INFRA Update

June 2010

LESSONS FROM THE IMPLEMENTATION OF REPUBLIC OF KOREA'S GREEN STIMULUS

Online at http://www.worldbank.org/infra

INFRA Update provides information about the World Bank's Infrastructure Recovery and Assets platform. INFRA was launched during the Spring Meetings in April 2009 to scale up the World Bank's infrastructure lending during the financial crisis, coordinate the response among international financial institutions and donors to bridge gaps in infrastructure financing and capacity, raise awareness on the need to continue financing infrastructure and create opportunities for cross-learning among partners to provide the foundation for rapid recovery and job creation and to promote long term growth. This e-newsletter provides information about Republic of Korea's Green Stimulus Package. For more information and to access INFRA publications, please visit http://www.worldbank.org/infra

Republic of Korea's Green Stimulus

Overview

Republic of Korea's $30.7 billion green stimulus package is one of the G-20's most significant. It has set rapid pace in implementing the stimulus and is emerging as a leader in green infrastructure, including energy efficient buildings, mass transit and water and waste management. The primary objective of this newsletter is to summarize the key elements of Greening approaches undertaken by Korea and to identify lessons that could be incorporated under the interventions proposed under the INFRA platform. This note also explores possible areas of cooperation with Korea.

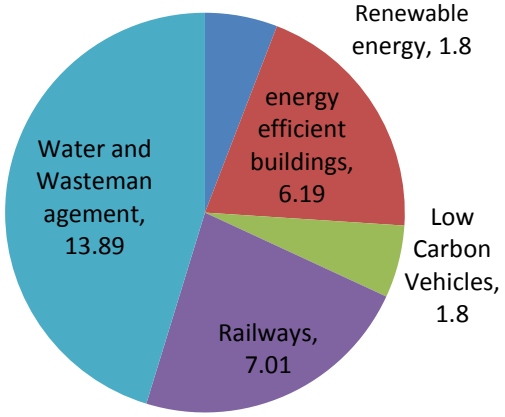
Background

From 1962 through the mid-1990s, Korea implemented regular five-year economic development plans based on theories of a quantitative growth paradigm, emphasizing labor and capital as key factors of production. While investments in labor and capital made rapid economic growth possible, this often had the unintended consequence of fuelling the conflict between growth and quality of life, and led to increased pollution and environmental deterioration.

Despite remarkable economic progress, Korea is still faced with numerous sustainable development challenges that require reforms and innovative approaches in various areas of the economy. The country's energy challenges are enormous, as it imports 97 percent of its total energy requirements. Its rapid industrialization and urbanization have resulted in a significant pressure on the environmental and natural resources, such as forests, water resources, and biodiversity. Freshwater scarcity also remains a critical challenge facing the country.

Carbon emissions have increased significantly during the past 15 years, making Korea one of the countries with

Figure 1- Breakdown of Korea's Green Stimulus



presents risks of higher levels of flooding and drought, which are already costing the country billions of dollars in damage. Recognizing that urgent measures are needed to address climate change both with respect to mitigation and adaptation, the government announced its "low-carbon, green growth" strategy in August 2008 to guide the nation's long-term development. This strategy is an innovative development approach involving a fundamental shift in the country's growth paradigm, from "quantitative growth" to "qualitative growth", which would emphasize quality of life in addition to economic growth.

The financial and economic crisis in late 2008 provided further impetus to the government's green infrastructure strategy. As Korea's growth rate fell in the aftermath of the crisis, the government launched a "Green New Deal" on 6 January 2009 as a means of stimulating job creation and revitalizing the economy. The stimulus package, which is comprised of a mix of financial, fiscal, and taxation policies, amounted to a total of

