ERCCT Online Paper Series:

Global Warming and the Politics of Climate Change in Taiwan

(Shih Yi-Yen)

August 2012

EOPS No. 0011

–Young Scholar Workshop 2012 selected collections –

European Research Center on Contemporary Taiwan

Eberhard Karls University, Tuebingen
Wilhelmstrasse 133
72074 Tuebingen
Ph.: +49 7071 29 72717
e-mail: ercct@uni-tuebingen.de

Global Warming and the Politics of Climate Change in Taiwan

YI-JEN, SHIH*

ABSTRACT

Human activities may cause warming through increasing carbon emissions to endanger diverse aspects of life. Following the current global concern on carbon emission reduction, this research wants to discuss Taiwan's passive response to climate change and its political context. In spite of being one of the largest carbon emitters in the world, Taiwan refuse to pass the Greenhouse Gas Reduction Act (GHGRA) with a positive legally binding target, while GHGRA is essential to formulate overall legal framework to manage national mitigation policy. This paper explains how Taiwan reacts to international climate policy through the revisited interest-based explanation. The explanation assumes that public concern of ecological vulnerability make decision makers act on climate change. Otherwise, domestic institutions and negotiations among different actors also have great influence on mitigation policy. It is because that those main actors always have different cost-benefit consideration in curbing carbon emissions. This paper argues that although there is widespread concern about global warming in Taiwan, most people thinks that environmental issues are of secondary importance because of the *Giddens's Parado*x. Moreover, different actors have their own interests and preference in the legislative process of the GHGRA. Among Taiwan's political leaders, both in the Executive and the Legislature, climate change lends itself to gestural politics.

Keyword: Climate Change, Greenhouse Gas Reduction Act, Revisited Interest-Based Explanation, Kyoto Protocol

* Postdoctoral Research Fellow, Center for China Studies, National Chengchi University. E-mail: yijenshih@gmail.com.

1. Introduction

Since the industrial revolution, human activities have substantially increased the concentrations of greenhouse gases (GHGs) in the atmosphere. These increases result in an additional warming of the climate system through enhancing the natural greenhouse effect, and harm humans and ecological systems. Scientific analyses have become more and more precise on the causes and impacts of climate change (Oreskes, 2004: 1686). The Intergovernmental Panel on Climate Change (IPCC) emphasizes that warming of the climate system is an unequivocal truth, as is evident from observations of increases in global average temperatures, widespread melting of snow and ice, and rising average sea level (IPCC, 2007: 30-31).

Global warming may not only worsen related environmental degradation, but change the frequency and the intensity of extreme climate events as well. Following from this, extreme climate events would exacerbate the phenomenon of natural resources depletion, such as food security (Brown and Funk, 2008: 580-581), and cause potential economic, social and political conflicts (Barnett, 2003: 14-15). Ulrich Beck (2010: 174-176) emphasizes that climate change would globalize and radicalize social inequality.

When there is a widespread consciousness that the potential risk of incurring in relevant economic losses and environmental degradations due to global warming is high, climate change has become one of the major environmental concern of most countries, including different countries and international groups (Victor, 2004). Since 1990s, international negotiations to reduce GHG emissions have been taking place, from Rio de Janeiro to Kyoto. However, national response strategies to climate change involves interactions among domestic politics, foreign policy and international relations (Paterson, 1996; Sprinz and Weiß, 2001). Taiwan's decision-making for climate change also has the similar political background.

Taiwan plays an indispensible role in international climate change politics. In the domestic level, Taiwan is a victim country which is threatened by climate change due to its highly ecological vulnerability. Climate change has already caused lots of adverse impacts to Taiwan, such as increasing loss of fresh water and the coastal ecosystems. What is more, Taiwan also experiences a variety of extreme climate events which carry much hidden costs, such as huge economic loss and increasing climate refugees, in turn leading to political, economic and social

instability (Hsu et al., 2011). For instance, the Xiaolin village (小林村) was totally destroyed by one catastrophic mudslide during Typhoon Morak in Aug 2009, and unfortunately, over 600 Xiaolin's residents are believed to have been buried alive. Liu Chung-ming, Professor of Atmospheric Science at National Taiwan University, argues that this buried residents can be regarded as one kind of climate refugee (Liu, 2010).

In the international level, Taiwan ironically plays one of those main GHG emission countries in the world. Taiwan has been excluded from most of international environmental negotiations since 1972 because its diplomatic dilemma and United Nations non-member status. Thus, United Nations and most countries neglect Taiwan's obligations to reduce GHG emissions. However, Taiwan is one of the largest energy use and GHGs emission countries in the East Asia and in the world. Table 1 and Table 2 adopt International Energy Agency (IEA) data to analyze show the long-term trends of Taiwan's carbon emission (International Energy Agency, 2011).

Table 1 The Trends of Taiwan's Population, Economic Growth, Energy use and CO_2 emission (1990-2009)

	Population (millions)	GDP (billions 2000 USD)	Total Primary Energy Supply(million toes)	CO_2 Emission (million tonnes of CO_2)
1990	20.3(0.385%)	261.4(0.784%)	48.2(0.549%)	114.3(0.545%)
1995	21.3(0.375%)	370.8(0.980%)	63.8(0.690%)	156.5(0.718%)
2000	22.2(0.365%)	491.4(1.073%)	85.1(0.848%)	217.3(0.925%)
2005	22.7(0.352%)	575.1(1.035%)	102.6(0.895%)	258.9(0.952%)
2007	22.9(0.347%)	638.0(1.027%)	109.9(0.912%)	272.3(0.937%)
2008	22.9(0.343%)	642.7(1.003%)	105.5(0.860%)	261.3(0.887%)
2009	23.0(0.340%)	630.4(0.981%)	101.1(0.832%)	250.1(0.862%)

Source: International Energy Agency (2011: 47, 77, 83, 86)

Table 1 shows that the total population in Taiwan was last reported at 23.0 million people in 2009 from 20.3 million in 1971, changing 13.3 percent during the last 18 years. While Taiwan has only 0.34 percent of the world's total population, Taiwan is responsible for 0.862 percent of the world's total emission of carbon dioxide (CO_2). At the same time, Taiwan's primary energy supply are 101.1 million

toes in 2009, which has 0.832 percent of the world's primary energy consumption. Table 1 reflects that both CO_2 emission and energy consumption in Taiwan are much higher than world average.

Otherwise, Table 2 compares CO_2 emissions in Taiwan and developed countries which are listed in Annex B of the Kyoto Protocol (Annex B countries). In 2009, Taiwan's total annual carbon emissions are 250.1 million tonnes only lower than twelve Annex B countries, including Australia, Canada, France, Germany, Italy, Japan, Poland, Russian Federation, Spain, Ukraine, United Kingdom, and United States, and higher than other 26 Annex B countries. Meanwhile, The average annual CO_2 emissions per capita in Taiwan is 10.89 tonnes, which is only lower than Australia, Canada, Estonia, Luxembourg and U.S.A. When most Annex B countries have their obligations to reduce GHG emission before 2012 according to the Kyoto Protocol, Taiwan ironically have no obligation due to its non-member status in the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. In other words, whether Taiwan can effectively control its carbon emissions would influence the performance of international climate governance. Thus, Taiwan must be regarded as an indispensible role for the future success of the international efforts to combat climate change.

Based on above-mentioned domestic and international reasons, this paper analyzes the politics of climate change in Taiwan and pay main attention on Taiwan's *Greenhouse Gas Reduction Act* (溫室氣體減量法, GHGRA) and its legally binding targets. When the Kyoto Protocol passed in the third Conference of the Parties (COP) of the UNFCCC in 1997, different countries adopt their political positions to response the Kyoto Protocol, especially in those Annex 1 countries of the UNFCCC. While some Annex 1 countries refuse, lag and retreat to ratify the agreement, such as United States, Australia before 2007 and Canada after 2012, others are inclined to positive response the Kyoto Protocol through different approaches.

