

# Skills Training in Korea-Responding to Green Initiatives

*By Namchul Lee(Korea Research Institute for Vocational Education & Training)*

## 1. Introduction

The concept of “Green Growth” was first adopted at the “Ministerial Conference on Environment and Development” jointly hosted by the Ministry of Environment of the Republic of Korea and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in 2005. It was initiated by Korea, the host country, and included in the outcome of the Conference,

Korea's new vision of "Low Carbon, Green Growth" strategy was presented by President Lee on the occasion of the 60th anniversary of the founding of the Republic of Korea on August 15, 2008. The core of the new national strategy is to shift the current development paradigm of quantity-oriented, fossil-fuel based growth to quality-oriented growth with more emphasis on the use of renewable energy resources and ecological efficiency. With this vision, Korea aims to develop into one of the seven green powerhouses by 2020 and top five by 2050.

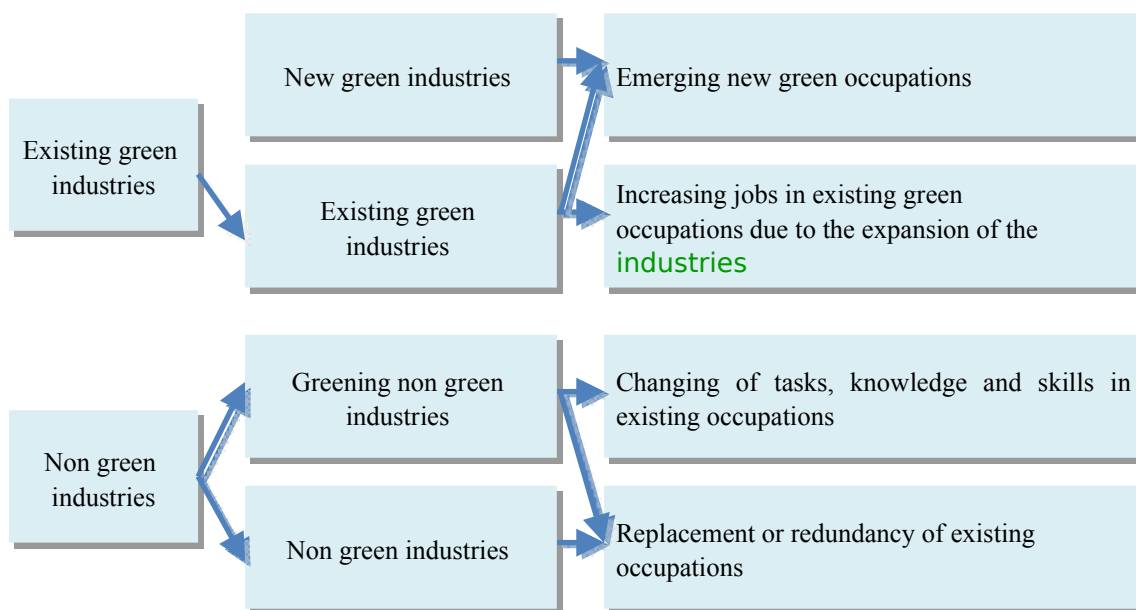
Green growth aims to foster economic growth and development while coping with the concerns over lack of natural resources, environmental depredation, and climate change. Green growth aims to catalyze investment and innovation, which will underpin sustained growth and give rise to new economic opportunities and change for enhanced well-being.

Environmental issues and the global financial crisis are the biggest challenges facing the global community. Korea’s efforts in formulating and realizing green growth

policies have been acknowledged by the international community as a prominent growth strategy to mitigate climate change and develop new growth engines. Shift in the development paradigm from quantity-oriented, fossil-fuel dependent economic growth to quality-oriented growth that relies on new and renewable energy resources.

