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Assessing South Korea's National Strategy for Green Economic Growth

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I. INTRODUCTION

Rapid industrialization coupled with limited domestic energy resources present South Korea with a daunting energy security issue. With domestic supply unable to satisfy burgeoning demand, the country must rely heavily both on imported energy sources and on its own increasingly controversial nuclear power plants. Furthermore, as South Korea's greenhouse gas (GHG) emissions continue to rise at a rate rivaling many of its developed counterparts, the government faces increasing pressure from the international community to curb emissions. Within this dynamic context, South Korea released its National Green Growth Strategy and set ambitious targets designed not only to mitigate growing emissions but to promote the adoption of greener principles at all levels of society.

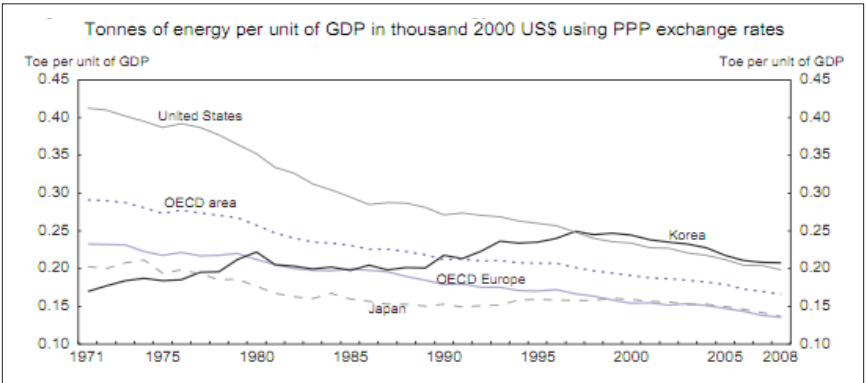
This essay examines the extent to which President Lee Myung-bak's green strategy has addressed the issues at the heart of the country's emissions problem and whether the policies truly represent a desire to adopt greener economic growth. A review of South Korea's remarkable growth over the last 30 years, and its subsequent environmental cost, provides a foundation for assessing the country's green policies prior to the National Green Growth Strategy. The concept of "green growth" is then defined and leads to a detailed discussion of South Korea's policies is presented. The essay concludes by examining the positives and negatives of South Korea's green policies and giving policy recommendations going forward.

II. KOREA'S INDUSTRIALIZATION AND ITS ENVIRONMENTAL COST

Over the last 30 years, South Korea experienced rapid industrialization that saw the country's gross domestic product (GDP) rise from just under $88 billion in 1980 to more than $1,450 billion in 2010, according to the International Monetary Fund. Dubbed the "Miracle on the Han River," this astonishing postwar growth has been fueled with imported energy to such an extent that today only a minute percentage of energy comes from domestic sources. The Korea Energy Economics Institute reports that, in 2010, domestic coal made up only 1.8 percent of South Korea's total coal use—and it was also only a fraction of the country's total energy mix.

In addition to such energy security concerns, South Korea's GHG emissions have skyrocketed, more than doubling between 1990 and 2007 and outpacing other countries in the Organization for Economic Cooperation and Development (OECD). The main drivers for increased energy consumption have shifted to the residential and industrial sectors, reflecting both higher standards of living and a booming export economy. Over the last century, climate records show that South Korea's average temperature has increased by 1.5°C, more than twice as much as the global average of 0.7°C. Seoul's temperature alone has increased by 2.5°C, according to a 2011 study published by the Nautilus Institute.

Figure 1. Korea has become one of the most energy-intensive economies in the OECD area



Source: IEA/OECD (2009a), *Energy Balances of OECD Countries 2009*, IEA/OECD, Paris.

Within this context of near-complete energy import dependence and growing concerns over environmental impacts, President Lee Myung-bak introduced his Low-Carbon and Green Growth Strategy during a 2008 speech commemorating the Republic of Korea's 60th anniversary. This plan established a framework for institutionalizing greener growth practices and signaled a significant policy shift toward proactive green economic growth. The National Green Growth Strategy that followed outlined impressive targets and boasted funding equivalent to $97 billion, or 2 percent of annual GDP. While it is too soon to analyze the strategy's effects on Korea's economy, the motivations behind this transition appear inconsistent with a true desire to promote sustainable growth. South Korea's green growth strategy has not yet led to any fundamental change in the country's economic growth model.