Table 2 Annex B Countries and Taiwan's CO_2 Emission in 2009

Country	total (million tonnes)	per capita (tonnes)	Country	total (million tonnes)	per capita (tonnes)
Australia	394.9 (1.36%)	17.87	Lithuania*	12.4 (0.04%)	3.71
Austria	63.4 (0.22%)	7.58	Luxembourg	10.0 (0.03%)	20.10
Belgium	100.7 (0.35%)	9.33	Morocco	41.3 (0.14%)	1.29
Bulgaria*	42.2 (0.15%)	5.56	Netherlands	176.1(0.61%)	10.66
Canada	520.7(1.80%)	15.43	New Zealand	31.3 (0.11%)	7.23
Croatia*	19.8 (0.07%)	4.46	Norway	37.3 (0.13%)	7.73
Czech Rep.*	109.8 (0.38%)	10.45	Poland*	286.8(0.99%)	7.52
Denmark	46.8 (0.16%)	8.47	Portugal	53.1 (0.18%)	5.00
Estonia*	14.7 (0.05%)	10.94	Romania*	78.4 (0.27%)	3.65
Finland	55.0(0.19%)	10.30	Russian Fed.*	1,532.6(5.29%)	10.80
France	354.3 (1.22%)	5.49	Slovak Rep.*	33.2 (0.11%)	6.12
Germany	750.2(2.59%)	9.16	Slovenia*	15.2 (0.05%)	7.42
Greece	90.2 (0.31%)	8.00	Spain	283.4(0.98%)	6.17
Hungary*	48.2 (0.17%)	4.81	Sweden	41.7 (0.14%)	4.48
Iceland	2.0 (0.01%)	6.26	Switzerland	42.4 (0.15%)	5.44
Ireland	39.5 (0.14%)	8.83	Ukraine*	256.4(0.88%)	5.57
Italy	389.3(1.34%)	6.47	U.K.	465.8(1.61%)	7.54
Japan	1,092.9(3.77%)	8.58	U.S.A.	5,195.0(17.91%)	16.90
Latvia*	6.8 (0.02%)	2.99	Taiwan	250.1(0.86%)	10.89

Source: International Energy Agency (2011: 46-48, 97-99).
* Countries that are undergoing the process of transition to a marker economy.

Most of the Kyoto Protocol member countries ratified the Kyoto Protocol directly. Otherwise, some countries harmonizes domestic laws with the responsibilities under the Kyoto Protocol. For example, Japan's Parliament passed the *Act on Promotion of Global Warming Countermeasures* (地球温暖化対策の推進に関する法律) in 1998, which claims that Japan should achieve the reduction target required by the Kyoto Protocol. Furthermore, some countries enact domestic laws with more positive reduction targets to show their political willingness toward reducing GHG emission. In Switzerland, *the CO_2 Law*, adopted in 1999, mandates that energy-related carbon emissions must be reduced by 10 percent from 1990 to 2010. Two sub-targets are built in the CO2 Law, including reducing 15 percent for stationary fuels and 8 percent for transport fuels (International Energy Agency, 2007:

27). The latest and most important example is UK's Climate Change Act 2008. According to the first article of the Climate Change Act, UK government should "ensure that the net UK carbon account for the year 2050 is at least 80 percent lower than the 1990 baseline."(Giddens, 2009).

Taiwan can not take part in the UNFCCC and the Kyoto Protocol, hence, Taiwan's government decided to enact the domestic act to response international climate actions. When the Kyoto Protocol entered into force on 16 February 2005, the GHGRA was drafted out by the Executive Yuan (行政院, Taiwan's central cabinet) in order to response the Kyoto Protocol and following international climate regulations. Hence, the framework of GHGRA refers to the Kyoto Protocol. For example, in the General Interpretation of the draft GHGRA emphasizes that Taiwan is unable to ratify the UNFCCC and the Kyoto Protocol due to its special international status, but Taiwan, as a member of the global village, accords to the spirit of the UNFCCC and the principle of common but differentiated responsibilities (CBDR) to mitigate climate change and pursue sustainable development.

The main research question is why Taiwan decided to be a passive role in global climate actions. The draft GHGRA is treated as Taiwan's national legal framework to response global climate actions, but its legislative process is fraught with difficulties and uncertainties. On the one hand, the Executive Yuan rejected to build a legally binding reduction target and write this target in the GHGRA. On the other hand, the Legislative Yuan (立法院, Taiwan's Parliament) has refused to pass the GHGRA from 2006 to now. Without the GHGRA as the legal basis, Taiwan is lack of obvious and certain reduction targets, and relative ministries can not formulate and implement climate policy to effectively control GHG emission.

This paper is composed of four sections to portrays the political dynamics of Taiwan's climate change policy. The first section includes brief literature review on national response to international environmental negotiations, and builds the revisited interest-based explanation. In the second section, this paper introduces the research methods and the data sources to explain Taiwan's climate change policy. In the third section, this paper analyzes whether Taiwan people's environmental awareness would influence their willingness to support positive climate change policy. Besides, in the fourth section, this paper discusses political bargaining

between the government and non government sectors during the climate decision-making process.

2. Literature Review

2.1. The Original Interest-Based Explanation and its Assumption

International environmental problems are the pollution that originates in certain countries but cause degradation in another countries' environment by crossing borders through pathways like air or water (Elliott, 2004; Chasek et al., 2010). the number and magnitude of international environmental problems, both transboundary and global in scope, grows dramatically since 1970s. In response, a multitude of global and local actors have responded to the challenge of international environmental problems. Egoistic sovereign states, represented by governments, are still the major actors attending to international environmental challenges, including as entities of international agreements by taking over legally binding obligations or in terms of providing the resources needed to pursue international environmental policies (Dolsak, 2001; Busby and Ochs, 2005; Lantis, 2006; Chasek et al., 2010: 53-61).

Detlef F. Sprinz and Tapani Vaahtoranta (1994; 2002) assumes the interest-based explanation of international environmental policy (IBE) to explains in a parsimonious way how countries reacted to international environmental problems. The fundamental assumption of the IBE is that the main actor responsible for international environmental policy is the state. Different countries have their own preferences, further, they rationally seeks wealth and power by comparing the costs and benefits of alternative courses of environmental action. Even though the state is treated as the main actor in international environmental policy, international environmental cooperation should not necessarily be perceived as being impossible. The effective international environmental agreement depends to great extent on whether states perceive shared interests or not (Luterbacher and Sprinz, 2001; Sprinz and Vaahtoranta, 2002).

For example, most developed countries have been the main pushers in the international negotiations to reduce GHG emissions, they have not acted as a unified

group. The United States has referred to scientific uncertainties as well as high abatement costs and refused to ratify the Kyoto Protocol in 2001, while most European Union countries decided to persist on strict climate agreements (Hovi, 2003: 20-21). Otherwise, when most developing countries have been skeptical about the need to act on climate change, but the judgment has not been shared by the small island nations that are particularly vulnerable to the potential rise in sea level and to greater incidences of tropical storms (Luterbacher and Sprinz, 2001).

To assert that countries pursue their national interest can not fully reflect what their specific preferences might be in a given situation. Therefore, Sprinz and Vaahtoranta (1994: 95-103) assumes that states are pursuing two main goals with the help of their international environmental negotiations. On the on hand, each country tries to avoid vulnerability in its own territory to transboundary pollutants. the degree to which countries are ecologically vulnerable provides incentives to remedy the situation by undertaking beneficial mitigation measures. Therefore, the IBE suggests that countries which experience high ecological vulnerability or serious environment degradation will strive for strict environmental regulations as compared to countries which have a resilient environment (Sprinz and Vaahtoranta, 1994: 79).

On the other hand, countries are not merely influenced by considerations of the environmental degradations avoided by way of international environmental policies. Instead, they also take the abatement costs of environmental policies into account. Therefore, the IBE expects that countries with low abatement costs might be more willing to support stringent international rules as opposed to countries with high abatement costs. Otherwise, a country's capacity to abate pollution influences its propensity to seek international environmental regulations. A country may promote strict regulations that would benefit it by increasing international demand for its pollution abatement technology and its substitute compounds (Sprinz and Vaahtoranta, 1994: 80).

Once countries are classified along these two dimensions, namely ecological vulnerability and abatement costs, as high or low, four categories of countries in the international environmental negotiations can be defined, as Table 3 shows, including pushers, intermediates, draggers and bystanders. Sprinz and Vaahtoranta (1994: 81) argues that those pushers will support stringent international environmental

regulation, while draggers may oppose international regulation. Otherwise, those intermediates will find themselves in a particularly precarious situation. Although they face environmental incentives to take part in environmental regulation, they may be unwilling to shoulder the substantial costs involved. As for bystanders, they should have little ecological incentives in environmental regulations, but they may adopt more ambitious positions than draggers due to the low costs related to their negotiation position.

