



# Asia Program

## SPECIAL REPORT

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## Green Tigers

### The Politics and Policy of Climate Change in Northeast Asian Democracies

EDITED BY BRYCE WAKEFIELD

**ABSTRACT** This Special Report examines how governments in Japan, South Korea, and Taiwan have approached the issue of climate change. **Yves Tiberghien** examines and compares Tokyo's climate change politics before and after Japan's historic 2009 general election. **Hoesung Lee** and **Jin-Gyu Oh** review the voluntary but detailed climate change strategy mapped out by the South Korean government. And **Chi-Jen Yang** and **Hui-Chen Chien** explore the relationship between climate change policy and Taiwan's quest to increase its diplomatic space.

#### INTRODUCTION

BRYCE WAKEFIELD

Climate change is a hot issue in all northeast Asian democracies. An international Gallup poll conducted between 2007 and 2009 showed that 70 percent of Taiwanese, and 80 percent of Japanese and South Koreans, saw climate change as a threat to themselves or to their families. Each case represented a higher proportion of the population than in the United States (63 percent) and in many of the European Union nations (60 percent average). Meanwhile, the difference in popular views on the issue between the People's Republic of China, which overtook the United States in 2007 to become the world's largest emitter of greenhouse gases, and Taiwan is stark. Only 21 percent of mainland Chinese respondents to the poll answered that they saw

climate change as threatening. Meanwhile, 91 percent of Taiwanese, 93 percent of South Koreans, and 99 percent of Japanese claimed that they were at least aware of climate change as an issue, figures again high by global standards.<sup>1</sup>

To explore how governments in northeast Asia have dealt with the issue of climate change, the Asia Program and the China Environmental Forum at the Woodrow Wilson International Center for Scholars co-hosted a two-panel joint forum on climate change in northeast Asia on November 17, 2009. The essays in this Special Report were originally offered at this Wilson Center conference, and examine the initiatives that governments have taken in democratic northeast Asia to respond to public demand for

official action on climate change.

The high levels of awareness about climate change in Japan, South Korea, and Taiwan might be the result public and private programs designed to spread knowledge about the issue. In April 2006, for example, the Japanese government launched “Team Minus 6%,” an initiative aimed to show ordinary citizens the changes they could make in their everyday lives in order to help Japan reach its goal of cutting greenhouse gas emissions by six percent of 1990 levels. Members of the public could declare (*sengen*) themselves for the initiative online, and by January 2010, 3.5 million had done so. They were joined by a number of Japanese celebrities, and 35,000 participating businesses.

However, as **Yves Tiberghien**, associate professor at the University of British Columbia, writes in this Special Report, last year’s victory of the Democratic Party of Japan (DPJ) has significantly altered the political discourse on climate change. Indeed, Prime Minister Hatoyama Yukio pledged to cut greenhouse emissions by 25 percent of 1990 levels between the election and the time he was officially named prime minister. The prime minister has also announced that he will tie Japanese aid to environmentally friendly projects overseas, a proposal labeled the “Hatoyama Initiative.”

Hatoyama’s sweeping vision for a reduction in greenhouse gas emissions is the result of a new way of conducting politics in Tokyo. Prior to the rise of the DPJ, environmental policy in Japan was usually the product of structural relationships linking industry, the bureaucracy, and a public reluctant to face high taxes or costs. Bureaucratic bargaining resulted in policy that was not often

ambitious, but at least carefully planned. In contrast, Tiberghien sees Hatoyama’s greenhouse gas reduction goal as indicative that nongovernmental organizations have played a significant role in the political process by forming links with individual politicians.

Whether such conduct will result in comprehensive and realistic policy proposals, however, is less clear. Some of the DPJ’s campaign promises, such as the elimination of road tolls on the nation’s expressways, are not in line with the environmental agenda, and there is little sign that the government has prioritized climate change as a consideration within domestic political debates. For example, in April 2010, highway policy became a matter of contention within the DPJ, with some party members hoping to honor election promises, and others, including Transport Minister Maehara Seiji, arguing that promises were too costly to be implemented fully. Environmental policy was not a significant consideration in either argument. The debate on road tolls shows how easy it is for the government to shelve concerns about climate change when dealing with other issues, even those that are relevant to Japan’s emissions levels.

Compared to Japan, South Korea has outlined an impressively detailed, yet coherent climate change strategy. While Seoul has only recently become a global player in terms of climate change, the Lee Myun-bak government has been making up for lost time. With polls showing that 81 percent of South Koreans think their government has not done enough to meet the climate change challenge,<sup>3</sup> Seoul outlined a comprehensive range of policies to curb its emissions in its report to the 2009 United Nations Framework

## THE ASIA PROGRAM

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Convention on Climate Change (UNFCCC) in Copenhagen, and in February 2010 set its climate change targets at 30 percent below 2020 “business as usual” estimates. What is most striking is that because of its historically late development, South Korea was recognized as a “Non-Annex I Party,” that is, a developing nation, under the earlier 1997 Kyoto Protocol on climate change, and unlike the developed “Annex I Parties,” was not obligated to submit any specific emissions targets as part of the Copenhagen framework. The government’s policy proposals, which come without preconditions, are thus totally voluntary.

As **Hoesung Lee**, vice-chair of United Nations Intergovernmental Panel on Climate Change, and dean of Keimyung University, and **Jin-Gyu Oh**, managing director of the Green Growth Research Division, Korea Energy Economics Institute, note, South Korea’s emissions reductions targets were the outcome of a year-long task force coordinating the views of the business sector, government, and research institutions. Various views on the appropriate level for emissions goals were aired and debated between sectors before they were announced as policy. Three separate committees on climate change, sustainable development, and energy merged to create a Presidential Committee on Green Growth to better coordinate and direct climate change policy.

High levels of policy coordination have meant that the government now has detailed policies to meet its self-imposed goals, including greater emphasis on energy efficiency, transport improvement, and renewable energy. There are plans for more hybrid cars and electric vehicles, and a greater reliance on biofuels. Nuclear power will make up a greater degree of South Korea’s energy profile, rising from 24 percent of energy use today to 41 percent in 2030. A cap-and-trade system to regulate South Korean emissions is set for implementation in 2012, and consumers will be encouraged to buy green products as well as use an extensive network of bicycle lanes. South Korea will also monitor its emissions using air, ship, and satellite-based observation systems. These are just a few of the policies outlined by the South Korean government in what is clearly an impressive and detailed agenda.

In Taiwan, private initiatives to raise awareness have been one of the more prominent aspects of the climate change debate. In February 2010, *Plus or Minus Two Degrees Celsius*, a documentary produced by Taiwanese politician and media personality Sisy Chen (Chen Wenqian), debuted to packed theaters in Taipei. Despite later doubts about the quality of information contained in the documentary, its message was simple: if global warming was not stopped, then significant parts of Taiwan, including the Taipei basin, would be among the first to disappear under the world’s rising oceans.

Spliced into the documentary were shots of the numerous unusual droughts, snowstorms, sandstorms, wildfires, and cases of torrential rain that occurred across the globe in 2009 alone. Typhoon Morakot, which that year devastated areas in the south of the island, and which showed Taiwanese President Ma Ying-jeou’s crisis management skills to be less than optimal, was thus placed within an international, and apocalyptic, context. The documentary also urged Taiwan’s citizens to email Ma and convince him to prioritize climate change policy as a matter of national security. It was subsequently viewed by millions, airing on all major cable and network television stations.<sup>3</sup> While *Plus or Minus Two Degrees Celsius* had little to say about climate science and made few specific policy proposals, its public reception demonstrated the awareness of climate change in Taiwan.

In addition to its potential to motivate the Taiwanese public to become involved in politics, climate change, like so many other international issues, is seen by Taipei as inherently linked to Taiwan’s status within international society. **Chi-Jen Yang**, research scientist at the Center for Global Change at Duke University, and **Hui-Chen Chien**, deputy director-general of the Department of Air Quality Protection and Noise Control at the Taiwan Environmental Protection Administration (TEPA), explain how the issue of climate change is also an issue of sovereignty for Taiwan. Recognition in the climate change regime would enhance the island’s diplomatic status, a key and constant goal of successive Taiwanese governments.

For Taiwan, the language used in international

agreements is a vital issue. Taiwan is party neither to the United Nations Framework Convention on Climate Change nor to the Kyoto Protocol. The wording of the UNFCCC precluded Taiwanese participation, although it allowed Switzerland—like Taiwan, a non-U.N. member at the time—to formally accede to the convention. Other international agreements are worded in a way that allows Taiwanese participation in international regimes when such participation is deemed necessary or worthy.

Because it is eager to be recognized by the international community, Taipei has often attempted to structure its climate change policies as though it is an Annex-I Party under the agreement. This has not been without difficulty, as under Kyoto, Annex I Parties each negotiated their obligated cuts in emissions levels. Nevertheless, this approach makes sense to many in Taipei, and not only because it makes it more likely that Taiwan will be recognized under the climate change regime in the future. In the past Taiwan has been threatened with tariffs for not adhering to rules and norms of other international regimes, even though it has not been a formal party to the corresponding international agreements. An attempt to bring its emissions in line with other developed nations would help it to avoid these tariffs.

Despite the difficulty that Taiwan has experienced in achieving representation in international circles, warming ties between Taipei and Beijing have also given the former new hope that it will be allowed a place at the climate change table. The Taiwanese government has thus focused on implementing climate change policy as a way of showing the world that Taiwan is a responsible international citizen and increasing the island's diplomatic space.

Indeed, climate change policies in all northeast Asian democracies are propelled not only by public opinion, but by conceptions of national purpose on the world stage. Taiwan's attempt to create international diplomatic space as a quasi-nation is representative of this dynamic, but the South

Korean government's enthusiasm for climate change also highlights Seoul's desire to position itself as a "middle power" — a state that attempts to increase its influence in the world by acting as a leader in multilateral forums. Tokyo's impressive goals (even without a strategy to achieve them) suggest a similar desire to position Japan as an international player, even if its domestic political incoherence encourages doubt about its ability to deliver. Climate change policy can thus be placed in the context of both public demands and broader issues that define the international politics of the region as a whole.

## ENDNOTES

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# REGIME CHANGE AND GREEN SHIFT IN TOKYO

YVES TIBERGHIE

Japan played an important role in hosting the 1997 Kyoto conference on climate change and in ratifying the Kyoto treaty in 2002, despite strong pressures from the United States and domestic industry groups. In the wake of ratification, Japan made significant initial efforts toward implementation, particularly in terms of energy efficiency and industrial innovation.

However, Japan has also avoided taking the painful measures necessary to reach its target of 6 percent below 1990 levels and has mostly been slacking on climate change policy since 2005. As a result, carbon dioxide (CO<sub>2</sub>) emissions in 2007 were 9 percent above 1990 levels, and 15 percent above the target. In 2008, the gap decreased slightly to 7.4 percent above 1990 levels, owing to decreased economic activity during the financial crisis. But the estimation for the Kyoto end date in 2010–2012 is that Japan will be at least 6 percent above 1990 levels, or 12 percent above target.<sup>1</sup>

This trajectory suddenly changed with the August 30, 2009, general election in Japan, which swept aside the conservative government of the Liberal Democratic Party (LDP). The election of a new centrist/social democrat majority led by the Democratic Party of Japan (DPJ) was the country's most profound electoral change since 1955. The DPJ is attempting to tilt policy-making toward a social-democratic orientation and toward a new foreign policy that explicitly presents the European Union as a model for Asia and seeks a "more equal" U.S.–Japan relationship.

