

GREEN GROWTH IN ACTION

KNOWLEDGE
NOTE SERIES

01



THE GREEN GROWTH MOVEMENT IN THE REPUBLIC OF KOREA: OPTION OR NECESSITY?

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I. OVERVIEW

When the former Korean president, Lee Myung-bak, took office in 2008, he proclaimed “Low Carbon, Green Growth” as the Republic of Korea’s new national vision. The most important driver of this vision was public recognition that high levels of carbon-dependent economic growth were not sustainable. This vision aimed to shift the existing development paradigm of quantity-oriented, fossil fuel-dependent growth to one of quality-oriented growth, with more emphasis placed on energy independence and sustainability through such means as increasing the use of new and renewable energy resources. From this standpoint, the green growth movement in the Republic of Korea appeared to be less an option than an essential path to achieving its vision of sustainable economic growth and the well-being of its people.

To achieve the new national development vision, Korean leadership took a strategic approach in which the government played an active role, similar to the visionary approach used to achieve rapid economic development in the 1960s and 1970s. The government established a legal framework on low carbon and green growth, set up a governance structure to implement green growth initiatives systematically, and established fiscal policies and budget resources to support the initiatives firmly.

The purpose of this note is primarily to explain why Korea adopted a green growth strategy as a new national development paradigm and how it was implemented by the government. Section II illustrates why green growth was a necessity in Korea; Section III describes how green growth was implemented by the Korean government, particularly with respect to institutional arrangements and fiscal adjustments for green growth; Section IV presents the key outcomes thus far; and lastly, Section V identifies lessons that could be applied in other countries.



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II. AN ESSENTIAL PATH

With the arrival of the era of resource shortages and intensifying environmental crises, many nations identified climate change and energy issues as their most dire problems. They were required to focus all their efforts on promoting the efficient use of energy and resources as well as minimizing environmental pollution. Korea was not exempt from the global environmental and energy crises and embraced green growth to address (i) the need for a new economic growth engine; (ii) the need to improve the population's quality of life; and (iii) domestic concern about climate change and the importance of adapting to it.

1. Korea adopted green growth as a new economic growth paradigm to create new growth engines and jobs through green technology and greening industries. In the 1960s, Korea achieved rapid economic growth through the development of heavy chemical industries, using an export-led strategy. Following this, development of the IT industry led to the creation of another growth engine. However, since the second half of the 1990s, the country struggled with low and jobless economic growth, which spurred the quest for a new growth engine.

Economic growth, while vital, is not the only contributing factor to a population's well-being. Quality of life, including the state of health and environmental quality, is also critical, as well as material living conditions such as income and wealth.



According to data from the Korea Energy Economics Institute, in 2010, Korea was the tenth largest energy consumer in the world and imported 97 percent of its total energy need, with over 80 percent of energy coming from fossil fuels, compared with 73 percent in Japan, 64 percent in the U.S., and 53 percent in France. More importantly, the types of industries that constituted 75 percent of the nation's industrial output, such as oil, chemicals, and steel, were all high consumers of energy. It was inevitable, therefore, that such a high-energy-consuming structure would be extremely sensitive to energy price fluctuations, and as a result, Korea's economy suffered a devastating impact each time the price of energy rose sharply. Korea's economic

health was vulnerable, with its economic fate susceptible to dramatic changes caused by external factors. Given Korea's high dependence on foreign energy resources and fossil fuels, it was imperative that the country adopt a low-carbon, energy-efficient strategy as a way to create a new engine for growth.

2. Green growth was necessary in Korea not only for economic growth, but also to improve the quality of life. Economic growth, while vital, is not the only contributing factor to a population's well-being. Quality of life, including the state of health and environmental quality, is also critical, as well as material living conditions such as income and wealth. According to a Gallup World Poll conducted in 2010, showing the average self-evaluation of life satisfaction on a scale from 0 to 10 in 34 OECD countries, Korea ranked below average, at position 27. It was evident that government policies aimed at improving quality of life were sorely needed in Korea.

