

International Pressure of the Introduction of Carbon Tax and U.S. Response: Policy Implications for Korea

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Abstract

Korea has suggested a goal for reducing greenhouse gas emissions by 37 percent from the BAU level by 2030 to international society. As a means to achieve this goal, a carbon tax has been discussed again. Both Korea and America highly rely on fossil fuel. Seen in this perspective, identifying how to address climate changes in America according to a carbon tax has great implications for Korea as to how to deal with climate changes. Since it was against national interest, America withdrew from the Kyoto Protocol in 2001 and also failed to pass the carbon tax bills sponsored after 1990 in the United States Congress due to the same reasons. Due to lobbying activities in industrial areas to prevent climate change legislation and skeptical reactions from civil society against a carbon tax, there has been lack of climate change legislation in federal government. According to them, we have suggested what needed to be importantly considered when reviewing the adoption of a carbon tax in Korea. In addition, it was emphasized that adoption of a carbon tax shall be performed in balance of national and international interest.

Keywords: *Greenhouse gas, Climate change, Climate change legislation, Carbon tax, Carbon tax bill, Cap and trade, Emission trading scheme, National interest, UNFCCC*

1. Introduction

In 1988, James E. Hansen, the director of the National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies, notified the senators about how global warming was caused by humans in the U.S. Senate committee testimony [1]. Four years later, the United Nations Framework Convention on Climate Change (UNFCCC) was concluded in 1992. In addition, he has been insisting on adoption of a carbon tax. To be specific, he was very disappointed that the Paris Agreement did not contain anything related to imposition of a carbon tax.

A carbon tax has been adopted in Finland, Netherlands, Norway, Sweden, and Denmark since the 1990s. They were all countries in Annex I according to Kyoto Protocol concluded unanimously in Kyoto, on December 11, 1997. According to Kyoto Protocol, Emissions Trading (ET) has been adopted as one of the means for reducing greenhouse gas. However, a carbon tax has not been suggested. What the European Union (EU) wanted might have been a carbon tax over ET. In regarding this issue, Aldy and Pizer (2015) have insisted that ET was adopted as it was less burdensome over a carbon tax according to strategies in climate negotiation including the derivation of participation and signature from countries in the UNFCCC. However, they still left a room for possibility to utilize a carbon tax as follows:

[A] national government could choose a carbon tax as its means (or one of its item) for implementing an international agreement premised on quantitative emission target [2].

Since Kyoto Protocol was established, ET has been internationally regarded as an alternative for reducing greenhouse gas, while a carbon tax has been on the rise as an alternative at the national level [3]. There is still a possibility for it to be promoted from the Paris Agreement. “The most ideal option to reduce greenhouse gas is to realize ‘globalization of carbon [taxes]’ for all the countries to adopt a carbon tax at the national level. However, due to disparity in overall economic and political circumstances in each country, this is a matter of common knowledge for how difficult it is to realize [4].” Especially, it is realistically difficult for countries emitting more greenhouse gasses and also equipped with industrial structure based on fossil fuel including steel, petrochemistry, cement, pulp/paper manufacturing, and non-ferrous metals to adopt a carbon tax. Seen in this perspective, Korea and America have common factors. To be specific, both countries highly rely on fossil fuel. Korea is ranked on top among the Organization for Economic Co-operation and Development (OECD) countries for an increasing rate of the emission of greenhouse gas as of 2015. America is the country that produces CO₂ the most per capita and also the greenhouse gas. However, these two countries have been representing contrasting attitude in coping with climate changes after the UNFCCC was concluded. Korea was not a country that was obligated to reduce greenhouse gas. However, they have been taking a leading role actively coping with climate changes by voluntarily suggesting the goal of reducing greenhouse gas in 2009 and preparing for laws and policies. As a result, they have been recognized as a model for coping with climate changes in the international society [5]. On the other hand, America has been recognized as a “rogue state” in the international society because they withdrew from the Kyoto Protocol in 2001 [6].

Identifying how America has been working to cope with climate changes based on a carbon tax is expected to provide great implications when considering to adopt a carbon tax as an option to reduce greenhouse gas in Korea.

Therefore, the objective of this study is to contribute for Korea to adopt a carbon tax in the future by analyzing how each of the leading roles including the administration and the Congress in America copes with climate changes from various angles.

