
Nuclear Power Policy in China and Germany-A Comparative Case Study after Fukushima

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[Abstract] Nuclear power is a controversial topic surrounding by science and politics, is it an evidence for sustainable development? The different nuclear power policies in China and Germany provided a vivid picture. China has published the medium and long-term nuclear power developing plan (2005-2020) which in the name of engaging sustainable development, climate change policies and clean energy policies. While Germany just made a decision to phase out nuclear power by 2022 after the Fukushima event and was praised for the sustainable development and renewable policies. It is interesting to look at the scientific and political framework for the different policies in these two countries after Fukushima. My paper will use discourse theory, which will analyze academic, scientific works, governmental documents and different news resources to examine how they legitimate for their different nuclear policies in their countries and how these policies got passed in the decision-making process, especially after the Fukushima nuclear event. Then the paper will explain what lead to these different policies in the two different country contexts. The interaction and relations between science and politics in these two countries will be studied. Not only the interests and powers behind scientific research undermined the objective of scientific evidence, but also the uncertainty of scientific or unclear of cause and effects greatly reduced the power of science in politics. The process of policy-making including scientific evidence for sustainable development is greatly influenced by politics.

Keywords: Nuclear power policy, discourse theory, Germany, China

Introduction

After more than one year of the Fukushima event, the demonstrations in Japan came again as the headline of the mass media worldwide. Tens of thousands of people crowded into a park in central Tokyo on Monday to protest the use of nuclear power in Japan, especially since the Japanese government announced the reactivation of the first nuclear reactor since the Fukushima crisis (BBC 07-02-2012; FOCUS 07-29-2012; Reuters and guardian 07-30-2012; CHINADAILY 07-31-2012; CNN 2012). The role of nuclear power is controversial in the world, is it still a solution for energy demanding, environmental protection and climate change? There are rethinking of nuclear power, still its role in human society is in different opinions. The different nuclear policies in Germany and China provide a vivid comparison to reflect human's dilemma in developing nuclear power. Is nuclear power an evidence for sustainable development? Germany and China have different answers to this question as showed by their different actions. Germany has decided to the phasing out nuclear power by 2022 and is going to make a rapid transition to the age of renewable energies. The impacts of

the recent earthquake on Japan's nuclear power stations sparked a change in attitudes toward nuclear energy use in Germany. The intention is for renewable energies' share of power generation to rise from the current 17 percent of power consumption to at least 35 percent in 2020. (BMU 09-2011). While China has said that it will safely and high-effectively to develop nuclear power, even though China State Council issued a ban to approve new nuclear reactor programs and demanded a comprehensive check of those running and under construction instantly after Fukushima event, the will to develop nuclear power is unshakable.(Chen 03-17-2011) China has published its ambitious nuclear power develop plan in 2007 by National Develop and Reform Commission, *the Medium and Long-term Nuclear Power Developing Plan (2005-2020)*. In this plan, the role of nuclear power is clearly defined as mitigating global warming, reducing pollution, meeting the energy demand and energy security, optimizing the electricity structure and sustainable development. It is suggested by some experts from the Chinese Academy of Engineering and China Nuclear Association which are the main think tank for nuclear power development policies that China should expand nuclear capacity from the original aim of 40 GWe (which will be reached at the end of 2015 in advance) to 70 GWe until 2020 base on the 10.80 GWe in 2005.(Deng 05-22-2011; Wang 05-31-2012). Even though China's restart of the nuclear has not yet happened, it is on its way quietly after the ratification of *Nuclear Safety and Radioactive Pollution Prevention 12th Five-Year Plan and the 2020 Vision* by the State Council, now the nuclear industry is waiting for the *Nuclear Safety Plan and the Adjusted Medium and Long-term Nuclear Power Developing Plan (2005-2020)*.(Hao 07-05-2012) Nuclear power policies are on the top agenda of both countries, but how they justify or legitimate their totally different nuclear policies in their own countries after Fukushima?

Since nuclear power is a high technology concentrated by scientists, the experts played an important role in the decision-making process of nuclear power energy polices through their knowledge. My paper is going to use discourse theory to analyze this process of legitimizing in both countries by politicians and experts who are the focus of my research subjects. The following part is going to explain my theory and methods, and then the paper will analyze the discourses in China and Germany respectively. After the description of discourses in both countries, I will try to explain the causes of the differences and the implications. The expecting conclusion is that the process of policy-making including scientific evidence for sustainable development is greatly influenced by politics.

Theory and methods

This paper will use discourse theory as a framework for analysis of political and scientific discourses around the nuclear energy policy in Germany and China after Fukushima nuclear crisis. 'Discourse' is defined here as an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices (Hajer and Versteeg 2005). Meaning is discourse dependent so that it is the discourse makes the world meaningful. (Hardy and Phillips 2002). Even though Fukushima is a fact, still its meaning and implications to Germany and China are

differently constructed by politicians and scientists through their knowledge in both countries. Knowledge refers to all kinds of contents that make up a human consciousness, or in other words, all kinds of meanings that people use to interpret and shape their environment. (Maier 2009) It is power, while it is created through social interaction in which we construct common truths and compete what is true and false (Jørgensen and Phillips 2002). Politics is a struggle of power, in this way it is a struggle about how to construct nuclear power in both countries through their knowledge to protect their own meaning. All information through various media about Fukushima challenged the former meaning of nuclear power in both countries. Politics involves reconciling differences through discussion and persuasion. Communication is therefore central to politics. And the doing politics is predominantly constituted in language. Different knowledge is constructed and contested in the mass media about nuclear energy. And the struggle between different knowledge claims could be understood and empirically explored as a struggle between different discourses which represent different powers and reveals the different identities of the speakers.(Jørgensen and Phillips 2002) According to Michel Foucault's discourse theory: within a discursive formation, social agents perpetuate power through the knowledge contained in the predominant discourse. Discourse analysis would identify the knowledge and how the knowledge firmly connected to powers and interests.(Maier 2009) To systematically explore often opaque relationships of causality and determination between a discursive practices, events and texts, and wider social and cultural structures, relations and processes; to investigate how such practices, events and texts arise out of and are ideologically shaped by relations of power and struggles over power.(Locke 2004)

Political discourse is a struggle of different meanings. Politics actors fix on what we have called 'legitimization'. What this means is that humans using language politically seem to feel a strong pressure to justify their actions or proposals for action in terms of oppositions between right and wrong. At the heart of what we call 'politics' is the attempt to get others to "share a common view" about what is useful-harmful, good-evil, just -unjust. Language is the only means for doing this. (Chilton 2004) Legitimizing and delegitimizing is an important function of political discourse. (Chilton 2004). The legitimizing their nuclear power policy, make what kinds of change, becomes a political struggle of knowledge which could be seen in the media. The Fukushima event in Japan is a fact, but how to discourse this fact is in different actors' hand through their knowledge and power. Because reality is seen as socially constructed, the analysis of meaning becomes central; for interpretative environmental policy research, it is not an environmental phenomenon in itself that is important, but the way in which society makes sense of this phenomenon. (Hajer and Versteeg 2005) What is the meaning of Fukushima event in China and Germany? The meaning of Japan Fukushima event is strongly affected by the political context of both countries. There is a competition defining nuclear energy's role worldwide in the future energy blueprint. The process of analyzing nuclear energy discourses and the potential of this methodology for revealing the processes of social construction in both countries would shed some light to the relation between science and politics.

Obviously different meanings in Germany and China lead to different nuclear energy policies. In the following section, we are going to look at the nuclear energy discourses in Germany and China after the Fukushima event guided by the following questions in mind.

- 1, who are the main subjects or actors in these different discourses of meaning and what powers and interest behind them?
- 2, what is their knowledge about nuclear power?
- 3, what functions does this knowledge have for the different subjects or actors?
- 4, what influence does these knowledge have for the nuclear power policy decisions?