These green growth initiatives and stimulus packages inevitably lead to restructuring of economy and industries, which in turn bring about changes in employment and jobs. Green jobs have been identified and emerged across different sectors. Green jobs require adequate skills and call for education and training strategies to reduce skill gaps that may exist under the transition to sustainable green economy. Labor market shifts due to the restructuring of industries in response to green growth ([See Figure 1]).

[Figure 1] Green Restructuring and its Impact on the Labor Market



Source: Presidential Committee on Green Growth(2009b).

## II. Korea's National Strategy for Green Growth

Korea established the Presidential Committee on Green Growth (PCGG) in February 2009 under the direct supervision of the President to facilitate the realization of the new national vision of “Low Carbon, Green Growth”. The Committee consists of 47 members, including relevant government ministers and representatives from key national research institutes, and has the mandate to discuss all subjects related to green growth, including the planning and implementation of policies on green growth as well as the coordination of government activities in this area.

Through the Committee, Korea announced 27 national strategies for Green IT in May 2009, finalized the Five-Year Action Plan for Green Growth in July 2009, confirmed the voluntary reduction of its GHG emissions to 30% below business-as-usual (BAU) levels by 2020 in November 2009, and announced the enforcement of the “Framework Act on Low Carbon, Green Growth” in April 2010.

The establishment of the PCGG is one of the most distinctive features of Korea’s green growth strategy. The launching of the Committee is proof of the Korean government’s dedication to promoting this new development paradigm, and the body’s effective leadership thus far has been the most critical element in developing effective green growth strategies and policies. Thus, the prioritization of green growth as its top national agenda has allowed Korea to become one of the early green leaders. Furthermore, Korea believes that green growth can be turned from vision into reality with the help of relevant ministries, advisory groups and private sector actors.

In particular, the PCGG’s focus on strengthening internal networks between central and local governments and heeding public opinion has created an open structure under which effective green growth policies have been developed.

On July 6, 2009, Korea announced the objective of becoming the world’s

seventh largest green economic power by 2020 and the fifth largest by 2050. To achieve these goals, Korea has formulated three strategies for green growth: (1) Mitigating Climate Change and Promoting Energy Independence, (2) Creating new Engines for Economic Growth, and (3) Improving the Quality of Life and Enhancing Korea's International Standing. These strategies are designed for facilitating the implementation of various sub-policies established under the "Low Carbon, Green Growth" vision, and the ten key policy directions, for achieving the vision (see Table 2).