On the other hand, the approach has been attempted to harmonize the national interest in Korea with international interest in the course of development for contents. However, I would like to make it clear that it is inevitable to develop them in the perspective of Korea for several cases.

2. Responses of Korea to Climate Changes

Korea was ranked in the top 7th in total emission of carbon dioxide (CO₂), 16th in accumulated amount of greenhouse gas, and the amount of emission of greenhouse gas per capita among the OECD countries in the world as of the end of 2015. In the third session of the Conference of Parties to the UNFCCC (COP3) held in Kyoto, Japan, in 1997, Korea was excluded in the countries obligated to reduce greenhouse gas as they were recognized with a position as the developing country according to the UNFCCC.

2.1. Responses of Korean Government to Climate Changes

Active responses to climate changes in Korea are based on ‘Low Carbon, Green Growth (LCGG)’ suggested by the former president, Myungbak Lee, on August 15, 2008. ‘Green Growth Committee’, the organization under immediate control of the president for proceeding ‘LCGG’, was established in February, 2009. In November, 2009, they have promulgated the will to reduce the amount of greenhouse gas by ‘30% of the Business as Usual (BAU) in 2020’ to the international society.

In addition, ‘Framework Act on Low Carbon, Green Growth’ was passed in the National Assembly on December 29, 2009 (140 consenting parties, 40 objecting parties, 10 withdrawing parties). In addition, ‘Act on the Allocation and Trading of Greenhouse-

Gas Emission Permits' (hereinafter referred to as 'Act on Emissions Trading') was passed in the National Assembly on May, 2012 (148 consenting parties, 3 withdrawing parties).

In addition, Emission Trading Scheme (ETS) started being implemented as of January, 2015, by the government led by current president Geunhye Park. In the interview with the president for the new year on January 12, 2015, she has promulgated to actively promote new energy businesses, reduce greenhouse gas, and pioneer new break-through for the growth. In addition, they have submitted 'Intended Nationally Determined Contributions (INDC)' that decided the goal to reduce greenhouse gas emissions '37% from the BAU by 2030' to the UNFCCC in June, 2015.

2.2. Responses of Korean National Assembly to Climate Changes

As examined above, National Assembly has passed 'Framework Act on Low Carbon, Green Growth' and 'Act on Emissions Trading' without much conflict. This disproves that National Assembly cooperated in all-party for the government led by former president, Myungbak Lee, to realize 'LCGG'. 29 members of the National Assembly have participated in the 'Carbon Tax Bill' sponsored by the member, Sangjung Sim from Progressive Justice Party in July, 2013. In June, 2013, the member named Wonsuk Park from the same party has proposed the 'Climate Justice Tax Bill'. However, both were undecided in the 19th National Assembly. On the other hand, it was feasible to sponsor a carbon tax law as legal ground was prepared in the Article 30 in 'Framework Act on Low Carbon, Green Growth'.

2.3. Responses of Industries and Civil Societies in Korea to Climate Changes

As the industrial structure in Korea is based on energy-intensive industries including steel, chemistry, and cement, the industrial world has been opposing to adopt a carbon tax. The Federation of Korea Industries has been insisting to carefully approach the adoption of a carbon tax since the past [7]. According to the result of analyzing the responses by using pre-announcement of legislation system [8] on the proposal of a carbon tax sponsored by a member, Sangjung Sim, 243 respondents with a distinct stance of either consent or objection among 245 respondents who submitted the opinions turned out to object strongly the adoption of a carbon tax. Especially, Korea Electric Power Corporation (KEPCO) objected because of the double burden from a carbon tax and ETS [9].

3. Calculation of Profit-Loss in America and Responses by Government and other Stakeholders to Climate Changes

Trends of responses in America for climate changes are divided into the periods before and after concluding Kyoto Protocol in 1997. Responses to climate changes in or outside of the country have been performed according to national interest. Now, we will examine the causes of objection for ratification of Kyoto Protocol among the senators in America. They objected because developing countries including China and India were not included in Kyoto Protocol as countries obligated to reduce greenhouse gas, and also because 'it might seriously harm the economy of the United States'. "[The Kyoto Protocol] did not generate net benefits for the United States." [10] This was soon led for America to withdraw from the Kyoto Protocol. America has insisted 'joint responsibilities' over 'historical responsibilities' in relation to the fundamental principle of the UNFCCC, 'common but differentiated responsibilities (CBDR)'. As a result, the UNFCCC became compromised while causing 'North-South Conflict' in international cooperation in responses of climate changes. In addition, seen in the perspective of 'polluter pays principle', it has caused a mismatch between causes and responsibilities of global warming.