III. DEFINING "GREEN GROWTH"

A number of factors are essential to formulating an effective green growth strategy. First, a successful green economic strategy must encourage growth and development while protecting the environment; it must ensure that policy departs from a mindset of traditional growth first, environment second. Second, it must also target business and consumer behavior using a variety of market-based incentives, such as pricing the negative externalities of pollution through a carbon tax or cap-and-trade system. Without initiating change from the bottom up, fundamental behavioral shifts cannot occur. Third, investment in R&D further enhances technological innovation that in turn promotes greater energy efficiency and fosters job creation in more advanced sectors. Effective green strategies must avoid promoting short bursts of growth that will only result in short-term unskilled labor opportunities. Lastly, countries must establish both an effective monitoring system and an independent regulatory body to oversee implementation of green policies and must ensure that business or government interests do not hamper the efficacy of such regulation. Together these guidelines outline an effective policy structure for green growth.

IV. DEFENSIVE POLICY APPROACHES PRIOR TO 2008

Prior to South Korea's major policy changes in 2008, the government had taken only defensive steps in promoting energy conservation and efficiency. According to the OECD Economics Department, in 1992 South Korea implemented its first mandatory energy-efficiency standards on 23 items, including refrigerators, air conditioners, and washing machines, requiring all units sold to achieve a minimum level of efficiency. This emphasis on efficiency continued through 1996, when the government began to award special labels to appliances that exceeded the efficiency levels required by law. Despite this push for greater efficiency in consumer electronics, South Korea did not establish firm climate change guidelines until 1999, when it enacted its First Comprehensive Counterplan for the Framework Convention on Climate Change. While this three-year plan took an important step in calling for modest emissions reductions, it did not significantly limit the energy use required to power the country's burgeoning economy. Despite continuing to make progress in tackling GHG emissions, South Korea upheld this defensive stance toward its own economic growth through four incarnations of its Comprehensive Counterplan.

South Korea's ratification of the Kyoto Protocol as a non–Annex I country, which ensured it did not have to set a specific GHG reduction target through 2012, is another example of the country's defensive policy stance. Even so, South Korea's Second Comprehensive Counterplan established a basic framework for achieving set goals by enhancing GHG reduction measures, setting up the statistics infrastructure, and introducing programs to encourage citizen awareness and participation. After incorporating additional considerations from relevant ministries, South Korea released its Third Comprehensive Counterplan in 2005, which prominently featured adaptive projects designed to tackle climate change on a sector-by-sector basis. The Fourth Comprehensive Counterplan came during the transitional period between Presidents Roh Moo-hyun and Lee Myung-bak. Despite maintaining only modest emissions reduction targets, it made a notable step forward by enlisting cooperation from the international community. Although each of these plans arguably furthered South Korea's commitment to greener economic growth, they were maintained only so long as they did not rein in economic growth as a whole.

The use of environmental taxes has been one bright spot in South Korea's efforts to green its economy, but a large disparity between sector rates indicates that the government continues to protect industrial growth. According to the OECD, between 1994 and 2008 revenue from environmental taxes in South Korea rose from 2 to 2.5 percent of GDP, accounting for 9.5 percent of the country's total tax revenue compared to the OECD average of 5.4 percent. Additionally, the period from 2001 to 2007 saw the taxes on diesel and liquefied petroleum gas butane rise 2.4 times and 6.8 times, respectively. Despite these encouraging developments, taxes levied on the industrial sector have remained low to ensure the continued development of the nation's economy. Although the government took significant steps in 2001 by beginning to tax heavy oil used by industry, a 2011 OECD study indicates that by 2009 the tax had only risen to about 3 percent of the total price. While South Korea has made headway in the implementation of an effective environmental tax system, large disparities in tax rates continue to exist between sectors, suggesting that the government values its green push only so long as it does not interfere with the country's economic progress.

V. LEE MYUNG-BAK'S GREEN ECONOMY

In February 2008, a year after the release of the Fourth Comprehensive Counterplan, South Korea inaugurated a new president, former Seoul mayor Lee Myung-bak. Known primarily for being the CEO of Hyundai Construction, Lee seemed an unlikely candidate to adopt a green economic growth model.

However, he swept into the Blue House largely based on his reputation for having restored Seoul's iconic *Cheonggyuecheon* stream. In 2007, *Time* magazine named him one of its Heroes of the Environment, alongside former US vice president Al Gore, for Lee's efforts to show that "environmentalism can go hand in hand with development." In conjunction with his pledge to tear out the highway that he himself had helped build over the stream in the 1960s, Lee, as mayor cleaned up Seoul's transportation system by developing a cleaner, faster fleet of public buses.