The discourse event is nuclear power policy after Fukushima event in Germany and China. I am going to pick out the relevant materials from academia, scientific works, government documents, experts' interviews and statements, news reports, some blogs and some forums and focus on their discourses of nuclear power. All these information I am going to get is from internet, since the internet produce and reproduce information from the above forms of materials. The key words are nuclear power in Germany and China with time span after Fukushima nuclear crisis.

Discourses in China

Firstly let's have a look at the former nuclear power policy which is facing challenges after Fukushima in China. China has a grand nuclear power plan named Middle and Long-term of Nuclear Power Development (2005-2020) which is made by the National Develop and Reform Commission (NDRC). This is included in the Five Years Plan which is the guideline of policies in China by the State Council. As a lack of a lead nuclear energy development body, the NDRC typically relies on research institutes, such as Tsinghua University, and nuclear industrial units to shape nuclear energy policies and to demonstrate their feasibility.(Zhou, Rengifo et al. 2011). In order to deal with energy problems, the State Council set up National Energy Commission in 2010 to take charge of energy issues. There are expectations that a Ministry of Energy would be set up in order to have a leading body to take responsible for energy policies. However, the National Energy Administration (NEA) is still under the leadership of NDRC and it takes responsibility for the daily administration of NEC. The NEA, under the NDRC and NEC, is responsible for: 1, the management of nuclear power; 2, laying out the nuclear development plan, entrance conditions, technical standards and its organization and implementation; 3, giving assessment opinion about the nuclear power planning and major project; 4, coordinating and guiding the research of nuclear power and the organization of the nuclear power plant emergency management. The NEA has the most authority among these agencies related to nuclear safety. It is responsible for licensing nuclear power plants which meet nuclear safety requirements (Wang and Chen 2012). After the Fukushima nuclear crisis, Primer Wen Jiabao, leader of State Council, hold a standing committee conference which made "Four Decisions" about nuclear power development on 16th, March 2011, five days after Fukushima nuclear crisis, organized an expert team to check the nuclear safety of nuclear power plants in China and frozen the approval of new nuclear power plants until the adjusted Medium and Long

term Nuclear Power Plan comes out. There is no name list of experts in the safety check team on the website of Ministry of Environment. But the Chinese Academia of Engineering is working on a key consulting project about Re-Research of Nuclear Power in China and it is said they has some phased research result, Suggestions about Nuclear Power Development in New Situation was heard at the State Council Standing Committee conference on 31th May 2012.(StateCouncil 2012). Even though the call of restart of new nuclear power plants is high, still the new nuclear power plan is not published yet. Most of the companies and shareholders are waiting for the decision of the State Council. Since the 18th National Congress of the Communist Party will be held in October 2012, and the Chinese new generation of leadership will come out, maybe the readjusted of nuclear power policy will be the task of next generation of government. The main subjects or actors in China nuclear power field are as following graphic showed.

Supreme Committee		State Council Wen Jiabao All decisions Includes five-years-plan and guidelines for nuclear policy			
National Development and Reform Commission (NDRC)	National Energy Commission (NEC2010)	Ministry of Environmental Protection (MEP)	Ministry of Industry and Information Technology (MIIT2008)	State-owned Assets Supervision and Administration Commission (SASAC) 1,China National Nuclear Corporation (CNNC) 2,China Guangdong Nuclear Power Corporation (CGNPC) 3,China Power Investment Corporation (CPIC) 4,China International Engineering Consulting Corporation CIECC 5,State Nuclear Power Technology Corporation (SNPTC,2007) shared by State Council 60% CNNC 10% CGNPC10% +CPIC10% +CNTIC 10% China National Technology Import and Export Corporation	State Electricity Regulatory Commission (SERC) Chinese Academy of Science (CAS) Chinese Academy of Engineering (CAE) Chinese Academy of Social Science CASS National Natural Science Foundation of China NNSFC China Nuclear Energy Association CNEA(2007)
Zhang Pin Xie Zhenhua	Wen, Jiabao Li, Kejiang Zhang, Pin Liu, Tienan	Zhou, Shengxian Li, Ganjie Xu, Qinghua	Miao, Yu	Wang, Yong 1, Sun, Qin (CNNC) 2, He, Yu (CGNPC) 3, Lu, Qizhou (CPIC) 4, Xiao, Fengtong (CIECC) 5, Wang, Binhua	
National Energy Administration (NEA2008)	National Energy Administration (NEA2008)	National Nuclear Safety Administration (NNSA)	China Atomic Energy Authority (CAEA)	Energy Department of CIECC	
Liu Tienan	Liu Tienan		Chen, Qiufa Wang, Yiren	Wang, Zeping	

After description of the major government agencies and scientific research institutes related to nuclear power in China, and then we will have a look at different discourses about nuclear power in China and their relations to these agencies and institutes.

First, let's turn to the news reports from the internet, which is considered the most timely to report the nuclear crisis and it gathers all kinds of interviews and blogs, is quiet a diverse flat plat for observing dynamic discourses. Since there are hundreds of articles related to nuclear power policy after Fukushima event. I am going to pick one of the website Sina.com which is one of the most popular websites in China as a representative. After I get the lists of articles, I will read through them and find out the main discourses and then put them in subgroups. I will try to take a note of relevant important information, for example, important individuals from above mentioned government departments and institutions.

There are 937 articles and 190 are picked out from more than 40 different newspapers, magazines and internet news reports agencies, which included important statements from above subjects about nuclear power policy in China and their knowledge about nuclear power energy is spoken out and debated in public.

In order to connect the macro entity with micro representation, here in the discourse we identify the speakers' background and their relationship with macro agents, after that the paper will analysis entities' role in decision-making process, these individual's knowledge about nuclear power and their influence to the society as whole.