3.1. Responses of Federal Government in America to Climate Changes

Former president, George H. W. Bush, revised the Clean Air Act in 1990 implementing the policy for transactions of emission of sulphur dioxide. He also signed the UNFCCC on June 12, 1992. Former president, Bill Clinton, signed in Kyoto Protocol in 1997. This section deals with contrasting responses to climate changes between administrations of two former presidents.

Former president, Bush, was elected by the support from fossil fuel industries and developed industry-friendly policies [11]. “Bush’s views on fossil fuels and carbon dioxide seemed to be visceral, a sentiment as strong as blood [12].” At last, America ended up withdrawing from the Kyoto Protocol, and EU countries were much dissatisfied [10]. However, there was a change in responses of America in climate changes due to the emergence of current president, Barack Obama, in 2008. During the G-8 Summit in Italy, President Barack Obama acknowledged the fault ‘for the lost 8 years in the past’ [13] by saying that:

I know that in the past, the United States has sometimes fallen short of meeting our responsibilities. So, let me be clear: Those days are over. One of my highest priorities as President is to drive a clean energy transformation of our economy, and over the past six months, the United States has taken steps towards this goal [14].

However, the president was required to take indirect approach since climate change legislation was not supported. The American Clean Energy and Security Act of 2009 (H.R.2454 of the 111th Congress) (Waxman-Markey Bill) that dealt with cap and trade was the representative example. This proposal was passed in the House of Representatives, but disapproved in the Senate. Therefore, this made president use various methods that did not require approval from the United States Congress such as executive orders, memorandums, and agreements based on the Clean Air Act while seeking for solutions to reduce greenhouse gas [15]. This represents that current president Obama had a hard time developing green policies in difficult domestic circumstances in various areas including economic recession when he was unable to be supported by the United States Congress, especially the Senate, just like the situation when the former president Bill Clinton was in presidential position.

3.2. Responses of the United States Congress to Climate Changes

This section examines sponsored bills reflecting the carbon tax or carbon fee. 22 cases of a carbon tax bill that have suggested the necessity of adopting a carbon tax from the 1990s to 2015 are represented in Table 1. Proposal of a carbon tax bill has been mostly performed by some of the members since the administration led by the former president, George H. W. Bush in 1990. Sponsors were all members from the Democratic Party except for the member, Inglis, from the Republican Party, and the member, Sanders, as an independent. In addition, all the members except for Senator Bernard Sanders and Senator Sheldon Whitehouse were all from the House of Representatives. There were eight members who sponsored the carbon tax bill. Hereupon, it was confirmed that members with an experience of sponsoring the bill turned out to sponsor at least two and up to six times. Especially, Stark, a democrat from California and also a member from the House of Representatives, was the initial and also the biggest sponsor of the carbon tax bill in America.

It was confirmed that carbon tax was sponsored more in the second administration than in the first administration of the government led by current president Barack Obama. However, all the suggested carbon tax bills have not been passed in both houses since members from the Republican Party harshly objected against them.

On the other hand, resolutions that objected the adoption of a carbon tax in corresponding with the sponsor of a carbon tax bill started being provided since 2010. We

will examine the contents of them according to 10 cases suggested in Table 2 sponsored by the 111th Congress up to now. Members who proposed the resolutions were all from the Republican Party. Each the Senator and the House of Representatives sponsored five times, respectively, and there were five members who sponsored resolutions. Members sponsored the bill in a range from one time to five times. Especially, the member named Vitter (R-LA) took the leading role to object the adoption of a carbon tax. Resolutions started being sponsored from 2010 in corresponding with active behaviors on climate changes shown after Barack Obama was elected as a president and also a remarkable sponsor of a carbon tax bill by members of the Democratic Party.