On the climate change front, the DPJ took a revolutionary turn as well. In early September 2009, Prime Minister Hatoyama Yukio made a conditional public pledge to cut emissions by 25 percent


from 1990 levels by 2020, representing a 34 percent cut from 2007 levels, despite fierce opposition from industry and widespread disbelief among think

Given Japan's high level of energy efficiency and previously introduced measures, cutting emissions will be costly and difficult.

tanks and bureaucrats. The pledge remains conditional on other major players (i.e., the United States and China) also making similar efforts. The pledge was publicly repeated in Hatoyama's speech at the United Nations General Assembly on September 22. On March 13, 2010, the Cabinet approved a bill that would turn this pledge into law if approved. However, the Diet has not yet completed the legislative process at the time of writing.

Given Japan's high level of energy efficiency and previously introduced measures, cutting emissions will be costly and difficult. In terms of its relative worldwide position on CO<sub>2</sub> emissions, Japan (9.3 tons per capita in 2000) is more efficient than the average for the Organisation for Economic Co-operation and Development (OECD) (11.3 tons per capita in 2000) or Germany (10.0), also much more efficient than the United States (20.0) and Canada (16.8). However, it remains less efficient than the EU (7.5) as a whole and significantly less than countries such as France (6.0) in particular. Japan's CO<sub>2</sub> emissions remained relatively

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stable, just below 1000 million tons from 1975 to 1990, but increased by 7.3 percent between 1990 and 1995. Thus, at the time of negotiations in

## Kyoto protocol policy stands as a classic case of a policy arena creating responsibilities for a number of ministries.

1997, Japan was about 9 percent above 1990 levels or about 15 percent from its committed Kyoto target. After the recent global economic crisis, the gap narrowed slightly, yet Japan never went below a total emissions output of 7 percent above the 1990 levels, leaving a 13 percent difference from its Kyoto commitments, a gap that still exists today.

### BACKGROUND: JAPAN AND THE RATIFICATION OF THE KYOTO PROTOCOL

Two core interacting features have determined Japan's climate change policy in the past. The policy outcomes vary depending on the interactions of these two factors. The first is the entrenched policy-making networks between industry, the bureaucracy—in particular the Ministry of Economy, Trade and Industry (METI)—and supporters of the LDP, the once-dominant party. The second is a Westminster parliamentary system with the capacity for major shifts in majority and centralized top-down policy leadership. This second factor only became evident in 2009 when the LDP was voted out of power for the first time in 54 years.


Climate change policy is marked by three classic cleavages. The first pits economic interest groups against newly rising non-governmental organizations (NGOs) and civil society actors. NGO influence is a relatively recent phenomenon, and NGOs have not been powerful enough to trump organized industrial interests under LDP administrations. The

NGOs' contribution to climate change governance has included information gathering, general information campaigns that raise public alarm, outreach and education, and selective partnering with pro-environment ministries or political actors. They have gradually developed important links with key politicians (especially in the DPJ and the Social-Democratic Party). They have also moved away from direct confrontation with the bureaucracy and have gradually engaged in cooperative relationships, especially with the Ministry of Environment (MOE). Key NGOs include *Greenpeace Japan*, *Kiko (Climate) Forum*, *World Wildlife Fund (WWF)*, *Friends of the Earth*, *A SEED JAPAN*, and *Citizens' Alliance for Saving the Atmosphere (CASA)*.

The second cleavage falls within the sphere of bureaucratic politics. The focus on bureaucratic rivalries is a mainstay in studies of the Japanese political economy. It is well established that the Japanese bureaucracy is both extensive in its regulatory reach and vertically entrenched, and much has been written about the top-down nature of Japanese environmental policy. Ministries have long traditions going back to the Meiji period (1868–1912), and the cabinet has traditionally been weak in coordinating policy between the ministries, which act as powerful fiefdoms. The most contentious issue areas are those where competences overlap among several ministries, such as telecommunications policy (METI and Ministry of Post and Telecommunication), economic strategy (METI and Ministry of Finance, or MOF), or corporate governance (METI, Ministry of Justice, and the cabinet).

Kyoto protocol policy stands as a classic case of a policy arena creating responsibilities for a number of ministries. The Ministry of Foreign Affairs (MOFA) is in charge of foreign relations, but is itself divided between its dominant North American bureau (prioritizing the U.S.–Japan alliance) and its bureaus in charge of treaties and global issues. MOE (a less-powerful agency until January 2001, a ministry since then) has a strong interest in climate change, but is a weaker and newer actor in the battle of the ministries.

On balance, METI is the more powerful ministry and has the ability to win bureaucratic battles



in the absence of political intervention. The ministry is in charge of energy policy and all aspects of industrial policy. METI's overall priority is industrial and economic competitiveness, although it also has a large interest in developing nuclear energy and new environmental technologies. METI is opposed to punitive regulations on industry or to giving too much power to MOE.

However, METI's power is not absolute. The Ministry of Finance has a dominant say over all budgetary decisions. Its priority lies in controlling expenses and cutting Japan's enormous public debt; wielding the budgetary knife also happens to be its main source of its power. In addition, MOF has an interest in preventing METI from gaining too much power over Japan's general economic policy. When it comes to Kyoto policies, MOF is opposed to a carbon tax on the grounds that it would divert precious political capital away from higher fiscal priorities, mainly the increase in the consumption tax.

Finally, the Ministry of Agriculture, Forestry and Fisheries (MAFF) has become involved in the Kyoto debate because of its control of forestry policy. The promise of high budgetary inflows toward forest management has made MAFF a strong supporter of Kyoto. MAFF has strong political linkages to LDP politicians in rural districts.

The third cleavage falls in the sphere of foreign policy. The new government has pitted the traditional reliance on the U.S.-Japan alliance as the core axis of Japanese foreign policy against the DPJ's internationalist agenda and commonality of views with the European Union. On balance, however, the DPJ's international agenda and its preference for multilateral relations are not strong enough to change the fundamental relationship between the United States and Japan.

The result of these three cleavages on Japanese climate change policy means that in the absence of strong political leadership, structural linkages between Keidanren, Japan's most influential industry and business organization, METI, and U.S. interests will likely lead to climate change policy that embraces incrementalism and gradualism. Major policy change is unlikely without political involvement.


However, in previous work with Miranda Schreurs, I argued that the METI-Keidanren coal-

The DPJ's international agenda and its preference for multilateral relations are not strong enough to change the fundamental relationship between the United States and Japan.

tion was forced to accept the ratification of the Kyoto Protocol in 2001-2002 because of the intervention of political leadership and the weight of symbolic politics attached to Kyoto in Japan at all levels.<sup>2</sup> Political leaders, including Prime Minister Koizumi Junichiro, responded to electoral calculations, shifting public opinion, and new NGO linkages, allowing the weaker side led by MOE to win the argument. In early July 2001, Koizumi initially sided with U.S. President George W. Bush, by hinting that Japan would not seek to ratify Kyoto. By July 23, he reversed this position after intense lobbying by NGOs and the eruption of climate change as a top election issue in the upper house elections that month.

#### **TUG OF WAR OVER IMPLEMENTATION – STRUCTURAL INERTIA**

Despite Koizumi's support for the ratification of the Kyoto Protocol, implementation of policy related to the protocol needed the backing of political leadership to tilt the balance away from the default position determined by the stronger entrenched groups within the climate change policy debate. However, this leadership was often lacking, and implementation continued to be incremental. Between 2002 and 2009, Japan reiterated its commitments, yet stuck to a soft implementation pathway without a



carbon tax or an Emissions Trading System (ETS). The government implemented policies related to innovation and efficiency, and emissions did stop increasing, yet the 13–15 percent gap to reach the target remained unchanged. At the end of 2002, emissions were at 7.6 percent above 1990 levels, and were almost exactly the same in 2008, though below the 9 percent level of 2007.

Japan has concentrated on voluntary measures and some tougher industrial standards, as well as focusing on the “Kyoto mechanisms,” that is, trad-

## Hatoyama’s public pledge marks a major change in Japan’s climate change policy from the recent decade.

ing emission allowances with other nations and the implementation of emissions reductions projects in other nations. A large part of Japan’s Kyoto policy depends on using carbon sinks through forest management and the introduction of a new energy policy, although the latter partially hangs on the construction of new nuclear plants, something that has not happened at all in the face of public opposition.

As of 2005, when there was still potential time for real measures that would bring Japan closer to its Kyoto target, the official plan drafted by METI called for: energy conservation and more efficient energy production (to reduce emissions by 4.8 percent); further cuts in uses of fluorinated gases (1.3 percent); further cuts in the use of methane, and in nitrous oxide and CO<sub>2</sub> from non-energy sources (0.4 percent); carbon sinks (mostly forests) (3.9 percent); and reliance on the Kyoto Mechanism (1.6 percent). Japan also views the Kyoto mechanisms as a “slack absorber” which can be adjusted if targets are not reached in other areas. These five supplementary groups of measures were expected to produce an additional cut of 12 percent and to be suf-

ficient to close the gap with the Kyoto target. The reality, as of 2009, is different, and the gap remains.

In late 2004, Japan considered tougher measures, including a carbon tax championed by Environment Minister Koike Yuriko. By the spring of 2005, however, it was clear that METI had won the battle behind the scenes and had succeeded in convincing Prime Minister Koizumi to arbitrate against the carbon tax. To the prime minister, the potential benefit of the tax remained uncertain, while the immediate cost was high. An opinion poll published by *Yomiuri Shimbun* in November 2004 showed that only 45 percent were for a carbon tax with 29 percent against. Meanwhile 70 percent of the public said that government and industry were not doing enough and that the key measures should be mandatory regulations on industry.

A second battle took place in 2005 around the proposal to introduce daylight savings in Japan, a measure that METI Minister Hiranuma Takeo believed would cut emissions significantly. However, Hiranuma had opposed reform of the postal system, a key policy of the Koizumi cabinet, and he was thus among the LDP resistance group targeted by Koizumi and expelled from the party in August 2005. He lost his seat in the September 2005 election. Since then, there has been no active proponent of daylight savings. In addition, some Japanese still associate daylight savings with the U.S. occupation. It was arbitrarily imposed in 1948 and immediately abandoned in 1952 once Japan regained its independence.

So, instead of those measures, Prime Minister Koizumi spearheaded the 2005 *Cool Biz* campaign, which has proven to be the most lasting of Japan’s climate change initiatives. The campaign called for all working men to shed ties and jackets from June to September and all offices to set air conditioning at 28 degrees Celsius. This led to a boom in retailing, but not to a serious cut in CO<sub>2</sub> emissions.

The lack of political leadership from 2002 to 2009, then, meant that the METI-Keidanren alliance maintained its dominance over a weaker MOE cluster.

## THE BALI MOMENT – DECEMBER 2007

The Bali summit in December 2007 was a key milestone in moving toward a successor to the Kyoto Protocol. In Bali, the EU sought a commitment of 25–40 percent cuts by developed countries from 1990 levels by 2020. In a major upset, Canada and Japan joined the U.S. in preventing the establishment of targets and diluting the EU proposals. Meanwhile, China and the associated G77 group of developing countries forced a softening of commitments demanded from developing countries.

For Japan, this position represented a shift from its earlier support for the Kyoto Protocol. Coming only a couple months after the start of Prime Minister Fukuda Yasuo's tenure, and at a time when a divided Diet had weakened the hand of the prime minister, there was little scope for political leadership on climate change. The METI-Keidanren pole thus again gained the upper hand. Prime Minister Fukuda later tried to rebalance Japan's position somewhat by making the environment the topic of focus at the G8 summit in Hokkaido in July 2008.