Time and frequency	Discourses subgroups	Important statements from key individuals	Notes and analysis
High to low			
13:46, March, 11 th , 2011-Sept, 29 th , 2011 More than thousands of articles	Special report about Japan's 9.0 earthquake and nuclear crisis The salt is sold out! Chinese salt panic buying wave from coastal area to the western.	1, The mini-blogs report from the public and journalists 2, A detailed knowledge of nuclear radiation from experts and government departments to placate the panic	Rumors and nuclear fear after nuclear plants explosion even worse than in Japan and the radiation itself. The instability of society in nuclear crisis made a deep impression to the government which makes it closely related to politics-to sustain social stability.
March 16 th , 2011 State Council Four decisions on China's nuclear power development from State Council 3 6 th , 2012 Safely and effectively develop nuclear power	1, a complete safety check was required immediately on all nuclear facilities; 2, strength safety management of current running nuclear power plants. 3, a complete check nuclear projects under construction. 4, strictly approval of new nuclear power projects. Middle and long-term development plan of nuclear power will be readjusted, and before the plan is approved, approval of nuclear power projects, including preliminary work of the projects, should be suspended.	Wen Jiabao (State Council): the government will optimize energy structure, promote the efficient use of traditional energy sources, safely and effectively develop nuclear power, and increase the share of new energy and renewable energy in country's total energy consumption. -Government Report at 2012 National People's Congress	State Council has the final say for nuclear power policy in China, it also bears the crisis. Nuclear power is a balance between economic develop and political crisis, the key factor is nuclear safety. The definition of nuclear power as safely and effectively and the order that it is before new and renewable energy also imply its role in energy structure in China. The Four Decisions instantly after Fukushima serve as assuage of social suspects of nuclear power in China.
4, 6 th , 2011—8, 8 th , 2012 Repeating the theme that China need nuclear energy, no one totally refuses nuclear energy 40 articles are using it as its titles, there are more than 80 interviewee said that nuclear power is necessary to China, some take it for granted, some admit there are no other choice for China at this moment.	Why China have to develop nuclear energy? 1, national security strategy 2, national energy strategy 3, environment and climate change 4, industrial strategy	Government officials and experts are jumping out in front of media to explain the importance of nuclear power. The name list is quiet long. A few examples Shi, Dinghuan, Lu, Zhiqiang State Council, China will not stop exploitation and utilization of nuclear power Zhang, Guobao former secretary of NEA China cannot Yinye Feishi. Xie Zhenhua NDRC responsible for climate change China is determined to develop nuclear power Sun Qin, CNNC clean energy strategy cannot leave out nuclear energy	The pro-nuclear expert coalition is large in number and powerful. They came from economic, energy or nuclear background and they are also officials serving the nuclear power industry in China. As experts, their expert knowledge about nuclear power is respected by the public. China's slogan that science and technology is the first productive power, making the nation strong and powerful has its source to the Mr. Science in the may forth movement. It is already a strong common consensus in society. However, as there are officials in nuclear industry, they are under great suspect to argue for their own interests, and this lowered their credit in the public.
After the consensus of nuclear power is necessary in China, the argument focus on the nuclear safety problem. The most mentioned one is related to technology: which type of reactor is safer? The technology struggle between three nuclear corporations.	Nuclear safety standards will follow the strictest standards principle, which is advantage for the third generation nuclear power plants, especially AP1000. A competition of different types of nuclear power and different technologies. The war of three nuclear kingdoms.	The import of AP1000 was decided by state council in 2007 and it even set up SNPTC to be its owner or to stimulate more competition between three state-owned nuclear corporations.	The SNPTC imported AP1000 owned by Westinghouse which is theoretically advanced technology while there is no one existed yet. It has several advantages including: technology and cost effective. The CNNC owned most of China nuclear power industry personnel, emphasis self-reliance and innovation insist on the second generation ACP1000. The CGNPC is supporting to adopt the French technology EPR.
The Economic interest around nuclear development was stirred up by the frozen approval, results financial damage to companies	The voice about restart of nuclear power plant approve is high, and most of people are quiet optimistic about it and waiting for	However, actually, many people failed, until now the approval is not restart. Most of the news is reported by some securities newspapers agencies. There	The new nuclear power plants approve are not open more than one year. Some are report to be in construction while others are still waiting for the Da Lutiao (big approval) from NDRC. All

and local government. There are interests which looking forward to the restart.	gain some profit from it.	are said that this frozen order are making some companies and local government losing money and the restart is good news to buy certain stock in stock market.	the nuclear power businessmen are waiting for the opinion of the State Council. It seems there are still lots to be done before restart.
Local government struggle for and against nuclear power plants: inland nuclear power protest in China	The arguments about the nuclear power projects in inland China are hotly debated.	The Wangjiang against Penghu nuclear power plants is an example to show the conflicts at locals Zhao Chengkun, CNEA ,MOE Wang Jinzhou,Vice Secretary of Wangjiang county,Fang Guangwen,Tao Guoxiang, Wang Nianze—four anti-nuclear fighters	This inland nuclear power project is an interesting story about nuclear protest and conflicts at locals. Local governments are competing for nuclear power plant located at their territory which greatly undermined a proper the environmental impact assessment at locals.
Who is going to cool down the nuclear fever of nuclear industry in China? The character of plan economy in China applied to nuclear power industry.	The scale and speed of nuclear power in China is in question. Too fast, too large with less check power for nuclear safety.	Great Leap Forward of nuclear power energy or the scale is still not able to meet the demand? He Zhaxiu, CCS strong against current nuclear development Tu Jianjun Carnegie Funding, too fast Wang Binhua, the speed is ok.	Great Leap Forward is quiet a sensitive word and has specific negative meaning in China. Even though there are several experts and officials rejected this word, still some experts admit that nuclear power development should slow down and have a stable development.
Nuclear development challenges Academia discourse, what do we lack and how could we to do it better.	Nuclear power development challenges: nuclear personnel, laws, institutions and capacity, information, public participation, finance etc.	There are appeared as suggestions and criticisms to nuclear development in China.	Most of these are available and are published by some anonymous persons or academic in laws and management. The most famous person is He Zhaxiu from CCS. Wang Yi is another one. He Zhaxiu has published several articles to criticize the inland nuclear power construction and the grand scale and speed of nuclear power plan by CCE. He is the leader of anti-nuclear policy in China. Are these experts' opinions going to be taken into account? Who are the experts in the expert panel which greatly influence the decision-making? Again this is decided by the government.
What are the others reactions and its implications? Discourse of international nuclear power policy	International community nuclear power policy and international cooperation	Interpretation of Japan, Germany, USA, Chinese Nuclear corporation with USA, Japan, Russia and enter into Turkey, England	The nuclear power plants in Japan is said to be old and technically backward, furthermore, their management has problems. Many nuclear experts said this would not happen in China. The Japanese experts are predicting that Japan has to restart nuclear power. The pass of AP1000 in USA is interpreted positive. The Chinese nuclear corporations compete in international nuclear market is said to be a signal for its competitiveness.

These discourses in the media showed the current nuclear power discourses in China and its interests and power. The State Council, represent the government, is the most powerful subject to make its own discourse of nuclear power in China. It can ignore the scientists' favor of self-develop nuclear power plant and technology which fall behind in international nuclear community and import the AP1000 as an advanced technology. It consciously induced competition to break the monopoly-two major nuclear corporations CNNC and CGNPC. The state council frozen of new nuclear power plants and did not give Da Lutiao (big road approval) from NDRC to some nuclear power plants which already have Xiao Lutiao's (small road approval) from NNSA project which also ignored the economic cost of those relevant manufactures and local governments. The major challenge at the moment is the balance between public opinion of nuclear safety, strong nuclear economic interests and limited nuclear power capacity. The nuclear power experts are the dominated experts who make their own statements about nuclear power in China. They are in organizations as government departments, state-owned corporations, research institutions and industrial associations. Their opposite numbers are in sparse and not organized. Even though the frequency of these discourses is much lower, still their influence and

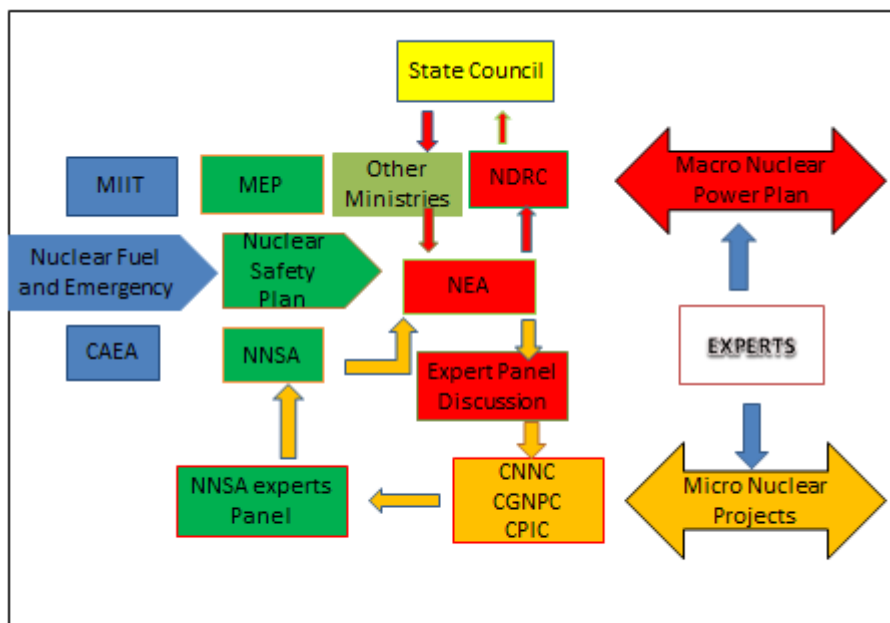
credibility is hard to tell from the news report. They are not going to be ignored by the central government. The more than one year long frozen is not expected by many optimistic nuclear experts. The NEA is promoting nuclear power to meet the energy demand of the society. The NNSA had limited capacity to inspect the nuclear safety, and it is not able to make a check and balance is showed by its weak discourse of nuclear safety in China and its Xiao Lutiao could not compared with the power of Da Lutiao which is at the hand of NEA-NDRC. Even after the Fukushima, the MOE passed the EIA of nuclear power corporations to get in stock market and they repeated about nuclear is safety in China. The state-owned corporations and local governments owned nuclear power are the major promoter of nuclear power development in China. The economic interests are showed by the highly intensive finance and economic discourses make by most news reports. Besides that the economic interests are also the power to make nuclear power information available to the public, more precisely to those in the stock market. The journalists are digging hard to get information about the restart of nuclear power and the nuclear power plan. The technology competitions in these three different state-owned corporations also highlight the current nuclear technology profile that is China is the biggest nuclear power lab in the world with all kinds of nuclear reactors. The local protests of Wangjiang criticize the pass of Pengze Hu nuclear project which showed that the public is a strong inspecting power rather than any official decision-process department. There are reports that Pengzhe Hu projects has lots problems, until all problems are solved, it will not restart soon.