As for ten times of submission for resolutions, democrats participated four times in the 112th, 113th, and 114th Congress as cosponsors. There were six members in total. However, considering the same members, there were a total of four members. Member, Rahall (D-WV-3) participated in H.Con.Res.142, H.Con.Res.8 and H.Con.Res.24 as a cosponsor. In addition, member, Manchin (D-WV), participated in S.Res.472 as a cosponsor. Both these two members were from West Virginia as “a coal state” and also in the Democratic Party [16].

The absolute majority of sponsors and cosponsors in the resolutions were from the Republican Party. However, members from the Democratic Party participated in them as well because they represented the interest of local constituencies beyond the political will or party platform. Especially, there were six members from the Democratic Party who voted in agreement in the voting for H.Con.Res.89 that passed the House of Representatives on June 10, 2016. They were members from local constituencies in Nebraska, Georgia, Texas, Arizona, and Minnesota.

In short, Table 1 and Table 2 clearly represent the aspect of conflict in these two parties in climate change legislation. According to the polarized situations in both parties as of now, there is a dim possibility of climate change legislation even if the Democratic Party dominates the White House or both houses. To add insult to injury, considering that the Republican Party dominated both houses in the interim election in the end of 2014, there is a very low possibility [17]. As a result, if the United States Congress is polarized into the North and South with continued conflicts in coping with climate changes, there is a possibility for them to be changed into ‘the American Unlegislated Zone’.

Table 1. Proposals For a Carbon Tax or Fee In the United States Congress

Congress	Bill number	Short or official title as introduced	Sponsor	Cosponsors	Date introduced
101st	H.R.4805	To amend the Internal Revenue Code of 1986 to reduce emissions of carbon dioxide by imposing a tax on certain fuels based on their carbon content	Rep. Stark, Fortney Pete (D-CA-9)	0	May 10, 1990
102nd	H.R.1086		Rep. Stark, Fortney Pete (D-CA-9)	0	Feb 21, 1991
103rd	H.R.804		Rep. Stark, Fortney Pete (D-CA-13)	0	Feb 03, 1993
110th	H.R.2069	Save Our Climate Act of 2007	Rep. Stark, Fortney Pete (D-CA-13)	3	Apr 26, 2007
	H.R.3416	America’s Energy Security Trust Fund Act of 2007	Rep. Larson, John B. (D-CT-1)	12	Aug 03, 2007
111th	H.R.594	Save Our Climate Act of 2009	Rep. Stark, Fortney Pete (D-CA-13)	3	Jan 15, 2009
	H.R.1337	America’s Energy Security Trust Fund Act of 2009	Rep. Larson, John B. (D-CT-1)	12	Mar 05, 2009
	H.R.2380	Raise Wages, Cut Carbon Act of 2009	Rep. Inglis, Bob (R- SC-4)	2	May 13, 2009
112th	H.R.3242	Save Our Climate Act of 2011	Rep. Stark, Fortney Pete (D-CA-13)	22	Oct 24, 2011

	H.R.6338	Managed Carbon Price Act of 2012	Rep. McDermott, Jim (D-WA-7)	4	Aug 02, 2012
113th	S.332	Climate Protection Act of 2013	Sen. Sanders, Bernard (I-VT)	1	Feb 14, 2013
	H.R.5307	America's Energy Security Trust Fund Act of 2014	Rep. Larson, John B. (D-CT-1)	0	Jul 31, 2014
	S.2940	American Opportunity Carbon Fee Act	Sen. Whitehouse, Sheldon (D-RI)	1	Nov 19, 2014
	H.R.5796	State's Choices Act of 2014	Rep. Delaney, John K. (D-MD-6)	0	Dec 04, 2014
	H.R.5873	Gas Tax Replacement Act of 2014	Rep. Huffman, Jared (D-CA-2)	0	Dec 11, 2014
	H.R.4754	Managed Carbon Price Act of 2014	Rep. McDermott, Jim (D-WA-7)	0	May 28, 2014
114th	H.R.309	Gas Tax Replacement Act of 2015	Rep. Huffman, Jared (D-CA-2)	0	Jan 13, 2015
	H.R.972	Managed Carbon Price Act of 2015	Rep. McDermott, Jim (D-WA-7)	3	Feb 13, 2015
	H.R.2202	Tax Pollution, Not Profits Act	Rep. Delaney, John K. (D-MD-6)	3	May 01, 2015
	S.1548	American Opportunity Carbon Fee Act of 2015	Sen. Whitehouse, Sheldon (D-RI)	1	Jun 10, 2015
	H.R.3104	America's Energy Security Trust Fund Act of 2015	Rep. Larson, John B. (D-CT-1)	0	Jul 16, 2015
	S.2399	Climate Protection and Justice Act of 2015	Sen. Sanders, Bernard (I-VT)	0	Dec 10, 2015

