status quo of institutional frameworks available for energy cooperation in the North East Asian region, thereby remaining challenges/issues are extracted. Then, given so-extracted challenges/issues, considered is what responses/measures have to be taken within the institutional frameworks.

To begin with, the frameworks available for energy cooperation within the region can roughly be divided into bilateral and multilateral ones. First, bilateral frameworks for cooperation include the Japan-China Energy Consultation[5] and the Japan-Korea Energy Consultation[6]. These bilateral consultations, where discussions have been continuing about the concerns held by respective parties, have produced some successful outcome in terms of enhanced information sharing. Second, as for multilateral frameworks in which the three of Japan, China and Korea are involved, such forums as ASEAN+3, APEC (EWG), IEF and the Asian Oil/Gas Consumers-Producers Round Table Conference can be cited. Each of these is designed to provide a wider multilateral framework in which the three of Japan, China and Korea are included in the capacity of its members.

Here a matter of grave concerns surfacing is that, at present, no institutional frameworks specifically designed for tripartite cooperation among Japan, China, and Korea exist at least at government level[7]. Of course, it is possible to unroll discussions about tripartite cooperation among Japan, China and Korea through bilateral consultations and within wider multilateral frameworks. Even if so, the absence of institutional framework for the promotion of cooperation, where the most important three countries in Asia can discuss any issues common to them, is considered as a matter of great concerns. To address this issue, it is desirable to found a multilateral policy dialogue arena, such as “Northeast Asia Energy Forum (provisional)”, where the three countries can discuss specific policy issues.

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5 The 17th Japan-China higher-working-level consultations held July 1995 (in Beijing) reached an accord that Japan-China Energy Consultations be held as a forum of opinion exchanges on energy between the two countries. Since then, seven consultations were held between the two countries.

6 In 1985 the Korean Ministry of Power and Resources and the Japanese Agency of Natural Resources and Energy agreed the establishment of energy consultations, of which 13th meeting was held in January 2006.

7 Meanwhile, tripartite consultations at oil-industry and experts levels have been made at international conferences and through forum activities, such as the North East Asia Petroleum Forum.

In the midst of an increasing importance of energy issues and complicated-ever situations over energy cooperation, debates/dialogues taken place at higher levels, such as Northeast Asia Energy Forum (provisional), are more desirable in principle, which means regular dialogues at government level are desirable, needless to say. In short, the framework of dialogue at the level of so-called "Track 1" is extremely important.

Unfortunately, judging from today's political relations among Japan, China and Korea, it remains uncertain if "Track 1" could immediately be installed at government level by the three countries. It also remains dubious whether Track 1, even if installed, could fairly demonstrate expected functions and unroll pragmatic dialogues/debates. Such being the situations, many experts having participated in this work strongly advocated the importance of the formation of "Track 2" as a forum for in-depth dialogue that supports Track 1. Namely, this is a concept that Track 2, a forum at experts/working levels, is to be installed as an institutional framework officially supported by relevant governments, where in-depth discussions are made of which outcomes can be input into government levels. What is more, direct participation of policymakers in Track 2 can be significant as well. On these arguing points, experts having participated in this works maintained as follows.

- Study meetings of energy experts should be held on a regular basis. And, it is more desirable if such meetings are attended by those who are responsible for policymaking on energy issues within respective governments. Policymakers should continuously be given opportunities where they are able to learn appropriate angles of analysis, while kept well informed.
- Under government backup, the three of Japan, China and Korea ought to consider the formation of Track 2-level study groups.

It is certainly more desirable if "Track 1" could function fully well. But, for the time being, as such developments can hardly be expected in reality, it appears most pragmatic and significant for Japan, China and Korea to continue and enrich the dialogue at government-backed "Track 2." The significant role fulfilled by enriched dialogue within this sort of institutional framework in propelling energy cooperation has been proved by European experience. That is, energy cooperation in Europe has never been treading a flat course. While facing difficulties caused by conflicting interests in various ways, every time, the presence of firm political wills toward cooperation as well as the existence of well-established institutional frameworks have bolstered cooperation[8].

[8] The experts having participated in this work also pointed out the importance of the European experience.

Thus, in order to drive tripartite energy cooperation among Japan, China and Korea forward, to install the framework of “Track-2” dialogue at expert/working levels is considered as a matter of extreme importance as a practical approach and roadmap. Of course, it is significant to discuss common issues to the three countries through bilateral consultations and/or such multilateral frameworks as ASEAN+3 and APEC. Yet, bilateral consultations are originally designed to unroll focused discussions upon specific issues to the two relevant countries, while wider multilateral frameworks are expected to handle important issues for all countries concerned. In this context, it is considered very important for Japan, China and Korea, the three major countries in Asia, to have a common platform, particularly a specifically designed platform, to handle their issues. To this end, on top of effective use of the existing institutional frameworks, of which functions should be streamlined, installation of new framework is strongly called for.

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