In 2008 and 2009, the Aso government prepared for the Copenhagen negotiations with a low-ball 8 percent commitment from 1990 levels by 2020, almost exactly the same as the 2010 Kyoto target established in the 1997 treaty.

## THE NEW HATOYAMA ADMINISTRATION – BACKGROUND

The August 30, 2009, lower house election led to a major political upset. It not only swept the ruling LDP out of power for the first time since its creation in 1955 (the LDP was out of power for 11 months from 1993–1994 but this was the result of a break-up of the party, not an election); it did so in a landslide. The recently formed and hitherto untested DPJ crushed the LDP, reducing its number of seats from 300 to 119. Meanwhile, the DPJ won 308 seats (from 115 before the election) out of a total of 480 seats. Climate change was not the major issue in the election. What swept the LDP aside was a perfect storm of public frustration, where long-standing anger at LDP corruption

combined with the global economic crisis and the rising inequality resulting from Koizumi's structural reforms, at a time when the DPJ had finally put together a credible bid for government.

The DPJ's rise to power represents a social-democratic shift in Japan. With slogans such as “put people before concrete,” the DPJ is attempting to transfer government funding away from construction and redistribution in favor of LDP interest groups, and has directed it instead toward broad social welfare initiatives. It also represents a major rhetorical change around foreign policy: the DPJ's promises include rebalancing the U.S.-Japan alliance, economic integration with China and Asia, and Asian currency integration.

A further political change that accompanies this new DPJ platform is the governing coalition with two major parties that the DPJ had to put together, in order to also have a majority in the upper house, given the strong bicameral nature of the Japanese political system. The People's New Party (PNP) is neutral on climate change, but the other partner, the Social Democratic Party (SDP) puts action on climate change as one of its top three electoral interests, although it opposes using nuclear energy in this pursuit.

## HATOYAMA AND THE GREAT NEW PLEDGE

In early September 2009, before even forming his government, Hatoyama publicly issued a new public pledge for the Copenhagen negotiations: a 25 percent cut in Japan's emissions from 1990 levels by 2020, on the condition that other major players would make serious efforts as well, although these were not precisely defined. Given that Japan is about 8 percent above 1990 levels at the moment, the pledge represents a 33 percent cut from current levels by 2020. Hatoyama repeated this pledge on the international scene in a major speech at the United Nations on September 22.

This public pledge marks a major change in Japan's climate change policy from the recent decade. It also marks a shift in global coalitions, with Japan joining the EU at the forefront of major action against climate change.



The election manifesto of the DPJ included that major pledge, but in softer terms (“aim at”) and with only a promise to “study” the idea of a carbon tax. The manifesto made only two concrete commitments on climate change:

1. To increase the ratio of renewable energy to total primary energy supply to 10 percent by 2020 (with a fixed price and mandatory purchase system); and

2. To boost environmental technology, including biomass, fuel cells, and superconductivity.<sup>3</sup>

In addition, the DPJ agenda contained one major contradiction on climate change. While concrete actions to change Japan’s trajectory have yet to come, the DPJ also made a contradictory election promise, namely the removal of all expressway tolls. This pledge was essentially a political one, both because expressway tolls are unpopular and because the revenues are earmarked for construction projects that disproportionately benefit interest groups that support the LDP. It also sets back the climate change cause before the DPJ even unfolds the rest of its agenda. As of early 2010, however, the DPJ ended up keeping most tolls (due to fiscal pressures) and only removing tolls on remote expressways.

Strikingly, Hatoyama’s political commitment seems to have preceded most preparatory work on how such a pledge could be implemented. A key committee bringing together the ministers from MOE, METI, and MOFA was set up only in early October. So were task forces on the implementation of both the domestic pledge and the accompanying Hatoyama initiative (for overseas aid targeting climate change reduction).

The early declarations coming from the DPJ or Environment Minister Ozawa Sakihito indicated that the government was considering three types of major measures: a major use of credits purchased overseas and development aid for possibly 10 percent of cuts, out of the total pledge of 25 percent; a “global warming tax,” floated on October 30 by Ozawa; and participation in an international emissions trading system with a cap-and-trade system.

On October 30, 2009, Ozawa indicated preparation for a climate change action tax (*ondanka taisaku zei*) to be introduced in 2010 at the level of 2400 yen (\$26) per ton of carbon, with poten-

tial total revenue of 2 trillion yen (\$21 billion).<sup>4</sup> However, before the DPJ estimates were released, the departing Aso government scared voters with estimates of its own. Citing government sources, the Nikkei newspaper wrote:

*Meeting the target without purchasing carbon credits from overseas could end up adding 360,000 yen (US\$3,910) to a typical household’s annual utility bill. . . . According to an estimate by the government under Prime Minister Taro Aso, the 25 percent cut would require a cocktail of difficult measures: increasing the use of solar power 55-fold; increasing the ratio of green car sales to all new car sales to 90 percent; cutting steel and cement production by 10-20 percent.<sup>5</sup>*

In late November 2009, the DPJ’s tax program led to another controversy, when the government dismissed the cost evaluations issued by its appointed academic team led by Professor Ueta Kazuhiro of Kyoto University as too high and appointed a new team instead. By December, DPJ Secretary General and shadow leader Ozawa Ichiro forced the government to abandon the plan of a carbon tax for 2010, given political realities.

The first major concrete step toward implementing the large goals promised by the Hatoyama government came with the March 2010 cabinet-approved bill to combat global warming (not yet voted upon by the Diet at the time of this writing). The bill commits Japan to its 25 percent pledge from 1990 to 2020, but also retains the conditionality on other major countries taking similar questions. The bill pledges to introduce a carbon tax in fiscal year 2011. On the other hand, in recognition of strong industry lobbying, the bill only commits the industrial sector to an emission ceiling per unit of production, rather than an absolute ceiling. It also pledges heavier reliance on nuclear energy, a pledge that has proved politically impossible in the past.

## **POLITICAL FORCES BEHIND THE NEW POSITIONING**

What can explain the great Hatoyama shift on cli-

mate change, and is it sustainable?

One underlying variable seems to be growing public support for climate change measures, even though most Japanese remain sensitive to taxes. A series of opinion polls taken by the *Asahi*, *Yomiuri*, and *Nikkei* newspapers between October 11 and November 8, 2009, all reported that 70 to 75 percent of Japanese support the 25 percent pledge made by Hatoyama *in principle* and about 80 percent support a new Copenhagen deal with binding targets. The same support level (70 percent) for the 25 percent pledge was found in March 2010.<sup>7</sup>

However, when primed on costs, voters soften up somewhat. Only 19 percent support achieving the goal with increased costs for households, while 69 percent would like to have an option that does not increase cost for households.<sup>8</sup> The most recent survey in March 2010 found strengthening support for carbon taxation: only 22 percent opposed a tax of 1,000 yen (US \$11) per month or less per household.<sup>9</sup> This seems to confirm long-term trends that have indicated growing support for the idea of a carbon tax, although this is not yet conclusive. The polls run by the prime minister's office (*kantei*) indicate that positive support for a carbon tax went from 24.8 percent in 2005 to 40.1 percent in 2007, and that neutral positions went from 36 percent to 24 percent during the same period.<sup>10</sup>

The core source of change, however, is political leadership by Foreign Minister Okada Katsuya with the support of Prime Minister Hatoyama, and strong links between the NGO community and the DPJ's point man on climate change, State Secretary for Foreign Affairs Fukuyama Tetsuro. The current environment minister, Ozawa Sakihito, a centrist in the party with close links to Hatoyama, has also taken a growing leadership role. This new political lineup also means that the formerly neutral MOFA has now shifted in support of MOE on climate change. This ushers in a new bureaucratic balance of power in the policy-making game. The presence of the SDP as a coalition partner adds another political lever on the side of action.

DPJ leaders were actually relative latecomers to the issue of climate change, given the earlier focus of the party on a mix of liberal economic reforms and stronger welfare system. The interest in climate change came out of electoral strategy

and through the action of political entrepreneurs within the party. The initial official party policy on climate change (with a target of a 20 percent cut by 2020) was issued by the committee on climate change, chaired by Fukuyama.<sup>11</sup> That early proposal included the concept of a carbon tax set at 3000 yen (US \$32) per ton. Only in January 2008 did heavyweight Okada jump on the bandwagon, becoming the head of the unit (*honbu*) in charge of climate change policy, with Fukuyama as secretary general. The DPJ moved to a 25 percent target only in June 2009, just before the election.

A key feature of the new DPJ approach is its closeness to NGO positions on what Japan should pledge and do. Greenpeace Japan had been lobbying for exactly a 25 percent target by 2020 and has issued strong words of support for Hatoyama's pledge.<sup>12</sup> Kiko Network has lobbied for a stricter 30 percent target.<sup>13</sup> WWF supports Hatoyama's pledge, but lobbies for an 80 percent cut by 2050 as well.<sup>14</sup>

There is, however, uncertainty among other key DPJ leaders and some of the important supporters of the party. Secretary General Ozawa Ichiro and Vice Premier Prime Minister Kan Naoto have yet to take any position on the climate change policy debate. It is doubtful that they support electorally risky measures such as the carbon tax. Meanwhile, Rengo, the labor union that counts as a key DPJ supporter has expressed concern about the 25 percent target and urged caution from the government.<sup>15</sup>

## CONCLUSION – COPENHAGEN AND BEYOND

Japan's abrupt shift put Japan on the EU side of the ledger at the Copenhagen conference in December 2009 and has drawn praise from European and UN leaders. Japan did play a positive role at the conference, combining its strong 25 percent pledge with the largest provision of financial aid to developing countries of any country (US \$15 Billion over 3 years, half of the grand total promised by the OECD). However, Japan also puzzled NGOs and pro-action diplomats by taking an extremely low-key approach to the conference. Its diplomats

remained behind closed doors and did not hold public press conferences. They did not seek to build a large coalition with the EU and other like-minded partners. In the end, Japan, just like Europe, was eventually shut out of the key room that saw the United States, China, India, and Brazil negotiate the final compromise.

Did Japan's big climate change shift prove to be too little, too late? The core negotiation axis for Copenhagen was clearly the G2 link between the United States and China. The big Japanese shift, with its lack of concrete action plan, was not enough to shift the balance of negotiations in Copenhagen. In addition, Japan and Europe failed to effectively cooperate. Furthermore, strained relations between U.S. President Barack Obama and Hatoyama over the relocation of a base on the Japanese island prefecture of Okinawa prevented Japan from playing its potential facilitating role between the United States and other countries.<sup>16</sup>

Before that, at the APEC summit in Singapore, Prime Minister Hatoyama did bring his climate change priority to the larger caucus of Asia-Pacific nations, urging them to take real action. Hatoyama, however, found himself isolated. The majority of nations, after apparent U.S. and Chinese prodding, issued instead a statement, indicating that they did not see Copenhagen as a realistic place and time to put together a new binding treaty. The precise target of a 50 percent cut in emissions by 2050 was abandoned in the final declaration.

In 2010, Japan's voice should become stronger. Its foreign policy team is gaining experience and getting organized. The March bill will give teeth to Japan's commitment (if passed). Japan will also host the 10th Conference of the Parties to the Convention on Biological Diversity in October 2010, assuring a central place to Japan's environmental diplomacy. Much, however, hangs on the resolution of the Okinawa base issue, U.S.-Japan and EU-Japan relations, and the July upper house election.