Table 3 Classification of a Country's Support for International Environmental Agreement

		Ecological Vulnerability	
		Low	High
Abatement Costs	Low	Bystanders	Pushers
	High	Draggers	Intermediates

Source: Sprinz and Vaahtoranta (1994: 81; 2002: 323).

The above-mentioned classification generates expectations about the response strategies of different countries. It could be expected that those pushers take more stringent environmental positions than intermediates do, while intermediates may support environmental policies more often than draggers. The likelihood of bystanders' supporting environmental policies should fall between those for pushers and draggers. In short, the IBE would generates expectations about the stringency of the international environmental regulations favored: pushers will lead with high demands and draggers will be the least enthusiastic, whereas both bystanders and intermediates will fall in between. Moreover, the IBE is not a static model. Technological innovation often reduces abatement costs. Should this be the case, formerly less enthusiastic countries, such as draggers and intermediates, may change their positions to support international environmental regulations that are more strict than those originally inclined (Sprinz and Vaahtoranta, 1994: 81; 2002: 323).

2.2. The Revisited Interest-Based Explanation

The original IBE was tested in two case studies, namely *the Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol) (Benedick, 1998) and *the Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by at Least 30 Per cent* (Helsinki Protocol) (Levy et al., 1993; Sprinz and Helm, 1999). By using quantitative data and either thresholds or averages for allocating countries to categories according to two main variables, Sprinz and Vaahtoranta (1994: 89-95) find that the predictions were largely borne out in the case of the Montreal Protocol. However, in the case of the Helsinki Protocol, only the category of pushers was well explained, whereas the countries in the remaining three categories mostly behaved passively in reducing sulfur emissions.

The IBE is adopted to explain national response to different international environmental negotiations. Ian H. Rowland (1995: 236-243) uses the IBE to investigate 24 member countries of the Organisation for Economic Co-operation and Development (OECD) and their positions toward international climate negotiations. Rowland finds that the merely 11 OECD countries are accurately predicted by the IBE. Sprinz and Weiß (2001: 76-85) also uses the IBE to review the United States and the European Union in the international climate negotiations under the UNFCCC. Shih Yi-jen (2008; 2009) also use the IBE analyzes why both China and the United States oppose positive climate agreements. Otherwise, Fang Rong (2010: 4582-4583) pays attention on five main developing countries, including China, India, Brazil, South Africa and Mexico, and uses the IBE to analyze the factors that affect the likely positions of these main developing countries.

Although most scholars recognize that the original IBE provides a parsimonious answer to classify countries' positions according to their values of ecological vulnerability and abatement costs, they also argues the IBE relies too much on economic and scientific indicators to predict countries' positions, and neglect the domestic political dimensions, such as public pressure on decision makers, and political bargaining among different actors, such as the legislative and administrative branch, relative industries and environmental non-governmental organizations (Rowlands, 1995; Sprinz and Weiß, 2001; Shih, 2008; 2009).

Therefore, this paper develops a revisited interest-based explanation (RIBE) of support for international environmental regulations. The RIBE of the international

politics of environmental management also focuses on two domestic factors that shape a country's position in environmental foreign policies. However, Instead the original IBE merely offers a partial but parsimonious view of how a country's preferences for international regulations are shaped. The RIBE pays more attention on two domestic factors and their political context. These preferences may change during international negotiations if the domestic politics of a country change.

On the one hand, The RIBE uses ecological risk toward pollution to replace ecological vulnerability. Each country seeks to avoid vulnerability to pollutant and pursues environmental policies that minimize adverse environmental impacts on their own citizens and ecosystems. However, ecological vulnerability by itself may not be able to spur a response. Rather, the scientifically informed perception of an ecological risk can make voters act on environmental degradation through public pressure in democracies. Incorporating ecological risk perception makes the RIBE more dynamic since the perception of ecological risk may differ even in the absence of changes in the state of the environment (Sprinz and Vaahtoranta, 2002: 324; Shih, 2012). Kathryn Harrison and Lisa M. Sundstrom (2007: 6-7) emphasize that an important motive for political leaders in democracies is that of reelection. All else being equal, the greater the public pressure with high ecological risk, the more likely a democratic country should be to ratify international environmental agreements.

However, Anthony Giddens (2009: 2) reminds that the relations between public conception of ecological risk and their support for international climate agreements exist the challenge of *Giddens's paradox*. Since the risks posed by climate change are not tangible, immediate or visible in the course of day-to-day life, the public will sit on their hands and do nothing of concrete nature of them. Giddens's Paradox affects most aspects of current reactions to climate change. Although most of the public accept that climate change is a serious threat, they always treat climate change as a back-off-the-mind issue rather than a front-of-the-mind one. Giddens's Paradox comes from the problem of temporal discounting. Laurie Hendrickx and Sietske Nicolaij (2004: 409) thinks that risk evaluations contain two components: ethical concerns focus on the morality of the actions causing the risk, and loss-related concerns focus on potential future losses. Robert Gifford (2011: 292) also emphasizes that temporal discounting, a kind of limited cognition, would cause people's underevaluation of distant or future risks.

Besides of temporal discounting, Giddens (2009: 102) also argues that the public goods characteristics of climate change might decrease public willingness to support positive climate policies. Climate change represents a tragedy of the commons on a global scale. The nations of the world, and individuals within them, overexploit atmosphere because they gain lots of advantages from the activities that contribute to global warming but suffer only a little fraction of the environmental costs. In turn, nations and individuals, as a free-rider, oppose to reduce GHG emissions unilaterally, because in doing so they would pay the full price of abatement but gain only a fraction of the benefits (Dietz et al., 2003: 1907; Sorros, 2005: 46-47; Harrison and Sundstrom, 2007: 1-2). Reducing GHG emissions is a kind of public goods, hence, most people think that they can not solve the global warming by themselves because of the challenge of free-riding (Barrett, 1999; Heal, 1999). Free-riding can arise in most area of social and economic life in which collective outcomes hinge on decisions taken by individual actors. Problems of free-riding exist in the area of climate policy, from the level of ordinary citizens right up to the international climate actions. The result of public goods and free-riding cause people unwilling to support climate policies, even they feel climate risk is dangerous.

On the other hand, The RIBE recognizes the importance of abatement costs, but emphasized that national interest calculation is based on domestic negotiations among different political actors. The original IBE highly relies on economic indicators to predict national response to international environmental agreements (Shih, 2012). For example, Sprinz and Vaahtoranta (1994: 86) hypothesized that the economic cost of reducing chlorofluorocarbons (CFCs) would influence countries' positions toward the Montreal Protocol, and annual costs of a 30 percent reduction of SO_2 from 1980 levels by the year 2000 would influence countries' supporting for the Helsinki Protocol. The RIBE argues that national interest does not equal to reduce economic cost. Fong Rong (2010: 4585-4586) uses macroeconomic indicators to predict five main developing country's positions toward post-Kyoto negotiations.

Different actors have their own opinions toward national interest and economic cost in the international environmental negotiations. For example, Yasuko Kawashima (1997) suggested that those political leaders having played a main actor

in pushing for environmental foreign policies have not been driven by public concern but by their personal beliefs about the interests of environmental diplomacy. Helen V. Milner (1997: 33-37) emphasizes the political structure of domestic preferences influences international negotiations. The policy preference of different actors, such as the legislature, the executive, relative industries and environmental non-government organizations (ENGO), in domestic politics derive from their interest.

In general, the form of the IBE permits a initial order assessment of the likely positioning of countries in international environmental negotiations. The RIBE suggests that a more elaborate explanation will have to demonstrate that the inclusion of political contexts leads to substantive increases in explanatory power.

3. Research Methods and Date Sources

This paper discusses the politics of climate change in Taiwan, which pays attention on the legislative process of the GHGRA. According to the research question and theoretical framework, this paper adopts both quantitative and qualitative methods to analyze the legislative process of the GHGRA.