The third discourse is about academia works about nuclear power policy in China. The academia is the cradle for knowledge. The articles which are showed above are journalists interviewed some experts, while academia works are wrote by experts. The academia works related to nuclear power after Fukushima nuclear crisis. These articles are from the China National Knowledge Infrastructure (CNKI), I searched articles in the key journals. The discourses around the academia are quiet clear: no one doubts about that nuclear power will still develop in China and the problem right now is how to make it safer. Most of academia from their own expertise background gives suggestions without points out any person or institution, while there are supported by various R&D fund by the government departments under the State Council. Still we can notice that several worried about the public acceptance of nuclear power and give advice to improve the public knowledge about nuclear power. Most of these papers are not from the second part interviewed experts, while the engineers, government officials, businessmen and stock investors are busy fighting for their own interests, the reflecting work are left to academia, still it is a pity to find that He Zhaxiu is again the person who criticize the current nuclear power policy the most in academia.

The description of China's nuclear power policy by different subjects and actors in different areas, their knowledge about nuclear power are showed in a glance, the functions of their discourses are analyzed based on their background and their will. Then the paper will focus the fourth question, what their influence for the nuclear power project decision-making?

We are going to observe from the macro and micro level of nuclear power-decision making in China, one is Nuclear Power Plan which is the blueprint for the nuclear power development, and the other is how each nuclear power plant get approved. There are over-laps between the macro and micro level decision-making process. China still has its plan economy, which is showed by the Five Years Plan by the China

Communist Party. The nuclear power development plan was published by NDRC as we mentioned several times. China's nuclear power project is using licensing management which is displayed in the following chart. After NDRC received an application of new nuclear power plant from state-owned nuclear corporation, CNNC, CGNPC and CPIC, it will ask the consulting corporation CIECC to make a feasibility report. CIECC will organize a panel of experts to make a fieldwork and write the report. (Zhu 2010; Zhou, Rengifo et al. 2011) A large part of the nuclear power experts are from academia research institute, two of them are usually on the list, one is Chinese Academy of Science and the other is Chinese Academy of Engineering, they are research institutes direct under the State Council. However, on all those government documents, their name are not published, only the name of governments departments or corporations. Are the interviewed experts in this decision-making process? This paper make an assumption that they were in this process which revealed by their titles and speeches, and they are in that expert circles, and they are, even though not revealed by journalist or their name was omitted.



The State Council's discourse of Fukushima as a nuclear crisis and made the four decisions to focus on the nuclear safety and social acceptance of nuclear power in China. Since China is now in a rapid development of nuclear power which aims to make nuclear power as its main energy source in decade. The reflection and rethink of nuclear safety is on the way. The nuclear safety report is produced by the MEP (NNSA), NDRC and China Earthquake Administration. The knowledge of nuclear safety was enlarged to calculate the extreme situation and overlade disasters with the hope that experts from other field rather than nuclear field will be included in the expert panel discussions when they make decisions. For the State Council, the nuclear fear caused by the nuclear crisis and its huge disturbance of social stability is now the main concern of government which aims to stay in power and keep social stability. The aim is how to make the nuclear power safer in China? Could the current institutions work well to supervise nuclear power development?

For the other government departments, their power in decision-making process after Fukushima will change. The trend is that MEP (NNSA) will have a more say during the nuclear power decision making process. The economic, energy and climate change demanding drive the rapid development of nuclear power in China. The NDRC leading NEA, taking responsibility of climate change and economic development is a dominant power in the nuclear power policy-making process. The Medium and Long-term Nuclear Power Plan 2005-2020 was published in 2007 by NDRC as the only author. The Nuclear Safety and Radiation Pollution Prevention 12th Five Years Plan and 2020 Vision was published in May 2012 with MEP (NNSA), NDRC, Ministry of Finance, NEA and Defense Industry Bureau (MIIT). The interviewees in the second part which emphasis the importance of nuclear power and fight for the nuclear power plan because it is they who made these plan and they would like that the Fukushima event do not influence the development of nuclear power in China, the YinYe Feishi discourse, for example, Zhang Guobao(NDRC) and Du Wanxian(CAE). The NDRC and NEA have its own expert resources which greatly influence what kinds of experts' knowledge they would take. If NDRC still dominated the nuclear power develop plan in China, their economic, energy and climate change discourses would be the same, which will prevent a more divers experts opinions during the nuclear policy making process. It is said that the MEP will have more personnel and more fund to open a new nuclear power department, still how to balance the strong power of discourse by NDRC and its related experts coalition is a big challenge in China. There should have an environmental impact assessment report of nuclear power plan to check the strong power of NDRC.

For the nuclear industry corporations, their knowledge focuses on the technology standards which concerned on the second and third generations nuclear power plants. There are two safety standards indicators which all make the AP1000 became a hot topic during the discourses. The SNPTC is ambitious to invent CAP1400 which would grant China the owner of this technology, as a newly founded corporation by the State Council, the competition with other two major nuclear power corporations is not easy, since AP1000 is still theoretically safer while without any running experience yet. The CNNC, as the represent of China's own technology ability and power keeps on meeting the safety standards while emphasis self-reliance and innovation. The CNNC holds most of the important resources, such as experts and research institutes. It is said that most experts do not agree to import AP1000, they are forced to agree to sigh. Because Zhang Guobao, the former director said that more than 60 experts were called to Beijing in a hotel for weeks to discuss it, they have to say they agree or not with their name on it. The strong power of politics, even though Zhang said that AP1000 is technically more advanced, still the different opinion of politicians and nuclear power experts about what kinds of nuclear power plants to use is still in question. From the news report, the CGNPC which using the French technology is actively promoting communication with the public while inviting the public to visit their nuclear power in internet and their experts are answering questions from internet citizens. The competition between three different nuclear corporations in China is fueled by the nuclear crisis, while they are all state-owned, the influence of politics is unavoidable. The political will would transcend the will of nuclear experts in China.

