

Not Good Enough: South Korea's 2030 Carbon Mitigation Target and the INDC

2015-17
OCT. 29, 2015

The Asan Institute for Policy Studies

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The 2030 Mitigation Target: Upholding a Cause or Practical Interests?

On June 11, 2015, South Korea released its Post-2020 Long-term Mitigation Target and Implementation Plan. The plan consisted of four Business As Usual (BAU) reducing 2030 levels by 14.7%, 19.2%, 25.7%, and 31.3%. This announcement served two purposes: the first was to make clear that Korea was still motivated to lower its emissions and the second was to reach national consensus as the country prepared to submit its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC). This release divided Korean society, and public debate between civil society and industry was rife. Yet, the Korean government finalized the mitigation target of 37% below BAU by 2030 and submitted the 2030 Mitigation Target to the UNFCCC on June 30. The 2030 Mitigation Target thus became a topic of both censure and debate, not only because it tarnishes South Korea's positive image and leadership position in greenhouse gas (GHG) mitigations and climate change response, but also because the Target may fail to garner sufficient support both domestically and abroad.

In the June 11 press release, the government announced that the 2030 Mitigation Target takes a holistic approach considering Korea's mitigation capacity and projected impact on the country's GDP growth rate, together with international contributions.¹ When the finalized 2030 Mitigation Target was released on June 30, the government explained that the nominally increased emissions reduction was meant to reflect South Korea's standing as 16th in the world for emissions adding to the accumulation of GHGs, as well as having the highest increasing marginal emissions rates amongst OECD countries.² However, negative feedback towards the 2030 Mitigation Target points out the

large opportunity costs associated with anticipated supply-side shocks. Conversely, there is also the view that increased reductions is warranted to compensate for the extensive emissions that resulted from industrialization in the South Korean economy's exponential growth phase. Others hold that the 2030 Mitigation Target is not only a regression from former sustainable economic growth goals, but also continuing an older industrial development-centred mentality. Under the 2030 Mitigation Target, high emissions manufacturing industries will have more time to maintain their present or even higher levels of emissions leading up to 2030.

Reception of South Korea's new mitigation target has not been favourable. For instance, Climate Action Tracker (CAT), a consortium of four research institutions that produces systematic analysis on the INDCs of major emitters, described the 2030 Mitigation Target as "inadequate" and misaligned with global cooperative efforts.³ This is a remarkable contrast from 2009, when South Korea mobilized a national agenda bringing together a mix of domestic and foreign policies to meet a self-imposed mitigation target of 30% below BAU by 2020. At the time, South Korea was establishing itself as a "middle power" in terms of its potential influence in the area of international cooperation.⁴ Amongst the countries that made non-obligatory reduction commitments of 15% to 30% below BAU to achieve a self-enforcing goal following recommendations made by the Intergovernmental Panel on Climate Change (IPCC), South Korea's commitment was the most ambitious. The country was lauded as a role model for its mitigation efforts, which consisted of measures such as a GHG and Energy Target Management System as well as a national Emissions Trading Scheme (ETS).⁵ However, these measures were not simply acts of good will; they constituted South Korea's "Low-Carbon Green Growth Strategy." Such efforts earned international recognition, enhancing the country's reputation as a leading middle power country. The election of South Korea to house the headquarters of the Green Climate Fund (GCF) against Germany and Switzerland is evidence of this recognition.⁶

During her keynote speech at the United Nations Climate Summit in September 2014 and the GCF's December 2013 opening ceremony in Songdo, President Park Geun-hye reaffirmed South Korea's vow to reduce its emissions and lead in climate change cooperation. She emphasized that responding to climate change should not be seen as a burden, but rather an opportunity to find an alternative future for power generation. For that reason, the regressive nature of the 2030 Mitigation Target, seemingly contrary to the President's remarks, surprised many. United States President Barack Obama urged

President Park to remain ambitious in her mitigation efforts in the long-term response to climate change so that South Korea may continue to lead with tackling global warming issues.⁷

The 2030 Mitigation Target announced in the INDC may have been intended to alleviate some of the condemnation that South Korea had received from abroad on backsliding in the original post-2020 mitigation plan. However, the fact that the final 37% reduction target was generated within just 20 days and entirely separate from the originally proposed four scenarios indicates insufficient preparation. In the 2030 Mitigation Target, South Korea plans to observe the “No Backsliding Principle” by using carbon credits purchased from international markets, accounting for up to 11.3% of the 37% targeted reduction of GHG emissions. Still, doing this may further tarnish the country’s reputation, exposing it to potential international “naming and shaming.” The 2030 Mitigation Target can instead be seen as the Park Administration prioritizing national economic interests. Yet the extent to which this policy change benefits South Korea’s national economic interests is uncertain. If the 2030 Mitigation Target is not met, then South Korea’s middle power image may deteriorate – not to mention the internal dispute instigated by such a failure. This paper identifies three key issues which South Korean government must take into closer consideration vis-à-vis the 2030 Mitigation Target:

1. Violating the “No Backsliding Principle”
2. Utilizing the International Market Mechanism (IMM)
3. Using GHG mitigation strategies to enhance future national competitiveness.