Some of the environmental externalities that affect health and quality of life are fundamental to human well-being, such as reducing air pollution and providing access to clean water. According to the OECD Better Life Index in 2011, Korea's level of atmospheric PM10—tiny air pollutants small enough to enter and cause damage to the lungs—was 33 micrograms per cubic meter, which was considerably higher than the OECD average of 21 micrograms per cubic meter. Korea also ranked below the OECD average in terms of water quality, as 78 percent of the population was satisfied with the quality of water, compared with an OECD average of 84 percent. Therefore, one of the main objectives in Korea's green growth strategy was to raise the quality of life through developing green cities, building green transportation infrastructure, and improving water management.

3. It was necessary to set a GHG reduction target in order to satisfy domestic interest in policy shifting as well as contribute to international efforts to respond to climate change. Korea actively participated in global efforts to mitigate climate change. It set the target for midterm GHG mitigation to be reduced by 30 percent by 2020 from the business as usual baseline. The target set by the Korean government was the highest level of mitigation recommended by the Intergovernmental Panel on Climate Change (IPCC) for developing countries in order to stabilize the global temperature increase at less than 2°C.

In addition to voluntary contributions to global climate change adoption and mitigation, however, Korea had its own incentive to change. The rise in temperature in Korea had exceeded the global average and the frequency of droughts and flooding was predicted to increase. While the average global temperature rose 0.74°C from 1906 to 2005 (IPCC, 2007), it rose 1.7°C from 1912 to 2008 in Korea (Korea's National Institute of Meteorological Research, 2009). Essentially, in Korea, the temperature was more than double the global average, demonstrating an alarmingly fast progression of climate change, even considering the effects of rapid industrialization and urbanization. In addition, considering Korea's high dependency on fossil fuel energy, in cases where obligations to reduce GHG were imposed by the international society, the burden on Korea's economy was expected to be immense. Given its susceptibility and vulnerability with respect to the environment and energy, Korea chose to join the international movement for climate change adoption and mitigation, unlike many other vulnerable countries.

III. GOVERNMENT'S ACTIVE ROLE

In order to achieve the national vision of green growth, the Korean government got actively involved. The government made institutional arrangements and either scaled up or developed the appropriate fiscal adjustments to achieve green growth. Effective governance was important to make the national vision a reality, and without fiscal support, most green growth initiatives could not be implemented.

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A. Institutional Arrangements for Green Growth in Korea

There are three key elements of the institutional arrangements made by the government: (i) a strategy and an action plan; (ii) high-level visibility for green growth policy; and (iii) the involvement of all related ministries, with particular emphasis on the private sector as a core contributor.

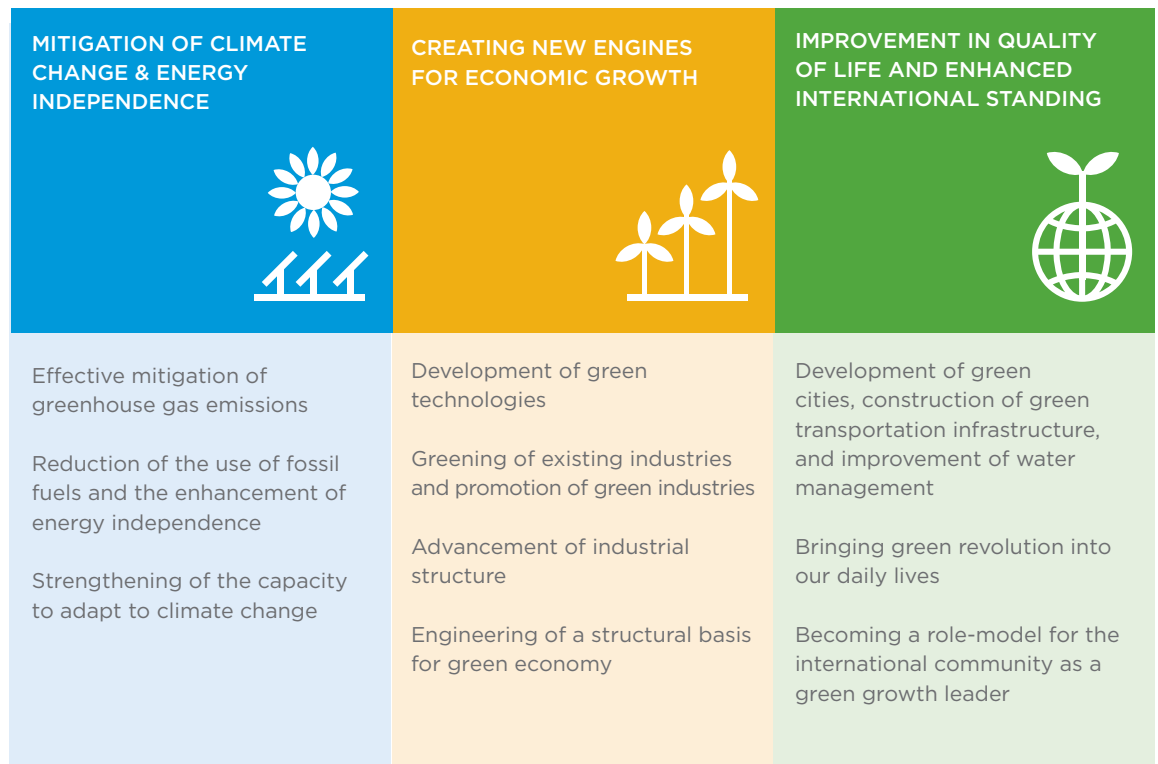
1. The National Strategy for Green Growth was adopted along with the Five-Year Plan for Green Growth. The National Strategy (2009–2050) was the central government's plan for green growth and envisaged three main objectives with ten specific