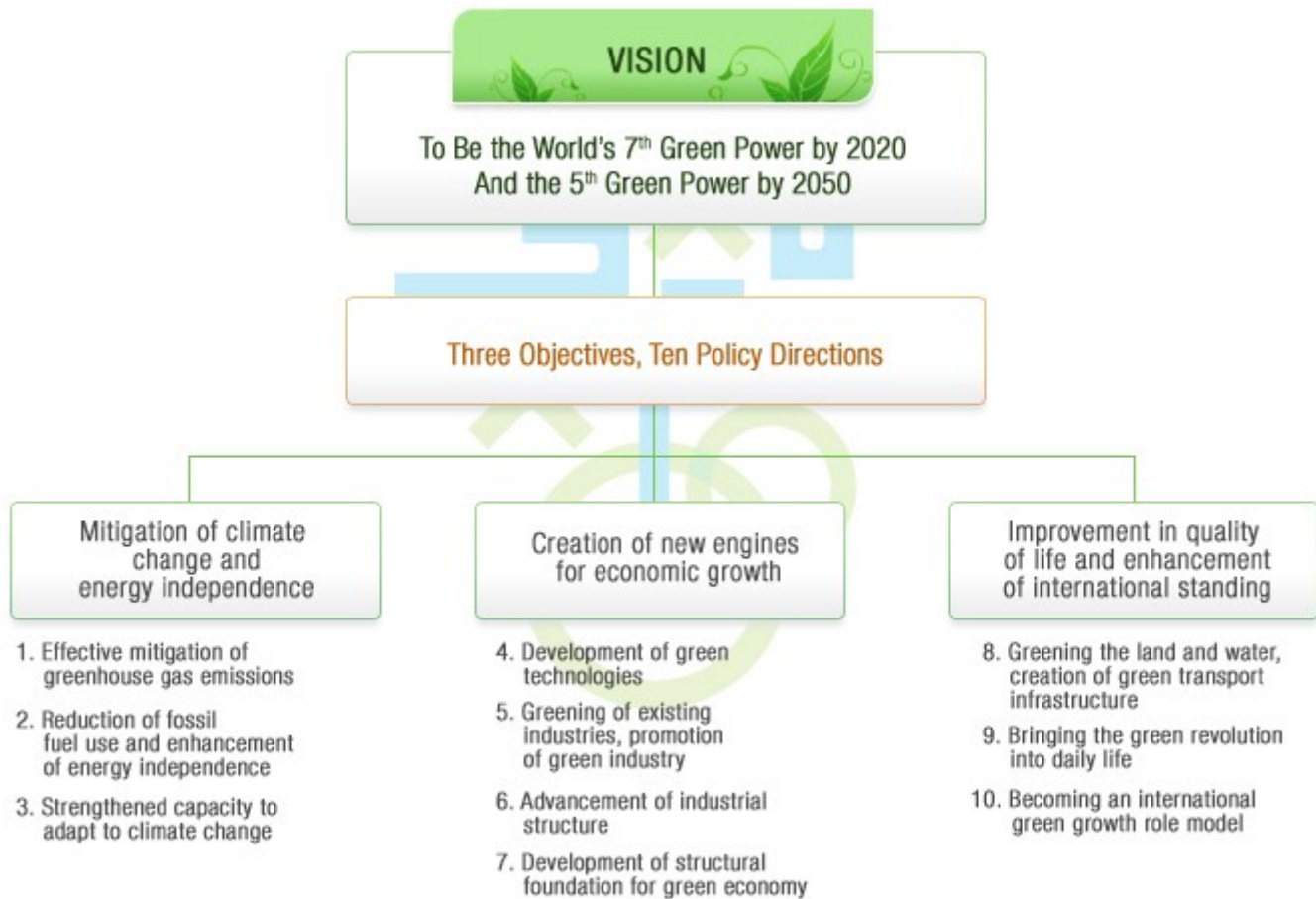
The policies set out under the first Five-Year Action Plan (2009-2013) for green growth has been well received by Korean society, resulting in a substantial increase in public and private investment. Under the five-Year Action Plan, KRW 107 trillion (approximately \$83.6 billion USD), which represents 2% of Korea's GDP, is to be allocated for managing issues related to climate change and energy, sustainable transportation, and the development of green technologies between 2009 and 2013 (PCGG, 2010d<sup>1</sup>).

This proactive plan and investment strategies demonstrate the strong will of the Korean government in promoting green growth policies and is symbolic of its efforts to secure required financial resources. According to the PCGG (2010d), the budget mentioned above is to be spent specifically on various activities associated with the research and development of green technologies, including those related to solar energy and fuel cells, the restoration of the four major rivers, and the development of green transportation ([see Figure 2]).

[Figure 2] Vision and Strategies of Korea Green Growth

---

<sup>1</sup> Presidential Committee on Green Growth (2010d). *Road to Our Future Green Growth*. Seoul.



The Korean government enacted and promulgated the “Framework Act on Low Carbon, Green Growth” on January 13, 2010, which went into effect on April 14, 2010.

The main purpose of the Framework Act is to implement legal measures that can effectively address climate change and energy issues and to promote sustainable development. Meanwhile, the Act also mandates the establishment of institutional and

implementation systems, for instance, the Presidential Committee on Green Growth, for low carbon green growth strategies so that the policies could be carried out in an efficient and systematic manner.

