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International Energy Regime: Role of Knowledge and Energy and Climate Change Issues

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Afrasian Centre for Peace and Development Studies
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Kenichi Matsui*

Introduction - What's the Problem

Although energy and climate change issues are very broad and complex issues involving big uncertainty, there has been a dominant or majority's view at any given time on these issues on which energy policies and planning of energy industries have been formulated. In the 1950's and 60's, oil has been seen as an abundant and cheap energy resource and after the first oil crisis in 1973, scarcity has been stressed even if the reserve-production ratio has remained fairly stable after the crisis. Also in the 1950's and 60's, nuclear power plants were introduced with rosy prospect but after the Three Mile Island and Chernobyl nuclear power plants accidents in 1979 and in 1986 respectively, risk and high cost of nuclear power plants have been stressed.

From the end of World War II to around the end of the 1970's, global cooling theory was dominant among climate scientists but since then global warming theory became dominant which emphasized the effects of increasing anthropogenic greenhouse gas especially CO2 emission despite claims of scientists having different view.

Energy policies have been formulated based on these dominant views and changed following their changes. By whom and how have these dominant views been formed and how have they permeated to the world? And why have decision makers formulated energy policies on these views?

1. What are International Regime and Epistemic Community

This paper tried to answer these questions applying the theory of "International Regime", which was introduced and developed primarily in the U.S. from around 1970's reflecting the growing interdependence of states and growing involvement of non-state players in the international politics. Stephan Krasner defines the "International Regime" as "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international

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relations"[1]. One school of this theory stresses the role of knowledge and the existence of "Epistemic Community", which as defined by Peter Haas is "a network of professionals with recognized expertise and competence in a particular and an authoritative claim to policy-relevant knowledge within that domain or issue-area"[2]. Applying this theory, this paper tried to show why international regime was formed in energy and climate change issues. This paper tried also to show the importance of knowledge in the process of regime formation and its impact on the regime-receiving countries.

2. Why International Regime in Energy and Climate Change Issues

To start with, why have international regimes been established in the area of energy and climate change?

First, because they are global issues. Energy, specifically, oil is a commodity traded around the world. Nuclear power plant involves sensitive technologies and its operation has impacts on the whole world. Climate change affects not only human being but all creatures on earth.

Secondly, it deals with a commodity indispensable to life and industrial activities and unevenly distributed natural resource. For this sort of commodity, a framework supplementing market mechanism is required to bring stable supply.

Thirdly, these issues are strongly linked with politics. Oil was a big factor in World War I and II and has been woven into the politics in the Middle East. Nuclear power plant is also a political commodity linked with nuclear proliferation. Climate change is now a highly political agenda linked with economic interest.

Fourthly, uncertainty is common in these issues. Proven oil reserve, prospects of technology development for new and renewable energy and for oil substituting fuel, mechanism of climate change, effects of various measures for reduction of green house gases and others, they all involve big uncertainty.

Fifthly, since there exists a dilemma on these issues, it is expected that better outcomes

[1] Krasner, Stephen D. "Structural Causes Regime Consequences: Regime as Intervening Variables," *International Organization*, Vol.36, No.2 (Spring 1982), p.186

[2] Haas, Peter M. "Introduction: Epistemic Communities and International Policy Coordination" in Haas, Peter M. (ed.), *Knowledge, Power, and International Policy Coordination* (Columbia: University of South

for each and for all can be brought through collaboration and coordination.

The above-mentioned factors, particularly the fourth and fifth, also explain why epistemic communities were formed in these areas. For collaboration or coordination is expected to bring better results than the case where players compete each other and decision makings are left for independent players. And where there exist uncertainties in these issues, to create a cooperative framework based on the knowledge or intellectual belief was strongly demanded. This is the cradle for a dawn of epistemic communities through active intellectuals who share common intellectual belief.