Although President Lee's declaration of green growth as a "new national development paradigm" only six months after taking office came as a surprise to many, it was hardly a departure from the policies he had adopted during his tenure as Seoul's mayor. And just as he had used the public's charged sentiments toward the *Cheonggyuecheon* stream to fuel his political objectives, his announcement of his Low-Carbon and Green Growth Strategy on the country's 60th anniversary appealed to South Korean nationalism.

VI. UNVEILING A NATIONAL GREEN GROWTH STRATEGY

In July 2009, almost a year after President Lee's speech, South Korea announced its National Green Growth Strategy, the core vision behind its new development initiatives. The strategy established two primary targets: to be the world's seventh green power by 2020 and its fifth green power by 2050. However, neither of these targets was formally defined and both have since been removed from the green growth policy website (www.greengrowth.go.kr). In addition to these targets, the strategy outlined three major objectives: mitigating climate change and increasing energy independence, creating new engines for economic growth, and improving quality of life and enhancing the country's international standing.

To address the first objective of mitigating climate change and promoting energy independence, the National Green Growth Strategy calls for mandated GHG emissions reporting and promotion of forestation; reducing fossil fuel use while increasing non–fossil fuels in the overall energy mix; and reducing the country's energy-use intensity to the OECD average. Additionally, the strategy declares that launching restoration efforts such as the Four Major Rivers Project will assist in strengthening the country's overall capacity to offset the effects of climate change.

To achieve the second objective of creating new engines for economic growth, the government announced plans to promote the development of green technologies, with the goal of achieving an 8 percent world market share in

relevant sectors within five years. The government also aims to green existing industries through assistance to small and medium enterprises, and promote the country's green industries abroad through increased export targets. Furthermore, by introducing an emissions trading system and credit guarantees to green industries, the strategy aims to establish a sound foundation for a burgeoning green economy.

Lastly, to improve the quality of life for its citizens and enhance its global standing, South Korea plans not only to green its landscape through restoration projects, but also to encourage its citizens to adopt greener principles in their everyday lives, while the government itself takes a more active role in international climate change negotiations. To cement the country's status as a role model for the international community, the South Korean government also announced a target for expanding the green portion of its Official Development Assistance (ODA), from 11 percent of the total ODA to 30 percent by 2020. Together these policies, under the umbrella of three overarching objectives, map out the framework of South Korea's green economic strategy through 2050.

VII. SHIFTING TO A PROACTIVE GREEN GROWTH POLICY

President Lee's Comprehensive Plan on Combating Climate Change, announced in August 2008, called for an abrupt shift in policy. It adopted a more proactive stance toward green economic growth, utilizing the climate industry as a primary driver for that growth. Government ministries subsequently scrambled to produce short-term plans that integrated this new national strategy. Within five months, South Korea released several important proposals concerning new energy technology and green job growth, including the National Energy Basic Plan, the Industrial Development Strategy for Green Energy, the Long-Term Master Plan for National Research and Development on Climate Change, Comprehensive Measures for Research and Development on Green Technologies, the Vision and Development Strategy for New Growth Power, and the Green New Deal. In the last case, the Green New Deal focuses heavily on construction and calls primarily for the restoration of the country's four major rivers, a process that involves both the dredging of the rivers and the building of 16 new dams. The Green New Deal also outlines plans for the construction of 14 additional nuclear plants by 2030.

In addition to these development initiatives, the government laid out specific policies to tackle GHG emissions in four major sectors: building, transportation, industry, and energy transformation. In the building sector, the guidelines call

for a 31 percent reduction in emissions by 2020. For the transportation sector alone, plans call for a 33–37 percent reduction in emissions by 2020. Designated green transportation zones are also planned, and a discount point will be offered to the public with the ultimate goal of total passenger share reaching a 65 percent share of mass transit. Within the industry sector, an energy target–setting program began in 2010 for industries with an energy intensity of more than 0.5 million tonnes of oil equivalent. Lastly, the energy transformation sector plans to introduce a renewable portfolio standard by 2012 and work on constructing a smart grid. The share of nuclear in South Korea's energy mix will also shift to 41 percent of installations and 59 percent of generation by 2030. It is important to note that these nuclear targets were set prior to Japan's Fukushima disaster and it is unclear whether they will remain in place.