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# INTEGRATING CLIMATE CHANGE POLICY WITH A GREEN GROWTH STRATEGY: THE CASE OF SOUTH KOREA

HOESUNG LEE AND JIN-GYU OH

The Copenhagen Accord requires Annex I Parties, those “developed” countries in the Organisation for Economic Cooperation and Development (OECD) in 1992, plus select “economies in transition,” to submit clear emissions reduction targets. Non-Annex I Parties, developing nations in 1992 including South Korea, are required to submit mitigation actions deemed nationally appropriate. The year 2020 was stipulated as a target year for both Annex I and Non-Annex I countries. Business-as-usual (BAU) emissions, those that would occur if no new action

Korea’s unilateral mitigation actions reflect the country’s strong commitment to addressing global climate problems

to cut emissions was taken, are the benchmark against which developing countries’ mitigation actions are to be specified. As of February 1, 2010, 27 developing countries had made submissions. With pledges from 28 developed countries, the 55 countries together account for 78 percent of global emissions from energy use.<sup>1</sup>

South Korea’s proposal at Copenhagen would, if implemented, reduce its greenhouse gas (GHG) emissions by 30 percent of the BAU estimates by

2020. There was no precondition for this pledge. Other countries’ pledges generally contain conditions of reciprocity or domestic legislative mandates. For instance, Mexico, which also declared 30 percent mitigation from its 2020 BAU estimate, made its goal conditional upon financial and technical assistance from developed countries.<sup>2</sup> China and India presented their mitigation goals in terms of emissions intensity (carbon emissions in proportion to GDP), as well as specifying that mitigation actions should be voluntary and that domestic legislation would remain dominant over international agreements.<sup>3</sup> Developed country pledges in general contain conditions of reciprocity including that “all major economies participate,” that “other developed countries commit themselves to comparable emission reductions, and that developing countries contribute adequately,” or specify the need for a “comprehensive global agreement” before their policies can take effect.<sup>4</sup>

Korea’s unilateral mitigation actions reflect the country’s strong commitment to addressing global climate problems. The principles of “common but differentiated responsibilities” under the United Nations Framework Convention on Climate Change (UNFCCC) and “nationally appropriate mitigation actions/commitments” under the 2007 Bali Action Plan<sup>5</sup> are two pillars supporting Korea’s contributions to global efforts to stabilize atmospheric concentrations of GHG. This paper examines the rationale for Korea’s climate change policy.

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## GHG INVENTORY DATA

The total emissions of the six gases defined as greenhouse gases (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>) doubled during the 16-year period from 1990 to 2006; gross GHG emissions increased from 298.1 million tons of carbon dioxide equivalent (tCO<sub>2</sub>eq) in 1990 to 599.5 million tCO<sub>2</sub>eq in 2006, at a 4.5 percent annual rate of increase, as shown in Table 1.

Energy consumption accounts for 84.3 percent of total emissions with this share remaining the same for the 16 years to 2006. Emissions

from industrial processes, the second largest source, account for only 10.6 percent. During 1990–2000 emissions from industrial processes increased rapidly from a 6.7 percent share to 11 percent. However, since 2000, such emissions have slowly declined as a share of the total. The emissions from agriculture and waste management have declined in absolute terms since 2000. The removal of emissions by forest and land use change amounted to 31.2 million tCO<sub>2</sub>eq in 2006, reaching 5.2 percent of gross emissions. The removal rate has declined for the last six years.

**TABLE 1: Trend in ROK GHG Emissions/Removal (percentage per annum)**  
(unit: million tCO<sub>2</sub> eq)

	1990	2000	2005	2006	'90- 06 (%)
Energy	247.7 (83.1)	438.5 (82.6)	498.5 (83.9)	505.4 (84.3)	4.6
Industrial process	19.9 (6.7)	58.3 (11.0)	64.8 (10.9)	63.7 (10.6)	7.5
Agriculture	13.5 (4.5)	17.0 (3.2)	16.1 (2.7)	15.1 (2.5)	0.7
Waste management	17.0 (5.7)	17.2 (3.2)	14.9 (2.5)	15.4 (2.6)	- 0.6
Gross emissions	298.1 (100.0)	531.0 (100.0)	594.4 (100.0)	599.5 (100.0)	4.5
Forest/Land use change	- 23.7	- 37.2	- 32.0	- 31.2	1.7
Net emissions	274.4	493.8	562.4	568.4	4.7

Source: Korea Energy Economics Institute, "Study on the National Inventory of Korea," December 2008.

## ENERGY CONSUMPTION AND CO<sub>2</sub> EMISSIONS

Energy consumption in Korea increased at an annual rate of 5.9 percent and carbon dioxide (CO<sub>2</sub>) emissions increased at an annual rate of 4.7 percent from 1990 to 2006. As shown in Table 2, carbon intensity has declined to 2.13 tCO<sub>2</sub> from 2.56 tCO<sub>2</sub> in 1990. The speed of decline in carbon intensity was 1.2 percent per year. This decline rate is four times as fast as the global average historical rate (0.3 percent).<sup>6</sup> The expansion of liquid natural gas (LNG) and nuclear power was responsible for the rapid decline in carbon intensity. The growth of the low-carbon energy sources was due

to energy policies seeking to improve national energy security and regional environmental quality. Notwithstanding decline in carbon intensity, per capita carbon emissions have increased to 10.29 tCO<sub>2</sub> from 5.57 tCO<sub>2</sub> in 1990.

Electric power generation is responsible for 36.1 percent of total CO<sub>2</sub> emissions, while industrial use of fossil fuels both as feed stock and as an energy source account for 31.7 percent. The latter category includes such sectors as the petrochemical industry, the iron and steel industry, and the cement industry. The transport sector accounts for 20 percent with the residential and commercial sector accounting for 11.4 percent along with public sector emissions at 0.9 percent.

**TABLE 2: Main Indicators of ROK Energy-related CO<sub>2</sub> Emissions**  
(toe = tons of oil equivalent)

	1990	2000	2005	2006	'90- 06 (%)
CO <sub>2</sub> (A) (million tCO <sub>2</sub> )	239.0	432.2	490.5	497.1	4.7
Population (thousand)	42,869	47,008	48,138	48,297	0.7
Energy (B) (thousand toe)	93,192	192,887	228,622	233,372	5.9
Per capita CO <sub>2</sub> emissions (ton)	5.57	9.19	10.19	10.29	3.9
Carbon intensity (ton/toe) (A/B)	2.56	2.24	2.15	2.13	-1.2

Source: Korea Energy Economics Institute, "Study on the National Inventory of Korea," December 2008.

**TABLE 3: Energy-related CO<sub>2</sub> Emissions by Sector in South Korea**  
(unit: million tCO<sub>2</sub> )

	1990	2000	2005	2006	'90- 06 (%)
Power sector	37.9 (15.9)	125.7 (29.1)	170.8 (34.8)	179.3 (36.1)	10.2
Industry	87.2 (36.5)	152.4 (35.3)	156.2 (31.8)	157.5 (31.7)	3.8
Transportation	42.2 (17.7)	86.6 (20.0)	97.5 (19.9)	99.3 (20.0)	5.5
Residential/	64.7 (27.1)	63.5 (14.7)	61.1 (12.5)	56.7 (11.4)	-0.8
Public	7.0 (2.9)	4.0 (0.9)	4.9 (1.0)	4.3 (0.9)	-3.0
Total	239.0 (100.0)	432.2 (100.0)	490.5 (100.0)	497.1 (100.0)	4.7

Source: Korea Energy Economics Institute, "Study on the National Inventory of Korea," December 2008.

Table 3 shows trends in emissions by sources with several key notable points. Emissions from buildings (residential/commercial) have continually declined, especially since 2000. Emissions from industry increased, although their share in total emissions declined throughout the period. During the 1990s, every sector except buildings recorded rapid increases in emissions. But beginning in 2000 growth rates of emissions from the industrial and transport sectors have significantly decreased.

As a result, the share of emissions from transport remained at 20 percent and the share from industry declined rapidly to 31.7 percent, losing 3 percentage points in a 6-year period. This peculiar pattern seems to reflect the aftermath of the financial crisis of the late 1990s and the rises in oil prices during the 2000s. However, a comprehensive study is needed to understand these trends and future CO<sub>2</sub> emissions.

## IMPACTS OF CLIMATE CHANGE IN SOUTH KOREA: OBSERVED AND PROJECTED CHANGES

The average temperature on the Korean peninsula has increased 1.5 degrees Celsius (°C) over the last 100 years.<sup>8</sup> The speed of the temperature increase in Korea represents twice the global average of 0.74°C. When compared to the 1920s, the spring and summer weather increased by around 20 days and winter weather decreased by around 30 days in the 1990s.<sup>9</sup> Extreme heat during the period from 1994 to 2005 led to over 2,000 mortalities.<sup>10</sup> For the last twenty years, rainfall intensity (annual rainfall divided by annual number of rainy days) has increased 18 percent because the volume of rain increased by 7 percent, although the number of rainy days decreased by 14 percent.<sup>11</sup>

The sea level around the peninsula rose on 1.9 millimeters (mm) per year, on average, for the period between 1964 and 2006, and the southern-

The speed of the temperature increase in Korea represents twice the global average.

most coastal region showed a considerably rapid sea level rise of 5.1 mm increase per year.<sup>12</sup>

The temperature increases resulted in changes in spatial distributions of plant and animal species.<sup>13</sup> For instance, apples used to be produced only in the southern region but rises in temperature reduced the apple production area in the southern region by about 75 percent, while allowing apple production increases in other regions located further north. Subtropical fruits such as pineapple and kiwi are now produced in South Korea. Japonica moved from its usual habitat on the southern coast to higher latitude regions. Walleye pollack, a fish that once thrived in the cold currents offshore Korea, is no longer available locally due to temperature increases in the sea, whereas the catch of squid tripled. The loss from weather-related disasters amounted to an average 2.6 trillion South Korean won (KRW) during the last ten years, substantially higher than 0.7 trillion KRW in the 1990s and 0.5

trillion KRW in the 1980s.<sup>14</sup> The damage estimates depend upon frequency and severity of storms, as well as the economic value of the damage. How much climate change is responsible for the four-fold increase in damage estimates is not known.


According to long-term climate projections by the Korea Meteorological Administration on the basis of an Intergovernmental Panel on Climate Change (IPCC) scenario, labeled A1B, the temperature will increase on the Korean peninsula by 2100 by 4°C and precipitation will increase by 17 percent.<sup>15</sup> As a result, most of the South Korean climate, except in the mountain regions in the east, will become subtropical

The information on the impact this warming will have on the South Korean economy is very limited. In 2080, rice yields will probably decrease 16 percent relative to the projected baseline crop yield, due to higher temperature during ripening than that required for maximum yield.<sup>16</sup> Forest loss due to climate change in the Korean peninsula may reach 2 percent of forest stock by 2100.<sup>17</sup> A one-meter rise in the sea level will inundate 1.2 percent of the Korean peninsula, affecting 2.6 percent of total population.<sup>18</sup>

There is little analysis on the financial cost of climate change in Korea. The cost of forest loss alone has been estimated in the range of US \$100 million and US \$558 million, depending upon scenarios of temperature increases and the migration speed of trees.<sup>19</sup> One study reported that the total cost of climate change in Korea under a 3°C temperature increase would amount to between US \$13 billion and US \$58 billion in 2100; and the net present value of cumulative damage from climate change would amount to between US \$143 billion and \$192 billion over the period from 1990 to 2100.<sup>20</sup>

Subtropical fruits such as pineapple and kiwi are now produced in South Korea.

The study does not mention how damage estimates would compare with macro parameters such as gross domestic product or with damage estimates reported for other countries. Information on



the climate damage costs, even if quite uncertain, would be useful for policymakers as it would allow them to assess response options addressing climate change problems.<sup>21</sup> Comprehensive research on physical impacts as well as their valuation is needed for Korea.

