

Comparative Study on the conflict in RE facility siting in Korea and Germany

- Property Right, Transaction Cost and Institutional Learning -

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<Abstract>

As problems on energy supply get worse, renewable energy technologies are highlighted as alternatives. However conflicts in renewable energy facility siting hinder the promotion of the technologies. Suggesting measures preventing conflicts, however the degree of public acceptance of RE promotion varies considerably in Germany and Korea. It can be assumed that the two countries hold differing institutions and consequently institutional learning which affects changes of behaviors' incentive structure and their preference works differently. To verify it, this study conducts a comparative analysis based on a theoretical framework of Rational Choice Institutionalism. Throughout Institutional Analysis and Development Framework it particularly analyzes how property right and transaction cost, main components of institutions, are recognized in the both countries and how institutional learning and its outcomes are going on.

Key words: Renewable Energy, Public Acceptance, Siting Conflicts, Rational Choice Institutionalism, IAD Framework, Property Right, Transaction Cost, Institutional Learning, Korea, Germany

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I. Introduction

World faces energy crisis today: conventional energy sources such as oil, coal and natural gas have finite deposits and also result in global warming; and nuclear energy has risk of serious accidents like Chernobyl and Fukushima, and problem of permanent radioactive waste disposal. Thus most of international organizations as well as states recognize that renewable energy (hereinafter RE) source - solar energy, wind energy, biomass *etc.* - is a key contributor to the solution of climate change and energy crisis.¹⁾

However it does not mean that RE technologies don't have any kinds of negative impact. The RE sources are environmentally friendly energy sources; however, we are confronted with critical situations. The more RE facilities are built, the more environmental and social conflicts occur. These conflicts may block the continuous RE deployment. Despite of the goal to spur the use of the RE sources, especially it is hard to find a site for the RE facility.

This study aims to find reasons why the conflicts in RE facility siting occur. For more detailed this research examines: (1) which conflicts occur in RE facility siting; (2) how property right is guaranteed and how much it affects transaction cost; and (3) which institutional learning and its outcomes happen in both countries. To reach the research purpose it compares the Korea's case with the German one: both countries having similar condition - political priority of energy security stemming from poor energy resource and heavy dependency on the 'high energy intensity' manufacturing industry - but totally different course of the renewable energy promotion.

¹⁾ see BMWi(Federal Ministry of Economics and Technology Germany) and BMU(Federal Ministry for the Environment, Nature Conservation and Nuclear Safety Germany), 2010, *Energy Concept for an Environmentally Sound, Reliable and Affordable Energy Supply*; Sathaye, J. *et al.*, 2007, "Sustainable Development and Mitigation," in B. Metz *et al.*, eds., *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge & New York: Cambridge University Press: 17; Greenpeace and EREC, 2008, *energy [r]evolution-A Sustainable Global Energy Outlook*: 10.

In the following chapter which conflicts in facility siting are occurring will be summarized. The third chapter theoretical and methodological framework will be introduced, and then the case studies and their findings will be dealt. With the limitation of this research the fifth chapter concludes the study.

II. Conflicts in RE facility siting

Problems around RE facilities can be summarized with (1) environmental problems and (2) social conflicts.

Environmental problems from RE facilities reveal in the *ExternE* study²⁾ conducted by the EU level. The study which analyzed the external cost of energy facilities also measured the impact of RE to the environment. Land use problems from PV power plants, noise impacts, visual intrusion, impacts on animals, epileptic fits and electromagnetic interference from wind turbines and traffic noise, potential nutrients loss, cultivation and human health effects of ash from biomass plants are representative examples.³⁾ Tucker *et al.*(2008) said that the RE facilities have significant impacts on environment, particularly as a result of land take, disturbance and the accidental killing of some species.⁴⁾ One research project focusing on the environmental impacts of on-shore wind farms concludes that poorly sited wind farms and turbines can damage habitats and fauna. They also cause habitat loss, habitat degradation, disturbance during construction and operation, and fatalities caused by collisions of vulnerable bird and bat species with turbines.⁵⁾

²⁾ *ExternE* is the well-known acronym for “External Costs of Energy” and a synonym for a series of projects starting from early 90s till 2005. See the official website http://www.externe.info/externe_d7/

³⁾ Krewitt, Wolfram *et al.*, 1997, *ExternE National Implementation Germany*; Krewitt, Wolfram and Schlomann, Barbara, 2006, *Externe Kosten der Stromerzeugung aus erneuerbaren Energien im Vergleich zur Stromerzeugung aus fossilen Energieträgern*.