Three main pillars form the institutional framework for South Korea's green growth: the Framework Act on Low-Carbon Green Growth, the Presidential Committee on Green Growth, and the Five-Year Plan for Green Growth. As the green strategy's primary legislative manifestation, the Framework Act promotes and enforces green policies through several provisions, including basic principles for building a green economy and green industries; establishment of and support for companies investing in green industries; diffusion of green growth culture in both production and consumption; establishment of an integrated information management system for GHG emissions; and eventual adoption of a cap-and-trade system. The act also calls for the creation of an oversight committee to regulate green policy implementation.

That oversight body took the form of the Presidential Committee. Established under the supervision of President Lee, the committee oversees implementation of this new national vision. It mandates deliberation on issues concerning policy direction, evaluation of green targets, and the overall establishment, revision, and enforcement of the green growth strategy. The Five-Year Plan is a short-term approach to achieve the long-term objectives of the strategy. Its detailed implementation focuses on securing new growth engines in order to transform South Korea's economy into a green economy.

Table 1. The Five-Year Plan for Green Growth (2009–13)

Trillion won[1]

	Total	2009	2010	2011	2012	2013
Total	**107.4**	**17.4**	**24.2**	**25.7**	**20.6**	**19.4**
Central government budget	98.9	17.4	20.5	21.9	19.6	19.4
Public enterprises' investment	8.5	-	3.7	3.8	1.0	-
Memorandum item: total green technology R&D investment in all categories	*(13.0)*	*(1.9)*	*(2.2)*	*(2.5)*	*(2.8)*	*(3.5)*
1. Adapting to climate change & enhancing energy independence	**57.5**	**8.5**	**15.5**	**16.0**	**9.8**	**7.7**
1. Effective mitigation of greenhouse gas emissions	5.4	1.0	0.9	1.0	1.1	1.3
2. Reduction of the use of fossil fuels and the enhancement of energy independence	15.4	2.8	3.8	2.9	3.0	2.8
3. Strengthening the capacity to adapt to climate change	36.7	4.7	10.9	12.0	5.6	3.6
(Four Major Rivers Restoration Project)	*(15.4)*	*(0.8)*	*(6.4)*	*(7.1)*	*(1.1)*	*(-)*
2. Securing new growth engines	**23.5**	**3.9**	**4.1**	**4.7**	**5.3**	**5.6**
4. Development of green technologies	7.6	1.5	1.4	1.5	1.5	1.6
5. The "greening" of existing industries and promotion of green industries	4.5	0.7	0.9	0.9	1.0	1.0
6. Advancement of industrial structure to increase services	9.7	1.4	1.5	2.0	2.4	2.5
7. Engineering a structural basis for the green economy	1.8	0.3	0.2	0.3	0.4	0.5
3. Improving living standards & enhancing national status	**26.4**	**5.0**	**4.6**	**5.1**	**5.6**	**6.1**
8. Greening the land and water and building the green transport infrastructure	23.9	4.6	4.2	4.6	5.0	5.5
9. Bringing the green revolution to daily lives	1.8	0.3	0.3	0.3	0.4	0.4
10. Becoming a role-model for the international community as a green growth leader	0.7	0.1	0.1	0.1	0.1	0.1

1. Actual budgets for 2009-10 and projections for 2011-13.
Source: Ministry of Strategy and Finance and Presidential Committee on Green Growth.

South Korea's geographic limitations affect the feasibility of the country's green growth strategy. For example, the large wind farms of western China are not reproducible in South Korea because of the latter's small land mass. To its credit, the Korean government has been exploring offshore options and recently announced plans to construct wind farms off the country's southwestern coast. The country's solar photovoltaic industry is enjoying strong government support, but solar remains significantly more expensive than fossil fuels. Although the National Green Growth Strategy has been heavily criticized for its continued adherence to nuclear energy, it is difficult to see how South Korea can meet its energy needs without it. Currently, renewables simply do not supply enough energy for the amount of space they require (as in large wind farms), making nuclear energy a likely essential component of the country's energy security strategy.

VIII. POSITIVE GREEN GROWTH DEVELOPMENTS

A number of positives stand out in South Korea's green economic growth strategy. First, the policies in the Five-Year Plan and the targets in the Comprehensive Plan on Combating Climate Change represent a notable departure from the government's earlier defensive position of promoting only those green policies that did not interfere with economic growth. There remains

significant room for improvement, but by declaring national GHG reduction targets, establishing a detailed short-term plan to achieve these targets, and creating an effective institutional framework, South Korea now has a more proactive stance toward transitioning to a greener economy. The government's adoption of the GHG and Energy Goal Management System in September 2011 further imposed concrete reduction targets on 497 major enterprises responsible for more than 68 percent of the country's GHG emissions.