We could see that the media-especially the internet played as a bridge between the experts and the public, its influence is far beyond newspapers, magazines and reports themselves. The detailed information about the anti-Pengze nuclear power is a

well-known example. Since nuclear power is involved with huge amount of investment in it. Even though there are many discourses which are in the frame of economic and finance, still the information that it reveal to the public is valuable, for example, reports about the process of the nuclear power plants at locals. The journalists interviewed more than hundred experts with all kinds of questions. Compared with the government inspecting department MEP's ability, the power of media is stronger because there are mobilize the great resources of the people. The environmental impact assessment of Pengze nuclear power is passed by the MEP, while the Wangjiang local government points out there are lots of problems, like the number of the population, the survey of public opinions and so on. These discourse by the public through the media points out, that market economic drives more information from the government decision-making process, nuclear power is not only a political issue, it is also an economic issue, the industries drive to more transparency. The media is a strong tool to embrace the public participation to nuclear power development in China. Compared with the bustling internet, the academia is quiet, but still there are some different voices, even though most of them did not challenge the role of nuclear power in energy, economic and climate change. Science and research in China is under the lead of government, they gave suggestions to the government to make Atomic Energy Law and improve public awareness of nuclear power. The dependent role of academia is hard to make a difference to the government discourse in academia. The government can greatly influence research through distribute of funding in nuclear power research in China. As nuclear power is a highly risk industry, China's nuclear power policy is dominated by the present political and favor- nuclear power experts alliance, therefore the voice of the public should improve. The salt panic buying has its reason and should not be ignored. Still, with all those arguments in different subjects and actors' mind, everyone is looking forward to the decisions of the top leaders from State Council.

Discourses in Germany

Germany has a long history of anti-nuclear power movements. (Nelkin and Pollak 1980; Joppke 1993). As early as 1998, the issue of phase out nuclear power policy was advocated by the coalition government was formed between the Social Democratic Party (SPD) and the Green Party, the planned time was 2022. The phase out of nuclear power policy was cancelled by the new coalition government lead by CUD/CSU and FDP in 2009 with an extended time. After Fukushima nuclear GAU, the chancellor made a three-month moratorium on nuclear power plants, requiring a safety check of all nuclear power plants by the Reactor Safety Commission(RSC) and call experts in to set up the ethic commission on safe energy supply which aims to have a new analysis of nuclear risks. The Ethic Commission is convinced that with the help of the Energy Turnaround measures presented here, nuclear power can be completely phased out within one decade.(Ethics Commissionon Safe Energy Supply 2011). On 30th, June 2011, after a broad political agreement in the Bundestag – the lower house of parliament voted 513–79 for the phase-out plan – it was decided that by 2022 all of Germany's 17 nuclear reactors will be shut down and the use of renewable resources will be expanded.(Jahn and Korolczuk 2012).

The main subjects and actors in Germany about nuclear power policy after the Fukushima GAU will be showed in the following chart.

Citizens	Bundestag(598) SPD(146),CDU+CSU(239),FDP(93),THE GREENS(68), DIE LINKE(76), The 17th Bundestag,2009	Chancellor Dr. Angela Merkels (CDU/CSU+FDP)			Bundesrat(69) 16 Federal States	Citizens
NGOs: Greenpeace BUND	SPD: Sigmar Gabriel, THE Green: Claudia Roth Die Linke:Klaus Ernst CSU: Horst Seehofer	Ministry of Foreign Affairs (FDP) Guido Westerwelle	Ministry of the Environment, Nature Conservation and Nuclear Safety Norbert Röttgen (22th,05,2012) Peter Altmaier (CDU)	Ministry of Economy Rainer Brüderle (FDP)	1,Baden-Württemberg 2,Hessen3,München4,Niedersachsen5,Schleswig-Holstein Federal States with Nuclear Power Plants	Energy Corporations: E.ON, RWE EnBW Vattenfall ,Areva,Siemens
Experts	Chairman Klaus Töpfer ex-Umweltminister Mathias Kleiner(President of German Research Foundation)	Ethics Commission on Safe Energy Supply 4 th , April to 28 th Mai,2011 17 members name lists available	Reactor Safety Commission(RSC) 16 members name lists published		Stefan Mappus(BW) Peter Harry Carstensen (CDU) (SH)	Johanna Thyssen E.ON Jürgen Großmann RWE June 2012 Hans-Peter Villis EnBW September,2012

These are the main subjects or actors that are active in the nuclear power discourses in Germany. The fate of nuclear power is decided in Germany, which subjects or actors are argue for phasing out of nuclear power and who are the losers during these process of nuclear power change in Germany? How do they insert their discourse into the policy-making process in Germany?

The discourses we are looking are from the sources of internet, the method that this paper apply is to put nuclear power in Germany in German in Google and the first popping out, except Wiki and other foreign websites, the Spiegel and Süddeutsche are the first two on the list, so that they are chosen as the source of news report. I am going to separate the different topics in subgroups and list them according to their frequencies.

Time and Frequency	Discourses	Important statement from key figures	Notes and analysis
12 th , March 2011 Minutenprotokll until to 17 th August,2012	Super GAU in Japan	Cancellor Merkel: while such an accident happened in a highly-developed country like Japan, Germany could not simply keep business as usual. Sigmar Gabriel: no nuclear power plant in the world is designed to withstand a nuclear meltdown-so not in Germany! The GAU is a real and concrete danger.	The comparison between Germany and Japan revealed a highly technology and industrial identity shared by them. The fierce criticisms from the opposition parties and the coming election in 2013 also greatly influenced the discourses.
The anti-nuclear wave	Numerous Anti-nuclear power demonstrations in Germany, the scale, the frequency and the background of people going for demonstration is unprecedented. The reports which argue for nuclear power is countable, only a few.	"Wer Laufzeiten verlängert, verkürzt seine Regierungszeit." Who extended the running time of nuclear power, shortened his term. Nucler powr, no thanks!	When thousands of people are going to the street to against nuclear power in Germany and the federal states' elections were coming, the choice left to the current coalition government is quiet limited. The will of the people will be reflected in the democratic system by elections.

Merkel :a moratorium A wise expert team	A three month moratorium: checking all nuclear power plants and shutting down seven old ones. The ethics commission for a safety energy supply	The legitimacy of moratorium is in doubts, not a law. Merkel: the task of this commission is on the one hand, focusing on the nuclear safety, on the other hand, answer the question, how to make renewable energies a practical and reasonable solution? The ethics commission suggested that less risks alternatives exist.	Merkel invited experts from science, politics and religions, however, not from energy industries. However, there is prerequisite that phase out based on: not endanger Germany's competitiveness as an industrial and business location.
Parties and nuclear power	CDU change 2009 nuclear policy CSU we are against nuclear power FDP finance and research SPD +the Green phase out nuclear power asap. Waiting for more support	Moratorium is not campaign maneuver Horst Seehofer painted green Philipp Rösler FDP the research of nuclear power should carry on Party profit, topic for elections	The Fukushima GAU made another big GAU in German politics. It made losers and winners during the process. The discourses in Germany are closely related to the history of parties' nuclear power politics in Germany. The new consensus about nuclear power in Germany is reached. Still there are other problems which are following
The Energy Turnaround	The energy corporations are talking about blackout and other risks of phasing out nuclear power. The ethics commission's report answered that Germany can make it without nuclear power. Energy Turnaround challenges and opportunities	Johannes Teysen: a short bridge is not a bridge Jürgen Großmann: illusion Industries are worried. The energy turnaround is expensive. Who is going to pay for it? The increase of renewable energies	Those who support nuclear energy are emphasizing the challenges of energy turnaround which is dominated on the media, while the opportunities are greatly undervalued. Great challenges also mean great pressure for the Germans, the motivation for new innovation is opened. There are many other possibilities.
Landtagswahl Federal states election at Baden-Württemberg	An election after the big GAU	Stephan Mappus (CDU) the man responsible for extending nuclear power plants, lost in a state that has chosen CDU for 58 years. SPD+The Green winner at local elections.	This reflected the slogan of the people, however, the result is even worse, the political life not shortened but ended. Since it is a strong industrial land, the strong will of Germans to say no to nuclear power is reflected to the political result as a democratic country example.
The big corporations	Their discourses are different: emphasizing the difficulties of energy turnaround Or say no to nuclear power and grab the opportunities	E.ON Energy Turnaround? Sure! When we do not have to pay. Siemens nuclear power? No. RWE Strategic change investing in solar energy Jurgen Grossman left	The big energy corporations are not on the same line with the government or the citizens. How to engage them in the energy turnaround is a big challenge. A Greenpeace study shows that the four only invest limited in renewable energies.
International community	The emphasis is that responsibility of nuclear safety respects no boundary. However, German is still on the side of few.	Umweltstaatssekretärin Ursula Heinen-Esser: all countries that is using nuclear power muss aware their responsibilities, it will not end with nation boundary. For the most countries in EU, Germany is an exceptional. Nuclear power in French? Yes, please. IEA chairwomen, the phase out of nuclear power in Germany is risky.	Germany's nuclear power policy is an exceptional in international community. As a for-runner in international environmental protection, the performance of Germany after the phase out of nuclear power will have enormous influence for other countries. If as an important industrial nation as Germany can succeed without nuclear power, then the justification of nuclear power in other countries would be greatly weakened. Still, now the other countries are just waiting and watching while at the same time just building more nuclear power plants. Is Germany an example of NIBY as a nation?