New Climate System and INDCs

At the 2015 Paris Climate Conference, the 21st Conference of the Parties (COP 21), delegates from the member-states of the UNFCCC will discuss ways to launch a new climate system that will better to respond to today’s environmental challenges. Unlike the Kyoto Protocol System, the new climate system will set progressive reduction obligations for both developed and developing countries. The Kyoto Protocol, which came into effect during the COP 3 in 1997, categorized member-states as either Annex I or Non-Annex I Parties depending on their obligation levels.⁸ In the current system, developed countries have a top-down reduction obligation from the high level of emissions during their respective periods of industrialization. The Protocol initially at-

tempted to reduce GHG emissions by developed countries to 5.2% below 1990 levels over five years (2008-2012). However, only countries with a history of high emissions have mitigation responsibilities based on these obligations while emerging countries like China and India that have recently become high emissions countries had no obligations to cut their emissions. Furthermore, extant problems regarding the effectiveness and sustainability of the Kyoto Protocol System were exacerbated through the lack of participation by major industrialized countries like the United States.

International talks and attempts to create a new climate system began as early as 2009 during COP 15 in Copenhagen. Yet the lack of preparation and consensus impeded these talks from becoming operationalized. COP 17 led to the creation of an Ad Hoc Working Group that was formed to draw out a blueprint for a new climate system under the Durban Platform for Enhanced Action in 2011.⁹ Warsaw's COP 19 in 2013 continued these efforts with the decision to create a "legal instrument or agreed outcome with legal force, applicable to all Parties" for a new climate system.¹⁰ Similarly, Lima's COP 20 in 2014 resulted in the Lima Call for Climate Action.¹¹

The basis of this new climate system is anticipated to be the bottom-up approach to mitigation centred on the submission of INDCs, introduced during COP 19. Development of this system, however, is being threatened by the possibility that member-states may be unable to reach the "2°C goal," the consensus reached during Cancun's COP 16 in 2010 attempting to limit global warming at two degrees centigrade above pre-industrial levels.¹² Achieving this sort of consensus is fundamental in establishing any new system based on voluntary mitigation. Yet should member-states be unable to reach the 2°C goal, the more influential member-states may attempt to add common and top-down responsibilities.

South Korea's Mitigation Target and the INDC

To reach national consensus on its mitigation policy, the government of South Korea released the post-2020 long-term GHG emissions reduction target and implementation plan, which contained four reduction scenarios as candidates for the country's INDC and the long-term mitigation target. The four mitigation scenarios with their respective reduction targets are explained in the following subsections, as is the reassessed 2030 Mitigation Target.

Reassessed BAU for 2030

Unlike industrialized economies, which set their mitigation targets based on recorded emissions of base years, developing economies with constantly increasing emission levels tend to set a mitigation target based on BAU.¹³ The 2020 BAU, which takes into consideration the rate of macroeconomic growth, oil prices, demographic fluctuation, industrial structure, and other expected socioeconomic elements, is expected to be 782.5 MtCO₂e. The 2030 BAU is assessed to be 850.6 MtCO₂e, an increase of 8.7%. Furthermore, 86.9% of the 2030 BAU emissions is expected to be released from energy-intensive industrial sectors as well as waste disposal and agro-livestock sectors. With the start of the national Emissions Trading Scheme in January 2015, business sectors urged the government to provide the recalculated BAU as it had promised to do so. This was particularly important as the 2005 to 2020 BAU and the Post-2020 BAU (2013 to 2030) showed a derivative of 6.4 MtCO₂e increase for the year 2020 (refer to Table 1).

Table 1. Post-2020 BAU against the 2009 BAU (MtCO₂e)

	2015	2020	2025	2030	Average Growth Year per Annum
Post-2020 BAU, 2013 - 2030 (Announced in 2015)	713.6	782.5	809.7	850.6	1.3%
2009 BAU, 2005 - 2020 (Announced in 2009)	709.0	776.1			1.8%

Source: Post-2020 Long-term Mitigation Target and Implementation Plan (June 2015).