<Table 1> National Strategies and Policy Directions for Green Growth

- |   |   |
|---|---|
| <p>3) Improving the Quality of Life and Enhancing International standing</p> <p style="text-align: right;">Korea 2011</p> | <ol style="list-style-type: none"> <li>4. Development of green technologies</li> <li>5. Greening of existing industries, promotion of green industry</li> <li>6. Advancement of industrial structure</li> <li>7. Engineering a Structure basis for a green economy</li> <li>8. Greening the land and water and building a green transportation infrastructure</li> <li>9. Bringing a green revolution to daily life</li> <li>10. Becoming a role model for the international community as a green leader</li> </ol> |
|---|---|

A technological transformation that reduces the carbon intensity of industry, in particular in Korea's manufacturing sector, is therefore a core component of a green growth strategy. The Korean Green Growth Plan seeks to promote the development of 27 core green technologies that would provide future engines of growth to the Korean economy(<See Table 2>)..

<Table 2> List of 27 Core Technologies in Korea Green Growth National Plan

Sector	27 Core Technologies	
Climate change	1. Monitoring and modeling for climate change	(4)
	2. Climate change assessment and adaptation	(4)
Energy source technology	3. Silicon-based solar cells	(1)
	4. Non-silicon based solar cells	(4)
	5. Bio-energy	(4)
	6. Light water reactor	(1)
	7. Next-generation fast reactor	(3)
	8. Nuclear fusion energy	(3)
	9. Hydrogen Energy R&D	(3)
	10. High-efficiency fuel cell	(3)
Efficiency improvement technologies	11. Plant-growth-promoting technology	(3)
	12. Integrated Gasification Combined Cycle	(3)
	13. Green car	(2)
	14. Intelligent Infrastructure for transportation and logistics	(4)
	15. Green city and Urban Renaissance	(3)
	16. Green building	(3)
	17. Green process technology	(2)
	18. High-efficiency light-emitting diodes / Green IT	(1)
	19. IT-combined Electric machines	(3)
	20. Secondary batteries	(2)
End-of-pipe technology	21. CO <sub>2</sub> capture, storage and processing	(3)
	22. Non-CO <sub>2</sub> processing	(2)
	23. Assessment of water quality and management	(2)
	24. Alternative water resources	(2)
	25. Waste recycling	(2)
	26. R&D in Monitoring and processing for hazardous substances	(3)
R&D in Virtual Reality	27. Virtual reality	(2)
(1) Technologies for short-term intensive investment; (2) Technologies for mid-term intensive investment; (3) Technologies for long-term intensive investment; and (4) Technologies for long-term gradual investment.		

Source : UNEP, 2009

### III. Korea's Economy and Changes in the Industrial Structure

<Table 3> Understanding Korea's Economic Development

2000s	<ul style="list-style-type: none"> <li>• Recovery from the recession caused by the recent global financial crisis</li> <li>• Knowledge-based economy</li> </ul>
1990s	<ul style="list-style-type: none"> <li>• Introduction of a more advanced system of managing the economy</li> <li>• Technology-intensive economy</li> </ul>
1980s	<ul style="list-style-type: none"> <li>• Promotion of heavy chemical industry-leading to creation of middle class and high social mobility</li> <li>• Expansion of the public welfare system</li> </ul>

	<ul style="list-style-type: none"> <li>• Capital-intensive economy</li> </ul>
1960~70s	<ul style="list-style-type: none"> <li>• Strong support for exporting companies</li> <li>• Labor-intensive light industry economy (supply of skilled workers through institutionalization of vocational education system)</li> </ul>

<Table 4> Economic Development and TVET

Phase 1 1960~75	<ul style="list-style-type: none"> <li>• Unlimited supply of workers</li> <li>• Labor-intensive industries</li> <li>• Demand for low-skilled workers</li> </ul>
Phase 2 1976~96	<ul style="list-style-type: none"> <li>• Emerging worker shortage</li> <li>• Full-fledged economic development focusing on heavy chemical industries</li> <li>• Emphasis on quality of labor force</li> </ul>
Phase 3 1997 and onwards	<ul style="list-style-type: none"> <li>• Rise in unemployment since the financial crisis</li> <li>• Change of growth paradigm: quantitative expansion to qualitative deepening</li> </ul>