3. Epistemic Community and Uncertainty

P. Haas argued this point more in depth[3]. He argues that epistemic community is not just a group of experts but a group of experts who share following beliefs, notion of validity and a common policy enterprise.

1. a shared set of normative and principled beliefs, which provide a value-based rational for the social action of community members.
2. shared causal beliefs, which are derived from their analysis of practice leading or contributing to a central set of problems in their domain and which then serve as the basis for elucidating the multiple linkages between possible policy actions and desired outcomes.
3. shared notion of validity – that is, intersubjective, internally defined criteria for weighing and validating knowledge in the domain of their expertise.
4. common policy enterprise – that is a set of common practices associated with a set of problems to which their professional competence is directed, presumably out of the conviction that human welfare will be enhanced as a consequence.

He argues also that uncertainty is one of the major logical dynamic for the epistemic community to get support and cooperation of politicians[4]. Politicians demand information, explanation and/or judgment for an uncertain thing. Climate change is a typical example. They have no knowledge about mechanism of the global warming.

Carolina Press, 1922), p.3

[3] Haas, Peter M. "Introduction: Epistemic Communities and International Policy Coordination" in Haas, Peter M. (ed.), *Knowledge, Power, and International Policy Coordination* (Columbia: University of South Carolina Press, 1922), p.3

[4] Haas, Peter M. "Introduction: Epistemic Communities and International Policy Coordination" in Haas, Peter M. (ed.), *Knowledge, Power, and International Policy Coordination* (Columbia: University of South Carolina Press, 1922), p.3

However, they have to decide political measures. Information and explanation by the top scientists help a lot for them to act. In a case where views of scientists differ, the support of majority of top authoritative scientists matters. I think, if there is no different view among scientists, the issue will not be difficult for politicians to handle even if it demands high costs, large amount of man-power and long time to solve.

A regime could be established on the issues which involve problems on which scientists differ in theory and problems to which scientists are not asked to answer or problems for which they can not answer since it deals with value judgment.

4. "International Oil Market Control Regime", "Non Proliferation-International Nuclear Power Plants Regime" and "Climate Change Regime"

There have been established three international regimes since around 1920's to today in the domain of energy and climate change i.e. "International Oil Market Control Regime", "Non Proliferation-International Nuclear Power Plants Regime" and "Climate Change Regime" .

In 1928, the International Oil Market Control Regime was established as "International Petroleum Cartel" by the big three oil companies; Standard Oil Company of New Jersey, Royal Dutch Shell Oil Co., and Anglo Persian Oil Co. Here, non-governmental players, namely oil companies, made up a set of rules to control their own behavior. Causal factor for the formation of the regime was the economic interest to avoid prisoner's dilemma. It was a hard regime with a clear set of principles, norms, rules and decision-making procedures. It was formed through intellectual leadership based on the entrepreneurship of the oil companies' top executives. It functioned well and the world oil market under the regime brought proper supply of oil coping with the growing demand with little price fluctuations.

After the oil shock in 1973, the "OPEC Cartel" succeeded the "International Petroleum Cartel" as "International Oil Market Control Regime". Players of the regime changed from oil companies to governments of oil producing countries. This change brought significant impacts to the regime. Due to the sovereignty of the states, it couldn't hold the rigidity in the rule and decision-making procedures as shown for example by the lack of punishing clause for the case violating rules. So it couldn't be a hard regime unlike the "International Petroleum Cartel". But the principles to get economic interests by avoiding prisoner's dilemma and to supply oil coping with the demand with the price

as reasonable and stable as possible didn't change and the essence of the norms of the preceding regime was maintained. Following the views of S. Krasner,[5] they lead to the conclusion that international oil market regime transformed but has not changed as an international regime through the change from "International Petroleum Cartel" to "OPEC Cartel". Due to the above-mentioned weakness of the OPEC cartel, this transformed regime didn't work well like the "International Petroleum Cartel".