## POLICIES AND MEASURES

The IPCC has stated that in order to stabilize carbon dioxide equivalent rates of GHGs at 450 parts per million (ppm) in the atmosphere, developed countries as a group would need to reduce their emissions from 25 to 40 percent below 1990 levels by 2020 and then 80-95 percent below 1990 levels by 2050.<sup>22</sup> Developing countries are expected to reduce emissions growth substantially below business-as-usual baselines by 2020. The organization provided a caveat that the recommended ranges do neither reflect political feasibility, nor cost variances. And yet choice of long-term goals was mentioned to be more important than specific design of an emissions reduction regime.

How would pledges submitted in compliance with the Copenhagen Accord compare with the IPCC-recommended reduction targets? According to an analysis by the World Resource Institute, the total reduction quantities of Annex I pledges—a 12 to 19 percent reduction below 1990 levels—do not meet even the lower 25 percent reduction estimate required to stabilize emissions at 450 ppm CO<sub>2</sub>eq. This means that emissions will have to drop at a steeper rate of 2.5 percent annually during 2020-2050 to meet the target of 80 percent reduction below 1990 levels and that the steeper reduction implies “potential turnover in capital stock well beyond what is technologically or politically feasible in a 30-year time period, based on historical trends.”<sup>23</sup>

Korea’s pledge of a 30 percent reduction relative to BAU is an outcome of a year-long coordinated taskforce involving government, business, and research institutions. The taskforce analyzed mitigation potential using both top-down and bottom-up approaches, and identified three scenarios to deal with emissions. The government held a series of public hearings involving various stakehold-

ers to assess these three scenarios. Environmental NGOs demanded much more ambitious mitigation actions, while energy-intensive industries cautioned against emissions restraints which they considered premature and damaging to the competitiveness of their industries in the world markets. Finally, a joint committee of the executive and legislature came to an agreement in favor of a 30 percent reduction. The president of Korea accepted this proposal.

In order to attain a 30 percent reduction target, absolute emissions levels would peak soon and then begin to decline gradually.<sup>24</sup> Other scenarios and proposals that were considered but rejected included lowering projected emissions by 27 percent relative to BAU and 21 percent relative to BAU in 2020.

Much of the reduction will be achieved through cost-effective mitigation measures (energy efficiency improvements and process innovations) and

There is little analysis  
on the financial cost of  
climate change in Korea.

current programs focused on renewable energy and nuclear power generations. These measures will account for about 70 percent of total CO<sub>2</sub> reductions anticipated by 2020. The rest will be achieved through adoption of more ambitious technologies including low-carbon automobiles and carbon capture and sequestration. A mixture of carbon pricing, cap and trade, and policies for technological development and deployment will be adopted for the remaining portion of the planned reductions.

The cost of mitigation of a 30 percent emissions reduction was estimated to be 0.5 percent loss in GDP, equivalent to an annual consumption loss of 220,000 KRW per household.<sup>25</sup> The mitigation action will bring benefits such as improved environmental quality, spill-over effects of R&D investment in low-carbon technologies, and improved energy security. Valuation of these benefits is subject to many barriers and uncertainty and therefore direct comparison with mitigation cost is not possible. The co-benefit of improved air quality could



be substantial, offsetting 20 percent to 70 percent of mitigation costs according to one study which analyzed the effects of CO<sub>2</sub> reduction of 30 percent below 2015 BAU. The government expects that in the long-term the aggregate gains from develop-

Energy policy is the main driver behind climate change actions. Energy is a factor that both exacerbates climate change problems and offers solutions to them as well. However, energy policies alone will not solve these problems.

ment in low carbon technologies, double dividends from a carbon tax and improved air quality could exceed the 0.5 percent GDP loss. However, it should be noted that the scenario selection was not the result of cost-benefit comparison but considered public acceptance. If a global treaty on climate stabilization existed, the value of reduced damages in Korea would set the ceiling on the level of mitigation actions that would have been taken. In the absence of such a treaty country commitments and actions can not be assessed on the basis of cost-benefit comparisons.


The climate change policy in Korea is directed by the Presidential Committee on Green Growth, established in 2009 by merging three committees: the inter-ministerial committee on climate change chaired by the prime minister, the committee on sustainable development also chaired by the prime minister, and the national energy council which was chaired by the president. The merging of these committees allows for comprehensive policy planning that recognizes the interrelationship of low carbon growth, climate change, sustainable development, and energy security. The mid-term CO<sub>2</sub>

reduction goal is one policy action that the committee has taken to launch Korea onto a green growth path.

The presidential committee adopted a long-term national strategy for green growth and a short-term five-year action plan in July 2009. The government decided to take a proactive position towards climate problems because non-action would also be costly, damaging the country's long-term growth potential. The national strategy for green growth consists of three objectives: climate change mitigation and energy independence, the greening of economic growth, and the enhancement of quality of life and international cooperation. The action plans consist of:

- reductions in greenhouse gases
- improvements in energy security
- improvements in adaptive capacity for climate change
- the development of green technologies
- the greening of industries
- sustainable development through advancement of industrial structure
- the greening of natural and built environments
- initiatives to change in consumption patterns
- enhancement of global partnerships for low carbon green growth

Energy policy is the main driver behind climate change actions. Energy is a factor that both exacerbates climate change problems and offers solutions to them as well. However, energy policies alone will not solve these problems. What occurs in areas outside of energy, such as lifestyle and industrial structure, significantly influences the effectiveness of energy policies addressing emissions reductions. For example, auto fuel efficiency improvement would not lead to a reduction in CO<sub>2</sub> emissions if driving distances increased more than the fuel efficiency gains in individual cars. Energy efficiency improvements in iron and steel, petrochemical, and cement industries would not lead to CO<sub>2</sub> emissions reduction if demand for outputs of these carbon-intensive industries grew more than the efficiency gains. CO<sub>2</sub> reductions are possible only if the three factors—energy, economy structure and consumption patterns—are working together to produce the



same goal, and not working against one another. Korea's action plans are designed to accomplish this goal. Energy policy needs to be supplemented by measures to advance industrial structure and rationalize consumption patterns. We will examine energy policy first and then illustrate supplementary roles expected from policies addressing industrial structure and consumption patterns.

### ***Energy efficiency programs***

The government has established aggressive energy efficiency targets.<sup>27</sup> Energy intensity, during as the energy use relative to GDP, is targeted to decrease by 11.3 percent between the 2007–2012 period and by 23.5 percent over the next 5 years, the 2012–2017 period. By 2030, efficiency improvement will reach 44.8 percent, with the intensity falling to 0.185 tons of oil equivalent (toe) per thousand U.S. dollars from 0.335 in 2007.

Technology plays an important role; through public research and development (R&D) funding, the government encourages development of information technology (IT) and nanotechnology (NT) which aim to increase energy efficiency. By integrating IT into energy systems, energy use in buildings will decrease significantly. Such technologies can also be instrumental in the improvement of power generation efficiency to a targeted goal of 40 percent by 2012, from the present 38 percent. NT will facilitate developing advanced energy storage technologies for advanced hybrid and electric vehicles.

Public R&D funds will be available for development of highly efficient LED (light emitting diode) products. The government encourages improvement in six consumer goods (televisions, refrigerators, air conditioners, washing machines, computers and set-top boxes) to increase their energy efficiency by 20 percent and limit standby electricity to less than 1 watt. Technology development and deployment programs also cover industrial boilers, motors, furnaces, drying machines and lighting appliances.

The voluntary agreement (VA) program, introduced in 1998 as a partnership program between government and industry, sets voluntary targets for

energy efficiency or carbon dioxide reductions in manufacturing facilities through a five-year period. Participating firms are provided with low-interest loans, tax credits, and technical support. As of the end 2006, 1,353 firms participated in the VA program with plans to invest 5 trillion KRW over a period of 5 years, enabling a reduction of 7.9 mil-

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lion toe (2.7 trillion KRW). In addition to the voluntary agreement program, there is a negotiated agreement program where plants consuming more than 20,000 toe per year will be faced with mandatory targets determined through negotiations beginning 2010.

The Energy Service Company (ESCO) has proven to be a useful instrument for accomplishing energy efficiency improvement goals. The government provides low-interest loans for ESCO activities, payable in five years with a five-year grace period for financing investment in energy-saving lighting systems, process improvement, and waste heat utilization. ESCO investment amounted to \$106 million for 156 cases in 2006.

Demand side management programs (DSM) have become mandatory for electricity, gas, and district heat suppliers. The government provides low interest loans for DSM and financial rewards on the basis of performance of DSM implementation.

Transport energy improvement depends upon a combination of fuel and carbon efficiency depending on individual mode of transport, travel distances and transport systems. Auto manufacturers are subject to fuel efficiency ratings and labeling programs designed to disseminate efficiency infor-

mation for consumer decisions. Beginning 2012, mandatory fuel efficiency standards are likely to be implemented. The target for these programs is 17 kilometers per liter (and 140 gCO<sub>2</sub>/km) by 2015. It will be phased-in over a three-year period with the first year in 2012 requiring 70 percent of the target to be realized. This will be compounded by incentives promoting the purchase of hybrid cars and subcompacts which include registration fee exemptions, tax deductions, and parking and toll fee discounts. City governments in large metropolitan areas have adopted exclusive bus lanes and plan to expand and integrate them with subway lines. The share of mass transit in urban transport will rise to 55 percent by 2013 from 50 percent at present. The rail system will increase its share to 22 percent of total transport demand by 2013 from its present 18 percent.

Building energy management has become important as urban buildings have increased in size while becoming more energy-intensive. The government encourages voluntary agreement programs for large energy-intensive buildings. There were 148 such buildings as of 2007. The government also encourages the adoption of energy management systems in buildings and has thus far implemented various programs that incentivize households and firms to purchase energy-efficient appliances. The energy efficiency rating and labeling programs will be expanded along with parallel CO<sub>2</sub> emissions labeling and performance standards. The use of incandescent bulbs will be prohibited from 2013.

### ***Electricity sector programs***

The power sector will continue to be a major source of CO<sub>2</sub> emissions for the next several decades. However, the expansion of nuclear and natural gas power plants will alleviate the burden. Currently, nuclear power accounts for the largest share of power generation at 39 percent of the total, followed by coal (37 percent), LNG (18 percent), and oil (4 percent); meanwhile, hydro power makes up only 1.4 percent.

Power demand is expected to increase at an annual rate of 2.1 percent, from 390 TWh (tera

watt hours) in 2008 to 500 TWh in 2022. In order to meet this demand, the government plans to increase generation capacity from 71.4 GW (giga watt) in 2008 to 100.9 GW by 2022. According to the Fourth Basic Plan for Electricity, adopted by the government in 2008 for the period from 2009 to 2022, the share of nuclear power will increase and the coal share will decrease. The government plans to build 12 new nuclear power plants (adding to the current 20 units), 11 units of LNG power plants (adding to the current 46 units), and 7 units of coal power plants (adding to the current 49 units). By 2022, the capacity share by fuel type will be: 32.6 percent nuclear; 29.2 percent coal; and 22.9 percent LNG. DSM programs are targeted to reduce peak load by 11.2 percent in 2022.

### ***New and renewable energy programs***

As of 2007, the share of new and renewable energy in total primary energy generation was 2.4 percent, including hydro-electric power. The government recently adopted the Third Basic Plan for New and Renewable Energy Technology Development and Dissemination for the period 2009-2030, setting share targets for new and renewable energy at 4.3 percent in 2015, 6.1 percent in 2020, and 11 percent in 2030.