The policies enacted since 2008 have resulted in some visible achievements, with notable increases both in spending on green R&D and in the number of green industry players. According to an Industrial Bank of Korea report, green technology investment by the country's top 350 companies rose by 34 percent in 2009 compared to 2008; and between 2009 and 2010 there was a 13.5 percent increase in total spending on green R&D. Not only has spending increased, but according to the UN Environment Program, South Korea has been incredibly efficient at distributing funds, with almost 20 percent disbursed in the first half of 2009 compared to the global average of 3 percent during the same period. These increases in R&D spending will aid in developing more efficient technologies and promoting long-term job creation. Furthermore, compared with 2007, the Presidential Committee on Green Growth reports that there are 2.1 times more companies, 3.7 times the number of employees in these companies, 7.3 times the quantity of exports, and 5.1 times the amount of private investment in South Korea's renewable energy technology industry. As with increases in green technology R&D, these positive economic growth numbers indicate that green initiatives are developing in tandem with South Korea's economy.

IX. REMAINING POLICY CHALLENGES

While South Korea has made encouraging progress in developing its green growth strategy, full implementation ultimately remains hindered by a continued preference for economic growth over a truly green transition. For example, the strategy relies on large civil engineering projects as "drivers of development" that, by their very nature, will themselves generate high levels of carbon emissions. On the positive side, the Five-Year Plan for Green Growth contains impressive measures designed to jumpstart the new economic model. Not only does it call for expanding government investment in green technology R&D from 2 trillion won in 2009 to 3.5 trillion by 2013—boosting such green R&D spending from 16 to 20 percent of overall R&D spending—but the plan also calls for spending an additional 2 percent of GDP per year through 2013 on green development projects.

Even so, a significant amount of this government spending will go toward the large construction projects, including the laying of additional railway lines for high-speed trains, river restoration, sewage facility infrastructure, and the government's controversial Four Major Rivers Project. With its heavy emphasis on dam construction and dredging, this project has attracted much criticism from environmental advocates, who claim that it may damage, rather than restore, the waterways. The impressive spending and rates of job creation outlined in South Korea's short-term plan are also somewhat misleading, as funding for the Four Major Rivers Project represents 64 percent of the total funding provided by the Green New Deal and is expected to generate 910,000 of the program's targeted 950,000 new jobs, according to a 2011 Nautilus Institute report. Furthermore, the Four Major Rivers Project will only create short-term unskilled jobs and does not solve the vital problem of creating long-term sustainable opportunities for the highly educated younger generation of Koreans who are finding it increasingly difficult to find work. Surprisingly, according to the Nautilus Institute study, government spending on green R&D currently accounts for only 12 percent of its total R&D spending, with the rest going to infrastructure construction projects, a clear indication that the government hopes to boost the economy through implementation of its green growth policies. The question remains whether this level of spending is sustainable or whether overinvestment will eventually lead to a "green bubble."

In addition to the construction-heavy domestic agenda, prescribed R&D spending places strategic emphasis on increasing industrial competitiveness in the global market, largely following South Korea's traditional export-led model of growth. Within this context, South Korea is following a form of market-driven green growth that emphasizes the economy first and the environment second. As a result, green "advocates" in South Korea increasingly hail from the business community, and thus far policy implementation has arguably favored those promoting green industry; policies addressing environmental issues such as climate change and emissions reduction get implemented only if they support government priorities.

Furthermore, South Korea's brand of green growth remains controversially green by international standards. Notably, South Korea's reliance on nuclear energy makes the country's strategy less green. The contribution from renewables is projected to increase only in small increments, from 2.7 percent in 2009 to 6.08 percent by 2020. Between 2020 and 2030, renewables are projected to jump to a 30 percent share of the energy mix, but it is unclear whether this lofty goal can be achieved given the long-term policy structure. The prospects for a greater focus

on environmental performance rather than on using "green" simply as a driver for economic growth appears limited by the paradox of so-called green growth.

In their current form, South Korea's green policies primarily act as growth drivers for the country's largest industries, including nuclear and construction. In addition to the obvious problems with the legitimacy of this "green" growth model, it remains unclear whether this strategy can truly achieve the industrial stimulus it claims. Green growth often reinforces technology dependency, and this will be especially true for South Korea, whose renewable energy industry remains in the nascent stages of development. Despite the large government investment in R&D, technology will lag behind global leaders for some time. As a result of this short-term import dependency, it is questionable whether the Green New Deal will be able to create the number of jobs it claims it can. While this technology dependency issue does not apply to the nuclear industry, and setting targets for increasing the number of operating plants ensures a source of job creation over the next few decades, there has been no reconsideration of the country's nuclear dependence in the wake of Japan's Fukushima disaster. If reliance on nuclear power is scaled back, the job-creation numbers will substantially decline.