Table 1 - Investment in the Five-Year Plan (2009-2013) in billion US$

Category of action plan and policy direction	2009	2010-11	2012-13	Total
[1] Measures for climate change and securing energy independence	**6.7**	**22.7**	**14.9**	**44.3**
1.Reduce carbon emissions*	0.8	1.7	1.9	4.4
2.Decrease energy dependence on oil and enhance energy self-sufficiency	2.2	4.4	5.1	11.6
3.Support adaptation to climate change impacts	3.7	16.7	7.9	28.3
[2] Creation of new growth engines	**3.7**	**8.3**	**10.2**	**22.3**
4.Develop green technologies as future growth engine	1.6	3.3	3.9	8.8
5.Greening of industry	0.6	1.4	1.6	3.6
6.Develop cutting-edge industries	1.2	3	4.2	8.5
7.Set up policy infrastructure for green growth	0.2	0.5	0.6	1.4
[3] Improving quality of life and strengthening the status of the country	**4**	**8.2**	**9.5**	**21.7**
8.Green city and green transport	3.7	7.4	8.6	19.7
9.Green revolution in lifestyle	0.3	0.6	0.6	1.5
10.Enhance national status as a global leader in green growth	0.1	0.2	0.2	0.5
Total	**13.6**	**37.6**	**32.4**	**83.6**

Note: Currency rate (= Korean Won / U.S Dollar) = 1,284.7 (June 30, 2009)

* Includes activities such as managing the implementation of carbon reduction goal, carbon emission trading, creation of national greenhouse gas inventory report system, etc.

US$38.1 billion, the equivalent of 4 percent of Gross Domestic Product (GDP), to be implemented over the period 2009-2012. A total of US$ 30.7 billion (about 80 percent of the total stimulus package) was allocated to environmental themes such as renewable energies (US$ 1.80 billion), energy efficient buildings (US$6.19 billion), low carbon vehicle (US$ 1.80 billion), railways (US$ 7.01 billion), and water and waste management (US$ 13.89 billion) (see figure 1). Korea's allocation for green stimulus as a proportion of its total fiscal stimulus plan is the highest among all major economies implementing fiscal stimulus plans.

Implementation

Korea has been particularly efficient in the actual spending of its green stimulus, with almost 20 percent of funds disbursed at the end of the first half of 2009, compared to only 3 percent for most countries, according to UNEP. Early stimulus package expenditures related primarily to the Four Major Rivers Restoration Project, which was prepared before announcement of the stimulus package. A further 26% of the green stimulus is expected to be disbursed in 2010. Overall, the government expects investment in green technology to rise 52% in 2010 compared to 2009. These green investments, together with other stimulus measures such as income and corporate tax cuts, have contributed to stimulating economic recovery. Korea was one of the few member countries of the Organization for Economic Co-operation and Development (OECD) that registered a positive growth in the first quarter of 2009 (0.1 percent), and it recorded the highest growth rate in the second quarter (2.3 percent).

The Korean Green New Deal represents a policy for creating jobs and revitalizing the economy. In the short-term, it aims to respond to the recent economic downturn and, in the mid-and long-term, to boost green growth. The Green New Deal will run through 2012, while the long-term strategy will continue to be pursued through five-year green growth plans; the first of which is implemented from 2009 to 2013. A new Global Green Growth Institute has been established to promote cooperation with developing countries.

Long Term Growth Strategy

Korea is making a major shift in orienting its economy towards a strategy for green growth, even beyond the stimulus. The country adopted Five-Year Plan for Green Growth in July 2009 to serve as a medium plan for implementing "low-carbon, green growth vision" announced in 2008. The Five-Year Plan further expands the Korean "Green New Deal" in terms of overall government investment, the number of projects, and the set of policy and fiscal reforms envisaged (see Table 1). At the same time, it streamlines the number of existing projects choosing to focus on projects the Korean government deems to be of primary importance, such as the projects relating to green technologies.

Under the plan, US$83.6 billion, representing 2 percent of GDP, will be spent in the area of climate change and energy, sustainable transportation and the development of green technologies. Legislators in Korea are also considering a "Basis Law for Green Growth", which will provide the legal foundation for green growth strategy. On December 29, 2009, the Korean National Assembly adopted the Basic Law, which President Lee Myung-Bak signed into law on January 13, 2010. Through the plan, the government expects to reduce greenhouse gas by 30 percent from Business As Usual by 2020. This

Table 2 - Investments in Four Major Rivers Restoration Project

Ministry	2009	2010	2011	2012	Total
Land, Transport and Maritime Affairs	0.6	4.8	4.7	0.4	**10.6**
Food, Agriculture, Forestry and Fisheries	0.1	0.4	0.8	0.9	**2.2**
Environment	-	0.2	0.2	-	**0.4**
Total	**0.7**	**5.4**	**5.7**	**1.3**	**13.1**

represents a 4 percent reduction from 2005 level, or 594 $MtCO_2$ equivalent.