Feed-in-tariff programs provide guaranteed rates for 15 years for wind and photovoltaic power generation. The cost of photovoltaic generation is KRW 647/kwh, fuel cell power generation KRW 282/kwh, wind power generation KRW 107/kwh and coal power generation KRW 54/kwh.<sup>28</sup> In addition, the government plans to implement renewable portfolio standards requiring power producers to use a specified quantity of new and renewable energy sources beginning 2012. The mandated share will start from 3 percent in 2012 and increase to 10 percent by 2020.

Biofuel is also likely to receive a mandated share beginning 2012. A renewable fuel standard for transport energy is under deliberation. It should be noted that biofuel subsidies are expensive. An OECD study reports that biofuel programs in the United States, the European Union, and Canada reduce GHG at a cost of US \$960 to US \$1700 per

ton of reduced CO<sub>2</sub>eq, equivalent to between US \$0.80 and US \$7.00 per liter of fossil fuel saved.<sup>29</sup> For rural regions, a plan for deployment of wood pellet boilers and geothermal heat is being developed. A feasibility study of small-scale (1 MW) geothermal power generation is under way. This year Korea's first tidal power generation starts with a 254 MW plant. Four years later a second tidal power plant of 520 MW will come online. Offshore wind power farms are under consideration as well. A feasibility study of a 100 MW offshore wind farm is near completion and an implementation plan will begin by the end of 2010.

In addition to the supply-push programs, the government also plans to provide demand-pull measures for new and renewable energy sources. The number of green homes will increase to one million by 2020 from current number of 62,000. Government buildings and public facilities will be subject to further guidelines for new and renewable energy use: the number of such facilities will rise to 11,000 by 2020 from the current 1,845 facilities. Five percent of their energy use must come from new and renewable energy sources. If private buildings satisfy this renewable energy requirement, they will be awarded a building energy certificate attesting the contribution to the national effort to reduce CO<sub>2</sub> emissions.

### ***Technology programs***

R&D plays a pivotal role in the transformation of the economy toward low-carbon growth. The government plans to increase the share of R&D in low-carbon technologies to 20 percent of total public R&D by 2013, up from current its 15 percent. This R&D will contribute to transforming a portfolio of 27 key technologies into new growth engines for the future low-carbon economy. They include among others, LED, silicone photovoltaic, hybrid vehicle, smart grid, advanced nuclear reactor, fuel cell, and CO<sub>2</sub> capture technologies.<sup>30</sup>

Industry structure needs to change with low-carbon industries expanding their share in the economy. The government plans to increase the number of green industrial complexes from 5 to 10 by 2013. These complexes will operate state-of-

the-art resource management systems designed to minimize energy, water, and emissions of residuals and CO<sub>2</sub>. For the economy as whole, resource recovery rate will increase from 15 to 17 percent by

Industry structure needs to change with low-carbon industries expanding their share in the economy.

2013. A cluster of robotics, IT, and communication technologies will increase their contribution to a green economy by way of expanding their export potential: the robotics industry expects to increase its share in the world market from 8.9 to 13.3 percent; the convergence technologies for broadcast/communication plan to increase their export potential from US \$0.5 billion to US \$1.2 billion by 2013. A portfolio of nanotechnology, new materials, and bio-pharmaceutical technologies will expand their contribution toward economy-wide transformation. The bio industry will increase revenues from 6 trillion to 22 trillion KRW by 2013, and the number of nano-based innovation products will rise from 0 to 30. And finally, the service sector will also help transform the economy with the software industry, tourism industry, healthcare providers and education services expanding their role as they utilize a rapidly advancing high-tech information and communication infrastructure.

The government will implement a cap and trade system beginning 2012. A program of simulations and demonstrations will start in 2011 and a gradual implementation will follow. The domestic carbon market is expected to reach 0.5 trillion KRW by 2013. Government-owned industrial banks plan to increase financing for green industry development to KRW 3 trillion by 2013 from the current KRW 1.8 trillion. The government plans to reform the tax system in favor of low-carbon investment and consumption at the expense of business-as-usual high-carbon activities.

### *Sustainable consumption and lifestyle*

Changes in consumption patterns and lifestyle are necessary. Carbon pricing is essential for the change, but market failures and externalities call for measures supplemental to carbon pricing. These consist of regulations and standards.

Government procurement will be subject to mandatory purchases of low-carbon green products. This requirement will expand beyond government sectors to other areas. It is expected that total amount of green purchase will approach KRW 4 trillion within three years from KRW 2.5 trillion now. To facilitate green purchases, a system of carbon labeling certificates, green store certificates and carbon point rewards will be strengthened. The government expects that certified carbon labeling products will increase ten times to 500 in three years with 600 certified green stores in operation and a million consumers participating in the carbon point reward system.

The future economy will  
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and carbon free.

Bicycle use will increase. A network of exclusive bicycle lanes will be built throughout the country with a total extension reaching over 3,000 km. In the bicycle network, green villages featuring state-of-the-art low carbon and efficiency technologies will be constructed in about 100 locales by 2013. Green village will serve as a center of learning and information dissemination for sustainable consumption and lifestyle.

### **CONCLUSIONS**

Climate change measures have positive and negative impacts on the Korean economy. The positive

impacts are reductions in the import and consumption of fossil fuels. Korea is currently reliant on fossil fuels for 84 percent of its total energy consumption, all of which it imports. Reduction in the use of fossil fuels will improve the balance of payments and energy security. Local air quality will improve too. If the cost required for reduction (fossil fuels reduced multiplied by the cost difference between alternative energy sources and fossil fuels) is less than the benefit accruing from improvement in economy, energy security and air quality, mitigation action will produce a net benefit. In the short-term, mitigation would be costly due to a substantial cost gap between alternative and traditional fuels. But the cost gap will decline due to technological progress. R&D and innovation in low carbon alternative energy sources will not only reduce the cost gap but also generate spillover effects, producing economy-wide benefits. The future economy will be less import-dependent, less vulnerable to energy security risk, less polluting, less energy intensive, and carbon free. If Korea becomes a technological leader in alternative energy, this will produce an additional positive benefit.

The negative impacts include reductions in consumption due to an increase in supply costs resulting from carbon constraints. This is a one-time economy-wide dead-weight loss from mitigation actions. It was estimated Korea would experience a GDP loss of 0.5 percent in the 30 percent reduction scenario. At industry levels, energy intensive (also carbon intensive) industries will suffer more than others. Korea's unilateral mitigation will reduce profits of the petrochemicals, iron and steel and cement industries. Their share in the economy is high at 27 percent, making their competitiveness important to Korea. In a carbon constrained world, these industries in Korea would lose competitiveness because their feedstock and energy have to rely on imports.

Climate policy is a balancing act between the two impacts. This act is an iterative process responding to new information on climate change, impacts and vulnerabilities and mitigation options and costs. As stated in the IPCC Second Assessment Working Group III Report, "The challenge is not to find the best policy today for the next 100 years, but to select a prudent strategy and to adjust it over time in the light of new information."<sup>31</sup>



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- 11 Days with heavy rainfall of over 50 mm increased by 22–25 percent.
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# TAIWAN'S CLIMATE POLICY: STRUGGLING TO FIT IN

CHI-JEN YANG AND HUI-CHEN CHIEN

**B**ecause of its ambiguous international status, Taiwan has not been able to join the existing global climate regime. The government of Taiwan is preparing itself for the post-Kyoto regime by building up its capacity to regulate greenhouse gases and setting reduction targets. Taiwan currently contributes about one percent of anthropogenic greenhouse gas emissions in the world, and thus Taiwan has its share of responsibility for global warming. Taipei should be included as a part of the solution. Taiwan's par-

ticipation in the World Health Assembly in 2009 suggests that the People's Republic of China (PRC) may be willing to accept participation by Taiwan in international organizations as long as the membership does not imply statehood. If the post-Kyoto regime is designed with flexible accession rules, Taiwan may thus be able to join while putting aside sovereignty disputes. The accession rules of the World Trade Organization and the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central

Pacific Ocean provide useful precedents on how to design such flexibility.

## TAIWAN'S AMBIGUOUS INTERNATIONAL STATUS

Taiwan is in a unique position on the global policy stage due to its ambiguous international status. The government of Taiwan calls itself "the Republic of China." The International Energy Agency calls it "Chinese Taipei." Taiwan is a full-fledged member of the World Trade Organization (WTO) under the name "Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu." However, Taiwan is not a member of the United Nations and is not allowed to become a party of the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC does not accept the signatures of non-UN members with two exceptions (see UNFCCC Article 20).

Switzerland joined the UNFCCC prior to its accession to the UN because the UNFCCC allows parties to the Statute of the International Court of Justice to sign. The European Union joined as a regional economic integration organization. Taiwan is neither a party to the International Court of Justice nor a regional economic integration organization. In order to monitor the development of the global climate regime, Taiwanese government officials attend the UNFCCC meetings as non-government-organization (NGO) observers. Taiwan's climate policy reflects its difficult and complicated international status.

In terms of annual carbon dioxide (CO<sub>2</sub>) emissions, Taiwan emitted 276 million metric tons of CO<sub>2</sub> in 2007 and ranked as the 23rd largest emitter

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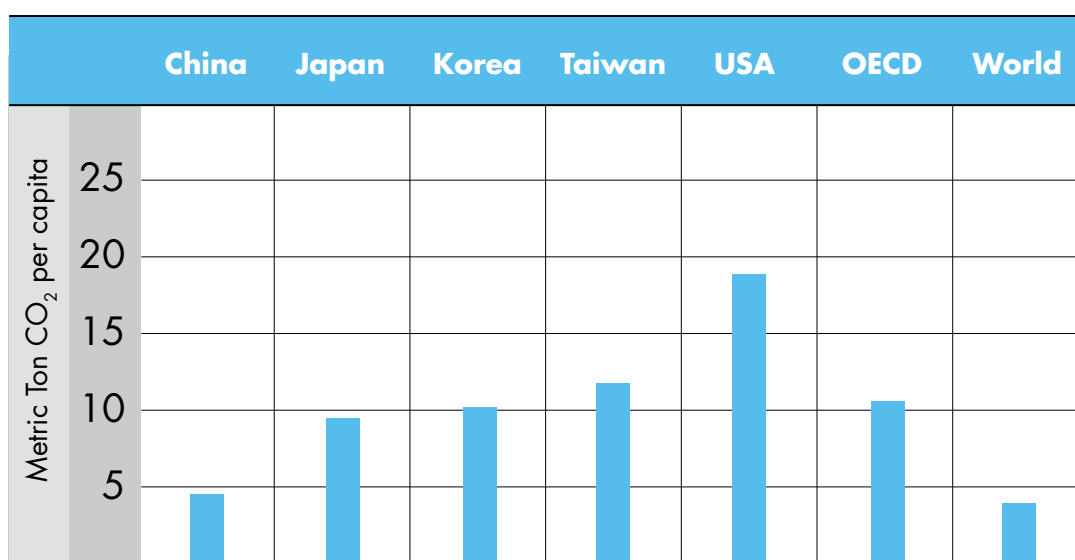
ticipation in the World Health Assembly in 2009 suggests that the People's Republic of China (PRC) may be willing to accept participation by Taiwan in international organizations as long as the membership does not imply statehood. If the post-Kyoto regime is designed with flexible accession rules, Taiwan may thus be able to join while putting aside sovereignty disputes. The accession rules of the World Trade Organization and the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central

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if compared to countries of the world. It contributes roughly one percent of global emissions annually. In 2007, Taiwan's per capita carbon dioxide emissions were 12.1 metric tons. International com-