We could notice that the discourses about nuclear power after Fukushima are quiet politicalized in Germany. The anti-nuclear demonstrations are larger and more frequent even than in Japan. The coalition government answered quickly to these demonstrations which changed its extended nuclear power plants. Chancellor Merkel's discourse is that if it can happen in Japan, then Germany should not keep business as usual. Even though it was happened in Chernobyl but it was in a former Soviet Union which Germany do not compared as the same. The three months moratorium is made and an ethics commission is organized to discuss about a safe

energy supply. We could see that the government can dominate the discourses by its power to choose those who can attend the ethics commission. The exclusion of representations directly from nuclear power branch and industry, and the representatives who are close related to the society and the people guaranteed the reflection of the will of the people that is nuclear power, no thanks. The discourse turned to how to have a safe energy supply without nuclear power. The answer by the wise commission that a safe energy supply, that Germany needs to and wishes to organize its energy supply such that energy is made available in a way that is reliable, environmentally-friendly and competitively-priced –so that energy can ensure prosperity in the future too. The three pillars of sustainability, an intact environment, social justice and a healthy and powerful economy. (Ethics Commission on Safe Energy Supply 2011). As a democratic country, the will of Germans is the deciding power of the fate of political powers. The consensus of phase out nuclear power is the majority. Germany has a long history of anti-nuclear power movement and the environmental awareness of the Germans is high. The public have participated to increase the share of renewable energies themselves and they have a high expectation of renewable energies. Their willingness to pay a higher price to choose electricity from renewable energies is also reflected in the market as consumer power. Even though the coalition government, especially the FDP who is representative of industry, have extended the nuclear power plants, this big GAU, greatly changed the justification of nuclear power and if they do not change, the result would be reflected in the next election. It is the majority of Germans that dominated the discourse of nuclear power in Germany.

The first sub-discourse topic is that the nuclear power and different political parties. These politicians are the main speakers or interviewees to explain their opinions about nuclear power in media. These different nuclear power policies among parties became an election competition, aiming to win political support and weaken the power of the opposite. The change of ruling coalition parties was criticized by the opposition parties as a political election strategy. The SPD and the Green grab every opportunity to criticize the nuclear policy of the ruling coalition and challenge the ruling coalitions. The ruling coalition CDU/CSU and FDP also has its own conflicts, the conflicts between the environmental ministers and the minister of economy. The CSU from Bayern has a distinctive position to against nuclear power and said the phase out should be as soon as possible which was titled as CSU was painted green. The CDU minister president of Baden-Württemberg- Stephan Mappus is a vivid example to pay for his support for prolonging the nuclear power plants, lost in a land which CDU was chosen for 58 years. The Green party, anti-nuclear power was one of its foundation policies, is the winner and Winfried Kretschmann became the first minister president of Baden- Württemberg. These two federal states are strong industrial areas which demand for energy still, they do not want to have nuclear power. Since next year 2013 is the year of election, the influence of nuclear power policy could not be undermined.

Another group of sub-discourses are from the energy companies, they are E.ON, RWE, EnBW and Vattenfall. As the holders of nuclear power plants in Germany, they

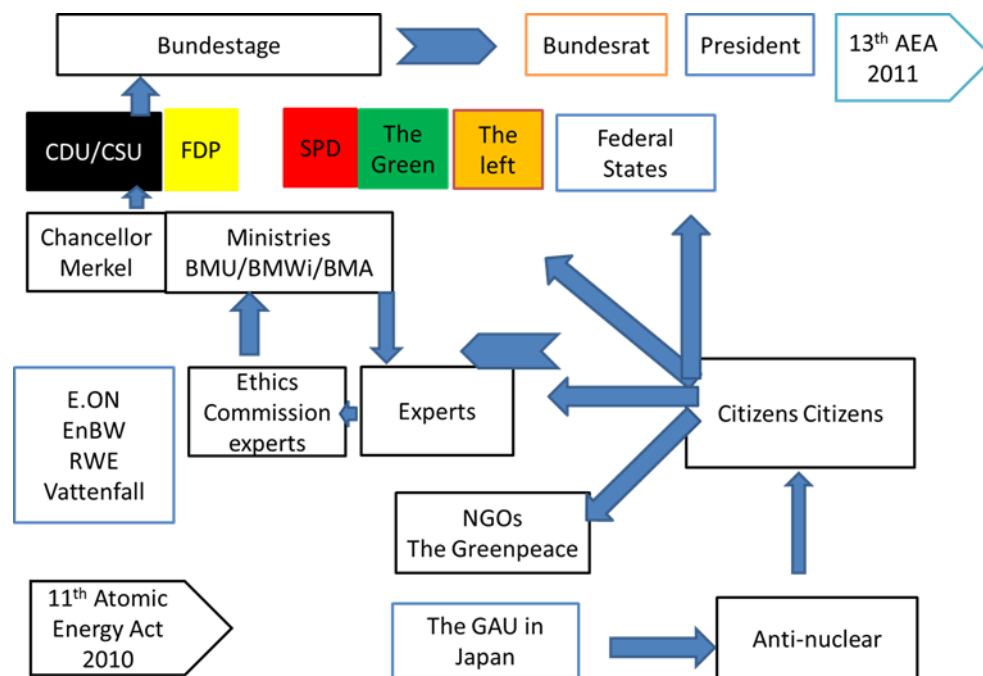
have a different voice from the above two actors. However, the trend of phase out of nuclear power is irresistible those who stand in this way will be washed away. For example, Jurgen Grossman ex-chief and atom-boss leaved RWE after in April, 2011 and Hans-Peter Villis will leave EnBW while it is going to set up a new company. Their next argument is to gain more time to phase out nuclear power. They are not satisfied with the 2022 deadline. As Johanna Thyssen from E.ON said that nuclear power is bridge energy, but such a short bridge is a meaningless bridge. They are going to stop to pay the eco-fund to support developing renewables, carbon storage and energy efficiency. For other companies, the discourses are mixed with lost and gains. Their lost in nuclear power means their opportunities in the development of renewable energies. Their main discourse concentrated on who is going to pay for the energy turnaround. The difference voices are appearing about the challenges of the energy turnaround. 1, how to supplement the electricity taken away from nuclear power? The suggestions are building more conventional fuel power plants. Then how does Germany achieve the aim to reduce carbon emission and climate change? There is possibility that the German's carbon emission will rise. Germany has to import electricity from neighbor countries and influence the whole EU electricity market. The renewable energy industry said that the electricity can be replenished by renewable energies. 2, the challenges of renewable energy are huge, for example, new grids problem. Since the old power grids cannot able to take in more than 20% electricity from renewable energy, a whole new power grid has to be built. 3, the rising of the electricity prices for citizens and the danger of a blackout and son on. From these arguments, we could see that the main problems are the energy turnaround is too expensive and will going to undermine the competitiveness of German economy which is the prerequisite of the energy turnaround not to harm the economy, the second is that to reduce the support from the citizens, the new power cable network definitely will impact the citizen's life. Will the large scale of renewable energy have NIBY problems?