Expected Outcomes of Stimulus

Spending on the green growth plan is expected to stimulate production worth US$141.1 billion to US$160.4 billion during 2009-2013. The stimulus is expected to create jobs in green industries for up to 1.6 to 1.8 million people during the five years. The Five-Year Plan prioritizes large infrastructure projects such as the four major rivers restoration project and investment in high technology sectors in its design.

Four Major Rivers Restoration Project. The project will entail investment of US$17.3 billion and is expected to help create up to 0.3 million new jobs (see Table 2 for investment by ministry). The project has five key objectives: 1) securing abundant water resources against water scarcity; 2) implementing comprehensive flood control measures; 3) improving water quality and restoring ecosystems; 4) creation of multipurpose spaces for local residents; and 5) regional development centered on rivers. The project is expected to help resolve issues relating to floods and water scarcity. The project is expected to help resolve the problem of floods and water scarcity; contribute to the restoration of the ecosystem of the river, increase the quality of cultural and leisurely activities and lives; revitalize local economies and promote green growth projects.

Investments in High Technology. Investment will also be directed into the high-technology sectors (see Table 3 for list of technologies to be supported under the stimulus), which should provide future engines of growth for the country, making use of its highly-educated work force.

Lessons from Republic of Korea's Crisis Response

Though the stimulus package has only been in effect for a short time, important lessons can be learned from the Korean experience. These include:

A strong champion can facilitate quick and effective implementation. The current president of Republic of Korea, with the support of his party in the Korean National Assembly, has provided strong leadership for this initiative. His personal interest in the program and weekly monitoring of its implementation during regular meetings of the nation's emergency response committee has helped improve disbursements and has resulted in a more effective and efficient implementation of the green stimulus package.

Involvement of Civil Society Organizations could have helped improve design and implementation. Some civil society organizations have expressed reservations as to whether the Four Major Rivers Restoration Project will improve the quality of water and overall environment. In addition religious groups and NGOs maintain that the project will lead to irreversible damage to the natural

Table 3 - 27 Core technologies in Korea's green growth national plan

Sector	Core Technology	Nature of Investment
Climate change	1. Monitoring and modeling for climate change	Short-term gradual
	2. Climate change assessment and adaptation	Short-term gradual
Energy source technology	3. Silicon-based solar cells	Short-term intensive
	4. Non silicon-based solar cells	Short-term gradual
	5. Bio-energy	Short-term gradual
	6. Light water reactor	Short-term intensive
	7. Next-generation fast reactor	Long-term intensive
	8. Nuclear fusion energy	Long-term intensive
	9. Hydrogen energy R&D	Long-term intensive
	10. High-efficiency fuel cell	Long-term intensive
Efficiency improvement technologies	11. Plant growth promoting technology	Long-term intensive
	12. Integrated gasification combined cycle	Long-term intensive
	13. Green cars	Mid-term intensive
	14. Intelligent infrastructure for transportation and logistics	Short-term gradual
	15. Green city and urban renaissance	Long-term intensive
	16. Green building	Long-term intensive
	17. Green process technology	Mid-term intensive
	18. High-efficiency light-emitting diodes / Green IT	Short-term intensive
	19. IT-combined electric machines	Long-term intensive
	20. Secondary batteries	Mid-term intensive
End-of-pipe technology	21. CO_2 capture, storage and processing	Long-term intensive
	22. Non-CO_2 processing	Mid-term intensive
	23. Assessment of water quality and management	mid-term intensive
	24. Alternative water resources	Mid-term intensive
	25. Waste recycling	Mid-term intensive
	26. R & D in monitoring and processing of hazardous substances	Long-term intensive
R & D in Virtual Reality	27. Virtual reality	Mid-term intensive

environment. The disputes over this project will likely lead to greater transparency and participation in design and preparation of future projects.

Green Stimulus needs to consider the quality as well as quantity of employment. Some experts believe the expected job creation from green stimulus to be overestimated and feel the government should give greater consideration to the quality and sustainability of employment.