The factor of ecological risk hypothesizes that citizens' ecological risk will influence national response to international climate actions. However, the relations between public ecological risk and their support for the GHGRA would exist the challenge of *Giddens's paradox* and the problem of temporal discounting. This paper uses the quantitative method and empirical data to analyze the relations between ecological risk and the public support for the GHGRA. The empirical data are from the Taiwan Social Change Survey 2010 and its Environment Module (TSCS 2010). The TSCS 2010 refers to the International Social Survey Programme 2010 and was operated by the Institute of Sociology and the Center for Survey Research at the Academia Sinica (Chang et al., 2011).

Otherwise, Although the importance of abatement costs is emphasized by the IBE and the RIBE, but the latter argues that abatement costs can not be simplified as the change of economic indicators (Sprinz and Weiß, 2001). A countries' abatement cost calculation is embedded in its political process. Different actors in the domestic structure have their own preferences toward national interest and abatement costs in

the international environmental negotiations. In order to realize different actors preferences and their political bargaining in the legislative process of the GHGRA, this paper uses qualitative method and in-depth interviews. In-depth and qualitative interviews are useful methods to use in understanding interactions among different actors because they use an open-ended, discovery-oriented method, which allows the interviewer to deeply explore the respondent's response on the GHGRA.

The nine respondents of in-depth viewing from different sectors include Wen-yan Chiau (邱文彥, 8th Legislator and former Deputy Minister of Taiwan's Environmental Protection Administration), Chea-yuan Young (楊之遠, former Director General of the Division of Air Quality and Noise Control of Taiwan's Environmental Protection Administration), To-far Wang (王塗發, 6th Legislator and former leader of the Taiwan Environment Protection Union), Chung-ming Liu (柳中明, former director of the Global Change Research Center at National Taiwan University), Kuang-jung Hsu (徐光蓉, chairperson of the Academic Committee of the Taiwan Environmental Protection Union), Han-shen Pan (潘翰聲, Spokesperson and former Secretary General of the Green Party Taiwan), Chi-yuan Liang (梁啟源, former Minister without Portfolio of Central Government), Tai-chi Hsiao (蕭代基, former President of the Official Chunghua Institution for Economic Research) and Tze-luen Lin (林子倫, Assistant Professor of Political Science at National Taiwan University).

Otherwise, this paper also uses official records of the Legislative Yuan proceedings from Taiwan's Parliamentary Library to understand the legislative negotiations among different domestic actors, including the Executive Yuan, Legislative Yuan, ENGOs, and industries.

4. Ecological Risk and Giddens's Paradox

Harrison and Sundstrom (2007: 6-7) emphasize that an important motive for politicians in democracies is that of reelection. All else being equal, the greater the public pressure with high ecological risk, the more likely a democratic country should be to ratify environmental agreements. Therefore, the RIBE hypothesizes that factor of public conception of climate risk can make voters act on environmental degradation through public pressure in democracies. However, Giddens (2009: 2)

argues the relations between public conception of ecological risk and their support for international climate agreements exist the challenge of *Giddens's paradox*, including the problems of temporal discounting and free-riding.

Taiwan can not participate in the UNFCCC and the Kyoto Protocol due to diplomatic dilemma. Hence, the draft GHGRA is regarded as Taiwan's national legal framework to response global climate actions, but its legislative process is fraught with difficulties and uncertainties. The Executive Yuan rejected to build a legally binding reduction target and write this target in the GHGRA. What is worse, the Legislative Yuan has refused to pass this act from 2006 to now. Most ENGOs expect that pubic pressure plays a critical role in pushing stringent international and domestic climate policies. For example, during the legislative process of the GHGRA and the Energy Tax Act, Han-shen Pan emphasizes that

> **"It is difficult in the promotion process, because it (the GHGRA) influences many people's vested interests. The only feasible way to promote, is not through the inner side of government, and is also not through technocracy, due to you can not resist their fallacies. The only way depend to outside citizens' power to change it directly, we think that the political approach is very important, solve it according to political approach…"**[1]

Based on the hypotheses of the RIBE, this paper run the linear regression model through empirical data from the TSCS 2010 to analyze the relations between public conception of ecological risk and their support for stringent climate policy, especially in the GHGRA.

4.1. Independent Variables

The RIBE thinks unless citizens perceive potential risks from international environmental problems that ecological vulnerability by itself may not be able to spur a response (Shih, 2008; 2009; 2012). The independent variable, ecological risk, adopts the survey question 27e "In general, do you think that a rise in the world's temperature caused by climate change is…" According to the empirical data from TSCS 2010, Table 4 compares risk perceptions associated with different

[1] Interview with Han-shen Pan, Spokesperson and former Secretary General of the Green Party Taiwan, May 5, 2011.

environmental problems, including air pollution caused by cars, air pollution caused by industry, pesticides and chemicals used in farming, pollution of rivers, lakes and streams, climate change, genetically modified food (GMF) and nuclear power station. Most people in Taiwan think that different environmental problems would cause varying degrees of ecological risks.

As Table 4 shows, 32.77 percent of the respondents think that climate change is extremely dangerous for the environment, which is only little lower than air pollution caused by industry but higher than other four environmental problems. Furthermore, we can find that 80.86 percent of people feel that climate change is very dangerous or extremely dangerous, which is also little lower than 86.05 percent in air pollution caused by industry, but much higher than 55.87 percent in air pollution caused by cars, 74 percent in pesticides and chemicals used in farming, 74.38 percent in water pollutions, 36.6 percent in GMF and 56.44 percent in nuclear power stations. In short, Most people in Taiwan feel that climate change is more dangerous for the environment than most of other environmental problems.

Table 4 Public Perception toward Environmental Degradation and Ecological Risk

items	air pollution / cars	air pollution/ industry	pesticides use	water pollution	climate change	GMF	nuclear power station
not dangerous at all for	7	3	5	9	13	55	37
the environment	(00.32%)	(00.14%)	(00.23%)	(00.41%)	(00.60%)	(02.75%)	(01.75%)
not very dangerous	88	19	52	72	38	321	238
	(04.00%)	(00.86%)	(02.36%)	(03.29%)	(01.75%)	(16.05%)	(11.23%)
somewhat dangerous	876	285	515	479	365	892	648
	(39.82%)	(12.95%)	(23.41%)	(21.91%)	(16.80%)	(44.60%)	(30.58%)
very dangerous	986	1166	1141	1180	1045	594	734
	(44.82%)	(53.00%)	(51.86%)	(53.98%)	(48.09%)	(29.70%)	(34.64%)
extremely dangerous	243	727	487	446	712	138	462
for the environment	(11.05%)	(33.05%)	(22.14%)	(20.40%)	(32.77%)	(06.90%)	(21.80%)
N	2200	2200	2200	2186	2173	2000	2119

Source: Chang et al. (2011)

Beside of public perception of climate risk, Giddens (2009: 2-3) argues that public conception of ecological risk can not translate into actual support for

international climate agreements exist due to the challenge of temporal discounting. From the perspective of environmental psychology, Robert Gifford (2011: 292) also agrees that temporal discounting would lead in underevaluation of distant or future climate risks. The independent variable, temporal discounting, adopts the survey question 39b "How much do you agree or disagree with each of these statements? For next generations, environmental protection is more important than economic development." As Table 5 shows, When people think of next generations' long-term future, nearly 80 percent of the respondents agree that environmental protection is much more important than economic growth. Conversely, there are merely 11.98 percent of the respondents to persist on the priority of economic development

Meanwhile, Alexander Gattig and Hendrickx (2007: 21) argues environmental risks often involve consequences that are highly uncertain, strongly delayed and occurring at distant places. Emilia Tjernström and Tom Tietenberg (2008: 316) also thinks that climate change, as a policy target, has an important temporal component. While the cost of taking current action fall on the current generation, the benefits accrue much later. Science and Technology is often promoted as the solution to many problems, including those related to climate change, such as the development of biofuels, wind power, solar power and other renewable energy technologies. Hence, public trust in environmental sciences would influence their support for positive climate policies (Giddens, 2009: 131; Terwel et al., 2009).

Table 5 For the next generations environmental protection is more important than economic development.

Items	frequency and percentage
Disagree Strongly	28(01.28%)
Disagree	234(10.70%)
Neither agree nor disagree	220(10.06%)
Agree	1193(54.57%)
Agree Strongly	511(23.38%)
N	2186

Source: Chang et al. (2011)

The more people trust that modern science and technology can effectively solve environmental problems, the more they are inclined to support for long-term climate

change policies. The independent variable, public trust in science and technology, chose the survey question 22c "How much do you agree or disagree with each of these statements? Modern science will solve our environmental problems with little change to our way of life". The results are as Table 6 shows.