Source: Prepared by the author by using the homepage of the United States Congress [18] according to data in Price on Carbon [16] permitted to use

Table 2. Proposals For Anti-Carbon Tax Resolutions In the United States Congress

Congress	Bill number	Official title as introduced	Sponsor	Cosponsors *	Date introduced
111th	S.Res. 461	A resolution expressing the sense of the Senate that Congress should reject any proposal for the creation of a system of global taxation and regulation.	Sen. Vitter, David (R-LA)	0	Mar 18, 2010
112th	H.Con. Res.142	Expressing the opposition of Congress to Federal efforts to establish a carbon tax on fuels for electricity and transportation.	Rep. McKinley, David B. (R-WV-1)	20 (3)	Nov 30, 2012
	S.Con. Res.61	A concurrent resolution expressing the sense of Congress that a carbon tax is not in the economic interest of the United States.	Sen. Vitter, David (R-LA)	20 (0)	Dec 06, 2012
	H.Con. Res.144	Expressing the sense of Congress that a carbon tax is not in the economic interest of the United States.	Rep. Pompeo, Mike (R-KS-4)	32 (0)	Dec 07, 2012
113th	H.Con. Res.8	Expressing the opposition of Congress to Federal efforts to establish a carbon tax on fuels for electricity and transportation.	Rep. McKinley, David B. (R-WV-1)	14 (1)	Jan 15, 2013

114th	S.Con. Res.4	A concurrent resolution expressing the sense of Congress that a carbon tax is not in the economic interest of the United States.	Sen. Vitter, David (R-LA)	19 (0)	Jan 28, 2013
	H.Con. Res.24	Expressing the sense of Congress that a carbon tax would be detrimental to the United States economy.	Rep. Scalise, Steve (R-LA-1)	155 (1)	Mar 14, 2013
	S.Con. Res.1	A concurrent resolution expressing the sense of Congress that a carbon tax is not in the economic interest of the United States.	Sen. Vitter, David (R-LA)	0	Jan 07, 2015
	H.Con. Res.89 **	Expressing the sense of Congress that a carbon tax would be detrimental to the United States economy.	Rep. Scalise, Steve (R-LA-1)	82 (0)	Oct 29, 2015
	S.Res. 472	A resolution expressing the sense of the Senate that a carbon tax would be detrimental to the economy of the United States.	Sen. Blunt, Roy (R-MO)	25 (1)	May 24, 2016

* Number in the parenthesis is Democrats.

** Passed the House of Representatives.

Source: Refer to Table 1.

3.3. Responses of State Governments in America to Climate Changes

Even if the federal government does not have climate change legislation, states or communities have been most actively performing the legislation for coping with climate changes [19]. As of the end of 2015, Regional Greenhouse Gas Initiatives (RGGI) in the Northeast States and cap and trade in California have been operated. However, a carbon tax has been operated in Montgomery Country in Maryland and Boulder City in Colorado.

Boulder City has passed Initiative 202, the Climate Action Plan (CAP) Tax through inhabitants' poll on November 17, 2006. It was the first a carbon tax in America. What was to be taxed was electricity that was generated by using fossil fuel. Xcel Energy collected the tax, and it was officially performed in 2007. Assembly in Boulder City has already adopted "Resolution No.906 (referred to as the Kyoto Resolution)" in 2002 indicating to reduce the emission of greenhouse gas to 7 percent below 1990 levels by 2012 [20]. On March 31, 2013, the carbon tax bill was expired. Therefore, a carbon tax was extended for five years through the vote on November 6, 2012. "[T]his Boulder initiative offers valuable lessons to cities exploring innovative policies to reduce emissions." And "[a] local carbon pricing policy that receives community approval" is a good example of demonstrating the policy mix of existing and new policies [21]. In addition, Assembly in Montgomery has passed Expedited Bill 29-10, Taxes-Excise Tax-Carbon Dioxide Emissions as the first bill in the county-level in America on May 19, 2015. Amount imposed with carbon taxes on major emitters of carbon dioxide is to be used to reduce the emission of greenhouse gas.