policy directions. In addition, to implement the agenda set out in the National Strategy in a systematic and consistent manner, the government developed the Five-Year Plan (2009–2013), which had been a very effective tool during the early stages of the Korean economic boom.

The first objective was to deal effectively with climate change and attain energy independence. This objective called for actions such as setting medium- to long-term mitigation goals, increasing the use of new and renewable energy sources, and strengthening the nation's adaptation capacities to counter the adverse impacts of climate change. The second objective was to create new engines of growth on multiple fronts. Emphasis was placed on increasing strategic investments in the research and development of green technology, establishing the structure for green finance, and introducing tax incentives for eco-friendly activities. The third objective was to raise the overall quality of life for the people and to enhance contributions to the international community through strong advocacy for green growth. Taking the importance of behavior change into account, the government implemented public campaigns, like the Green Start movement¹, designed to enhance citizens' understanding and participation.

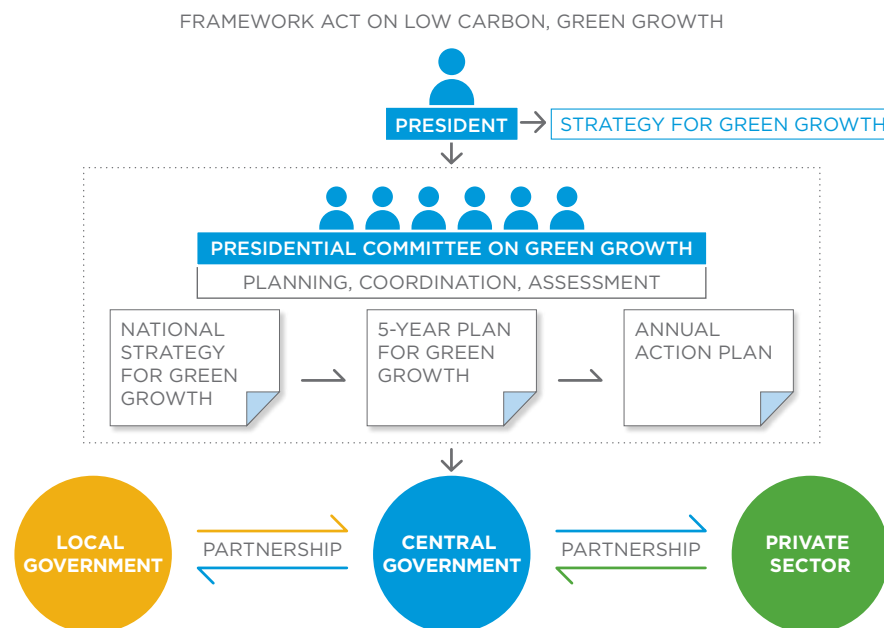
¹ The Green Start movement aimed to reduce GHGs and realize low-carbon green growth by establishing green lifestyles in the non-industrial sector, including homes, transportation, and businesses, through cooperation among the government, industries, and civic groups.