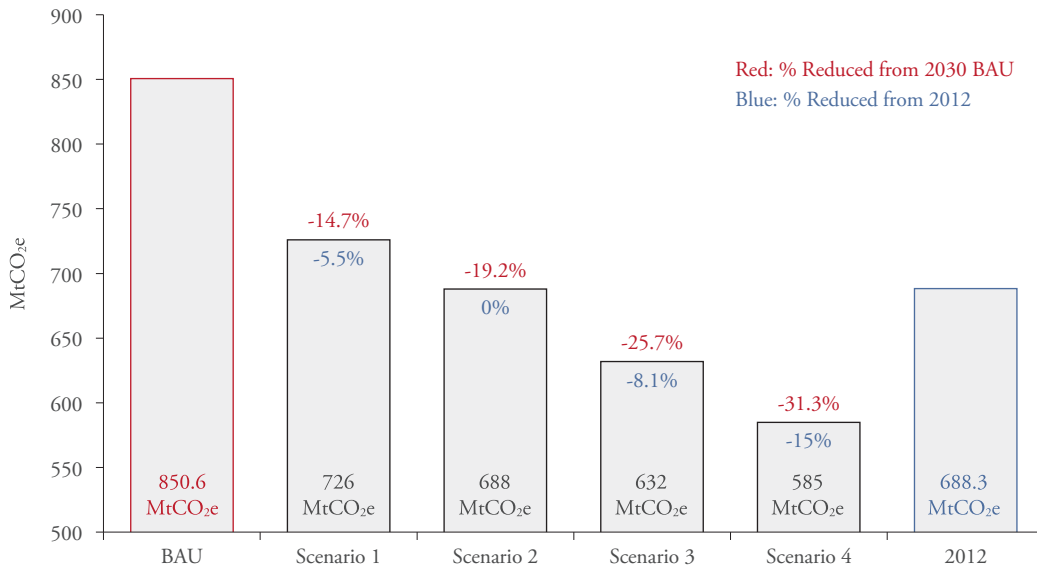
Four Mitigation Scenarios and the Finalized Mitigation Target

The following section presents the four mitigation scenarios and South Korea's proposed INDC with the BAU announced by the government on June 11, which is graphically represented on Figure 1.

1. Scenario One: 14.7% reduction from 2030 BAU

- Target: 726 MtCO₂e after reduction, 5.5% increase from 2012 emissions
- Policies:
 - Strengthening of sector-specific mitigation policies in industry, energy generation, transportation, and construction
 - Implementation of cost-efficient mitigation techniques

Figure 1. 2030 BAU to Four Mitigation Scenarios



Source: Post-2020 Long-term Mitigation Target and Implementation Plan (June 2015).

2. Scenario Two: 19.2% reduction from 2030 BAU

- Target: 688 MtCO_{2e} after reduction, no change from 2012 emissions
- Policies:
 - Scenario One policies with reduced coal combustion
 - Energy maintenance systems for buildings and industrial complexes
 - Average fuel efficiency mechanisms for vehicular use
 - Other mitigation methods entailing subsidization

3. Scenario Three: 25.7% reduction from 2030 BAU

- Target: 632 MtCO_{2e} after reduction, 8.1% decrease from 2012 emissions
- Policies:
 - Scenario Two policies with expanded use of nuclear power
 - Initialization and implementation of Carbon Capture and Storage (CCS)
 - Additional large-scale subsidization of mitigation methods such as green car production

4. Scenario Four: 31.3% reduction from 2030 BAU

- Target: 585 MtCO_{2e} after reduction, 15% decrease from 2012 emissions

- Policies:
 - Scenario Three policies with additional reduction methods
 - Expanded nuclear power generation depending on national consensus
 - Expanded CCS
 - Coal-to-gas switching

5. 2030 Mitigation Target (Finalized): 37% reduction from 2030 BAU

- Target: 536 MtCO_{2e} after reduction, 22.1% decrease from 2012 emissions
- Policies:
 - Scenario Three policies to achieve 25.7% decrease from 2012 emission
 - Additional 11.3% decrease through international market mechanism (IMM)

The South Korean government explained that it based its reassessed BAU and expanded mitigation target on the potential capacity of South Korea, projected macroeconomic impact on GDP growth rate, and international expectations and standards.¹⁴ This reassessment was based on the 2013-2030 predictions released in the January 2014 “Second Energy Master Plan” which anticipated a 3.08% GDP growth rate.¹⁵ Other socioeconomic expectations also factor in, including the 0.23% population growth rate, 1.04% increase in the number of households,¹⁶ 1.28% increase in international oil prices (based on Dubai crude oil prices),¹⁷ and steady growth in two sets of industrial sectors: (1) steel, petrochemistry and other energy-intensive industries and (2) manufacturing sectors such as machinery, automobiles, shipbuilding, communications equipment, semiconductors, and others.¹⁸ Based on these valuations, the four mitigation scenarios represent a 14.7 to 31.3% reduction from the 2030 BAU, equal to a 5.5 to 15% reduction of actual GHG emissions in 2012 (refer to Figure 1).

Even if Scenario Four, the most ambitious of the four mitigations scenarios, was chosen, the government will still be criticized for backsliding from its original, more forward-looking mitigation policy, which centred on a green growth strategy and committed to 30% reduction from the 2020 BAU. This commitment was largely in response to the criticism that South Korea was receiving for its high emission levels in recent years: in 2012, the country’s CO₂ emissions were the 7th highest in the world; 16th in contribution to total GHG emissions; and 6th in CO₂ per capita among the OECD countries. The government was motivated to continue its rise to leadership in international cooperation on climate change, corroborated after being selected to host the GCF for attempting to create new green energy industries and revolutionize the effi-

ciency of national energy.¹⁹

Issues on South Korea's Finalized Mitigation Target

South Korea is not only committed through its membership to the UNFCCC to submit an INDC, but also by mandate of national law under the Framework Act on Low Carbon Green Growth (heretofore “Framework Act”) to pursue a national mitigation target. The “National Greenhouse Gas Emissions Reduction Roadmap 2020” (heretofore “Roadmap 2020”), which by way of Article 42 of the Framework Act and Articles 25 and 26 of the Presidential Decree on the Framework Act on Low Carbon Green Growth, set this target emissions at 543 MtCO₂e, which was 30% lower than the 2020 BAU of 776.1 MtCO₂. The Roadmap 2020 also outlined yearly target emissions (Table 2).