Table 6 Modern science will solve our environmental problems with little change to our way of life

Items	frequency and percentage
Disagree Strongly	44(02.04%)
Disagree	887(41.20%)
Neither agree nor disagree	275(12.77%)
Agree	913(42.41%)
Agree Strongly	34(01.58%)
N	2153

Source: Chang et al. (2011)

In general, only 43.99 percent of the respondents agree that modern science and technology can effectively solve our environmental problems, which is defined as technosalvation (Gifford, 2011: 293). On the contrary, 43.24 percent of people distrust that science can finally solve environmental degradation. This reflects most people in Taiwan have very different opinions about science and technology role in environmental areas.

Besides of public trust in the development of science and technology, Robert Gifford (2011: 295) argues that public trust in government environmental decision-making also might effect their support for long-term climate policies. If people decided that most environmental policies are inadequate, they might oppose national climate policy even they feel ecological risk is dangerous. The independent variable, trust in environmental policy, adopts the survey question 61 "the government will solve our environmental problems in Taiwan or not?" As Table 7 shows, there are 50.05 percent of the respondents who would trust the government's environmental policies, but 49.95 percent distrust the government can effectively control pollutions. This reflects that most people also exists different opinions about the government's capacity in environmental issues.

Table 7 What do you think whether the government is capable of solving our environmental problems in Taiwan or not?

Items	frequency and percentage
Very incapable	269(12.35%)
Fairly incapable	819 (37.60%)
Fairly capable	1058 (48.58%)
Very capable	32 (01.47%)
N	2178

Source: Chang et al. (2011)

As for the public goods characteristics of climate change, Giddens(2009: 102) emphasizes that problems of free-riding exist everywhere in the area of climate policy. For example, in the domestic level, people who continue to drive SUVs are free-riding off those who have switched to smaller cars. In the international level, dragger countries that have done little or nothing to reduce GHG emissions are free-riding off those pusher countries. Gifford (2011: 294) thinks that the fearing of being victimized by free-riders servers as a barrier for some individuals, who asks why they have to support positive climate regulations and response strategies when others will not.

Therefore, The independent variable, international public goods, chose the survey question 32b “How much do you agree or disagree with each of these statements? Poor Countries should be expected to make less effort than richer countries to protect the environment.” This question related to the CBDR principle under the UNFCCC and the Kyoto Protocol. If people are unwilling to be victimized by free-riders, they might disagree that different countries can have different responsibilities in the international environmental regulations. As Table 8 shows, 72.51 percent of the respondents answers that most countries should have same responsibilities to protect the environment, including developing and developed countries. At the same time, only 21.55 percent agrees that poor counties can make less effort than those richer countries.

Table 8 Poor Countries should be expected to make less effort than richer countries to protect the environment

Items	frequency and percentage
Agree Strongly	29(01.33%)
Agree	442(20.22%)
Neither agree nor disagree	130(05.95%)
Disagree	1253(57.32%)
Disagree Strongly	332(15.19%)
N	2186

Source: Chang et al. (2011)

Furthermore, the independent variable, domestic public goods, adopts the survey question 26d "How much do you agree or disagree with each of these statements? This is no point in doing what I can for the environment unless others do the same." As Table 9 shows, 80.68 percent of the responders agree that it is meaningless in doing what they can for the environment unless others do the same. In other words, feelings about free-riders in the environmental areas are very strong, and most people fear to be victimized by free-riders.

Table 9 There is no point in doing what I can for the environment unless others do the same.

Items	frequency and percentage
Disagree Strongly	36(01.63%)
Disagree	351(15.92%)
Neither agree nor disagree	39(01.77%)
Agree	1186(53.79%)
Agree Strongly	593(26.89%)
N	2205

Source: Chang et al. (2011)

4.2. Dependent Variables

This paper concerns why Taiwan decided to be a passive role in global climate actions. On the one hand, the Executive Yuan rejected to build a legally binding

reduction target and write down in the article of the GHGRA. On the other hand, the Legislative Yuan has refused to pass the GHGRA from 2006 to now. This paper uses two relative variables as dependent variables to represent public pressure on the legislative process of the GHGRA.

The first dependent variable bases on the survey question 32a "How much do you agree or disagree with each of these statements? For environmental problems, there should be international agreements that Taiwan and other countries should be made to follow." This variable measures people's willingness to accept restrictions imposed by international environmental agreements. Meanwhile, this dependent variable is related to individuals' support for the GHGRA, while the draft GHGRA is regarded as Taiwan's national legal framework to response global climate negotiations. As Table 10 shows, although Taiwan can not participate in international climate negotiations because of diplomatic dilemma, 93.88 percent of respondents agree that there should be international environmental agreements that Taiwan and other countries must be made to follow.

Table 10 For environmental problems, there should be international agreements that Taiwan and other countries should be made to follow

Items	frequency and percentage
Disagree Strongly	4(00.18%)
Disagree	47(02.15%)
Neither agree nor disagree	83(03.79%)
Agree	1374 (62.80%)
Agree Strongly	680 (31.08%)
N	2188

Source: Chang et al. (2011)

The first dependent variable uses the survey question 70b "How much do you agree or disagree with each of these statements? You will vote for the candidate because of his/her environmental policies." Harrison and Sundstrom (2007: 6-7) emphasize that an important motive for political leaders in democracies is that of reelection. Thus, the public support in campaign would influence political leaders' positions in legislative process of the GHGRA. As Table 11 shows, only 43.51 percent of the respondents would vote for the candidate because of the candidate's

view on environmental protection. On the contrary, Over half of the respondents thinks that their voting behavior are not merely affected by environmental policies.

Table 11 You will vote for the candidate because of his/her environmental policies

Items	frequency and percentage
Disagree Strongly	96 (04.37%)
Disagree	767 (34.91%)
Neither agree nor disagree	378 (17.21%)
Agree	881 (40.10%)
Agree Strongly	75 (03.41%)
N	2197

Source: Chang et al. (2011).

Compared these two dependent variables, over ninety percentage of people in Taiwan agree that there should be international environmental agreements that Taiwan and other countries must be made to follow. However, only 43.51 percent of people in Taiwan will elect pre-environmental candidates. Over half of the respondents thinks that environmental protection is not the main factor to influence their voting behaviors. In other word, most people would support for legislation of the GHGRA, but candidates' positions toward climate change would not influence their voting behaviors.

4.3. Data Analysis and Discussion

The RIBE hypothesizes that factor of public conception of climate risk can make voters act on environmental degradation through public pressure in democracies (Shih, 2012). Further, the relations between the ecological risk perception and their support for climate policies exist the challenge of Giddens's paradox, including the problems of temporal discounting and free-riding (Giddens, 2009: 2).

Based on the theoretical framework and research design, this paper builds linear regression models to analyze the relations among above-mentioned independent variables. Those socio economic variables, including gender, age, income, level of education, level of urbanization, marital status are controlled. Each

dependent variable includes three linear regression models. The first model analyze the relations between socio economic variables and the dependent variables. The second model control socioeconomic variables and analyze the relations between people's ecological risk perception and their support for climate policies. Otherwise, The third model also control socioeconomic variables, and then analyze whether the independent variables, including ecological risk, temporal discounting and the free-riding problems will influence people's support for climate policies.

The dependent variable, people's support for the GHGRA, is firstly analyzed, and the statistical results are as Table 12 shows. Model 1 reflects that level of education would influence people's support for the GHGRA. People with higher education would be more willing to agree that statement "there should be international agreements that Taiwan and other countries should be made to follow." Otherwise, the level of urbanization also affect respondents positions toward international environmental agreements. People living in the urban and urban suburban, compared to those living in rural areas, are more inclined to support for international environmental agreements.

Referring to the RIBE, Model 2 analyze the relationship between ecological risk and people's support for the GHGRA. Huang-hsiung Hsu (2011) emphasizes that Taiwan is always threatened by climate change. Climate change has already caused lots of adverse impacts and a variety of extreme climate events. When the socioeconomic variables are controlled, as Table 12 shows, the more people think that climate change is dangerous, the more they are willing to support for the international environmental actions.