⁴⁾ Tucker G. *et al.*, 2008, *Provision of Evidence of the Conservation Impacts of Energy Production*. Institute for European Environmental Policy (IEEP): 133.

Recently it is a trend for projects to get bigger based on the concept of economy of scale. The most serious environmental problem and the most well-known to the public is the palm oil plantations in the rain forest region. The UN pointed out that the expansion of cultivation in East Asia had been associated with widespread deforestation and violation of human rights of indigenous people due to the palm oil plantations⁶⁾.

PV power plants planned with the economy of scale sometimes have cut not only trees on mountains, but also mountains themselves. In Korea it is not hard to see cut mountains for the PV power plants. One research has pointed out that PV power plants which can reduce the GHGs emission generates more CO₂ since trees had to be cut to build the PV power plants⁷⁾.

The environmental problems lead people's resistance. In parallel with the expansion of RE facilities organizations or initiatives against renewable projects appear and they raise their opinion. In Germany, for example, many anti-wind power organizations were established.⁸⁾ NABU⁹⁾, one of the biggest environmental NGOs in Germany, warns that "nobody really knows what will happen in an area where such a large solar power plant is active."¹⁰⁾

Additionally in the planning and implementing stages RE projects sometimes cause friction between local people and project developers: some RE facilities are under construction regardless of inhabitants' opinions. Local people are directly

⁵⁾ Bowyer, Catherine *et al.*, 2009, *Positive Planning for Onshore Wind: Expanding onshore Wind Energy Capacity while Conserving Nature*. The Royal Society for the Protection of Birds: 9.

⁶⁾ UNDP, 2007, *Human Development Report 2007/2008*, New York: UNDP: 143.

⁷⁾ KEI (Korea Environment Institute), 2009, *Environmental Assessment and Environment-friendly Development of Renewable Energy I: Photovoltaic and Wind Energy*: 70.

⁸⁾ see <http://windkraftgegner.de>

⁹⁾ Naturschutzbund Deutschland e.V.

¹⁰⁾ Spiegel Online, 2011, "Germany Turns On World's Biggest Solar Power Project," in *Spiegel*, 2 August 2009, Retrieved August 02, 2011, <http://www.spiegel.de/international/germany/0,1518,643961,00.html>; 10% of solar electricity in Germany is generated in freestanding plants which are criticized as they impede the natural scenery (Bruns, E. *et al.*, 2009, *Erneuerbare Energien in Deutschland - eine Biographie des Innovationsgeschehens*. Berlin: Universitätsverlag der TU Berlin.): 255: 274.

affected with environmental problems. However, they don't have chance to bring up their complaint since they are alienated in the decision making process. Furthermore, visible benefits from RE facilities go to project developers outside of the local area where environmental problems occur, rather than keeping the benefits in the local area. The local people are also displeased with these phenomena.

Project developments like RE facilities promotion cause conflicts among actors involved since they accompany both positive and negative transformations. Actors are approval authorities, project developers and local communities. When the number of conflict factors gets larger or the context of conflicts gets sharper, then the conflicts develop collective actions. They lead to suspense and distrust in the local communities, thereby making it is easier for projects to postpone or to be canceled.

Dissatisfaction and complaints which local people feel from certain projects can be generalized as concept of the public acceptance. There are many causes pertaining to the societal acceptance.¹¹⁾ If applying RE technologies are not familiar, then local people have space to doubt the projects. If local people don't get detailed information on a certain project, then they can't prove whether they agree or not. If their complaints are not accepted or not taken into account, then they may resist. Benefits from certain projects don't remain in the region, and then the affected local people think that they are sacrificed for the enterprises conducting the project. Sometimes it thereby shows as the NIMBY syndrome.¹²⁾

In spite of the widespread public support, individual RE projects continue to encounter the acceptance problem and consequently resistance by citizen groups.¹³⁾

¹¹⁾ See; Tucker *et al.*, 2008; KEI, 2009, 3; Bowyer *et al.*, 2009; Heiskanen, E. *et al.*, 2006, *Cultural Influences on Renewable Energy Acceptance and Tools for the development of communication strategies to promotE ACCEPTANCE among key actor groups*.

¹²⁾ ETK (Energy Transition Korea), 2006, *Social Acceptance Raise Scheme for Diffusion of Wind Farm*, MOCIE (Ministry of Commerce, Industry and Energy of the Republic of Korea): 75.

¹³⁾ Heiskanen, *et al.*: 23.