Hereupon, a carbon tax and cap and trade in America have been adopted and operated at the local and regional levels. Cap and trade turned out to be relatively more utilized than a carbon tax.

3.4. Responses of Industrial World to Climate Changes

Industrial world was concerned with 'carbon leakage' in the case of adoption of a carbon tax. There is a possibility for the government to cause conflict in preparation for

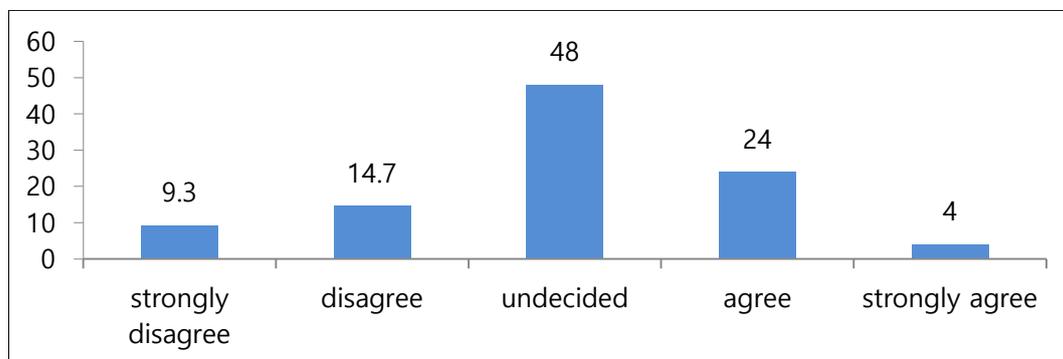
such an issue. However, they are still able to draft a plan for equivalent a carbon tax through ‘Border Carbon Adjustments (BCAs)’ [22]. They have been opposing with climate change legislation by collectively or individually developing anti-carbon tax activities to protect their interests from carbon taxes from the past.

Responses to climate changes in the industrial world are divided into anti-climate actions and pro-environmental actions. Anti-climate actions include “umbrella organizations” and “industry-specific associations.” The former one represents “the Chamber of Commerce, National Association of Manufactures, Business Roundtable, and US Council for International Business,” while the latter represents “coal, oil, and other fossil-fuel intensive industries [1].” On the other hand, pro-environmental actions are mostly performed by natural gas industries, renewable energy industry, and environmentally friendly organizations. At last, they hold fast to their interest to administration, the United States Congress, and international society through lobbying activities. The most it was for an industry world to emit greenhouse gas, the most they donate election campaign fund not to the Democratic Party but to the Republican Party [23]. This explains how it was not realistically possible to legislate climate changes. On the other hand, considering how there were more than four lobbyists per member in the Unites States Congress [1], it implies how complicated dynamic relationship of responses for climate changes was.

3.5. Responses of Civil Society in America to Climate Changes

Civil society had a skeptical attitude to the adoption of a carbon tax in America. However, their reaction turned out to be different depending on how to use the amount imposed on a carbon tax. According to the investigation performed in 2011, the proportion of supporting “a carbon tax without a set financial cost” was analyzed to be 32% [24]. “Only 29% of Americans strongly or somewhat support a carbon tax” according to the investigation performed in 2013 [25]. According to the investigation performed in 2014, cases of not suggesting the purpose of using taxation turned out to constitute 34% followed by 29% for “attaching a specific cost to the carbon tax”, 38% for reducing “the federal deficit”, 56% for reimbursing to the citizens in the form of “a rebate check”, and 60% for funding “research and development for renewable energy programs” [26].

In addition, as shown in Figure 1, only 28% of the respondents indicated that it was feasible for the current president Barack Obama to legislate a carbon tax, while 48% of them indicated ‘undecided’, and 14.7% indicated ‘disagree’. As for the possibility of passing a carbon tax bill in the Unites States Congress, it was confirmed that respondents had skeptical attitude [27].