Model 3 tests the relationships among ecological risk, temporal discounting and the free-riding problems and people's support for the GHGRA. There are three empirical findings from Model 3. First, people's climate risk perception also influence their willingness in supporting international environmental agreements. Second, besides of ecological risk, feelings about free-riding in the area of climate change can influences respondents response to support the GHGRA. Table 12 reveals that the more people disagree the statement "poor Countries should be expected to make less effort than richer countries to protect the environment", the more they are inclined to support for the climate agreements. Similarly, the more people agree the statement "There is no point in doing what I can for the

environment unless others do the same," the more they also inclined to support for the climate agreements. Third, feelings of temporal discounting also influences people's support for the climate agreements. The more people agree the statement "for the next generations environmental protection is more important than economic development, " the more they prefer to support international environmental agreements. Otherwise, When people believe that science development and government policy can effectively solve domestic environmental pollutions, they are more willing to support international environmental agreements.

Table 12 Linear Regression for Ecological Risk (Dependent Variable: People's Support for the GHGRA)

	Model 1		Model 2		Model 3	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Ecological Risk			***0.20	0.02	***0.17	0.02
Temporal Discounting					***0.13	0.01
Trust in Science					*0.03	0.01
Trust in environmental policies					*0.04	0.02
International Public Goods					***0.06	0.01
Domestic Public Goods					**0.04	0.01
Urbanization (rural area)						
Township	0.06	0.04	0.05	0.04	0.04	0.04
Urban Suburban	**0.12	0.04	*0.10	0.04	*0.09	0.04
Urban	**0.12	0.04	**0.11	0.04	*0.09	0.04
Level of Education (elementary school and below)						
Junior high school	***0.13	0.04	0.07	0.04	0.05	0.04
Senior high school	***0.24	0.05	***0.17	0.05	***0.16	0.05
University and above	***0.35	0.05	***0.29	0.05	***0.27	0.05
Income	0.00	0.01	0.00	0.01	0.00	0.01
Constant term	***3.96	0.11	***3.21	0.12	***2.31	0.15
N		2142		2117		2057
Adj R-squared		0.0522		0.1023		0.1513

*P≤.05；**P<.01；***P<.001, The variables, gender, age and marital status are also controlled..

Further, the voting behavior variable in turn is analyzed, and the statistical results are as Table 13 shows. Model 4 reflects that level of education would influence voting behaviors. People with higher education would be more willing to elect pro-environment candidates. The possible reason is that people with higher education are able to access climate change information. Most people only have a vague idea about the causes and impacts of climate change (Nisbet and Myers, 2007: 447-450). The people with higher education might access and understand the climate issue more easily. When they realize potential threats from climate change, they would change their behaviors to support international environmental agreements and elect those pro-environment candidates.

Table 13 Linear Regression for Ecological Risk (Dependent Variable: People's Voting Behavior for Environmental Protection)

	Model 4		Model 5		Model 6	
	Coef.	s.e.	Coef.	s.e.	Coef.	s.e.
Ecological Risk			**0.09	0.03	*0.07	0.03
Temporal Discounting					***0.17	0.02
Trust in Science					**0.06	0.02
Trust in environmental policies					***0.13	0.03
International Public Goods					0.02	0.02
Domestic Public Goods					0.00	0.02
Urbanization (rural area)						
Township	0.06	0.06	0.05	0.06	0.02	0.06
Urban Suburban	0.11	0.07	0.09	0.07	0.06	0.07
Urban	*0.16	0.07	*0.15	0.07	0.12	0.07
Level of Education (elementary school and below)						
Junior high school	*0.15	0.07	*0.13	0.07	0.11	0.07
Senior high school	***0.28	0.08	**0.26	0.09	**0.23	0.09
University and above	***0.47	0.08	***0.45	0.08	***0.40	0.08
Income	-0.01	0.01	-0.01	0.01	-0.01	0.01
Constant term	***2.86	0.17	***2.46	0.21	***1.46	0.26
N		2150		2121		2058
Adj R-squared		0.0220		0.0282		0.0616

*P≤.05；**P<.01；***P<.001, The variables, gender, age and marital status are also controlled..

Referring to the RIBE, Model 5 analyze the relationship between ecological risk and refers to the RIBE and people's voting behaviors. When the socioeconomic variables are controlled, as Table 13 shows, when people feels that climate change and its adverse impacts becomes more dangerous for the environment, they are more inclined to elect voters for environmental protection.

Model 6 tests the relationships among ecological risk, temporal discounting and the free-riding problems and voting behaviors. There are three empirical findings from Model 6. First, people's climate risk perception also influence voting behaviors. When they perceive the potential threats from climate change, they will change their voting behavior in elections. Second, The relation between feelings about free-riding in the area of climate change and voting behaviors is not statistically significant. Third, feelings of temporal discounting highly influences people's decisions in the elections. When people agree that meeting present needs should not compromise the ability of future generations to meet their own needs, they are inclined to support pro-environment candidates in elections. Similarly, The more people trust that environmental science and government policy can effectively solve environmental problems, the more they are also inclined to elect those pro-environment candidates.

5. Abatement Cost and Domestic Negotiations

Besides of the factor of ecological risk conception, The RIBE also includes abatement costs to explain national response to international environmental actions. Unlike the original IBE, the RIBE emphasizes that national interest calculation is based on domestic negotiations among different actors. emphasizes The political structure of domestic preferences influences international negotiations. The environmental policy preference of different actors, including the legislature, the executive, relative industries and ENGOs, in domestic politics derive from their interest. (Shih, 2008: 149; 2009: 209-211). Thus, this paper uses in-depth interview method to analyze how Taiwan define its own national interest in the legislative process of the GHGRA

5.1. Non-Government Sector

The legislative process of the GHGRA reflects Taiwan's response to international climate agreements. Taiwan is a typical newly industrialized country (NIC) , and its fast economic growth has made it one of the so-called four Asian tigers. However, as Table 1 shows, Taiwan also becomes one of the main GHG emitters in the world following rapid economic development over the last decades. One of the challenges for the UNFCCC, especially in the post-Kyoto period, is to define the role of NICs through international negotiations under the UNFCCC, because these NICs' historical GHG emissions are lower than Annex 1 countries but higher those most of Non-Annex 1 countries. Most NICs, such as Singapore or South Korea, always define their role and responsibilities through diplomatic climate negotiations. However, Taiwan's role in international climate actions are extremely ambiguous, because it can not define its own role as a Annex-1 or non-Annex1 country through diplomatic climate negotiations. What is worse, Taiwan also can not use flexible mechanisms to reduce domestic GHG emissions due to its non member status of the international climate agreements.

The climate policy preference of different actors derive from their interest. Most energy intensive industries (EIIs) , such as China Steel Corporation Taiwan (中國鋼鐵, CSC), Formosa Plastic Group (台塑關係企業, FPG) and Chinese Petroleum Corporation Taiwan (台灣石油 CPC), are the main GHG emitters in Taiwan. Their interests gains from continued pollution, especially in the combustion of fossil fuels. Industries expect Taiwan to be a dragger in the climate negotiations, and warns that any more stringent climate policies would decrease industrial capacity in international competiveness.

Thus, these carbon intensive industries urges that Taiwan should define itself as on of the non-Annex 1 countries. Based on the premise of non-Annex 1 countries, industries in turn oppose the GHGRA and any stringent reduction GHG emission targets. For example, Chinese National Federation of Industries (CNFI), the main interest group of Taiwan's manufacturing businesses, lobbied the Executive Yuan should "*prudently consider the relative policies and measures of the GHGRA*."(CNFI, 2008: 32-33). Further, Taiwan should not build concrete emission reduction targets according to its quasi non-Annex 1 country status. Industries argues that Taiwan's development path are similar to most developing countries, hence, the reduction targets and time schedule can not be written down in the article

of the GHGRA. Building positive reduction targets would be harmful to industrial profits and competitive capacity.

Compared to those carbon intensive industries, most ENGOs which worry about the environmental effects of climate change support for the GHGRA. In NGOs opinion, even though Taiwan are exclude from the UNFCCC, Taiwan, as a victim country, still should be a pusher role in international climate actions. To-far Wang, the former Legislator, uses official energy statistics (Ministry of Economic Affairs, 2011: 18), as Table 14 shows, to criticize that those EIIs in Taiwan use about thirty percent of total energy consumption but only contribute less than five percent of total GDP.[2] Therefore, those environment-friendly NGOs urges that the Executive Yuan must define our country as quasi Annex 1 countries to push positive climate policies. On the one hand, NGOs expect that most Legislators have to support the GHGRA to pass it as soon as possible. On the other hand, the clear and positive target, based on 1990 level, is need in the article of the GHGRA.