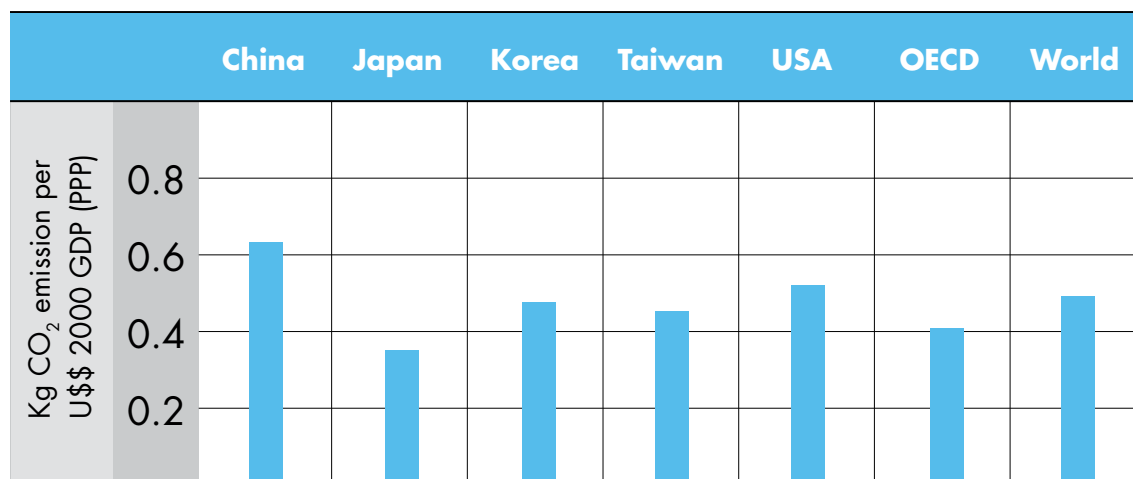
parisons of per capita annual CO<sub>2</sub> emissions and CO<sub>2</sub> intensity relative to Gross Domestic Product (GDP) (2007 data) are shown in Figures 1 and 2.

**Figure 1. Comparison of per capita CO<sub>2</sub> emissions**



Source: IEA, Key World Energy Statistics 2009.

**Figure 2. Comparison of CO<sub>2</sub> intensity in economy**



Source: IEA, Key World Energy Statistics 2009.

## TAIWAN IN MULTILATERAL ENVIRONMENTAL AGREEMENTS

Due to its identity conundrum, Taiwan has to deal with multilateral environmental agreements in unusual ways. Taiwan's past experience in multilateral environmental agreements has shaped the Taiwanese government's perception of and reaction to the emerging global climate regime. The most notable experiences are with the Convention

Due to Taiwan's identity conundrum, it has to deal with multilateral environmental agreements in unusual ways.

on International Trade in Endangered Species (CITES) and the Montreal Protocol under the Vienna Convention for the Protection of the Ozone Layer.

The United Nations considers Taiwan a province of the PRC. It follows that the United Nations should consider Taiwan bound by the PRC's accession to UN conventions. However, the compliance mechanisms of the UN conventions often rely on individual members' actions on trade sanctions or trade restrictions. Taiwan is a separate customs and trade region from the PRC, and the PRC has no control over Taiwan's environmental policy and enforcement. Many of Taiwan's major trade partners do not consider Taiwan bound by China's accession to UN environmental conventions.

In several cases, Taiwan has encountered threats of trade sanctions due to violations of UN environmental conventions (Chow, 1995). In these experiences, Taiwan's ambiguous international status has placed it in a vulnerable position. On the one hand, Taiwan is not allowed to negotiate obligations in the conventions or even choose participation. On the other hand, Taiwan's trade partners may punish Taiwan for not participating or not complying. In 1994, the United States imposed trade sanctions on Taiwan for its violation of CITES, which Taiwan

was never allowed to join.<sup>1</sup> The Montreal Protocol presented a special dilemma for Taiwan. The protocol bans trade in ozone-depleting substances between non-parties and signatories. Taiwan was threatened with trade sanctions simply because it is not allowed to become a party to the protocol.

Taiwan has a highly trade-dependent economy. In 2008, international trade accounted for 127% of its GDP (DGBAS, 2009; MOF, 2009). In addition, semiconductors and electronics, which are produced with ozone-depleting substances, are crucial industries in Taiwan. Trade sanctions on controlled substances and related products would constitute unbearable blows to Taiwan's economy.

The Montreal Protocol divides countries into two groups: Article-5 countries and Non-Article-5 countries. Article-5 countries, which are developing countries with low consumption of controlled (ozone-depleting) substances,<sup>2</sup> are allowed to delay implementation of control provisions and may receive assistance under the Multilateral Fund. The PRC is an Article-5 country in the Montreal Protocol. Non-Article-5 countries are developed countries that follow a relatively stringent schedule.

Fearing possible trade sanctions, the Taiwanese government decided to voluntarily adhere to the obligations of Non-Article-5 countries in the Montreal Protocol and negotiated with its major trade partners for understandings that they will not invoke trade sanctions on Taiwan due to its non-party status in the protocol. By following the non-Article-5 schedule, Taiwan has committed itself to a more stringent standard than would be required if it was considered a part of PRC.

The Kyoto Protocol also divides parties into two groups: Annex-I and Non-Annex-I. Annex-I parties are developed countries that committed

Taiwan's ambiguous international status has placed it in a vulnerable position.

to binding greenhouse gas (GHG) reduction targets. Non-Annex-I parties, which are developing

countries, are not subject to such reduction targets but are required to report their emission inventories and can participate in the Clean Development Mechanism (CDM). This mechanism allows an Annex-I party to invest in GHG mitigation activities in a Non-Annex-I party and receive offset credits for its investment. Because developing countries typically have more low hanging fruit in GHG mitigation opportunities than those with developed economies, CDM offset credits can be significantly cheaper than Annex-I domestic reduction. CDM provides Annex-I countries with low-cost GHG mitigation opportunities while providing Non-Annex-I parties with clean foreign investment.

There is confusion in the Taiwanese government whether to follow the rules for Annex-I or Non-Annex-I countries. Because Non-Annex-I countries currently have no binding target on GHG reduction, it is tempting for Taiwan to identify itself with this group. However, if a compliance mechanism is instituted in the future, it would be difficult for Taiwan to negotiate an exemption with its trade partners if it is not taking on serious obligation. The UNFCCC's principle of "common but differentiated responsibilities" presents a special difficulty for Taiwan. Annex-I countries do not share a uniform reduction target. Each Annex-I country's target in the Kyoto Protocol was individually negotiated. Even if Taiwan chooses to follow the obligations of an Annex-I country in the Kyoto Protocol, there is no simple formula to follow. The market-based mechanisms in the Kyoto Protocol are also problematic. Taiwan cannot be a host country of CDM activities because its designated national authority (DNA) would not be recognized by the UNFCCC.<sup>3</sup> It is highly unlikely that PRC's DNA would approve any CDM project in Taiwan because it has no means of supervising and monitoring such a project. The Taiwanese government is leaning toward identifying itself with Annex-I status and becoming a buyer of CDM offset credits, a.k.a. Certified Emission Reduction (CER). However, the non-party status means that it is difficult for the Taiwanese government to directly acquire primary CERs<sup>4</sup>, while Taiwanese companies and organizations might be able to purchase CERs from secondary markets.<sup>5</sup>

Nevertheless, before Taiwan considers buying carbon credits, it must first determine how much it needs to buy. Without formal participation in the Protocol, Taiwan would not be able to commit to a binding target that is recognized and accepted by the global climate regime.

## **TAIWAN'S ACTIONS AND TARGETS ON GHG MITIGATION**

Despite its uncertain status on the global stage, Taiwan has been working on developing tighter domestic policies to prepare it for participation in global environmental treaties. In response to the inception of the UNFCCC, the government of Taiwan established the Global Environmental Change Task Force under the cross-ministerial National Sustainable Development Committee in 1992. The government convened the first National Energy Conference (NEC) in 1998 as a response to the Kyoto Protocol. The Taiwan Environmental Protection Administration (TEPA) was charged as the leading government agency in GHG pol-

Even if Taiwan chooses to follow the obligations of an Annex-I country in the Kyoto Protocol, there is no simple formula to follow.

icy. The first NEC set a tentative GHG reduction target, but it provided TEPA with very limited means of enforcement. TEPA compiled the GHG emission inventories and prepared Taiwan's first National Communication to the UNFCCC. The UNFCCC would not accept Taiwan's National Communication because Taiwan is not a party, even though the PRC's National Communication<sup>6</sup> does not contain emission inventories of its "Taiwan province." Taiwan therefore has become a missing piece in the global GHG portfolio.

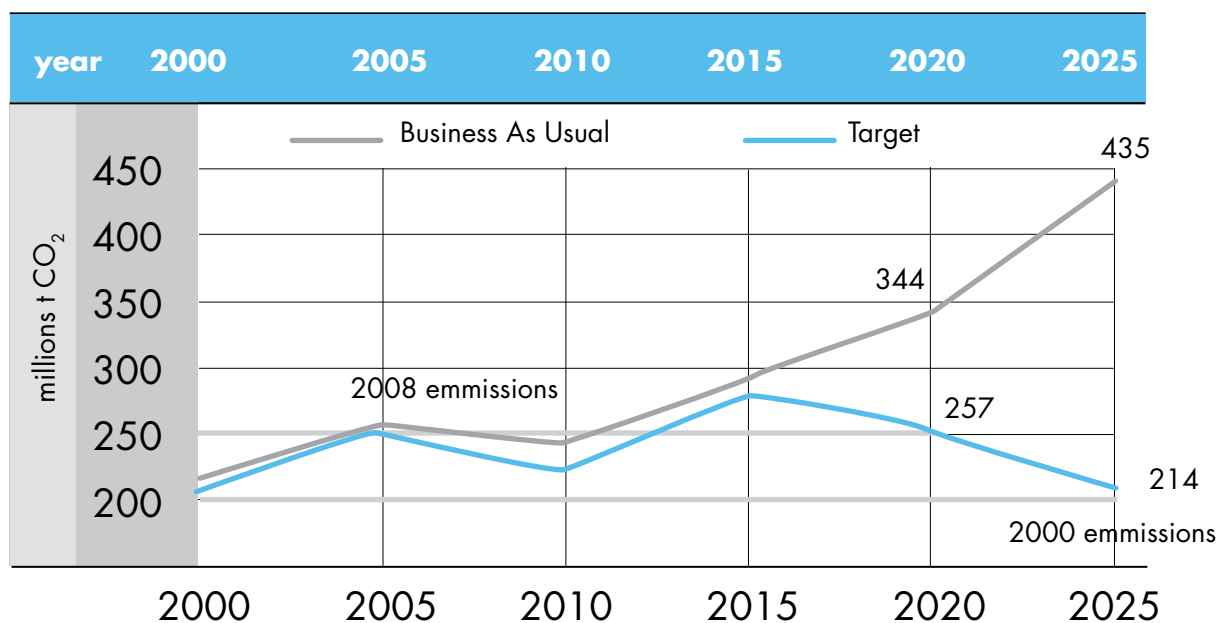
Anticipating a global GHG regime, the Taiwanese government is building its capacity to

regulate GHGs. Taiwanese government authority on GHGs is fragmented and grossly insufficient. Existing environmental laws in Taiwan do not authorize TEPA to regulate GHGs. The Air Pollution Control Act in Taiwan does not consider GHGs pollutants. TEPA has the legal authority to include GHG emissions in environmental impact assessments, but such assessments are far from a sufficient policy tool to regulate GHGs. There needs to be a new statutory authorization before TEPA can enforce an effective GHG reduction policy. Over 80 percent of GHG emissions in Taiwan come from the energy and industry sectors, which fall into the jurisdiction of the Ministry of Economic Affairs (MOEA). In order to strengthen the government mandates on energy efficiency, MOEA

needs to revise the Energy Management Act for a greater legal authorization. The MOEA has also drafted a renewable energy bill and introduced it to the legislature in 2002.