The success of a certain project matters to the stakeholders, like the developer, the investors, the landowners and the community.¹⁴⁾

Since the late of 1990s where the RE facilities started to be built widely many of scholars began to research on these phenomena.¹⁵⁾ As measures for preventing conflicts, studies conclude: (1) sufficient information offer; (2) guarantee of local inhabitants' participation during the process; and (3) sufficient compensation recovering cost-benefit inequality. In spite of suggesting measures, however, the degree of public acceptance on RE facilities varies from country to country. While in Germany more than 80% of people support RE promotion and RE capacity is continuously increased, in Korea it sees that the lack of public acceptance hinders the promotion of RE power plants.¹⁶⁾

III. Rational Choice Institutionalism and Analytical Framework

Seeing the conflicts around RE facility siting as *crash* of involved actors' preferences, rational choice institutionalism (hereinafter RCI) has much more explanatory power than other theories since RCI focuses on the *rational* individuals seeking their utility maximization in order to explain the origins, the effectiveness, and the stability or the change of institutions.¹⁷⁾ Due to this reason, RCI is applied as a theoretical analytical tool for this study. The comparative analysis is undertaken throughout the perception of property right and transaction cost, formation of policy preferences and institutional learning in Korea and Germany.

¹⁴⁾ Lowenstein, J. 2011, "The Impact of Technology on Wind Farm Development," in *Renewable Energy World.Com*, July 19, 2011. Retrieved August 02, 2011, <http://www.renewableenergyworld.com/rea/news/article/2011/07/the-impact-of-technology-on-wind-farm-development>

¹⁵⁾ See Krewitt *et al.*, 1997; Krewitt & Schломann, 2006; Tucker *et al.*, 2008; KEI, 2009, 3; Bowyer *et al.*, 2009.

¹⁶⁾ MOTIE (Ministry of Trade, Industry and Energy Republic of Korea), 2014, *The 2nd National Energy Plan*: 104.

¹⁷⁾ Ha, Yeon-Seob. 2003, *Institutional Analysis*, Dasan Books, Seoul: 71.

1. Conflicts, Preferences, Rational Choice Institutionalism

The RE sources are generally noticed as environmentally friendly- and decentralized energy sources; however, it is confronted with direct critical situations from local inhabitants and communities. They complain of noise, traffic, impacts on animals, visual intrusion and so on. Social conflict can be defined as struggle among actors directly involved like project developers, local inhabitants, civil societies and approval authorities.

Hocker and Wilmot defined conflict as “an expressed struggle between at least two interdependent parties who perceive incompatible goals, scarce resources, and interference from the other party in achieving their goals.”¹⁸⁾ Retzinger and Scheff categorized conflicts as the realist approach that conflict involves material interests and the rationalist approach that conflict is the outcome of conscious intentions.¹⁹⁾

In terms of conflicts in facility siting, Mazmanian and Morell pointed out that cost-benefit inequality, environmental concerns of local inhabitants, risks of new technologies and distrust of authorities/project developers lead to conflicts among stakeholder.²⁰⁾ Each actor may make these conflict causes to reach its goals, so it can be said that the conflict, at least limited to facility siting conflict, is a struggle of individual's preferences.

To grasp each actor's goal, in other words, to get individual's preferences, each actor performs rationally.²¹⁾ However combing each individual's rationalities, then collective action dilemma happens, which means that the outcome might not be rational. Rational Choice Institutionalism (RCI) begins with this point. Institution is a concept appearing as a solution for the dilemma. North said that institution is a game rule and also humanly devised constraint which is formulating interaction

¹⁸⁾ Hocker, Joyce and William Wilmot, 1985, *Interpersonal Conflict*, 2nd ed. rev., Dubuque, Iowa: Wm. C. Brown Publishers: 23.

¹⁹⁾ Retzinger, S. and Scheff, T., 2000, “Emotion, alienation, and narratives: Resolving intractable conflict,” *Mediation Quarterly*, 18: 71 - 85: 77.

²⁰⁾ Mazmanian Daniel A. and Morell, David, 1990, “The ‘NIMBY’ Syndrome: Facility Siting and the Failure of Democratic discourse,” in Norman Vic and Michael Kraft eds., *Environmental Policy in the 1990s: Toward a New Agenda*, Washington, DC: CQ Press.