Table 2. 2014-2030 Timetable for National GHG Reduction (MtCO₂e)

Year	National Greenhouse Gas Emissions Reduction Roadmap 2020 (2014.1)									INDC (2015.6)		
	'12	'13	'14	'15	'16	'17	'18	'19	'20	'20 ²⁰	'25	'30
BAU			694.5	709.0	720.8	733.4	747.1	761.4	776.1	782.5	809.7	850.6
Target Emissions			659.1	637.8	621.2	614.3	604.4	585.4	543.0			535.9 (632.0) ²¹
National Reduction	1.6%	3.3%	5.1%	10%	13.8%	16.2%	19.1%	23.1%	30%			37.0% (25.7%)

Source: National Greenhouse Gas Emissions Reduction Roadmap 2020 (2014.1) and the 2030 South Korea to GHG Mitigation Goal to 37% from BAU (2015.6).

With the announcement of the Roadmap 2020 and yearly mitigation targets, South Korea earned itself a leadership role in global climate change cooperation. The Roadmap 2020 not only set an agenda through which South Korea may further cooperate with other countries, but also a new national growth plan based on the principles of sustainability that continued to ensure the economic competitiveness of the country via green growth. Yet carbon-intensive manufacturing industries that historically led South Korea's “Miracle on the Han” industrialization may not be so willing to reduce emissions. Nonetheless, Roadmap 2020 attempts to draw out positive externalities of

production in industries that embrace green growth, high value-added supply chains, high profit gains from private investment, and public funding opportunities to help design the next economic growth engine. With the 2030 Mitigation Target, whether the government can coordinate the policies needed for expanded international cooperation and GHG mitigation while strengthening national competitiveness is uncertain. Nonetheless, a more fundamental question may be whether the international community even accepts the proposed INDC of South Korea.

Violation of the “No Backsliding Principle”

The South Korean government argues that since the finalized 2030 Mitigation Target is larger than reduction targets set for 2020 in absolute quantity terms, the “No Backsliding Principle” will not be violated.²² Segments of public sentiment as well as the industrial sector expressed that since Korea is embracing the INDCs voluntarily as one of Non-Annex I Parties, the “No Backsliding Principle” should not apply. Yet, it is important to remember that the Lima Call for Climate Action, to which South Korea is bound because of its membership in the UNFCCC, stated every UNFCCC Party should submit its INDC representing “a progression beyond the current undertaking of that Party.”²³ In this case, South Korea’s violation of the Principle may be multi-dimensional, but the argument that the 2030 Mitigation Target is a violation still holds.

If mitigation efforts occur according to South Korea’s proposed INDC, then projected GHG emissions by 2030 will be 539.5 MtCO_{2e}. Considering that this value represents a 22.1% reduction from actual emissions at 2012 levels, the new 2030 Mitigation Target is a more ambitious goal compared to the current 2020 BAU commitment and thus does not violate the Principle. However, the 11.3% emissions reduction promised in the 2030 Mitigation Target is planned to be achieved through international carbon market purchases. By 2030, the actual GHG reductions in South Korea will be 25.7% or 632 MtCO_{2e}. In other words, the mitigation planned for 2020 is being delayed 10 years, rendering an additional 89 MtCO_{2e} in actual emissions *ceteris paribus*. Even with the 11.3% (-96 MtCO_{2e}) enhanced mitigation via international carbon markets, criticisms that South Korea is violating the “No Backsliding Principle” are technically valid since the country is not fulfilling its mitigation obligations of having higher actual reductions over time.

Additionally, compared to the mitigation target over the next five years (2015 to 2020), the post-2020 mitigation target can be criticized for not being sufficiently ambitious.

Indeed, the projected reduction over the next five years (2015-2020) is 94.8 MtCO_{2e} while the post-2020 ten years (2020-2030) is just 7.1 MtCO_{2e}. Since the projected reductions between 2020 and 2030 are lower than that of 2015 to 2020, Korea violates the Principle on these terms.

Although the confirmed 2030 Mitigation Target and INDC are set to come into effect from 2020 to 2030, it is unclear whether the political context during this period will remain the same as when the original 2020 reduction plans were conceptualized. With the adjusted 2020 BAU, the 2030 Mitigation Target and its implementation strategy are expected to undergo modifications as a result of prolonging the original five year strategy (2015-2020) until 2030. Since the total timeframe is being extended, actual mitigation taking place in this period, at least up to 2020, is expected to decrease. Publication of a new roadmap with detailed annual plans to achieve the 2030 Mitigation Target is certain to ignite more extensive debate on whether the “No Backsliding Principle” was violated.