FIGURE 1. THREE OBJECTIVES AND TEN DIRECTIONS OF GREEN GROWTH



2. The Lee administration established the new position, **Senior Secretary for Green Growth, in the Presidential Office**. The position was first called the Secretary of Future Vision, but was later renamed and promoted, taking on a monitoring role for the “Low Carbon, Green Growth” strategy and playing a key role in transforming presidential endorsement into actual implementation of green growth initiatives. Through the collaborative teamwork between this position and the Presidential Committee on Green Growth (PCGG), Korea was able to scale up the governance structure not only for formulating green growth strategies and policy, but also for monitoring them constantly, allowing for policy and technical adjustments as needed.

FIGURE 2. INSTITUTIONAL FRAMEWORK FOR GREEN GROWTH



3. Korea established the PCGG as the highest inter-ministerial institution, with broad engagement from the private sector. This Committee was co-chaired by the Prime Minister and a representative of the private sector, and consisted of relevant government ministers and representatives from private stakeholders. The Committee's mandate was to discuss all subjects relevant to pursuing green growth, as well as coordinate government work in this area. Similar to the central PCGG, a Regional Committee on Green Growth was composed to deliberate on matters relating to green growth policy formulation and implementation at the local government level. Through these central and regional committees, the planning and implementation of green growth initiatives were monitored and encouraged to achieve planned outcomes. Private sector participation was also imperative in order to prompt behavior change within the private sector and resulted in the launch of five Green Growth Private Sector Consultative Bodies, bringing business, scientists, civil society, information technology, and financial leaders together to obtain expert advice and promote private sector involvement in green growth policies.

B. Fiscal Adjustments for Green Growth

With regard to fiscal adjustments that enabled Korea to implement green growth, there were four noteworthy points considered: (i) green growth needed to be monetized in the form of a budget policy; (ii) the central finance and planning agency had to play a leading role; (iii) a green growth budget increase should not necessarily require a decrease in health and education budgets; and (iv) reallocation of budget resources for green growth was needed in some expenditure sectors.

1. There was no separate green stimulus package. Green growth was fully integrated into Korea's April 2009 supplementary budget. From late 2008 into early 2009, countries around the world began issuing economic stimulus packages to address the global financial crisis. In view of the degree to which Korea was affected by the crisis, it also needed to join this undertaking.

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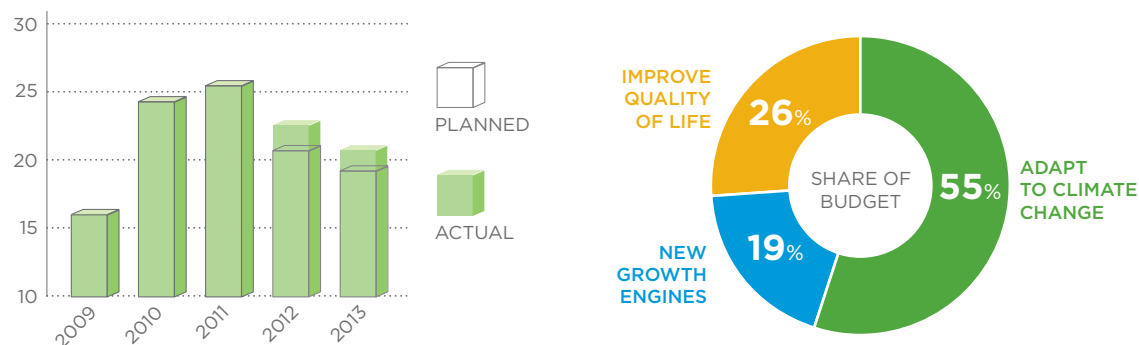


In January 2009, the government launched the Green New Deal, which identified key projects focused on renewable energies, energy efficient buildings, low-carbon vehicles and railroads, and water and waste management. For this New Deal, the government established an investment plan of KRW 50 trillion (USD 38.5 billion) for 2009 to 2012. At the same time, the supplementary budget was prepared, of which the green stimulus package—including infrastructure investment to revitalize the economy and create green jobs—was a key component. At KRW 17.9 trillion, 6.3 percent of the original FY2009 budget, the supplementary budget was the largest in Korea's fiscal history, and many green growth-related programs were included in the expenditure increases.