Source: Prepared by the author by extracting the contents from the Table 2 by Choi (2015) [27]

Figure 1. Perception of Possibility for the President Barack Obama To Pass a Carbon Tax Bill (N=75, In %)

4. Review on the Introduction of a Carbon Tax in Korea and Implications from America on This

This section examines what needs to be considered when reviewing the introduction of a carbon tax as well as the background that adoption of a carbon tax has been raised as an issue again.

4.1. Re-emergence of Necessity for a Carbon Tax

First of all, Korea has set up the goal of reducing greenhouse gas in INDC submitted to the UNFCCC by '37% from the BAU by 2030'. Among them, the proportion of reduction from international market was designed to be 11.3%. However, the feasibility to realize them is still not certain. In addition, 13.7% of them are planned to be achieved through the improvement of related laws and policies including 'Act on Emissions Trading'. Hereupon, there is a high possibility for it to be concluded to a carbon tax.

Secondly, ETS was performed in January, 2015. The market was opened to 525 companies. However, their performance level turned out not to be high. Only about 0.23% of the total emission allowances 5.4322 hundred million ton provided by the government for a year in 2015 was used for transactions. Therefore, this is a ground for requiring a means to assure certainty in achieving the goal of reduction for greenhouse gas determined by the government.

4.2. Considerations when Reviewing a Carbon Tax

Assuming that Korea adopts a carbon tax, four important matters to be considered prior to designing the framework are suggested.

4.2.1. Courses of Legislation of a Carbon Tax

As the Korean government-drafted bill about the response to climate change was introduced and passed, it is likely that the time-consistent policy is not secured [28]. The National Assembly should make the utmost efforts to eliminate that likelihood and reduce national losses. A good example is a carbon tax. Article 52 of the Korean Constitution stipulates that 'bills may be introduced by members of the National Assembly or by the Executive'. National interests should be the standard of judgment for deliberating and voting on a bill, regardless of who the introducer is. "The construal of national" is definitely the "economic advantage [29]." As stipulated by Paragraph 2, Article 46 of the Korean Constitution, Members of the National Assembly 'shall give preference to national interests and shall perform their duties in accordance with conscience'. In the context of Korean political structure, it may actually be difficult for lawmakers to make a choice based on national interest while leaving behind the party platform or the interests of their own precinct [30]. It is necessary to judge and decide a bill in accordance with the lawmakers' own rights and duties, regardless of the ruling or opposition parties, in the state of being free from different interests encompassing lawmakers. What the United States Congress has shown to the international society was a great example of this.

If anything is against their national interest, the United States Congress has compromised or rejected them regardless of international climate negotiations or domestic climate change legislation. The Senate has indicated not to ratify Kyoto Protocol in 1997. The United States Congress made decisions in objecting the ratification of international protocol to protect domestic companies or in delaying, supporting, or rejecting the policies suggested by the president [31]. The Senate is able to execute the right of ratification of international protocol protecting the

national interest in the independent position with administration even if they belong to the same department with the president. In addition, none of the twenty-two carbon tax bills submitted to the United States Congress since 1990 was passed. In spite of the statement “[a] carbon tax can work in the United States [32]”, a carbon tax legislation in America was unable to be passed in the United States Congress. This has strong implications for the National Assembly in Korea.

Therefore, it is required for the National Assembly to thoroughly and carefully review in an independent position when reviewing the carbon tax bill and decide whether to adopt it. At this time, the top priority in determination shall be ‘national interest’, and the commonly highest priority shall lie in ‘international interest’.

4.2.2. Methods of Introducing a Carbon Tax

‘Traffic, Energy and Environment Tax’ is the representative energy tax in Korea. It is required to supplement the energy tax by reducing and adjusting the energy tax rate instead of abolishing them while reinforcing the role of environment tax in internalizing the greenhouse gas environmental expenses and deriving the reduction of greenhouse gas by adopting a carbon tax as a new item of taxation [33]. This is in the same perspective as the ‘Carbon Tax Bill’ sponsored by the member, Sangjung Sim, was designed in 2013.

4.2.3. Period of Introducing a Carbon Tax

Korea planned to reduce greenhouse gas emissions by ‘37% from the BAU by 2030’. Based on the emergency of the issue, I suggest the period of adopting a carbon tax to be January, 2019, with following grounds.