²¹⁾ Mckenzie, R. B. and Tullock, G., 1978, *The New World of Economics*: p. 9.

among individuals.²²⁾ Namely, conscious design of institution is needed to prevent a collective action dilemma. RCI starts on a proposition that individuals seek its self-interest and aims to explain as general theory how institutions solve the collective dilemma.²³⁾ North classifies institutions into two categories: informal constraints such as culture, tradition and norm; and formal constraints like regulations and rules.²⁴⁾

Weingast revealed that institutions “constraint the sequence of interaction among actors, the choices available to particular actors, the structure of information and hence beliefs of the actors, and payoffs to individuals and groups.”²⁵⁾ It means that institutional approach to analyze conflicts in facility siting can be worthwhile since it can explain the change of actor’s behavior and preferences.

2. Property Right and Transaction Cost

Property right and transaction cost are main components of institution, which directly influence formation of economic incentives that actors require to play in a certain institution. The economic institutions, interacting with political institutions, impact on the efficiency of a state.²⁶⁾

Property right means not a relation between human-being and things, but a behavior relationship which is compelled by relation among human-beings brought on thing itself, its acquisition, use and transfer.²⁷⁾ Generally property right is

²²⁾ North, Douglass C., 1990, *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

²³⁾ Ha, Yeon-Seob, 2002, “Tendency of New Institutionalism: Theoretical Self-Reform and convergence (in Korean language),” *Korean Administration Study*, Vol. 36, No. 4, (Winter 2002): 339~359: 342.

²⁴⁾ North, Douglass C., 1989, “Institutions and Economic Growth: An Historical Introduction,” *World Development*, Vol. 17, No. 9, 1319-1332: 1321-1322.

²⁵⁾ Weingast, Barry R., 2002, “Rational-Choice Institutionalism,” in Ira Katznelson and Helen V. Milner eds., *Political Science: The State of the Discipline*. 660-92. New York: W.W.Norton & Co.: 661.

²⁶⁾ North, Douglass C., 1997, “Transaction Cost through Time,” in Claude Menrard eds., *Transaction Cost Economics*, Edward Elgar Publish.

²⁷⁾ Furubotn, E. G. and Pejovich, S., 1972, “Property Rights and Economic Theory: A Survey of Recent Literature,” *Journal of Economic Literature* (10): 1137-1162: 1139;

understood as guaranteeing tenants' action territory and furthermore as norms or institutions to secure tenants' right against infringement.²⁸⁾

Since property rights can be seen as rules or norms to restrict deviant behaviors, people can concrete their economic benefit expected if they live in where private property right has taken root well. In this regard, the property right provides a series of interacting models which contributes to the dissolution of conflicts.²⁹⁾ Furthermore, Alston and Müller (2005) pointed out that the set of property rights is the most important institution of a society for economic growth.³⁰⁾

Siting and installing RE facilities bring value changes of properties. One hand, local inhabitants owning the planned sites or receiving benefits from the sites will lose their current profit, but they are getting another form of property: rent or sale money. However after installing RE facilities they will face negative impact of external cost on environmental problem such as noise, scenery change or danger of accident. On the other hand, project developers invest money into securing the site and expect profit from the RE facilities.

During the value change of properties the question of how fairly the property rights of all actors are guaranteed is very important, especially from the view of social conflicts and as a result, public acceptance.

Coase indicated a transaction cost is a cost incurred in making an economic exchange.³¹⁾ Search and information costs, costs for decision making, enforcement costs and observation costs belong to transaction costs. North said the transaction costs "consist of the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreement."³²⁾ A community which has lower transaction costs can be said as

Lösch, D., 1983, "Die Theorie der Property Rights," *Wirtschaftsdienst*. XII: 623-628: 624; Mckenzie and Tullock, 1978: 9.

²⁸⁾ Opp, K. D., 1983, *Die Entstehung sozialer Normen*, Tübingen: pp. 139~149

²⁹⁾ Choi, Nak-Kwan and Kook, Young-hee, 2006, "A Theoretical Review of New Institutionalism and New Institutional Economics(NIE) (in Korean language)," *Korean Local Self-governing Study*, Vol. 20, No. 02.

³⁰⁾ Alston, L. J. and Müller, B., 2005, "Property Rights and the State," in C. Menard C. and M. M. Shirley eds., *Handbook of New Institutional Economics*, 573-590.

³¹⁾ Coase, Ronald, 1960, "The Problem of Social Cost", *Journal of Law and Economics*, 1960.

more economically efficient. Thus the transaction cost is a useful criterion to measure a certain community's efficiency. In this regard, institution is a mechanism to reduce transaction costs.³³⁾

Regulations on the siting of RE facilities provide actors with various conflict factors like profit, value and process. The transaction costs vary depending on the legitimacy of the regulations and the execution processes.