The "Non Proliferation-International Nuclear Power Plants Regime" deals with the area of non-proliferation of nuclear weapons and electricity generation by nuclear power plants. Here, players are states. Causal factor is the non-proliferation of nuclear weapons. This regime is a hard regime with a set of strict principles, norms, rules and decision-making procedures. It was formed through intellectual negotiation based on the theories developed by the arms control epistemic community. This regime has functioned but has problems like the existence of non-member countries being doubted as having nuclear weapons and existence of member countries being doubted for violating the rules and still the existence of doubt about the enthusiasm of nuclear weapon having countries for its total abolition.

The "Climate Change Regime" deals with the climate change in the world and its accompanying social and economic problems. Causal factor is the avoidance or containing global warming. This regime looks like a hard regime having a set of strict principles, norms, rules and decision-making procedures but it requires more time to be able to judge whether it is really hard or not. Forming this regime was led at the beginning by negotiation through intellectual leadership of the climate change epistemic community but was led afterwards mostly by states paralleling with the growing importance of economic factor. To judge if this regime will work or not, we need again more time. But due to the defects of this regime such as; legal problems of the Kyoto Protocol as international environmental law; existence of many and big free riders; and heavy burden for some member countries, transformation of the regime seems to me unavoidable.

Worldwide movement for liberalization of electricity market from around the 1980's has originated in the U.K. and U.S. in their effort to overcome the economic depression in the 1970's and has been diffused to the world first mainly by Anglo-Saxon politicians and economists favoring market mechanism and then by economists in other countries also believing in this theory. In this case, it was not necessary to set up an epistemic

[5] Krasner, Stephan D. ed. *International Regimes*, Cornell University Press, 1983, p.4

community to promote this movement because majority of the economists in the world shares the validity of this theory even if there have been some very active economists and/or institutes in this area. Formation of this movement would be best applied as the movement under the empire of ideology. There are principles but hardly norms, rules and decision-making procedures. So this can be called movement but not regime.

5. **Suppliers of First Knowledge**

Considering the important role of knowledge and epistemic communities in the process of formation of international regime and dominant view on energy and climate change issues, where and by whose original idea, thought or intellectual belief is borne as well as the process through which the original idea disseminated to the world have crucial meaning in the world politics.

Here I call this original knowledge or intellectual belief as ‘first knowledge’ or ‘first intellectual belief’ and the information on this first knowledge or intellectual belief as ‘first information’. There are two groups in the founder and sender of the first knowledge in the energy-climate change issues. The first group is the energy related people and the second is the non-energy related people. To the first group belong the people who are directly involved in the energy business, research and/or energy decision making and administration. To the second group belong the people who are not directly involved or related to the energy questions like economists, political scientists and environmentalists.

Until around the middle of the 1970’s, most of the first knowledge originated from the first group, namely energy business people, energy policy makers in governments, staffs in the energy related international organizations as well as the staffs in the energy divisions of the general international organizations. Among them, U.S. and British-Dutch international oil companies and energy administrators and politicians in the U.S. played a dominant role.

Top executives of the so-called big three oil companies played like an epistemic community and established “International Petroleum Cartel”. Major oil companies had led the “Liquid Fuel Energy Revolution” (switch from coal to oil) by providing information that formed a public opinion, supporting this revolution. The speech of President Eisenhower at the U.N. General Assembly in 1953, calling for peaceful use of nuclear energy initiated the formation of the public opinion in promoting the

construction of nuclear power plants.

From middle of the 1970's, first knowledge which originated from non-energy people has been growing and playing a greater role for the formation of the world energy view except the case in which the political scientists specifically the Harvard-MIT arms control theory group played a critical role even in the 1950's and 1960's in forming the nuclear non-proliferation regime. Information originated from this group has been delivered again mostly from the U.S. The oil crisis in 1973 gave economists strong impetus to make the study on energy issues, particularly on relations between oil demand, supply and price.