Problems with Utilizing the International Market Mechanism (IMM)

A more serious problem with the 2030 Mitigation Target is that a third of the reduction will take place through the “International Market Mechanism” (IMM). Since the exact role of the IMM in the new climate change system is still unclear, the South Korean government must be prepared to clarify how the IMM will factor into its national planning. Without doing so, the potential costs and consequences of employing the IMM may pose unanticipated difficulties in pursuing the 2030 Mitigation Target. Furthermore, the Korean government made reference to the IMM rather than “New International Market Mechanism (NMM)” that would refer to the IMM in the new climate system. This raises doubts on whether the government invested sufficient time and effort in the background research necessary for the drafting process, especially regarding the future of utilizing market mechanisms in climate change response.

On the viability of purchasing carbon credits as one of the primary components of the country’s INDC, the government stated that Switzerland, Canada, and Mexico have included market mechanisms in their INDCs so that they can expand their potential mitigation capacity.²⁴ Although true, there exist crucial differences between these countries and South Korea, making this comparison untenable. For instance, in spite of having emissions equal to about 7% that of South Korea’s (51.4 MtCO_{2e} in 2012), Switzerland was the first country to submit its INDC with one of the most ambitious targets with a 50% reduction from 1990 levels by 2030. Switzerland declared that it will re-

alize its INDC—a reduction to 26.7 MtCO₂e by 2030, equivalent to 8% of South Korea’s emissions at 314.7 MtCO₂—“mainly domestically.”²⁵ Purely domestic mitigations in South Korea would be relatively difficult as, unlike Switzerland, it is a high emissions country.

Similarly, Canada is known for decoupling economic growth and environmental degradation by enjoying net macroeconomic growth of 12.9% in the period between 2005 and 2013 while reducing its carbon emissions by 3.1%. Canada’s INDC comprised of a 30% reduction from 2005 levels by 2030. While the country included the use of the NMM to reach its INDC, the Canadian energy market is directly connected with the United States. Hence, the Government of Canada explained that it is “implementing a responsible sector-by-sector regulatory approach to reduce emissions, aligned with Canada’s major economic partners, like the United States, recognizing the importance of cooperative action in an integrated North American marketplace.”²⁶

Regarding Mexico, the country submitted an INDC with an unconditional 25% reduction target from BAU by 2030. Through financial measures, including the potential use of the NMM, the government stated that its target may rise to 40% conditional reduction.²⁷ From its projected 1,110 MtCO₂e by 2030 at BAU, domestic reduction will account for 277.5 MtCO₂e while the remaining 166.5 MtCO₂e reduction is expected to take place through use of the NMM subject to a global agreement. In Mexico’s INDC, the government clearly stated that its “unconditional INDC commitment (25% domestic reduction from the 2030 BAU) will be met regardless of such mechanisms, although these would assist cost-effective implementation.”²⁸ However, even without using NMM, Mexico’s reduction target (198.3 MtCO₂e) over 10 years (2020-2030) is almost 28 times that of South Korea’s (7.1 MtCO₂e) even after factoring the use of NMM. Even though both countries are regarded as middle-power states, there exist substantial contextual differences affecting each country’s INDC. While Mexico clearly states in their INDC that they may have a different reduction target contingent on the use of the NMM, South Korea’s INDC does not make explicit that one-third of the 37% 2030 Mitigation Target is to be secured through foreign market acquisitions.

The 2014 Lima Accord (FCCC/CP/2014/10/Add. 1) declared that “the use of market mechanisms shall be supplementary to domestic action.”²⁹ However, whether the 11.3% or one-third of South Korea’s INDC mitigation target to be secured through the NMM can be considered as supplementary is questionable. Furthermore, the 2010 Cancun

Agreements (FCCC/CP/2010/7/Add. 1) stated that the NMM was meant for the purpose of overall global GHG emission reductions rather than part of an individual country's fulfilment of its mitigation obligations.³⁰ This is in contrast to the Kyoto Protocol System, where the IMM could be used for individual mitigation commitments.

The NMM is a supplementary carbon-trading mechanism aimed at global mitigation, and its characteristics and role are currently under discussion. Along these lines, South Korea could play a leading role in institutionalizing the NMM with the intention of making it favourable to the country's needs. This will be possible only when South Korea proves that it has the will to share best practices with the international community. Yet, South Korea—currently the top seventh CO₂ emitter in the world—plans to implement its INDC pledge by purchasing carbon credits amounting to one-third of its mitigation target from international markets. This is as good as signalling to the international community that South Korea will give up its leadership in future global discussions on climate change, most importantly the NMM. This means the process of constructing the NMM may stray from what may be in Korea's best interests. Moreover, as INDC premised on the assumption that the NMM is an advantageous pricing mechanism represents considerable risk for South Korea.