3. Institutional Learning

Institutional learning is defined as a process to understand the institution's nature, to acquire knowledge, information and skills of a certain institution and to adapt to the institution.³⁴⁾ Knowledge, belief system and their relation of institutional learning are core concepts of institutional learning.³⁵⁾

It can be said the concept of knowledge is a fruit of accumulation.³⁶⁾ Belief system is a system to recognize, explain and interpret external environment. Its examples are behavior regulation and norm which are provided from formal/informal institutions. Based on the belief system actors decide what they will do. Thus, actors decide their behavior incentive throughout the process of institutional learning.³⁷⁾

Institutional learning is closely related to policy. Policy as formal institution directly affects actors' property rights and the transaction costs. If a profit which is a result of a certain policy is lower than the existing one, then actors disobey

³²⁾ North, 1990: 27.

³³⁾ Lee, Min-Chan, 2002, "Political Implication of Rational Choice Institutionalism: Case of Green Belt and Young-Wol Dam (in Korean language)," *Korean Society and Administration Study*, Vol. 13, No. 2(May, 2002): 81~102: 86.

³⁴⁾ Lee, 2002: 87.

³⁵⁾ North, 1990: pp. 74~78; Stein, Johan, 1997, "How Institutions Learn : A Socio-Cognitive Perspective," *Journal of Economic Issues*, 1997; Gregersen, Birgitte and Björn Johnson, 1997, "Learning Economics, Innovation Systems and European Integration," *Regional Studies*, Vol. 31, 1997.

³⁶⁾ Gregersen and Björn, 1997: 480.

³⁷⁾ Yoo, Dong-Woon, 1999, *New Institutionalism Economics* (in Korean language), Seoul: Seonhaksa

the policy implementation or they pursue opportunistic behavior.³⁸⁾

March and Olsen said that individual's value and preferences are endogenously formed within the institutional context.³⁹⁾ In other words, preferences and interests which individuals have are the artifact of institutions, and institutional rules and processes differently form and change the value and the preferences.⁴⁰⁾ It means that conflict in RE facility siting is a collage expression of clash of individual's value and preferences and it is also a product of institutions, furthermore it can be understood that values and preferences which stakeholders seek are formed with institutional rules and processes. Therefore by analyzing institutions which affect to form actors' value and preferences, it can be found what causes lead to conflicts and how conflicts are prevented.

4. Institutional Analysis and Development Framework

IAD (Institutional Analysis and Development) framework was developed by many of RCI theorists, like Elinor Ostrom who were conducting many researches on common pool resource problems. This tool needs five components to understand social phenomena: attributes of physical world; attributes of community; rules-in-use; action arena; and actors. The core of analysis is the action arena where individual's decision making and choice are undertaken. The action arena, therefore, is a place where social phenomena occur, and it is affected by prior three components such as attributes of physical world, attributes of community and rules-in-use.⁴¹⁾

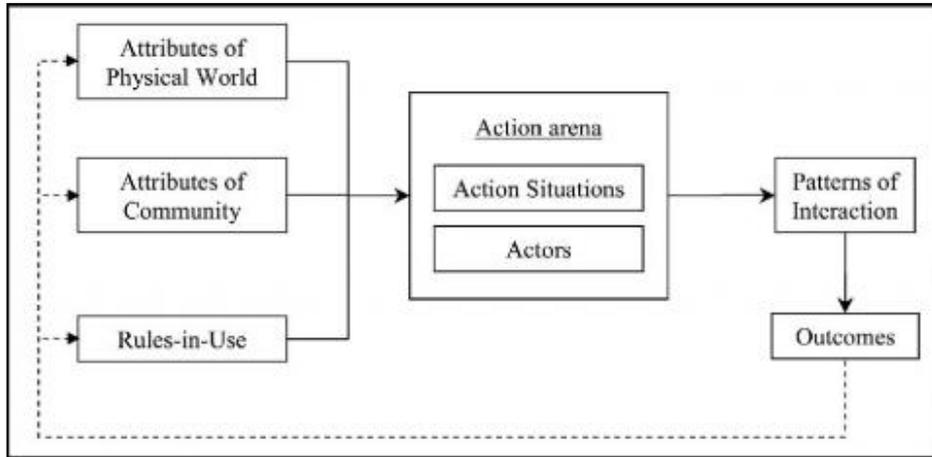
³⁸⁾ Lee, 2002: 87.