### III. Vocational Training

Korea's vocational training has hauled the country's economic development by raising and supplying functional human resources necessary in the process of industrialization since 1967 when Vocational Training Law was enacted. The drastic change in the country's economic structure to focus more on the secondary industries along with the promotion of the second Five-Year Economic Development Plan facilitated a sharp increase of the demand for functional human resources in the heavy and chemical industries.

The enactment and enforcement of Vocational Training Law in 1976 led to the beginning of vocational training system based on the obligatory training. This law requires employers to raise a set number of human resources, and they are obligated to pay an appropriate training fee if unable to do so. Advancement of knowledge-based economy has accentuated the importance of vocational training of all level while necessitating the establishment of lifelong training system.



Government promoted career development business under the employment insurance system as the new vocational training structure. The introduction of employment insurance system in July 1995 integrated vocational training into the career development business within the employment insurance frame.

The focus of vocational training has been transferred from raising functional human resources to advancement training and lifelong career development. Career development business under the employment insurance legislation is offers an incentive to encourage employees and employers to voluntarily train and participate.

The enactment and enforcement of Employee Training Promotion Act in January 1999 repealed the training obligation system, and instead emphasized the autonomy in vocational training.

It also resulted in a significant increase of civilian participation to training programs, and it expanded the training subject from manufacturing to office management and service industries. It was the realization of the need for fundamental reform of the training system following the lack of training resources and an increase in demand for advancement training that led to these changes.



# Relationsh

## Vocational Education and Training

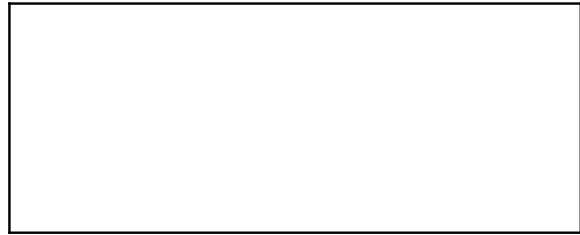
### Vocational Education

- 2000: Vocational High School Promotion Policies
- 2001: Vocational Education promotion Policies
  - strengthening competitiveness
  - high schools-universities collaboration
  - integration of academic and practical education
- 2001: Junior College Development Policies
  - restructure of overall junior college system
  - specialized educational offering
  - development of specialized courses
- 2005: Policies for innovating Vocational Education System
- 2007: Vocational High Schools Development

### Vocational Training

- 2001: A comprehensive set of measures to address youth unemployment
- Support for the vulnerable groups including long-term unemployed
- Expansion of labor market information system
- Training foreign workers through industrial training programs
- Training SMEs incumbent workers through SME VT consortium
- Sector Human Resource Development Councils
  - ▶ *lifelong career competency development for unemployed, employed, workers in SMEs, irregular workers*

Strategies in 2007  
• 2008: Introduction of High School Diversity 300 Project  
▶ *reforming higher vocational institutions including vocational high schools and junior high schools*



VET institutions still provide traditional training courses. It is challenging to locate VET centers to retrain those workers affected by the green growth industry. There are many programmes named green in its course title, but the contents do not necessarily reflect green skills. While the diverse policy measures and strategies have been issued at the national level, it will take a long time to implement the policy at the local training centers and institutions.

### **Case: Korea Polytechnic Colleges**

Restructuring curricula of Korea Polytechnic Colleges to meet the needs of middle level technicians is example of skills response of greening occupations. Since 2008, Korea polytechnic college went through major curricula restructuring to response to the recent green growth initiatives and new growth engine industries.