Agendas for National Competitiveness in the Future

In the Roadmap 2020 published in January 2014, the Park Administration explained that the policies suggested therewith were not only meant to reduce South Korea's GHG emissions, but also set its future strategy. The Roadmap was designed not only to fulfil South Korea's commitment to environmental stewardship, but also improve the country's competitiveness through structural economic improvements. The aim was to reduce the national, per capita, and GDP valuated GHG emissions so that the country can start to move away from being a high emissions industrial country dependent on imported energy. Furthermore, the plan provided an alternative path to revitalize a stagnant economic growth rate, improve energy efficiency, and embolden green businesses to lead the economy forward. Roadmap 2020 was thus closely integrated with the country's future strategy and medium- and long-term policies to promote renewable energy development, develop national R&D schemes, and support small-to-medium sized enterprises.

With the 2030 Mitigation Target, adjustments to the strategy and policies in the Roadmap are necessary. The anticipated increase in calculated emissions from the 2020 tar-

get of 543 MtCO_{2e} to 634 MtCO_{2e} in 2030 represents the government's turn away from the Roadmap 2020's green growth policies. Instead, industrial sectors are being allowed more emissions, with their share of emissions mitigations reduced from 18.5% to 12% of the BAU. Instead of focusing on larger sources of emissions, such as transportation (34.4%), construction (26.9%), and the public sector projects (25%), the 2030 Mitigation Target increased the mitigation requirements for industrial sectors with low targets to begin with, thereby discouraging more sustainable mitigation practices like high energy efficiency for business and industrial consumption, investment in green technologies, and the utilization of renewable energies. Consequently, some profiteering businesses have already begun requesting for a redistribution of carbon credits based on the recalculated 2020 BAU.

In contrast to government declarations of “signalling to the business community its firm determination towards mitigation”³¹ in Roadmap 2020, reduced industrial sector obligations in the 2030 Mitigation Target indicates the government's change in position. In the past, mitigation strategies were sector-based and had five year implementation cycles. Yet, the 2030 Mitigation Target is void of such sectoral reduction commitments. The government's lacklustre attitude towards mitigation is further evident in granting the industrial sector an expanded emissions allowance thereby allowing the heaviest polluting industries to continue to reap large profits. This will be made possible by the public bearing the financial burden in purchasing carbon credits through a market mechanism in the form of government expenditures.

In terms of macroeconomic impact, Roadmap 2020's target of 30% emissions cut from 2020 BAU had an anticipated economic impact of -0.502% marginal real GDP growth.³² The economic ripple effect on GDP growth of the Post-2020 Long-term Mitigation Target and Implementation Plan is an anticipated -0.78% from real GDP in the fourth mitigation scenario (31.3% reduction from 2030 BAU). While the economic impact of the 2030 Mitigation Target has not been modelled, it is assumed to be fairly close to -1% of real GDP. Considering that the net economic impact of climate change on developing countries is estimated to be -19% of GDP by 2030, a 1% domestic GDP reduction is a number that might invite for more significant industrial contributions to mitigation while remaining within social consensus. Conversely, attempting to win over the public by protecting the largest emitters (*i.e.*, the industrial sector) and spreading their burden of the mitigation goal across society is more likely to instigate conflict.

Table 3. Estimated economic ripple effect of GHG mitigation commitments

	Roadmap 2020 (2014.1)		Post-2020 Long-term Mitigation Target and Implementation Plan (2015.6)			
	2015	2020	2030 Scenarios			
			I	II	III	IV
GHG Mitigation (% from BAU)	10.0	30.0	14.7	19.2	25.7	31.3
GDP Contraction (% from projected growth)	-0.096	-0.502	-0.22	-0.33	-0.54	-0.78

Source: Roadmap 2020 (2015.6), calculated with computable general equilibrium analysis by the Korea Environment Institute (KEI).

One must also ask whether backsliding from its national GHG mitigation commitments and lowering environmental restrictions for the industrial sector would even improve the competitiveness of the South Korean economy and its manufacturing sector? Requests to reduce mitigation commitments by the industrial sector stems from the need to be more price competitive as well as encourage potential investments. This trend, rather than being forward-looking towards long-run green growth, is centred on maintaining present competitiveness, making clear that both the government and industrial sector are overlooking the increasing decoupling of economic growth and GHG emissions. For example, the EU reduced total GHG emissions by 19% and a 1/4 reduction per capita (from 12 to 9 tCO₂e), while still enjoying a 45% increase in GDP between 1990 and 2012.³³ This is a promising precedence for the viability of green economic growth, departing from the traditional way of thinking that puts economic growth at odds with environmental protection.

The European Environment Agency (EEA) evaluated this decoupling as originating from highly efficient renewable energy implementation through government policies within the Union.³⁴ This demonstrates a government's ability to influence the future of their country through policy-setting goals and that shifting industrial sectors to low-emissions production can be an investment. If South Korea's government continues to view shifting its industrial sector to low emissions production a burden with no future return, then the country may find itself excluded from the quickly developing trend of green growth. Although improving the present competitiveness of firms is indeed important, preparing for the future does not necessarily have to be at odds with that goal. Industrial

innovation does not come from maintaining the *status quo*, but from progressive thinking to generate additional value and reduce future uncertainty. Only the government has sufficient overarching influence to concentrate national efforts towards these goals.