The last sub-discourse is about international community, the phase out nuclear power action in Germany seems do not have many appreciators in the international community, it is an exceptional. Even in the EU, the majority members show more surprise of German emotional decision while keep on nuclear power. The super nuclear power country, France is the neighbor of Germany which Germans are protesting the French building nuclear power plants near the border. The nuclear power-boom in Asia and the renaissance of nuclear power are on its way, the decision of Germany is special since they are Germans. However, one of the countries, Japan which to Germany as its own reflection, will phase out its nuclear power plants or not? The big demonstration in Japan one year later against the restart of nuclear power echoed the demonstration in Germany. The Japan is going to take a new feed-in-tariff to promote the increased utilization of renewable energy, while Germany's experience are worth for Japan.(Huenteler, Schmidt et al. 2012)

Now let's turn to the academia works, there are two papers which answered the main arguments in the media. One is will the nuclear power lowered the electricity price by Uwe Nestle from eco-social market institute, the answer is no. The second one is will

the nuclear power a solution for sustainability and climate change by Lutz Mez from environmental policy research center Free Universität Berlin, the answer again is no. A third paper is titled German Exceptionalism: the end of nuclear energy in Germany, which explained the history of nuclear power energy in Germany and concluded with that it will be the first country to change its energy model, and is therefore going to be a laboratory for the energy mix of the future. So we could see that these scientists' knowledge about nuclear power are not in favor of nuclear power, they pointed the disadvantages of nuclear power and emphasized the strength of renewable energy. Germany's government support of environmental research is revealed by its diverse and dynamic environmental research institutions.

After we explained all these discourses, we are going to take a look at how these different discourses connected to the decision-making process and what is their purposes and influence to the society as a whole.



The political context of Germany defined its discourse of nuclear power largely after Fukushima. Germany is a democratic country with a multi-parties system which the citizens could impact the political process by voting and by demonstrations. The wave after wave of anti-nuclear power demonstrations motivated the majority of Germans to fight against nuclear power. On the other hand, the Germans have a long practice in renewable energy sectors, for example the Feed-in-Tariff which encourage people to put solar PV on their roof, to set up wind mill in the field and so on. The renewable energy industry are growing which provides jobs and economic growth, the German citizens relatively have a high trust in renewable energy. The public participation in these two energy sector is obviously to the government.

The current coalition government extended the life of nuclear power plants in Germany in 2009 to boost economy and take a lead in climate change. The discourse of the big GAU by chancellor Merkel that if it happened in Japan, it could also

happen in Germany changed the discourse from economic and climate change benefit to nuclear risk and energy turnaround. The ethics commission for a safer energy supply was organized to make detailed layout of nuclear risk and the alternative of renewable energy. Nuclear power as a technology that is not totally tamed by the human beings, the risk will always be there. As a technological advanced country, Japan's efforts after the crisis is not able to manage, the nature once again challenged the human technology. There is a philosophical thinking about the relation of human being and the nature.

The opposition parties criticized the favor-nuclear power parties with full power. The nuclear power is discoursed in a context of political power struggles to win the support of voters and defeat the others. The oppositions SPD and The Green demanded a nuclear phasing out as soon as possible, while the CDU and FDP have to make a plan that acceptable for all shareholders. It is interesting to look at that CSU as a coalition party has different opinion with CDU and FDP and complained about the extending time of nuclear power plants. The CDU paid for its own nuclear power policy, lost election to a federal state that belongs to CDU for 58 years. The nuclear GAU made a GAU to the German multi-parties system. The Green has a long profile for anti-nuclear power which made it the biggest winner during this GAU. The result is that the politicians' fate has obviously in the hands of its attitudes towards nuclear power, so that we could conclude that political support for phase out nuclear power is a fact in Germany now.

Even though there are public and political supports for phasing out nuclear power in Germany, still there are industries which did not agree with it. Since the citizens are also customers in energy market, their refuse of nuclear power pressured the energy companies to get rid of nuclear power. The fates of some presidents who spoke up for nuclear power are ended just like nuclear power in Germany. However, the focus of energy industries knowledge is divert from nuclear power to the energy turnaround, they are asking for a longer life of nuclear power as a bridge-energy. The phase out of nuclear power also brought loss to the climate change funding and put risk to the German industries. They argued that the price of electricity is going to rise and the huge investment needed to make energy turnaround which in the end the public has to pay. The advantages of renewable energy are discussed and the problems in renewable energy are largely reported.

Another important discourse is from the international community which made the efforts in Germany so exceptional. Germany stands up to a leader in environmental protection in the world. However, we are in a world running short of conventional energy resources and rising CO₂ emissions, Germany is a country that dare to turn the trend of the world development in nuclear power. It is admired, but also criticized as an emotional decision with a pessimistic predict. Not to mention the world, even in the EU, there are totally different opinions about nuclear power energy. The French are waiting for the Germans to import electricity produced from nuclear power. New power plants are going to be built in the neighbor. The decision of phasing out nuclear power at moment is hard to diffuse to other EU countries. Even though the EU has a different nuclear power policy, the German's energy turnaround can also benefit from the network of EU. Everyone will pay attention to the progress or challenges of the energy turnaround in Germany. Will there be another industrial revolution?

The discourse around Germany is between nuclear power and its alternative—renewable energy. The citizens are the key power to phase out nuclear

power. They attended in environmental organizations, anti-nuclear power demonstration and vote for politicians and parties. The strong environmental research power in Germany argued against the justification of nuclear power for economic and climate change. On the other side, the industries except renewable energy industries or related companies, especially the nuclear power industry is murmuring the huge price that Germany has to pay for its decision and its harm to economic competitiveness in world market. The hope lies in technology and innovation progress, especially how to make renewable energy competitive.

A Comparative Analysis and Conclusion

The different discourses in both countries lead their way to justify their own nuclear power policies domestically. One common trend could be seen in these two countries that politics is leading the trend of main discourses. Because of different political context, who is going out to discourse nuclear power, what kinds of knowledge are emphasized and what is neglected and who are included in decision-making process are also greatly influenced by politics. Since knowledge about the nuclear power is from different subjects and actors, which have different interests and powers behind them, so we are going to look at the relation between subjects' knowledge (science) and politics in both countries.

Who are the main actors who got interviewed and have the right to talk about nuclear power? In China, the knowledge about nuclear power is dominated by the nuclear power related experts. The interpretation of the panic salt buying is that the public lack of nuclear power knowledge, so it is the responsibility of nuclear power experts to spread nuclear power among the people. These experts lead a technical discourse of Fukushima nuclear crisis and they argued if proper action was taken, it could avoid. The ability of human to control nuclear power is stressed and the importance of advancing technology and science is emphasized over and over again. It could be said it is dominated by a nuclear power coalition, which are made of strong organizations and enjoy all kinds of resources, such as scientific knowledge, while the people, as a check power, is in dispersion and lack of information to argue against with this dominance discourse. Contrary to China's discourse, German's nuclear power is dominated by politicians and experts from different expertise background, especially from environmental related fields in the direction of an ethic problem. And about the Fukushima event, the damage caused by the nuclear crisis is highlighted in German's discourses, and the assumption is that it could also happen in Germany since it happened in a highly-developed, technical advanced country as Japan. The anti-demonstrations of Germans are strong signs to the German politicians, that the German people demand a future without nuclear power.