³⁹⁾ March, James G. and Johan P. Olsen, 1984, "The New Institutionalism: Organizational Factors in Political Life," *American Political Science Review*, 78: 734-49.

⁴⁰⁾ Ha, 2002: 341.

⁴¹⁾ Ostrom, E., *et al.*, 1994, *Rules, Games, and Common-Pool Resources*, Ann Arbor: The University of Michigan Press.

<Figure 1> The IAD Framework⁴²⁾



Attributes of physical world indicating various natural conditions relating social phenomena which individual's interaction is undertaken; attributes of community demonstrating community's character or norms which community members share; and rules-in-use meaning rules which are actually applied and obeyed in the action arena: those three components just decide the incentive structure. They do not determine the outcome of individual's interaction.

IAD framework analyses how individuals interact each other and what the outcome is in the action area which are affected by attributes of physical world, attributes of community and rules-in-use. For this analysis, the IAD framework assumes the rational individuals in principle. Ostrom *et al.* supposed the 'varying degree of rationality', which means that individuals try to learn and follow behavioral heuristic rather than finding the optimum if works or information required for the rational choice are out of individuals' cognitive capability.⁴³⁾ The degree of individual's rationality is also influenced by attributes of physical world, attributes of community and rules-in-use.

⁴²⁾ Ostrom, E., *et al.*, 1994: 37.

⁴³⁾ Ostrom, E., *et al.*, 1994.

IV. Case studies in Germany and Korea and Findings

This study aims to find a point why the measures the conducted studies already suggested do not work in Korea while they are coming into action and successfully have increased public acceptance in Germany. For that, this study begins with analysis of reasons and contents of conflicts which occur during site decision process in Korea and Germany.

1. Case Studies

From the literature review on conflicts in RE facility siting it was done to categorize problems and conflicts raised by actors involved. Total 12 case studies from 6 researches were reanalyzed.⁴⁴⁾ The subjects of this analysis are (1) the contents of conflicts; (2) stakeholders/actors; (3) the recommendation these researches suggested.

The cases are: according to the region, 6 cases in Germany and 6 cases in Korea; in the applying technologies, 11 cases with wind turbines and 1 case using biogas plant; in terms of completion, 5 projects were successful while the other 7 projects were canceled or not completed.

Since environmental problems and social conflicts were various from the designing stage to the implementing of the projects, this research made a category of the conflicts so that the property right and the relevant transaction costs can be measured. The subject projects and the contents of the category of the conflicts are shown in the following table.

⁴⁴⁾ Heiskanen *et al.*, 2006; ETK, 2006; Kim, D., 2007, *Conflicts around Nan-san Wind farm in Jeju and Tasks to the local energy transition*; KEI, 2009; Yeum, M., 2008, "Building Wind Turbines and Community Receptivity (in Korean language)," *Social Science Review (Kangwon University)* 47: 59-85; and Author own study.

Table 1. Renewable Energy Projects and Conflicts⁴⁵⁾

Project Name (Place / Technology and Capacity)	Findings (1) Providing project information to local people; (2) Opportunity for local inhabitants to invest in the project; (3) Participation in the planning process; (4) Result of the project; (5) Other notes
<i>Windkraftanlagen Baumberge</i> (Havixbeck, Germany / Wind)	(1) In the planning stage, all information released to local communities via news media; (2) Yes; (4) Success; (5) Trustworthy leader and his own investment
GeneralWind (Dardesheim, Germany / Wind)	(1) Efforts to convince local authorities and local communities; (2) Yes; (4) Success; (5) Project leader was well aware of the importance of local acceptance
<i>Udenhausen-Mariendorf</i> (Trendelburg, Germany / Wind)	(1) Providing the detailed information to every household; (2) Yes; (3) From the first stage local people could participate in the planning and citing process; (4) Success; (5) Negative impacts on the wild turbines also provided
<i>Butendiek</i> (Sylt, Germany / Off-shore wind)	(1) More than 20 times official presentations and public hearings; (2) Yes; (4) Not started yet; (5) Local community who was afraid of tourism decline organized the anti-wind organization and its collective action
Windfeld (Buessow, Germany / Wind, 22 wind turbines)	(1) Neglect to provide information and to convince local people; (4) Failure; (5) Opponent leader Prof. Mengel agreed to promote wind energy, but not too much in a certain area
Bioenergy Village <i>Jühnde</i> (Jühnde, Germany / Biogas, 700 kW CHP gas engine)	(1) Joint forums were initiated to learn technology; (2) Yes; (3) Yes; (4) Success
<i>Hankyung Wind Park</i> (Jeju, Korea / Wind)	(1) After only one time project presentation to local people, the project talked with only small number of village leaders, No information providing; (2) No; (3) No; (4) Part of project canceled due to the opposition; (5) Focus on only 'citing place acceptance' rather than public acceptance
<i>Jeju Off-shore Model Project</i> (Jeju, Korea / Off-shore wind for research)	(1) Small part of inhabitants; (2) No; (3) No; (4) Failure; (5) Failure in getting local inhabitants agreement according to the related legal institution