They introduced economic theory and concepts, like price elasticity of oil demand to the analysis of energy demand and supply. Their view that price mechanism does work even for oil, has been accepted by the people through the big fall of oil demand due to high oil price in about 10 years after the crisis.

From the 1970's, the voice of environmentalists has been intensified and affected the energy sector. "Limits of Growth", published by the Club of Rome, had a big impact on the energy sector and life-style. Thoughts such as Anti-Economic Growth, Anti-Nuclear Power Plant, Zero Energy Growth and Soft Energy Strategy flourished. In the 1980's, global warming and liberalization of the energy markets came on a political agenda through the energetic action of climate change epistemic community represented by the IPCC and economists, particularly U.S. and British economists, delivered theoretical background for the liberalization of the energy market. As seen in this development, most of the first knowledge originated in the U.S. and Europe. This shows that first knowledge can not be generated everywhere in the world but in the country or area where active and free academic research are made possible with the accumulated economic resources and where one has to think about the issues globally day by day. This implies that first knowledge be borne mostly in the hegemonic countries.

The next step is the dissemination of the first knowledge originated from the academicians and researchers in these countries to the world. This has been done by scientists and researchers themselves, who created the first knowledge or intellectual belief but this has been done more broadly by other less creative scientists, researchers journalists, politicians and administrators by providing people concise summary of the first knowledge and sometimes with simile for easy understanding.

6. Role and Limits of Quantitative Models

In this process, results of the computer simulation have been increasingly quoted for persuasion. It is hard for people to doubt the results of the computer simulation. But we should be cautious to them keeping in mind the following merits and demerits of the computer simulation.

First, it is obvious that quantitative model is playing a very important role in decision-making. There is no doubt about the fact that numbers matter in decision-making.

Secondly, the bigger and more complex model with larger number of variables and equations does not necessarily produce the better information for thinking about the future. Simplification by making priority for important factors may bring better information.

Thirdly, most long-term forecasts published by the establishments have the character of short-term forecast, i.e. extrapolation of the recent past trend reflecting institutional bias. This type of long-term forecast also tends to be the base for dominant views. This point will be explained in more detailed way later.

Fourthly, quantitative model itself is not necessarily value free as taken for granted. Recognized or not by model builders themselves, they construct models and/or choose models fit for getting their value judgment on the concerned issues, i.e. on their qualitative models. Results of the simulations fit for their value are emphasized as most likely with such naming as the policy strengthened case. Figures for this case run through in the world without control propagated by media. People do not care about assumptions or conditions.

Coming back to the third point above, namely the institutional bias, characteristics of short term forecast and provision of base for dominant energy views of the long term forecasts made by the establishments, i.e. big energy companies, governments and authoritative institutes including international organizations, these phenomena can be explained as follows:

1. Forecasts or views of the establishments tend to be extrapolations of the

recent past because they are produced by energy policy makers and/or administrators, executives and/or planners of big energy industries who make much of short term future relative to long term future and produce forecast based on the supply fundamentals at the time of making forecast and at longest 3 to 10 years in the future. And generally their views are made based on the first knowledge which originated in the U.S. or European sources and disseminated to the world. For them, long term forecast substantially different from the extrapolation of the recent past also would mean self-negation. It is less risky and more clever for them to follow the recent past trend. This is conservative but it is understandable considering their responsibility as decision-makers for reducing to minimum the damage caused through possible change in future. This is the origin of the institutional bias.

2. Since these forecasts take the recent past trend into greater account than the structural change in future and tend to exclude drastic change, people take it easily as a prudent and realistic view or policy.

3. People take it easily also from the fact that authoritative establishments produced them. For the very complex and difficult issues, what matters is not the content but who are telling them. That's to say what matters is whether authoritative people or institutions are involved or not. And from this aspect, forecasts or views of the establishments are generally taken by people easily.