5.2. Government Sector

When relative industries, especially in EIIs, and ENGOs have contradictory positions on the GHGRA, the government actors play critical roles in compromising different opinions to build national climate polices. However, when government actors share power over climate decision making, especially between the Environmental Protection Administration (環境保護署, EPA) and the Ministry of Economic Affairs (經濟部, MEA), and policy preference differ.

The MEA, the main authority of national economic and energy affairs, is inclined to support for industrial positions. In the legislative process of the GHGRA, all past and present Ministers of the MEA oppose to build compulsory reduction targets, and argues that Taiwan has to avoid controlling total CO2 emissions. Mei-yueh Ho (何美玥), former minister of the MEA, urges that If the GHGRA with positive legally binding targets is passed by the Legislative Yuan, Those EIIs will lose their competition capacity. At the same time, the MEA also claims that Taiwan should be categorized as a non-Annex 1 country because of his historical GHG emissions are less than those developed countries.

[2] Interview with To-far Wang, former Legislator, March 30, 2011.

Table 14 Energy Consumption and Value-add of Energy Intensive Industries

Year	Energy Consumption		Value-added		Energy Intensive of EIIs ($LOE/10^3NTD$)	Dependence of Imported Energy
	Quantity 10^3KLOE	percentage	Amount(at 2006 constant prices) Million NTD	percentage		
1990	14,306	28.06%	214,019	4.03%	66.84	96.01%
1991	15,029	27.55%	222,116	3.87%	67.66	97.15%
1992	15,926	27.48%	235,774	3.82%	67.55	97.27%
1993	16,489	27.14%	255,897	3.89%	64.44	97.83%
1994	18,321	28.18%	282,103	3.98%	64.94	97.77%
1995	19,119	27.92%	290,033	3.85%	65.92	97.97%
1996	19,491	27.16%	299,079	3.76%	65.17	98.17%
1997	20,906	27.74%	336,701	4.01%	62.09	98.28%
1998	21,446	26.71%	344,400	3.97%	62.27	98.26%
1999	22,305	26.35%	369,764	4.02%	60.32	98.49%
2000	25,034	27.29%	390,732	4.02%	64.07	98.74%
2001	30,788	31.72%	374,455	3.91%	82.22	98.68%
2002	32,284	32.12%	436,547	4.33%	73.95	98.88%
2003	33,960	32.54%	453,929	4.35%	74.81	98.94%
2004	36,370	33.44%	482,931	4.35%	75.31	99.04%
2005	35,852	32.25%	483,502	4.16%	74.15	99.15%
2006	37,465	32.94%	512,787	4.19%	73.06	99.22%
2007	42,734	35.85%	545,009	4.20%	78.41	99.24%
2008	41,567	35.93%	513,173	3.93%	81.00	99.25%
2009	41,031	36.29%	495,942	3.87%	82.73	99.25%
2010	44,567	37.04%	-	-	-	99.30%

Source: Ministry of Economic Affairs (2011: 18)

Note: EIIs in Table 14 includes paper, chemical material, non-metallic mineral products and basic metal industry. Otherwise, energy consumption of chemical materials industry includes petrochemical feedstocks.

Compared to the MEA, the EPA's position on the GHGRA seems controversial. In the beginning, the EPA expected that Taiwan can be a pusher country in the international climate negotiations. The draft GHGRA is a important milestone, and officers of the EPA always claims that the GHGRA is the first climate act in developing world.[3] Further, the EPA officers hope to adopt the GHGRA against some highly pollution industries and their development projects, including the

[3] Interview with Wen-yan Chiau, former Deputy Minister of the EPA, March 22, 2011.

Kuo-kuang Petrochemical Park (國光石化) and the FPG's Steel Plant (台塑煉鋼廠).[4]

However, the EPA was enforced to adjust its position on environmental protection. It is because the Executive Yuan is lack of a adequate decision-making structure. Mitigating GHG emissions involves many sectors, but climate issue is oversimplified as a pure environmental issue by political leader in Taiwan. How to response global warming becomes environmental affairs. In these political circumstance, the EPA, one of the smallest ministries in the Executive Yuan, is appointed to manage formulation and implementation national climate policy and the legislative process of the GHGRA. In the end, the EPA can not embrace its pro-environmental position, and it is enforced to take the pro-development position, which is similar to the EPA and those EIIs.

In the level of the Legislative Yuan and the Executive Yuan. Among political leaders, climate change lends itself to gestural politics. Most political leaders claims they are willing to support for the GHGRA, and encourage the Legislative Yuan to pass this act. On the one hand, mitigating GHG emissions become a slogan of political correctness. Seldom of them doubt the necessity of reducing GHG emissions or the scientific certainty of global warming. On the other hand, the draft GHGRA has set aside from 2005 to now.

Most leader are unwilling to pass the GHGRA with legally binding targets, because reducing GHG emissions involve two controversial political issues. The first issue is to adjust domestic industrial structure through changing the long-term low-energy-price policy. Taiwan highly relies on imported energy, as Table 14 shows, but Taiwan's government, as a typical case of the developmental state, formulated the low-energy-price policy to promote industrial development and economic growth. However, low-energy-price policy leads in the development of these carbon intensive industries. At the same time, most people in Taiwan take using low-price energy for granted. Most political leaders understand that changing low-price energy policy is necessity to meet GHG emission reduction target. However, they perceive that increasing energy price is harmful to their reelections.[5]

[4] Interview with Chea-yuan Young, former Director General of the Division of Air Quality and Noise Control of the EPA, March 22, 2011.

[5] Interview with Chi-yuan Liang, former Minister without Portfolio of the Executive Yuan, April 22, 2011.

The second issue relates to adjust energy structure and the role of energy use. According to the IEA's data, 57.46 percent of carbon emissions are from electricity and heat production (International Energy Agency, 2010: 68). In others would, building sustainable energy sector is indispensible to meet GHG emission reductions. However, Nuclear policy is a important controversial issue between two main political parties, The Kuomintang (國民黨) and The Democratic Progressive Party (民主進步黨), especially in the issue of build the fourth nuclear power plant.

6. Conclusions

This paper discusses Taiwan's passive response to climate change and its political context. In spite of being one of the largest GHG emitters in the world, Taiwan refuse to pass the GHGRA with a positive legally binding target, while GHGRA is essential to formulate overall legal framework to manage national mitigation policy.

This paper explains how Taiwan reacts to international climate policy through the RIBE. On the dimension of ecological risks, most people agrees that Taiwan should take part in international environmental agreements, but over fifty percent of the respondents are unwilling to vote for pro-environmental candidates. Otherwise, when people thinks that climate change is dangerous for the environmental, they would like to change their behavior to support the climate regulations. Moreover, the factor of temporal discounting will influence people's willingness to support or oppose climate regulations.

On the dimension of abatement costs, this paper use in-depth interview methods to analyze preference and actions among different actors. In the non-governmental sector, relative carbon intensive industries and ENGOs have contradictory positions on the GHGRA. When ENGOs urges that Taiwan should define itself as a Annex 1countries, relative industries persist on Taiwan's quasi non-Annex 1 country status to protect their so-called international competitive capacity. In the government sector, there are three finding of this paper. First, the EPA and the MEA have their own interests and policy preferences. The MEA are inclined to protect industrial development, while the EPA support the GHGRA but oppose write down the legally binding target in the article of the GHGRA. Second,

among most political leaders, climate change lends itself to gestural politics. Third, Meeting GHG emission reduction targets involve energy structure and industrial structure. Most political leaders worry that supporting climate policies are harmful to their elections.

Reference

Barnett, Jon. 2003. "Security and Climate Change." *Global Environmental Change* 13(1): 7-17.

Barrett, Scott. 1999. "Montreal Versus Kyoto: International Cooperation and the Global Environment." In *Global Public Goods: International Cooperation in the 21 Century*, edited by Inge Kaul, Isabelle Grunberg, and Marc A. Stern. New York: United Nations Development Programme: 192-219.