2. One of the key success factors was that the central finance and planning agency proactively supported integration of green growth programs into national budget allocation. Green growth was a priority during the Lee administration. In order to link the administration's agenda and public spending, the Ministry of Strategy and Finance (MOSF), the central finance and planning agency in Korea, accorded high priority to green growth initiatives when formulating medium-term expenditure plans and compiling annual budgets. Thus, the request for fiscal support in the Five-Year Plan for Green Growth was fully reflected in the Five-Year National Fiscal Management Plan (2009-2013), Korea's medium-term expenditure plan, as well as in subsequent annual budgets.

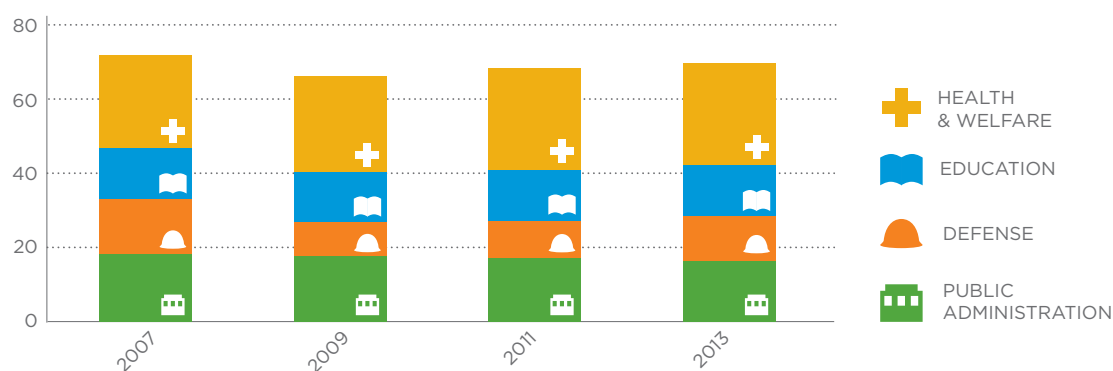
The government also established the “2 percent budget rule”, a policy whereby 2 percent of GDP would be allocated over five years for the implementation of green growth strategies. The total amount projected over the five-year period was KRW 107.4 trillion, with actual expenditure expected to be KRW 110.6 trillion (Figure 3). Of the three priority objectives, adaptation to climate change made use of the highest portion of funds (55 percent) due mainly to the Four Major River Restoration Project², which totaled KRW 14.3 trillion over the period (Figure 4).

FIGURE 3. GREEN GROWTH BUDGET (IN KRW TRILLION) FIGURE 4. SHARE OF BUDGET (2009-2013)



3. At the outset, there was concern that a green growth budget increase could come at the expense of other crucial budget items. However, data since 2007 shows this was not the case. The national budget was reprioritized by the MOSF to include green growth among expenditure sectors, without having an adverse effect on budget allocations for important public goods, such as health and welfare and education. In fact, the budget amounts and the share of the overall budget allocated to such public goods were continuously increased—health and welfare increased from 25.8 percent in 2007 to 28.5 percent in 2013, while education increased from 13 percent to 14.6 percent over the same period (Figure 5). The necessary funds were mobilized through an expenditure review process by cutting expenditure on programs with low execution rates and poor performance. Additional resources were made available following efforts to reduce public administration expenses by 10 percent.

FIGURE 5. BUDGET TREND BY SECTORS (SHARE OF TOTAL BUDGET, %)



4. Fiscal adjustments in budget allocation were made within specific expenditure sectors. In the transport sector, for example, budget priority was transferred from roads to railroads in pursuit of green growth, resulting in an increase in the share of the budget allocated to railroads from 19 percent in 2007 to 25 percent in 2013. Following this, the ratio of roads over railroads in the transport budget decreased from 1.6 to 1.2. Additionally, in the R&D sector, greater priority was accorded to investment in green R&D, resulting in an increase of the proportion of green R&D to total R&D from 16.5 percent in 2009 to 22.2 percent in 2012.

² The Four Major River Restoration was a water project that constructed barrages and dredged in the four main rivers of the Republic of Korea, with the following objectives: (i) secure abundant water resources to combat water scarcity; (ii) implement comprehensive flood control measures; (iii) improve water quality and restore ecosystems; (iv) create multipurpose spaces for local residents; and (v) pursue regional development centered around rivers.

IV. KEY OUTCOMES

It is too early to comprehensively evaluate the results of Korea's green growth as only five years have elapsed since Korea launched green growth as a national development strategy. However, some outcomes are already evident.