⁴⁵⁾ Author

<i>Nansan</i> Wind Farm (Jeju, Korea / On shore wind, 14.7MW)	(1) Two times presentations for just part of local inhabitants; (2) Financial compensation rather than the opportunity; (3) No, project developers decided all; (4) Started to build, but abandonment on the way due to the intense local resist; (5) After starting construction opponents initiated collective resist. Related authorities didn't react upon the situation
<i>Shinan</i> Wind Farm (Shinan, Korea / Wind, 183MW)	(1) No project presentation to local inhabitants; (2) No; (3) No; (4) Failure; (5) Effort to convince only the land owners of citing place.
<i>Youngyang</i> Wind Farm (Youngyang, Korea / Wind, 54MW)	(1)No; (2) No; (3) Local people discounted during planning and approval process; (4) Not yet finished; (5) Environmental problems from the construction of access road. <i>Red-tape</i> Environmental Impact Assessment
<i>Geoje</i> Wind Park (Geoje, Korea / Wind, 40MW)	(1)No; (2) No; (3) No; (4) To stop the approval process, local people founded anti-wind organization and has been swinging the collective actions; (5) groundwater contamination after logging on the expected wind park site.

2. Findings

In terms of the property right, Germany enjoys the formally/informally resolute perception. Seeing formal perception, individual's property right is secured based on the related laws. Federal Immission Control Act (BImSchV) and its strong Environmental-Impact-Assessment and Emission-Assessment-Law are enforced, as institutional constraints, to analyze the external environmental impact resulting from development projects. Also it can be easily find that there are less criticism against NIMBY resists and the attributes of community that problems or conflicts will be dealt in accordance with law/formal institutions. These informal circumstances support the sound perception of the property right.

On the other hand, Korea has lack of lower perception on the property right. Frequent use of the expropriation scheme for development projects result in the anxiety that the opponents may lose their property with very lower value. The EIA degenerating as just *red-tape* loses confidence from local inhabitants. Also there is a dominant attributes of community that public interests are prior to individuals' property right. Once opposing certain development projects, the collective actions are easily denounced as NIMBY.

These striking differences make the transaction costs in each country unlike.

In Germany, Renewable Energy Act (EEG) has created a very stable market for RE project transaction. Approval Authorities are working with consistent policy execution to secure actors' property right. Some regulations such as wind park priority area scheme and very strong EIA blockade against conflicts in advance. Furthermore consistent researches and institutional review are conducted to minimize the transaction cost. As a result, local inhabitants derive benefits from the low transaction cost thanks to high trust of policy. Despite of high information cost, project developers take advantage of low cost for searching proposed sites and contacting local inhabitants.

On the contrary, in Korea, due to the non-consistent policy execution the local inhabitants distrust the approval authorities. Also the recent tendency of the deregulation has been pushing the agreement of residents minimized. Local inhabitants have to pay the high transaction cost to get skills/information to keep its property right. Project developers may enjoy the low information cost and low implementing cost in advance, but once resist from local people raised, massive administrative costs for compensation or private security are delegated to them.

Actors' institutional learning in the both country, of course, works differently.

As mentioned above, stable market, rigid protection of property right, approval authorities as fair judges result in the low transaction cost in Germany. Under the condition with low transaction cost, the huge demand to transact the production of RE facilities is generated. As a result of institutional learning, the concept of *citizen power plant (Bürgerkraftwerk)* was created and developed. The amendment of the tax law (Jahressteuergesetz) in 2008 which the local administrations get 70% of business tax from RE facilities has been accelerating the explosive RE facility deployment.

However, in Korea unstable property right protection and high transaction cost make an environment which the *interest conflict* among actors easily happens. Local Inhabitants often attempt collective actions or *opportunism* to secure higher property. This is a result from the institutional practices of yesteryear which heavily depended on compensation strategy. This can be said an embodiment of the path dependency. Project developers also make use of opportunism. They tend

to provide local people with limited information to prevent conflicts in advance and to use unallowable ways to get inhabitants' consents like manipulation of documents.