4. Once these forecasts are published, they become stronger because they turn out to be the majorities forecasts. Even if it turns out wrong, people who take the forecast will not be blamed because majority takes it and makes the mistake. The real world moves following what the majority thinks regardless whether it is correct or not. Since the social phenomenon is irreversible, what happened has happened. And since people precede and discuss or think about the possible gain or loss under the forecasts of the establishments than to discuss if it is correct or not. As a result, majorities forecasts become the more spread.

5. Majorities forecast become the more supported also by following the psychology of the modelers that they feel relieved and recognized when they get the results close to the figures of the forecasts published by the more established organizations.

Through this mechanism, there emerge dominant views at any given time in the energy and climate change issues despite the fact that they are essentially very complex and uncertain issues.

7. Receivers of First Knowledge and Regimes

So far the formation of international regimes, the birth of epistemic community in this area and the existence and origin of the dominant view in the energy and climate change issues in the world has been discussed. And this discussion relates mostly to the aspect of suppliers of first knowledge and creators of regimes.

Here I will discuss a little about the aspects of receivers of first knowledge and regimes taking Japan as an example. The Japanese energy policy changed substantially almost every 10 years after World War II as it coped with the change in the overseas situation or pressure from overseas assimilating the outside factors into the Japanese situation.

Key incidents bringing the change started with the governing by the occupation army in 1945, and followed by the conclusion of U.S.- Japan Peace Treaty in San Francisco in 1951, trade liberalization in 1961, first oil shock in 1973, Plaza Agreement and crash of oil price in 1986, Asian financial crisis and the conclusion of Kyoto Protocol in 1997.

Until the 1970's, there were essentially no big conflicts for Japan's adaptation for changes in the overseas. If there were some conflicts, they remained in the energy sector and necessary changes were made relatively smoothly by the government and industrial sector through mutual consent[6].

Characteristics of energy policy formation in Japan during these periods are summed up as follows:

> First, the principal direction has been given in a way to adapt for the overseas situation. This is understandable, considering Japan's very poor natural resources endowment, dependency on foreign trade in economy and on the U.S. in defense.
>
> Secondly, being given the principal direction, concrete and detailed measures

[6] Samuels, Richard D. *The Business of the Japanese State - Energy Market in Cooperative and Historical Perspective*, Cornell University Press, 1987

were made up through the process of mutual consent between government and industrial sectors.

Thirdly, in case of pressures from overseas, their requests were not accepted as they were. Negotiations were made taking time to make them more acceptable as possible.

From the 1980's, however, this situation has been shaken up through pressures from overseas particularly from the U.S. for liberalization of market which in later stage involved the electricity market, and made hard the process of mutual consent. Also the global warming issue, again knowledge from overseas for Japan, has been flooding in and it has given a big impact on the energy sector. It gave also impetus for the people's involvement in the energy decision-making through the formation of public opinion.

Japanese electricity industry was in good shape in the 1980's, under the regional monopoly unlike that of U.S. electricity industry. Electricity tariff was not high either even in terms of U.S. dollars in purchasing power parity. Weakness in intellectual resilience, however, due to the side effects of the success of policy making through mutual consent between government and industry made much ado for the fuss of liberalization of electricity market. Weakness in intellectual resilience also created the feverish mood for climate change issue fanned by mass-media, which made possible Japan's acclamation for conclusion of a defective Kyoto Protocol.

This intellectual weakness in Japan after World War II had its origin principally in Japan's economic and political situation, - namely dependency on foreign trade under the foreign trade regime established mostly by the U.S. and dependency also on the U.S. in defense as mentioned above. To accommodate oneself to the outside situation, to the ground design flowing from overseas does not demand global way of thinking. And the fact that adaptation for the overseas situation and handling of the pressure has been successful even if sometimes with luck, hindered people to see things globally. It seems now, however, necessary in the big wave of globalization even for Japan to nurture intellectual resiliency and contribute to picture global design through reflecting Japanese and Asian *Weltanschauung*.

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