Opportunities for Cooperation in Green Infrastructure

As the Republic of Korea increasingly prioritizes green infrastructure and gathers relevant knowledge and experience relating to it, there will be more opportunities for cooperation in this area to work with INFRA partners in support of less developed countries. Some notable areas include:

Co-operation on Carbon Funds. In addition to promoting green growth within the country, the government is strengthening its efforts to advance the level of green technology in developing countries through collaboration with partners on clean technology projects. In 2009, the Korean government, through Korea-Exim bank invested US$20 million in the Future Carbon Fund managed by the Asian Development Bank (ADB). The Fund will be invested in Clean Development Mechanism projects and give Certified Emission Reduction to the investors as a dividend. The Korean government is open to contributing to similar investment fund with other development institutions and this could be potential area of cooperation for INFRA partners.

Parallel Financing. The Economic Cooperation Development Fund (EDCF), the official development aid program of the Korean government, is planning to increase its support to clean energy projects. Since Korea became a member of Development Assistance Committee in the Organization for Economic Cooperation and Development, it plans to operate the EDCF based on more flexible terms and conditions. EDCF funding is available to fill financing gaps through parallel financing with World Bank and other development partners.

Lessons Learned. Korea has also already registered 37 CDM projects in United Nations Framework Convention on Climate Change (UNFCCC) as of April 2010 and the government is open to sharing lessons gained through the national stimulus package and its international development on green growth.

Related Publications and News

Topic	Summary	Source	Date
Asian Leaders Look Beyond Today	New business models for clean and inclusive growth and the preservation of natural resources are required to face multiple challenges posed by climate change, according to business and government leaders gathered at the World Economic Forum on East Asia. Collaboration should include incentives and subsidies for research and development in green technologies, greater cooperation among Asian countries in speeding up approval of green goods and services, and changing the mindset of consumers and employees on energy use and conservation. "Green growth is not just an option," said Yoon Jong-Soo, Deputy Minister of Environment for the Republic of Korea. "It is the new paradigm that the world must be committed to."	IDN	7-Jun-10
Credit Crunch Throws Up Opportunities	The credit crunch was not good news for clean technology. Investment in clean energy fell by 6.6 per cent to $162bn last year from $173bn the previous year, having grown threefold from 2004 to 2007.The setback would have been greater if not for the funds allocated for green sectors in the stimulus packages of countries. A large proportion of stimulus funding around the world was directed at green investment. HSBC, the bank, estimates that governments allocated more than $430bn in fiscal stimulus globally to “climate change themes”. The US, China and the Republic of Korea were among the biggest green stimulus spenders, with Korea allocating almost 80 per cent of its funding to greening its economy	Financial Times	3-Jun-10
S. Korea's green growth committee takes initiative in low-carbon, eco-friendly policies	While Korea's green growth committee aspires to better balance environmental issues and economic growth, Korean society is still divided on the government-led wave, questioning how truly green and how efficiently manageable those government policies are.For example, civic environmental groups are pointing out that the already controversial Four River Project has more to do with a construction boom, rather than reviving the nation's major rivers.Small businesses are complaining that they are not getting enough subsidies for green technology development, accusing the government of being too focused on large-size firms. Despite criticism, the Korean government is firm on steering its way through any obstacle whatsoever	People's Daily Online	31-May-10
Green growth as plan for development	Korea has efficiently disbursed 20 percent of its green stimulus by the first half of 2009, and also recorded a 2.3 percent growth in the second quarter of the same year, the highest among OECD members. This clearly shows that Korea is capable of overcoming the economic crisis, while at the same time building green infrastructure with more green investment	Korea Herald	11-May-10
Asian Leaders Look Beyond Today	New business models for clean and inclusive growth and the preservation of natural resources are required to face multiple challenges posed by climate change, according to business and government leaders gathered at the World Economic Forum on East Asia. Collaboration should include incentives and subsidies for research and development in green technologies, greater cooperation among Asian countries in speeding up approval of green goods and services, and changing the mindset of consumers and employees on energy use and conservation. "Green growth is not just an option," said Yoon Jong-Soo, Deputy Minister of Environment for the Republic of Korea. "It is the new paradigm that the world must be committed to."	IDN	7-Jun-10