Finally the achievement of the policy's goal in the both is strikingly different.

In Germany, the promotion of RE facilities is very successful policy tool for such as GHG emission reduction, energy self-reliance increase, actors' economic profit, job creations, tax revenue security in siting areas and so on. Throughout the very strong public acceptance of more than 80% of German supporting RE expansion as of 2013 more than 25% of electricity came from RE and the German government expects its 80% from RE by 2050.

However, Korea still fights a hard battle. Advantages of RE facilities are not magnified. Most of people perceive that RE projects are similar as other construction projects bringing environmental- and social problems and finally benefit-cost inequality. Since the demand for RE facilities has not been generated, *deadweight loss* occurs. It's a vicious spiral: low public acceptance on RE; and then low deployment; less than 2% of electricity from RE; and low RE promotion target in the long term energy plan.

V. Conclusion and Limitation of the study

This comparative research examined whether institutions are results from interaction of various preferences, and analyzed and verified which implication is brought throughout RCI which mainly focuses on property right and transaction cost.

Researches based on RCI analysis framework examine that: there is no guarantee that the policy does not put into action as the state intended; and the achievement of policy goal depends on change of actors' behavior incentive structure and change of their preference rather than the amount of resource and manpower provided by the state.⁴⁶⁾ Thus, reaching the policy target to prevent the conflict

⁴⁶⁾ Lee, 2002: 99.

and to increase the public acceptance during the RE promotion, it is needed to provide the institutional strategy which attracts the behavior incentive structure and the preference change from the actors. The implication of this research is to verify this proposition.

The analysis based on the institutionalism poses some questions to the existing theories dealing with coping with policy non-compliance and securing of policy compliance. The existing theories explain that moral persuasion, economic compensation and coercive measures can secure the policy compliance. However this research based on institutionalism verifies that policy design taking into account the property right and the transaction cost and successful inducement of the institutional learning are more important factors.

It is always anticipated that the policy non-compliance happens since any policy results in benefited and damaged groups. The institutionalism theory reveals that policy compliance is secured at the policy design phase rather than the policy implementation. As a result, in principle, policy cost required to reach the policy goal can be saved. In other words, better policy design contributes not only to the economy of the policy cost, but also securing policy compliance before conflicts happen.⁴⁷⁾

This research did not include external condition's change and influence of political power relation which is formulated at the policy design phase. For example, trials of strength among relevant actors on the nuclear energy technology, energy policy change after the Fukushima accident, appearance of strong leadership politicians are not dealt in this research.

In addition this research has the intrinsic limitation that other institutionalism studies do. Namely, empirical analysis with quantitative methods is needed to increase the theoretical preciseness and accuracy. Empirical analysis examines whether researchers' subjective prejudice has influenced a research setting and finally can overcome the research limitation.⁴⁸⁾

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⁴⁷⁾ Lee, 2002: 99.

⁴⁸⁾ Lee, 2002: 100.

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<국문초록>

**재생가능에너지 시설 입지 갈등 비교 연구:
소유권, 거래비용, 제도적 학습**

염광희*

에너지 공급 문제가 악화될수록, 재생가능에너지 기술이 대안으로 주목받고 있다. 그러나 재생에너지 시설의 입지를 둘러싼 갈등은 이 기술의 지속적인 보급을 가로막는다. 갈등을 예방하는 대책이 제시되었음에도, 재생가능에너지 보급에 관한 시민 수용성의 정도는 한국과 독일에서 매우 다르게 나타나고 있다. 이는 두 나라가 서로 다른 제도를 갖고 있으며, 행위자의 인센티브 구조와 그들의 선호 변화에 영향을 주는 제도적 학습이 다르게 작동하기 때문으로 가정할 수 있다. 이를 증명하기 위해, 본 연구는 합리적 선택 제도주의를 이론적인 분석틀로 삼아 비교 분석을 수행한다. 제도분석및개발(IAD) 분석틀을 활용해 제도의 주요 요소인 재산권과 거래비용이 두 나라에서 어떻게 인식되는지, 그리고 두 나라에서 제도적 학습과 이에 따른 결과가 어떻게 나타나는지 분석하여, 독일 재생에너지 보급 성공을 견인한 시민발전소 개념이, 소유권이 잘 보장된 사회에서 나타난 제도적 학습의 결과임을 밝힌다.

주제어: 재생가능에너지, 시민 수용성, 입지 갈등, 합리적 선택 제도주의, IAD 분석틀, 재산권, 거래비용, 제도적 학습, 한국, 독일

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