1. Most significantly, Korea's green growth policy has given a boost to the development of green technology and the green industry. The renewable energy industry has grown 6.5 times in terms of sales and 7.2 times in terms of exports since 2007 (Figure 6), while the green R&D budget has more than doubled from 2008 to 2012. Moreover, private green investment was invigorated, with green investment by the top 30 conglomerates showing a 75 percent annual increase between 2008 and 2010 (Figure 7). The field showing the most notable achievements is the new growth engine field. This includes the completion of the world's largest electric car battery factory, which placed second in terms of LED production and posted a drastic turnaround from a trade deficit to a surplus in 2010. These large gains were due mainly to the first mass production of 40-inch LED TVs in the world (Figure 8) and the launch of Korea's first mass-produced electric car.

FIGURE 6. RENEWABLE ENERGY INDUSTRY (IN USD BILLION)

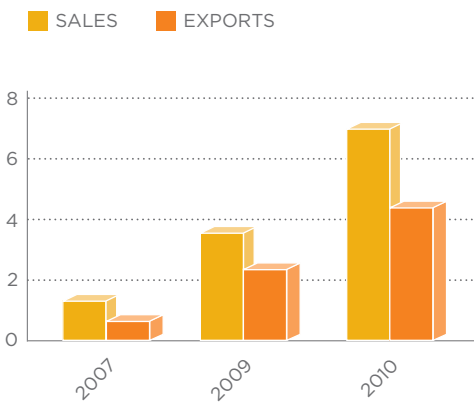


FIGURE 7. GREEN R&D AND INVESTMENT (IN KRW TRILLION)

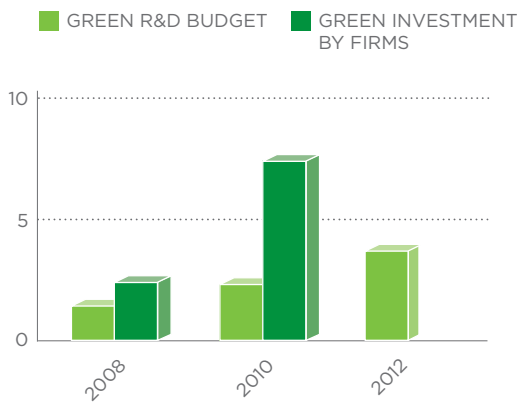


FIGURE 8. TRADE BALANCE OF LED (IN USD BILLION)

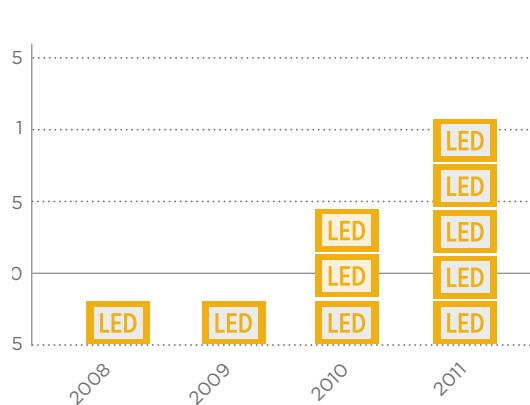
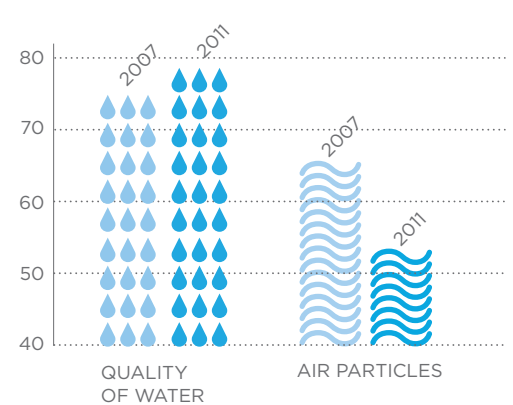


FIGURE 9. QUALITY OF ENVIRONMENT (% , MICROGRAMS)



2) Climate resilience has been strengthened, and quality of life has improved. The ability to respond to the effects of climate change on water resources and natural disasters has been enhanced. One of the most notable achievements is that stable water resources, which act as a contingency in the event of droughts and flooding, have been secured through the Four Major River Restoration Project and the construction of small and large eco-friendly dams. Furthermore, the quality of life has been enriched as air and water quality in urban areas has improved. For example, the proportion of quality water rose from 75 percent in 2007 to 78 percent in 2011, and whereas air particles were measured at 65 micrograms in 2007, they had dropped to 54 micrograms by 2011 (Figure 9).