The sustainability of South Korea's green growth strategy remains questionable. Even if one considers this growth model to be fundamentally green, a number of factors reduce its chances at significantly changing the country's environmental performance in the long run. As the link between low-carbon development and industrialization, green technology reduces the relative amount of pollution produced per unit. Despite this *relative* reduction in emissions, *absolute* levels will not necessarily fall; as the pursuit of green growth continues, additional pollution will inevitably be generated. Often, as efficiency increases, cheaper resources lead to the greater consumption of the resource. As the country consumes more energy, more GHG will be produced and released into the atmosphere. In the years following implementation of the National Green Growth Strategy, South Korea's environmental performance has actually deteriorated. In 2010, the Environmental Performance Index ranked it 94th out of 163 countries, a drop of 43 places since 2008, making South Korea the lowest-ranking OECD member. For these reasons, South Korea's current green growth strategy appears neither sustainable nor secure.

X. POLICY RECOMMENDATIONS GOING FORWARD

While it may be too early to comprehensively assess the failures and successes of South Korea's green growth strategy, a number of policy adjustments may help the country achieve a more successful transition to truly greener economic growth. First, South Korea's current strategy employs a top-down approach that fails to obtain consensus from the general population. Shifting to a more bottom-up approach that includes the whole of society in the transition process will aid in the shift toward a greener lifestyle. If the South Korean government puts more resources and autonomy in the hands of organizations that can begin this process of greening the everyday lives of its citizens, it might be able to implement change at the grassroots level. To further aid in changing energy consumption patterns, it may also be helpful to realign the goals of green development with those of sustainable development; the latter promotes more efficient energy use overall and will contribute to obtaining greater energy security. South Korea should also push for more local energy generation, as there is presently a large disparity between where energy is produced and where it is used. A more localized system would allow energy production to switch from the centrally controlled supply model to a more efficient, decentralized demand-management structure. It may also contribute to greater participation by local residents in production and consumption decisions, which in turn may contribute to greater energy efficiency and the overall stabilization, or even lowering, of national energy use.

Second, South Korea should consider implementing a cap-and-trade emissions trading system instead of relying solely on the proposed carbon tax. Such a system allows permit holders to emit a preset amount of GHG. Permits obtained in excess are then traded on an open market. Despite large start-up costs, once such a system is in place it offers several advantages. First off, it can aid in securing a more targeted level of emissions reduction. Second, unlike a carbon tax, it does not need to be adjusted for inflation or growth. Third, by encouraging firms to get involved and forging linkages with the international carbon market, the system is self-maintaining and can potentially aid in lowering the costs of reducing emissions.

Lastly, in creating effective drivers for green economic growth, the government should encourage innovation by increasing investment in green R&D and by establishing and utilizing connections between industry and universities. To facilitate the technological developments necessary to transition to a greener economy, greater public funding of nascent technologies is required, as many

such technologies do not have the commercial viability needed to attract private investment. Adopting these policy recommendations will help prevent South Korea from falling into the import dependency that will hamper its efforts to create domestic jobs and generate market-competitive technology.

XI. CONCLUSION

South Korea has made significant progress toward adopting a greener economic growth model, but the government remains reluctant to promote green policies that could potentially hamper economic development. While an effective institutional framework has been put in place, it only offers a top-down policy agenda and does not promote change in societal behavior at a grassroots level. Furthermore, the market-driven approach clearly sees the greening process as a potential engine for greater economic growth as a whole. The majority of funds detailed in the Five-Year Plan and the Green New Deal have been allocated to the construction and nuclear sectors, and yet such large-scale civil engineering projects and greater use of nuclear power are paradoxical to green growth. Furthermore, while it remains difficult to ascertain feasible alternatives to South Korea's nuclear power plants given the country's geographic limitations, stronger policies designed to tackle energy efficiency and reduce consumption could make headway in curbing the country's growing energy demand. If South Korea truly wants to adopt a greener economic model, it must find a happy medium between "only green and no growth" and "only growth and no green." Adopting policies that promote energy sustainability in the daily lives of citizens and in government regulation of domestic industry will help the country move toward a more effective greening of its economy.

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