After the Kyoto Protocol entered into force in 2005, the Taiwanese government convened the second National Energy Conference. TEPA drafted and submitted the Greenhouse Gas Reduction Bill to the legislature in 2006. Revisions to the Energy Management Act, the Renewable Energy Development Act, and the Greenhouse Gas Reduction Act remained in the legislature for years and were eventually removed from the legislative agenda at the end of the sixth legislative body in January 2008.<sup>7</sup>

**Figure 3. Taiwan's GHG reduction targets**





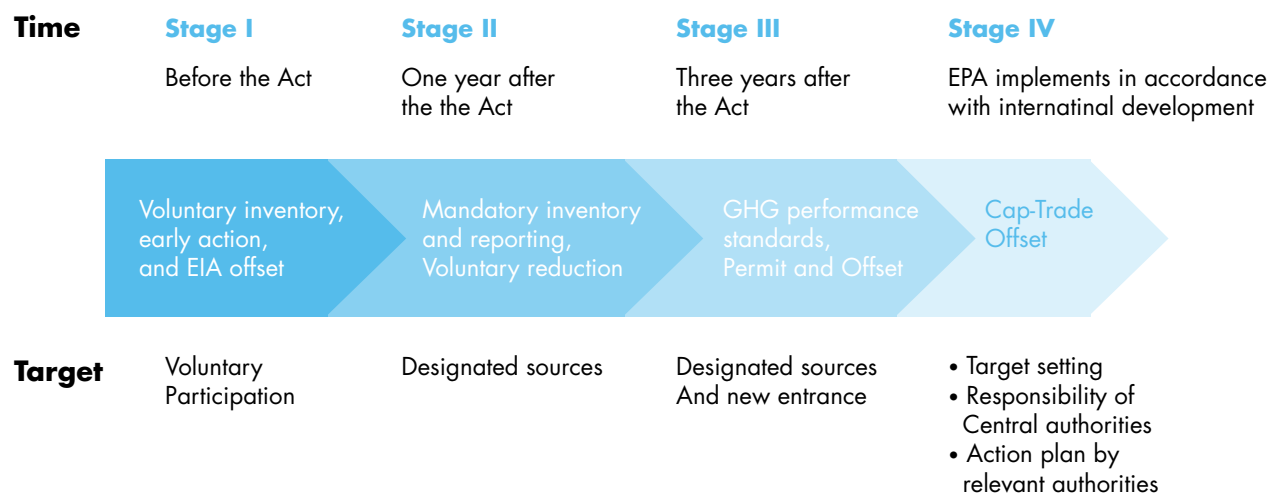
After President Ma Ying-jeou took office in 2008, he announced his target of stabilizing Taiwan's GHG emissions at 2008 levels by 2020. TEPA later expanded to a three-step target to bring the country's emissions down to 2008 levels by 2020; down to 2000 levels by 2025; and to half of 2000 levels by 2050 (Figure 3). TEPA established the GHG Reduction Management Office and resubmitted the Greenhouse Gas Reduction Bill to the legislature in 2008. It is still being considered, but if it passes, the bill would authorize TEPA to regulate GHGs with a cap-and-trade scheme and sectoral emission performance standards. The bill leaves the decisions on the quantitative capped levels and performance standards to TEPA. It would authorize but would not obligate TEPA to reduce GHG emissions. TEPA is also establishing industrial GHG emissions registering, auditing, and verification systems. TEPA is building its capacity to regulate GHGs, but not yet committing itself to a legally binding cap.


Meanwhile, the MOEA is also signing voluntary reduction agreements with major industries, including electricity, steel, cement, pulp, textile, and

semiconductor. The seventh legislature approved the revised Energy Management Act in June 2009 to provide the MOEA with a greater and broader authority in mandating energy efficiency standards. The goal is to improve energy efficiency by more than 2 percent annually, so that Taiwan's energy intensity will decrease 20 percent from its 2005 level by 2015, with a long-term target to reduce energy intensity by 50 percent by 2025. The Renewable Energy Development Act was also passed in July 2009. This Act authorizes subsidies for renewable energies and feed-in-tariffs for renewable electricity. MOEA is authorized to determine the rate of feed-in-tariffs.

TEPA has a stepwise GHG reduction strategy (Figure 4). Before the GHG Reduction Bill becomes law, it can only rely on environmental impact assessments to require new development and expansion projects to reduce or offset 20–50 percent of their GHG emissions (Chien, 2008a). Meanwhile, TEPA is also promoting voluntary reporting of GHG emissions by the industries and encouraging early actions in emission reduction.

**Figure 4. Taiwan's GHG reduction strategy**





Once the GHG Reduction Act is passed, TEPA would start to mandate GHG emissions reporting from designated major emitters and encourage voluntary reduction in the first year. Within three years of the Act's passage, it would impose sectoral GHG performance standards and start issuing GHG emission permits and certifying offset credits. The final stage would be to establish a cap-and-trade scheme and seek to link Taiwan's carbon market to a broader international market (Chien, 2008b).

There may be feasible ways to put aside the dispute and work out an arrangement for Taiwan to participate in a post-Kyoto climate regime.

The European Union (EU) is seeking to build, by 2015, an OECD-wide carbon market by linking the EU Emission Trading Scheme with other comparable cap-and-trade systems. Its long-term vision is to expand the carbon market to include major emerging economies by 2020 and eventually build a global carbon market (CEC, 2009). The Taiwanese government is working on becoming a part of this vision.

#### **TAIWAN'S VISION OF A POST-KYOTO CLIMATE REGIME: NOBODY LEFT BEHIND**

Taiwan's ambiguous international status has long been the roadblock to its participation in international agreements. It is unlikely that the dispute over Taiwan's statehood will be resolved in the near future. However, there may be feasible ways to put aside the dispute and work out an arrangement for Taiwan to participate in a post-Kyoto climate regime. Its experiences in participating in the World Health Assembly (WHA), the WTO and the Convention for the Conservation of Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention)

may provide useful lessons.


Taiwan fought for observer status as "Republic of China (Taiwan)" or "Taiwan" at the WHA, the supreme governing body of the WHO, every year from 1997 to 2007, but was never able to overcome strong opposition from the PRC government.<sup>8</sup> Since the inauguration of President Ma in 2008, Taiwan revised its China strategy from confrontation to engagement. Through informal negotiations with the PRC, Taiwan for the first time acquired observer status under the name of "Chinese Taipei" in WHA in 2009. It appears that the PRC government might accept Taiwan's participation in UN activities as long as Taiwan does not seek it as an assertion of statehood.

The Taiwanese government has recently announced that UNFCCC is one of its next targets<sup>9</sup> as a specialized UN agency where it will try to achieve "meaningful participation." This goal, however, will be very hard to attain.

Taiwanese government officials have participated as observers in UNFCCC events under the name of a semi-governmental think tank, the Industrial Technology Research Institute (ITRI), registered as NGO observer to the UNFCCC. Obtaining another observer status or changing the name from ITRI to Chinese Taipei would not be meaningful progress. Obtaining party status in the UNFCCC, however, is quite unlikely.

Currently, the UNFCCC only allows UN member states, regional economic integration organizations, or parties to the Statute of the International Court of Justice to accede to the convention. The Kyoto Protocol only allows parties to the UNFCCC to join. Taiwan does not qualify under any of these categories. However, if the post-Kyoto climate regime is designed with flexibility in member qualification, Taiwan may be able to fit in. The accession rules of the WTO and the WCPF Convention may provide precedents in how to design such flexibility.

The WTO accession rule stipulates that any state or customs territory having full autonomy in the conduct of its trade policies may join the WTO. Taiwan was therefore able to join the WTO as a separate customs territory while putting aside dispute over its statehood. In a similar manner, if



the post-Kyoto climate regime is designed to allow membership of a territory having full autonomy in the conduct of its climate policy, Taiwan may be able to join.

The WCPF Convention was intentionally designed to allow Taiwan's membership because Taiwan owns the second largest fishing fleet in the West and Central Pacific Ocean. The WCPF accession rule contains special arrangements for participation by fishing entities. Taiwan has therefore become a WCPF member (under the name of Chinese Taipei). Likewise, the post-Kyoto regime could be designed to allow participation of GHG emitting entities. Because universal participation is important in ensuring the effectiveness of global climate regime, the accession rules should be made flexible to accommodate all players.

A flexible accession rule might also encourage other governments with special status to join the post-Kyoto climate regime. For example, under the PRC's "one country, two systems" constitutional design, the PRC national government cannot enforce GHG mitigation policies in its special administrative regions (Hong Kong and Macau). Since Hong Kong and Macau enjoy autonomous decision making in their climate policies, it is reasonable for them to become separate members in the global climate regime. Before the United States as a whole becomes ready to join the post-2012 climate regime, some of its regional regimes

(such as the Regional Greenhouse Gas Initiative, the Midwest GHG Reduction Accord, and the Western Climate Initiative) might be willing to join, if the accession is designed to allow such separate membership.

Climate change is a common challenge for humanity and the fight against it is the common responsibility of everyone in the world. Taiwan has its share of responsibility and certainly should be included as a part of the solution.

Climate change is a common challenge for humanity and the fight against it is the common responsibility of everyone in the world. Taiwan has its share of responsibility and certainly should be included as a part of the solution. It would benefit not only Taiwan, but also the international community, to work out a way to fit Taiwan in.

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## ENDNOTES

- 1 The sanctions were lifted in 1995 after Taiwan stopped trading tiger and rhinoceros parts.
- 2 Article-5 countries are defined as having less than 0.3 kilograms in annual consumption of the controlled substances per capita.
- 3 The rules of CDM require that a CDM project must be approved by the DNA of the host country.
- 4 An Annex-I party may directly invest in a CDM project in a Non-Annex-I party and acquire the CERs derived from the project by registering it at the CDM Executive Board. Such CERs are referred to as primary CERs.
- 5 After the CDM credits are approved and registered, parties may trade the CERs in regional carbon markets such as the EU Emission Trading Scheme. The CERs being traded in these carbon markets are referred to as secondary CERs.
- 6 The UNFCCC requires all parties to report their GHG emission inventories and climate policies. The report is called "National Communication."
- 7 According to the Taiwanese legislative rule, if the Legislative Yuan does not reach a decision on a bill before the next reelection, the bill will be removed from the legislative agenda. The term of the 6th legislative body was from February 1, 2005 to January 31, 2008.
- 8 Taiwan applied as "Republic of China (Taiwan)" from 1997 to 2001, as "Taiwan" in 2002, as "Health authorities of Taiwan" in 2003, as "Taiwan" from 2004 to 2008.
- 9 The other is the International Civil Aviation Organization. See "Taiwan needs to participate in UNFCCC, ICAO: Premier Wu." *Central News Agency*, October 1, 2009. Available from [www.etaiwannews.com/etn/news\\_content.php?id=1071456](http://www.etaiwannews.com/etn/news_content.php?id=1071456).

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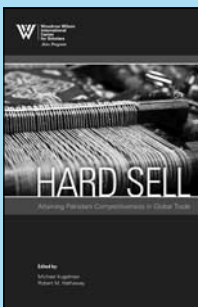
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