V. LESSONS LEARNED

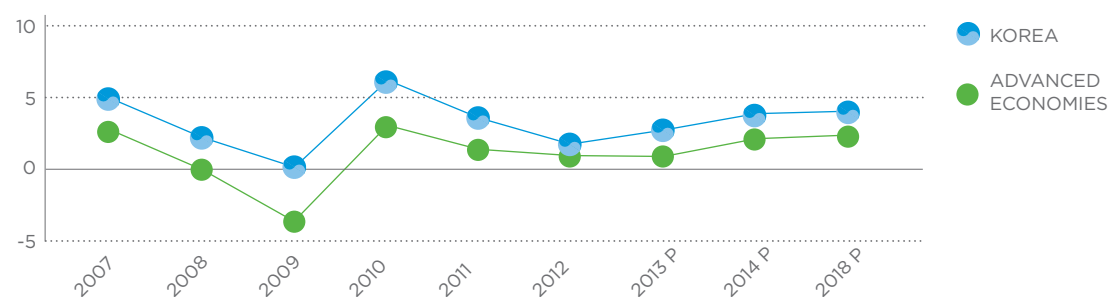
Although the green growth movement in Korea has only recently been launched as a long-term strategy until 2050, several lessons can be learned from the experience thus far.

1. **Environmental awareness and economic development are not mutually exclusive and can be balanced.** As shown in Figure 10, the Korean economy rapidly recovered in 2010 from the global financial crisis, and the real GDP growth rate has increased at a similar pace overall since 2007 as that of advanced global economies. There is no evidence to date that green growth implementation in Korea had and shall have an adverse effect on its economic growth. In particular, for countries like Korea with a high dependence on foreign energy resources and fossil fuels, a low-carbon strategy would be imperative for sustainable economic growth in the medium to long term.

In addition, fiscal support for green growth did not prove detrimental to other crucial budget items. Some may argue that health and education budgets must be cut in order to increase the green growth budget. However, by taking measures to reallocate budget resources among expenditure sectors and to reprioritize among budget programs, for example roads and railroads, Korea was able to mobilize resources for green growth while increasing budget allocations for health and education. Evidently, budget allocation among green growth and other critical sectors does not need to be a zero-sum game.

FIGURE 10. REAL GDP GROWTH RATE (%)

Source: *World Economic Outlook (IMF, 2013)*



2. **Participation in a global drive to mitigate climate change can prove beneficial to a country's domestic interests.** Korea actively took part in the global movement to be a responsible member of the global community. It may be argued that compliance with the global movement to reduce GHG emissions presents threats to a country's economic development. However, Korea's participation in this international movement did not require a trade-off against its domestic interests. In view of the rapid rise in temperature and Korea's highly fossil fuel-dependent industry structure, Korea urgently needed to contribute actively to the global movement to ensure its own sustainable economic growth and improvement of the quality of life.

3. **Effective institutional arrangements are critical to the success of a national green growth vision.** A national vision may have strong support from the President, but it cannot produce concrete results without systemic institutional measures to support the vision. As the green growth agenda is a multifaceted issue with many stakeholders, an inter-ministerial body was invaluable in providing oversight and for the design, coordination, and monitoring of the green growth strategy and related policies. The Presidential Committee on Green Growth acted effectively in this capacity, along with the Secretary to the President for Green Growth, and was endowed with the authority to implement, monitor, and make adjustments as needed.

4. **The likelihood of success is greater when the central finance and planning agency plays an active role.** In general, the central budget agency has a tendency to have a conservative approach to new, large-scale expenditure. There were several elements in Korea, however, that made the agency take a proactive stance in leading fiscal support for green growth programs. First, green growth was a priority on the presidential agenda and the PCGG communicated continuously with the agency. Moreover, the Five-Year Plan for Green Growth included an investment plan for 2009 to 2013, which set forth the total amount projected and main programs targeted, all of which was agreed with the agency. Finally, Korea's budget process and practice have been well aligned so to integrate policy into budget allocation in both annual and medium-term plans. Therefore, the Five-Year Plan for Green Growth was fully integrated into the Five-Year National Fiscal Management Plan.