Government policies for national resource allocation may improve GHG mitigation and socioeconomic conditions of the whole country, thereby also shaping the country for posterity. As such, holding public forums and receiving open feedback is critical before reaching any final national planning decisions. Despite three rounds of national negotiations—a meeting of the Public and Private Joint Inspection Unit (June 11), a public hearing (June 12) and a debate at National Parliament (June 18)³⁵—national consensus-building efforts were insufficient in deciding the 2030 Mitigation Target. One can thus conclude that the South Korean INDC did not consider all the economic and civil society stakeholders involved in a sufficiently holistic manner.

Lastly, the confirmed INDC with its new mitigation targets makes inevitable a complete revision of the Roadmap 2020, which was put into force 18 months ago from the time of writing. Changing such policies without completely operationalizing them can be disruptive to good administration, severely limiting the enduring impact of implementation. This is particularly troublesome since a lack of consistent government policy between the five-year terms of presidential administrations muddles the political signals being sent to the nation.

Yet, national agendas can certainly be modified; they must be redefined to reflect what is expected to happen in the near future. However, the 2030 Mitigation Target employs almost the same economic basis on which its predecessor, the Roadmap 2020, was founded. A significant change in policy objective requires more detailed explanation of necessary adjustments rather than a summary of recalibrated preliminary data. In the Roadmap 2020, it was stated that through new technologies and other policy implementations such as the Emissions Trading Scheme, only minor negative impacts on the economy were expected.³⁶ Considering that the Roadmap 2020 has been implemented only for a year and a half, however, reasons behind altering the national mitigation strategy is not immediately clear. It is thus difficult to discern whether the Korean government is motivated to embrace mitigation or green growth while also fully considering the anticipated long-term impacts of relevant policies.

Conclusion: Will South Korea's Mitigation Strategy Ensure Profitability?

South Korea was able to demonstrate its middle power influence in climate change negotiations despite the absence of any official authority or binding rulemaking capacity by bringing together like-minded states within the larger group of countries involved. Such influence and progress in international cooperation for climate change response is impossible with mere diplomatic rhetoric. South Korea coupled rhetoric with action by turning challenge into opportunity: systemic improvements to its economy by expanding growth potential via a national strategy that took into close consideration global environmental threats and economic stagnation.

South Korea's INDC mitigation target is not just an international commitment to the new climate system, but also a national future strategy. This strategy nonetheless revolves around protecting the competitiveness of the country's manufacturing industry. The government's search to find new opportunities rather than settle with the consequences of climate change has proven to be little more than pretence with its recent policy decisions.

The new climate system is yet to be recognized. Its specific appropriation of national commitments and mechanisms are still being developed. While this new international regime is in its formative period, it will be crucial for South Korea to have diplomatic influence as a core state. Yet achieving leadership in climate change response is difficult, especially after having been named and shamed by the international community.

If the government chooses to put national competitiveness and profitability over international cooperation and the country's future, then it will have to devise a strategy that not only ensures long-term economic benefit, but also receives public consensus. This is essential in minimizing the on-going conflict between the business community and civil society. Government efforts to establish this consensus thus far have been lacking, notably after the 2030 Mitigation Target announcement.

Yet there are still signs of change. The government showed that its primary motivation is not purely profit maximization and that it continues to abide with its obligations by submitting the INDC. These may signal that South Korea can still take leadership over international cooperation on climate change response. To become this international agenda-setter, South Korea must show that it has both an ambitious national agenda

and sufficient will to carry it through. The low carbon green growth strategy in the Roadmap 2020, for instance, was based on forward-looking and ambitious mitigation goals. It was also one example of how Korea has played a part in the on-going global endeavours of climate change response and sustainable development. Recognized for its national efforts towards these ends, the country was able to attract foreign capital through organizations like the GCF and the GGGI (Global Green Growth Institute). In this way, Korea had been increasing its international influence through green diplomacy as a middle power. However, the 2030 Mitigation Target very much threatens to reverse this progress by spurring both foreign and domestic criticism.

The 37% mitigation from 2030 BAU announced by the South Korean government has been submitted to the UNFCCC, but the fact that only 25.7% is in domestic reductions, with the remaining 11.3% to be purchased as carbon credits from international markets, remains unknown to the international community. While this post-2020 long-term mitigation goal was announced domestically in South Korea, the INDC submitted to the UNFCCC did not include such an explanation: a decision that the government made to evade criticism. Even the Minister of Environment, whose Ministry was and continues to be the competent authority regarding the mitigation commitments of South Korea, admitted that “not only has the 2030 Mitigation Target caused controversy domestically, it has received mixed reaction from the international community.”³⁷ After considering the extent to which this new mitigation strategy of South Korea is being denounced, one begins to wonder whether it will really be profitable in the long-run at all.