In order to develop technicians and technologists who can meet the needs of green economy, restructuring of the polytechnic colleges seem to be critical. To this end, over the next five years (2009-2013), 20 per cent of the existing courses and curricular will be under restructuring process and produce approximately 10,000 technicians and technologists in green industries.

In order to apply for the restructuring curricula funds, polytechnical college campuses across the country proposed new courses and curricula based on their extensive needs assessment of respective industry and local labor market where the

applicant campus is located in. In particular, since one of the main objectives of the polytechnical colleges is to provide ready-to-work technicians and technologists upon the demands of local labor markets, the needs assessment of the local labor market must be critical.

The prospective businesses where the graduates of the polytechnical colleges would work after graduating the programme are identified in the proposal. In addition, tasks and job analysis of prospective workplaces was conducted where graduates of the programme can be hired. After revising the curricula, the overall application rate for the polytechnical colleges increased by 30 per cent.

For example, the Polytechnical College Incheon campus changed the electrical measurement and control programme to the electrical energy system programme to meet the recent increasing demands for energy equipments and facilities control technicians. The school revised the main curriculum to cover new renewable energy systems such as solar photovoltaic (SPV), wind power, fuel cells, etc.

Also the curriculum enhanced hands-on practice programmes by providing new equipments and facilities of new renewable energy systems. Along with the newly revised initial education for the future technicians, the department also provides training programmes for the current employed in the field using the same equipments and facilities. By revising the curriculum to meet the current needs of the labor market, the department expects to recruit more students and raise the employment rate of the graduates.

# Skills in Tra

## **IV. Suggestions for Policy**

### **Creating positive effects on employment and labor market**

- Establish green workforce training plan to support green industrial policy
- Identification of Green skills & technical needs and analysis
- Education and training for green job relocation
- Statistical and information infrastructure on green employment.

### **Utilizing green jobs**

- Linkage of training programmes and national job standard
- Creating green certification

### **Legislative and institutional foundations for green employment**

- Enactment of 「Green jobs Act」 and 「Green job skills development Act」
- Linkage of green industry workforce training and related institution

- Green industry development through selection and concentration


### **Workforce development in the renewable energy sector**

- Establish policy measures of the renewable energy workforce training at national level
- Demand-oriented vocational education and training in the for renewable energy sector
- Workforce development according to the specific sphere in the renewable energy sector
- Re-education and re-training for job relocation in the renewable energy sector

### **Re-organization vocational education & training curriculum & programs in green technology sector**

- Promoting research on workforce demand in green industry sector and workforce training program
- Suggesting the Guidelines in green technology
- Support software and hardware for the re-organization vocational education and training program in green technology
- Introduction of Project Financing(PF) schemes for green skills development

# Re-educati



VET institutions still provide traditional training courses. It is challenging to locate VET centers to retrain those workers affected by the green growth industry. There are many programmes named green in its course title, but the contents do not necessarily reflect green skills. While the diverse policy measures and strategies have been issued at the national level, it will take a long time to implement the policy at the local training centers and institutions.

## **The Way Forward**



**Leading sustainable growth by nurturing highly-skilled technology experts that can create high value-add**



<i>Vocational Training</i>		<i>Vocational Education</i>
<ul style="list-style-type: none"> <li>• Resolving mismatch of skills and labor supply</li> <li>• Programs relevant to market demands</li> </ul>	S/W	<ul style="list-style-type: none"> <li>• Raising quality and relevance of education in a global environment</li> <li>• Clear definition of distinct identity and role of TVET institutions</li> </ul>
<ul style="list-style-type: none"> <li>• Advancing public TVET offerings</li> <li>• Fostering private TVET market</li> </ul>	H/W	<ul style="list-style-type: none"> <li>• Streamlining the structure of junior colleges</li> <li>• Promoting meister schools and specialized high schools</li> </ul>
<p>Lessons and experiences gained from Four decades of TVET administration and delivery</p>		

(End)