What kinds of interests and power do they have in both countries? In China, these experts who came out to talk and answer question about nuclear power are representatives from states nuclear corporations, nuclear power research institutes and government departments. Their interests are favor nuclear power and their power is great under the current nuclear decision-making process in China. Their expertise in

nuclear power is valued both by the government and the people. The government relies on these nuclear power experts to make its own development plan, while the people looked up these experts to get information about nuclear power. China has a strong social culture which admires science and technology, while science and technology attract most of the brilliant student. In Germany, which has a long history in environmental research and development, they are the main actors who have a say and are believed by the public about nuclear power information. These experts are supporters for renewable energy which are able to take place of nuclear power in Germany. The nuclear risk to the society is over its benefits to the society. Through decades of practice, the Germans have produced large part of electricity from renewables and this is a movement of down to the community and household families. The Public has high environmental awareness and at the same time, they valued knowledge from environmental experts.

The discourse subjects in China is nuclear experts support by the state-owned nuclear industry while in Germany, the subjects are the environmental experts who are supported by the public. In China, the nuclear decision-making process have showed that an expert-politician coalition in a closed high-level circle decision making process which the public has no formal channel to influence the decision, only through their fear interpreted as instability and their hope of the central government's authority and mercy. In Germany, the power of the public is vivid showed in the federal states election after the Fukushima event. The politicians' career is depending on their ability to meet the demand of the public. The members of the ethics commission is another influence of how politics choose specific experts in this important policy consulting institute, the excluding of direct experts from nuclear industry gave no chance to the nuclear power plants interests.

Even though there are quiet lots knowledge about nuclear power in both countries, still through their interests and powers behind them, we could notice the purpose behind all these detailed discourse. In China, nuclear energy is defined as a clean energy, the government would safely and effectively to develop nuclear power, the Fukushima challenged the "Safe" problem, most of the experts are saying that nuclear power plants in China is safe, we will adopt the most advancing technology which is taken as the most safe in the world. The comparison of nuclear power discourse focuses on coal in China which killed thousands of coal mining workers every year, and the coal is polluting the air and gives out carbon emission. Another is nuclear power is necessary for China at the moment, the conventional energy is running out while the energy demanding is soaring in China. China invested lots in every kinds of energy, including renewable energy, but the development of renewable energy at the moment has so many problems which greatly broke the expectation of the people. While in Germany, the comparison discourse is renewable energy which is less risk and cleaner as nuclear power. Germany has much less pressure for a rising energy demand at the moment as in China. The renewable energy develops very well in Germany, creating jobs and producing electricity. There are Germans who would like to pay more to use electricity from renewable energy. Germans holds a high expectation of renewable energies.

Nuclear power is a controversial power in the framework of sustainable development. Is it cheap, is it clean, is it environmental-friendly and is it safe? China and Germany would not agree with each other in these adjective of nuclear power. Even though the knowledge about nuclear power in a scientific perspective are the same, it is the

politics that decides what knowledge are going to be adopted and emphasized, and what knowledge are neglected or omitted. As nuclear power is still a power that human being can not totally control it, there are still so many uncertainty about all those nuclear waste under the ground or ocean. The possibility of nuclear crisis is always there, and there are many nuclear power plants in the world. The research of science and technology is advancing to the unknown nuclear power, but how safe is safe? How much risks a society would like to bear? What kind of life do we choose?

The Chinese government choose to develop nuclear power has its own reasons, while German's refuse nuclear power is also persuasive. Politics decide the way to go. In China, nuclear power is an alternative of conventional energy, especially coal. In Germany, nuclear power is a worse alternative compared with renewable energy. In China, the challenge lies in how to make nuclear power safe. Since Chinese Academia of Engineering has its own preference towards nuclear power, the first thing is to diversify the expert team in the decision-making process to check the power of nuclear industry. Germany enjoys the support of the public and the expert team, however, the industry has its own interests which are questioning the energy turnaround, so that how to engage the opposition power to promote renewable energy development is a big challenge for the government. Even though both countries have decided the different fate of nuclear power in their own country in the near future, still there are opportunities for more cooperation and communication in both countries.

Reference:

- BBC (07-02-2012). "Japan switches on Ohi nuclear reactor amid protests."
- BMU (09-2011). *Questions and answers about transforming our energy system*. N. C. a. N. S. German Federal Ministry for the Environment.
- Chen, Q. (03-17-2011). 国务院：调整核电规划 暂停审批新项目 *State Council: The Adjustment of Nuclear Power Plan and Suspend the issue of New Nuclear Power Plant*. 上海证券报 Shanghai Securities News. finance, The People.com.cn.
- Chilton, P. A. (2004). *Analysing political discourse: Theory and practice*, Psychology Press.
- CHINADAILY (07-31-2012). "东京上演万人烛光反核游行 内阁犯难绿党诞生 *Thousands of people anti-nuclear power with lighting candle, challenging the cabinet and founding the green party*".
- CNN, J. O. a. J. M. (2012). "Tens of thousands demonstrate against nuclear power in Japan."
- Deng, J. T. W. (05-22-2011). 徐玉明表示：2020 年中国核电有望达到 7000 万千瓦 *Xu Yuming: China's Nuclear Power Capacity is Expected to Reach 70GWe*. Xinhua New Agency Jinan Branch. CCTV on line, Xinhua News Agency.
- Ethics Commission on Safe Energy Supply, E. C. (2011). *Germany's Energy Turnaround--A Collective Efforts For The Future*. Bundesregierung. Berlin.
- FOCUS (07-29-2012). "Zehntausende demonstrieren in Japan gegen Kernkraft... *Thousands anti nuclear power demonstration in Japan*."
- Hajer, M. and W. Versteeg (2005). "A decade of discourse analysis of environmental politics: achievements, challenges, perspectives." *Journal of Environmental Policy & Planning* 7(3): 175-184.
- Hao, L. S. L. (07-05-2012). 核电重启的背后推手 *The Pusher Behind the Restart of Nuclear Power* Xincaijing
- Hardy, C. and N. Phillips (2002). *Discourse analysis: Investigating processes of social construction*, Thousand Oaks, CA: Sage Publications.
- Huenteler, J., T. S. Schmidt, et al. (2012). "Japan's post-Fukushima challenge—implications from the German experience on renewable energy policy." *Energy Policy*.
- Jørgensen, M. and L. J. Phillips (2002). *Discourse analysis as theory and method*, Sage Publications Ltd.
- Jahn, D. and S. Korolczuk (2012). "German exceptionalism: the end of nuclear energy in Germany!" *Environmental Politics* 21(1): 159-164.
- Joppke, C. (1993). *Mobilizing against nuclear energy: A comparison of Germany and the United States*, Univ of California Pr on Demand.
- Locke, T. (2004). *Critical discourse analysis*, Continuum International Publishing Group.
- Maier, S. J. F. (2009). *Theoretical and Methodological Aspects of Foucauldian Critical Discourse Analysis and Dispositive Analysis*, Sage Publications Ltd.
- Nelkin, D. and M. Pollak (1980). *The Atom Besieged: Extraparliamentary Dissent in France and Germany*.

Reuters and guardian (07-30-2012). "Protesters demonstrate against nuclear power plants at Japan's parliament."

StateCouncil (2012). Wen Jiabao 温家宝主持召开国务院常务会议

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“十二五”规划及 2020 年远景目标》. S. C. Office. Beijing.

Wang, Q. and X. Chen (2012). "Regulatory failures for nuclear safety—the bad example of Japan—implication for the rest of world." Renewable and Sustainable Energy Reviews 16(5): 2610-2617.

Wang, R. (05-31-2012). “十三五”中国的核电装机约 7 0 0 0 万千瓦 In The Thirteenth- Five Years, China's Nuclear Capacity will about 70GWe. Chinese Securities Newspaper.

Zhou, Y., C. Rengifo, et al. (2011). "Is China ready for its nuclear expansion?" Energy Policy 39(2): 771-781.

Zhu, Y. (2010). Offering Advice and Suggestions for China's Nuclear Power Industry,an Exclusive Interview With Wang Zeping, Deputy of Energy Business Department of CIECC. China Investment.