First of all, ‘Traffic, Energy and Environment Tax’ will be valid until the end of 2018. Especially, the period of abolishing the ‘Traffic Tax Act’ has been extended to January, 2019. Therefore, it is possible to naturally proceed the abolition and new establishment of environment-related tax.

Secondly, the current government has presented the principle of ‘welfare expenses without increased tax’, and this has been reflected on the government operation. In addition, ETS has been implemented since 2015. If one particular government implements ETS and a carbon tax at the same time, it becomes an undesirable policy and also a huge burden.

Third, the Kyoto Regime is scheduled to end, while Post-Kyoto Climate Regime will start in the incumbency of the next president. The first review on the performance of INDC will start in 2023.

4.2.4. Mix of a Carbon Tax and Other Policies

The amount of greenhouse gas emission has been continuously increasing in Korea for the past ten years. It is required to promote policy integration of market and non-market mechanism to effectively achieve the goal in reducing the greenhouse. According to climate change legislation submitted to the National Assembly in Korea, they have dealt with diverse mechanisms. The more diverse means of policy are, the more they are able to secure the certainty of reduction for greenhouse gas. It is needed to maximize the synergic effect by integrating ETS, Renewable Portfolio Standard (RPS), and Greenhouse Gas and Energy Target Management System that are being implemented in Korea with a carbon tax.

4.2.5. Social Acceptance

A carbon tax is an exchange for emitting carbon [34]. Therefore, it is of a burden on citizens and industrial worlds. It is required to accept public opinion from the

stage of legislation and make an approach on legislation by considering psychological aspects so that a carbon tax is regarded as climate insurance [35]. This is the reason why all the carbon tax bills were not passed even if climate change legislation in America might have been sponsored according to the results of a thorough investigation in multi-angles for influence from the relevant bill. Especially, it is required to analyze the influence of them on low-income households and prepare for responses.

5. Conclusion

The solution of Post-Kyoto Climate Regime will zoom into the carbon tax. In addition, discussion on the adoption of a carbon tax will be accelerated in Korea. So far in this paper, we have been identifying what needs to be importantly considered. The initiation was found in responses of climate changes in America. Especially, we have approached on the issue with a focus on trend of how both Korea and America highly relied on fossil fuel as well as of contrasting responses of climate changes between them.

Korea has suggested 'LCGG' as national agenda on the National Liberation Day and implemented policies in 2008 by including the desire in all over the world in the name of 'independence from the threat by climate changes'. As a result, Korea has become a model for responses of climate changes. Especially, Korea has organized and maintained laws and policies including 'Framework Act on Low Carbon, Green Growth', and 'Act on Emissions Trading' and sponsored a carbon tax bill. ETS has been implemented in 2015. In addition, Korea has tacitly promulgated to adopt a carbon tax as a means for achieving the goal to reduce greenhouse gas emissions by 2030.

On the other hand, America withdrew from the Kyoto Protocol in 2001 due to inequality of responsibility for reduction of greenhouse gas and economic loss. They had been maintaining the isolated climate change policies for the next eight years since then. However, as Barack Obama was elected as the president in 2008, there was a change in policies. However, industrial worlds in taking a leading role in anti-climate activities based on election campaign fund and low level of responses from civil society have caused the lack of climate change legislation. The current president, Obama, ended up proceeding indirect climate change policies where the United States Congress maintained non-cooperative attitude. However, cap and trade and a carbon tax have been implemented at some of the local and regional levels.

Korea has provided background for why adoption of a carbon tax has been discussed again and emphasized that independent decision shall be made by members in the Assembly in the perspective of national interest while reviewing the adoption of a carbon tax above all. Korea then has suggested the adoption of a carbon tax as a new item of taxation and the period of adopting it as in the incumbency of the next president. In addition, they have emphasized policy mix and social acceptance to maximize the effect of reduction of greenhouse gas.

As the adoption of a carbon tax is discussed in Korea, it entails much objection while seeking for implications in America where all the circumstances are different. It is the undeniable reality that all the countries want to lead negotiation for supporting their national interest when discussing international cooperation for responses of climate changes. In the end, National Assembly in Korea will decide whether to adopt a carbon tax. However, the decision shall be made to harmonize national and international interest in the long-term perspective.

This paper is expected to serve as a role of means in improving the national image and promoting national interest in the future when a carbon tax is adopted in Korea.

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