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9. United Nations. Decision 1/CP.17. FCCC/CP/2011/9/Add.1. March 15, 2012.
10. United Nations. Decision 1/CP.19. FCCC/CP/2013/10/Add.1. January 31, 2014.
11. United Nations. Decision 1/CP.20. FCCC/CP/2014/10/Add.1. February 2, 2015.
12. United Nations. Decision 1/CP.16. FCCC/CP/2010/7/Add.1. March 15, 2011.
13. There has been criticisms that basing the South Korea mitigation target based on developing economies is inappropriate. "Forget Developing Country-Style GHG Policies." *Hankuk Ilbo*. 2015 June 22; Han, S. "Column on Environment: Expanded the Goalpost and Score." *Joseon Ilbo*. 2015 July 4.
14. *Ibid.*, #1.
15. Korea Development Institute (KDI). *Long-run Potential Growth Rate* (May 2013).
16. Statistics Korea. *KOSIS 2010 Household Population Census Results* (2010).
17. IEA. *World Outlook 2012* (November 2012).
18. Korea Institute for Industrial Economics and Trade (KIET). *GHG Mitigation System and Influence on National Industrial Structure* (May 2013).
19. The ROK Government. "2030 South Korea to GHG Mitigation Goal to 37% from BAU." Press Release. 2015 June 30.
20. The 2015 June readjusted BAU is 6.4 MtCO₂e higher than the 2020 BAU in the Roadmap 2020.
21. The 2030 Mitigation Target has a 37% increase in mitigation but the actual domestic reductions are 25.7%.
22. *Ibid.* #2.

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23. United Nations. Decision 1/CP.20. FCCC/CP/2014/10/Add.1. February 2, 2015.
 24. *Ibid.*, #19.
 25. “Switzerland will realize its INDC mainly domestically.” Switzerland’s INDC submitted to the UNFCCC (2015.2.27).
 26. Canada’s INDC submitted to the UNFCCC (2015.5.15).
 27. Mexico’s 25% GHG mitigation from 2030 BAU includes SLCP (Short-Lived Climate Pollutants) emissions. In other words, the unconditional mitigation will include a 22% reduction of GHGs and a 51% reduction in Black Carbon (BC, Particulate Matter $\leq 2.5 \mu\text{m}$ in size, or atmospheric “brown cloud”), whereas through financial mechanisms like the NMM, Mexico will conditionally scale up its mitigation to 40% mitigation from 2030 BAU at 36% GHG reduction and 70% BC reduction.
 28. Mexico’s INDC submitted to the UNFCCC (2015.3.30).
 29. “23. In meeting their commitments / contributions / actions, Parties may make use of market mechanisms and actions in the land-use sector in accordance with X. 23.1 The use of market mechanisms is to: (a) Mobilize the widest range of potential investments for adaptation and mitigation; (b) Create incentives for early action; (c) Incentivize and coordinate effective mitigation and adaptation action from the broadest range of actors, including the private sector, to support the implementation of this agreement; (d) Ensure consistency with individual commitments / contributions; (e) Be in accordance with the provisions on transparent accounting as contained in section J (*Transparency of action and support*), in particular to avoid double counting. 23.2 The use of market mechanisms shall be supplementary to domestic action.” United Nations. *Lima Accord, Appendix: FCCC/CP/2014/10/Add.1.* (2015.2.2).
 30. “80. (The Conference of the Parties) Decides to consider the establishment, at the seventeenth session of the Conference of the Parties, of one or more market-based mechanisms to enhance the cost-effectiveness of, and to promote, mitigation actions, taking into account the following: (a) Ensuring voluntary participation of Parties, supported by the promotion of fair and equitable access for all Parties; (b) Complementing other means of support for nationally appropriate mitigation actions by developing country Parties; (c) Stimulating mitigation across broad segments of the economy; (d) Safeguarding environmental integrity; (e) Ensuring a net decrease and/or avoidance of global greenhouse gas emissions; (f) Assisting developed country Parties to meet part of their mitigation targets, while ensuring that the use of such a mechanism or mechanisms is supplemental to domestic mitigation efforts; (g) Ensuring good governance and robust market functioning and regulation.” United Nations. *The Cancun Agreements: FCCC/CP/2010/7/Add.1.* (2011.3.15).
 31. The ROK Government. *National Greenhouse Gas Emissions Reduction Roadmap 2020* (2014.1).
 32. Korea Energy Economics Institute. 2014. *Evaluating the Impact of the Emissions Trading Scheme (ETS) on International Trade of the Industrial Sector in Korea.* KEEI Research Paper 14-12 (2014.11.28).
 33. EEA (European Environment Agency). 2014. *Why did greenhouse gas emissions decrease in the EU between 1990 and 2012?* Available at <http://www.eea.europa.eu/publications>.
 34. In addition to policy efforts related to renewable energy within each country, the EU also had in place a representative GHG emission reduction policy approaches known as the EU Nitrates Directive, the Common Agricultural Policy, the EU Landfill Directive, the EU Directive on the Energy Performance of Buildings,

the EU Large Combustion Plant Directive, EU Climate and Energy Package, and so forth. (EEA, 2014).

35. *Ibid.*, #19.

36. *Ibid.*, #31.

37. Yoon, Sung-gyu (the ROK Minister of Environment). “Low Carbon Economy, an Opportunity for the State.” *Joonang Ilbo*. July 07, 2015.



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ISBN 979-11-5570-129-4
ISBN 978-89-97046-06-5(SET)

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