Beck, Ulrich. 2010. "Remapping Social Inequalities in an Age of Climate Change: for a Cosmopolitan Renewal of Sociology." *Global Networks* 10(2): 165-181.

Benedick, Richard Elliot. 1998. *Ozone Diplomacy: New Directions in Safeguarding the Planet*. Cambridge: Harvard University Press.

Brown, Molly E. and Christopher C. Funk. 2008. "Climate: Food Security Under Climate Change." *Science* 319(5863): 580-581.

Busby, Josh and Alexander Ochs. 2005. "From Mars and Venus Down to Earth: Understanding the Transatlantic Climate Divide." In *Beyond Kyoto: Meeting the Long-Term Challenge of Climate Change*, edited by David Michels. Washington D.C.: Center for Transatlantic Relations, John Hopkins University.

Chang, Ying-hwa, Su-hao Tu, and Pei-shan Liao. 2011. *Report for Taiwan Social Change Survey 2010 (in Chinese)*. Taiepi: Institute of Sociology, Academia Sinica.

Chasek, Pamela S., David L. Downie, and Janet Welsh Brown. 2010. *Global Environmental Politics*, Fifth. Boulder: Westview Press.

CNFI. 2008. *2008 annual White Paper on Chinese National Federation of Industries (in Chinese)*, Edited by Taipei.

Dietz, Thomas, Elinor. Ostrom, and Paul C. Stern. 2003. "The Struggle to Govern the Commons." *Science* 302(5652): 1907-1912.

Dolsak, Nives. 2001. "Mitigating Global Climate Change: Why are Some Countries Doing More Than Others." *Policy Studies Journal* 29(3): 414-436.

Elliott, Lorraine. 2004. *The Global Politics of the Environment*, Second. New York: Palgrave.

Gattig, Alexander and Laurie Hendrickx. 2007. "Judgmental Discounting and Environmental Risk Perception: Dimensional Similarities, Domain Differences, and Implications for Sustainability." *Journal of Social Issues* 63(1): 21-39.

Giddens, Anthony. 2009. *The Politics of Climate Change*. Malden, MA: Polity.

Gifford, Robert. 2011. "The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation." *American Psychologist* 66(4): 290-302.

Harrison, Kathryn and Lisa M. Sundstrom. 2007. "The Comparative Politics of Climate Change." *Global Environmental Politics* 7(4): 1-18.

Heal, Geoffrey. 1999. "New Strategies for the Provisions of Global Public Goods: Learning from International Environmental Challenges." In *Global Public Goods: International Cooperation in the 21 Century*, edited by Inge Kaul, Isabelle Grunberg, and Marc A. Stern. New York: United Nations Development Programme: 220-239.

Hendrickx, Laurie and Sietske Nicolaij. 2004. "Temporal Discounting and Environmental Risks: the Role of Ethical and Loss-related Concerns." *Journal of Environmental Psychology* 24(4): 409-422.

Hovi, Jon, Tora Skodvin and Steinar Andresen. 2003. "The Persistence of the Kyoto Protocol: Why Other Annex I Countries Move on Without the United States." *Global Environmental Politics* 3(4): 1-23.

Hsu, Huang-hsiung, Yi-chao Wu, Chia Chou, Cheng-ta Chen, Yung-ming Chen, and Mong-ming Lu. 2011. *Taiwan Climate Change Science Report (in Chinese)*. Taipei: National Science Council.

International Energy Agency. 2007. *Energy Policies of IEA Countries Switzerland 2007 Review*. Paris: OECD/ IEA.

International Energy Agency. 2010. *CO2 Emissions from Fuel Combustion Highlights- 2010 Edition*, 2010. Paris: International Energy Agency,.

International Energy Agency. 2011. *CO2 Emissions from Fuel Combustion Highlights- 2011 Edition*, 2010. Paris: International Energy Agency,.

IPCC. 2007. *Climate Change 2007: Synthesis Report*. Geneva, Switzerland: IPCC.

Kawashima, Yasuko. 1997. "A Comparative Analysis of the Decision-Making Process of Developed Countries toward CO2 Emissions Reduction Targets " *International Environmental Affairs* 9(2): 95-126.

Lantis, Jeffrey S. 2006. "The Life and Death of International Treaties: Double-Edged Diplomacy and the Politics of Ratification in Comparative Perspective." *International Politics* 43(1): 24-52.

Levy, Marc A., Robert O. Keohane, and Peter M. Haas. 1993. "Improving the Effectiveness of International Environmental Institutions." In *Institutions for the Earth: Sources of Effective International Environmental Protection* edited by Peter M. Haas, Robert O. Keohane, and Marc A. Levy. Cambridge, Mass. : MIT Press: 397-426.

Liu, Chung-ming. 2010. *12 Steps to Chang the Future: Decipher Taiwan's Environmental Change (in Chinese)*. Taipei: Heliopolis.

Luterbacher, Urs and Detlef F. Sprinz. 2001. "Problems of Global Environmental Cooperation." In *International Relationship and Global Climate Change*, edited by Urs Luterbacher and Detlef F. Sprinz. Cambridge: MIT Press: 3-22.

Milner, Helen V. 1997. *Interests, Institutions, and Information-domestic Politics and International Relations*. Princeton, N. J.: Princeton University Press.

Ministry of Economic Affairs. 2011. *Energy Statistics Handbook 2010* Taipei: Ministry of Economic Affairs.

Nisbet, Matthew C. and Teresa Myers. 2007. "Twenty Years of Public Opinion about Global Warming." *Public Opinion Quarterly* 71(3): 444-470.

Oreskes, Naomi. 2004. "Beyond the Ivory Tower: The Scientific Consensus on Climate Change." *Nature* 306(5702): 1686.

Paterson, Matthew. 1996. *Global Warming and Global Politics*. London: Routledge.

Rong, Fang. 2010. "Understanding Developing Country Stances on Post-2012 Climate Change Negotiations: Comparative Analysis of Brazil, China, India, Mexico, and South Africa." *Energy Policy* 38(8): 4582-4591.

Rowlands, Ian H. 1995. "Explaining National Climate Change Policies." *Global Environmental Change* 5(3): 235-249.

Shih, Yi-jen. 2008. "Global Warming Issues in China: the Perspective of Environmental Politics (in Chinese)." *Chinese Political Science Review* 45(1): 139-164.

Shih, Yi-Jen. 2009. "Global Warming and the Politics of Climate Change in United States (in Chinese)." *Journal of State and Society* 7(1): 187-241.

Shih, Yi-jen. 2012. *Global Warming and the Politics of Climate Change in Taiwan (in Chinese)*. Taipei: Doctoral Dissertation, Graduate Institute of Development Studies, National Chengchi University.

Sorros, Marvin S. 2005. "Garrett Hardin and Tragedies of Global Commons." In *Handbook of Global Environmental Politics*, edited by Peter Dauvergne. Cheltenham: Edward Elgar: 35-50.

Sprinz, Detlef F. and Carsten Helm. 1999. "The Effect of Global Environmental Regimes: A Measurement Concept." *International Political Science Review* 20(4): 359-369.

Sprinz, Detlef F. and Tapani Vaahtoranta. 1994. "The Interest-Based Explanation of International Environmental Policy." *International Organization* 48(1): 77-105.

Sprinz, Detlef F. and Tapani Vaahtoranta. 2002. "National Self-Interest: a Major Factor in International Environmental Policy Formulation." In *Encyclopedia of Global Environmental Change Vol. 4 Responding to Global Environmental Change*, edited by Mostafa K. Tolba. Chichester: John Wiley and Sons: 323-328.

Sprinz, Detlef F. and Martin Weiß. 2001. "Domestic Politics and Global Climate Policy." In *International Relationship and Global Climate Change*, edited by Urs Luterbacher and Detlef F. Sprinz. Cambridge: MIT Press: 67-94.

Terwel, Bart W., Fieke Harinck, Naomi Ellemers, and Dancker D.L. Daamen. 2009. "How Organizational Motives and Communications Affect Public Trust in Organizations: the Case of Carbon Dioxide Capture and Storage." *Journal of Environmental Psychology* 29(2): 290-299.

Tjernström, Emilia and Tom Tietenberg. 2008. "Do Differences in Attitudes Explain Differences in National Climate Change Policies?" *Ecological Economics* 65(2): 315-324.

Victor, David G. 2004. *The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming*. New Jersey: Princeton University Press.