Green Growth and Green Jobs in Korea: Potentials and Perspectives

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- The green economy and green jobs in Korea is on the growth steadily and its potential is enough but not to realize fully now.
- Green economy policy should be designed to achieve both employment and environmental protection together and also in the insight of ‘just transition’.
- It is important to make green economy issue to be political agenda with political parties, civil society organizations, trade unions and so on.
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1.1 Sectoral composition of the economy and changes overtime

In a short period of time, the Korean economy grew dramatically with support of the government. This rapid growth was debt to an export-oriented heavy chemical industry. From 1960 to 2010, the Gross National Income (GNI) increased more than 217-fold from $79 to $17,175, while the exports increased more than 14,500-fold from $32,000 to $ 466 million. The proportion of manufacturing reached its highest around in 1988 and has been stable since. On the other hand, the service industry is on the gradual decline. The proportions of agriculture, fishery, mining, and SOC (water, gas, electricity and construction) industries continue to decrease. The traditional model of Korean economic growth has been initiated from progressive investment and employment by Chaebol groups, which created positive results in wage increase and national income increase. Then followed growth of middle class with purchasing power and domestic market size. However, this model has faced its limitation since the 1990s. The jobless growth and the Asian Financial Crisis fueled the collapse of middle class, while the domestic market remained sluggish. Such circumstances helped halt the skyrocketing economic growth. Now, the Korean society is faced with a challenge to “democratize” the economy; in other words, to realize more justice and fairness in the economy. For instance, the country’s economic policy needs to switch its focus from Chaebol to small and medium-sized companies, which have more potential to boost employment. The nation also needs to increase spending on social welfare to expand the domestic market.

Table 1: Proportional change in Korean industries, with average annual increase rate in parentheses

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forest, Fishery</td>
<td>6.9 (3.6)</td>
<td>4.9 (10.9)</td>
<td>3.2 (0.3)</td>
<td>2.1 (-4.2)</td>
</tr>
<tr>
<td>Mining</td>
<td>0.9 (19.1)</td>
<td>0.8 (3.1)</td>
<td>0.2 (-7.8)</td>
<td>0.1 (1.1)</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>26.4 (18.9)</td>
<td>28.9 (15.7)</td>
<td>22.1 (3.2)</td>
<td>24.1 (6.0)</td>
</tr>
<tr>
<td>Utilities (Electricity, gas, water)</td>
<td>7.6 (21.7)</td>
<td>5.5 (2.6)</td>
<td>5.4 (10.4)</td>
<td>4.9 (-0.4)</td>
</tr>
<tr>
<td>Construction</td>
<td>2.6 (26.5)</td>
<td>2.7 (12.0)</td>
<td>2.2 (-2.4)</td>
<td>1.1 (-0.9)</td>
</tr>
<tr>
<td>Wholesale/Retail and Food/Lodging</td>
<td>4.1 (11.3)</td>
<td>5.0 (13.1)</td>
<td>4.0 (6.0)</td>
<td>3.8 (-0.2)</td>
</tr>
<tr>
<td>Transport, Storage, and Telecommunication</td>
<td>10.6 (35.9)</td>
<td>12.0 (9.1)</td>
<td>10.8 (10.1)</td>
<td>11.8 (-3.4)</td>
</tr>
<tr>
<td>Finance and Insurance</td>
<td>1.9 (18.7)</td>
<td>2.2 (5.1)</td>
<td>3.0 (14.1)</td>
<td>2.5 (1.8)</td>
</tr>
<tr>
<td>Realty and Hospitality</td>
<td>22.0 (9.2)</td>
<td>21.0 (15.6)</td>
<td>29.9 (0.4)</td>
<td>26.8 (6.1)</td>
</tr>
<tr>
<td>Public Administration, National Defense</td>
<td>11.4 (10.1)</td>
<td>10.8 (8.9)</td>
<td>11.9 (6.8)</td>
<td>13.4 (1.2)</td>
</tr>
<tr>
<td>Education Service</td>
<td>2.1 (11.2)</td>
<td>2.1 (10.7)</td>
<td>2.6 (12.8)</td>
<td>4.7 (8.2)</td>
</tr>
<tr>
<td>Health and Social Welfare</td>
<td>0.9 (9.9)</td>
<td>1.5 (15.5)</td>
<td>1.6 (6.1)</td>
<td>1.7 (4.5)</td>
</tr>
<tr>
<td>Other Services</td>
<td>2.7 (6.2)</td>
<td>2.6 (10.2)</td>
<td>3.1 (8.2)</td>
<td>3.0 (2.5)</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: The Bank of Korea
1.2 Which sectors are resource-intensive?

Manufacturing industries have been leading the economic development in Korea. They were able to grow due to various supports from government such as low energy cost and became resource-intensive to that extent. Particularly, the ten main industries\(^1\) including steel and petrochemistry compose 55% of the entire manufacturing. Energy and environmental issues are easily ignored since heavy chemical industry is at the center of economic development scheme. Korean industries are heavily dependent on fossil fuel energy (83%). High energy-consuming industry makes up 38% of the entire consumption, which exceeds far beyond the OECD average (22%). Typical high energy-consumption industries are steel, petrochemistry, cement, paper, non-ferrous metal industries. These and manufacturing, which includes shipbuilding and car making industries, make up 75% of the entire energy consumption (SERI, 2008).

Table 2: Proportion of energy consumption by each sector in Korea and other countries (2006)

<table>
<thead>
<tr>
<th></th>
<th>Non manufacturing</th>
<th>Manufacturing</th>
<th>High energy consumption industry</th>
<th>House-hold</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
<td>64.4</td>
<td>15.9</td>
<td>48.5</td>
<td>38.3</td>
<td>13.1</td>
</tr>
<tr>
<td>Japan</td>
<td>59.4</td>
<td>22.2</td>
<td>37.2</td>
<td>27.6</td>
<td>14.1</td>
</tr>
<tr>
<td>German</td>
<td>47.4</td>
<td>17.7</td>
<td>30.1</td>
<td>20.5</td>
<td>26.5</td>
</tr>
<tr>
<td>OECD average</td>
<td>45.5</td>
<td>16.7</td>
<td>28.8</td>
<td>21.5</td>
<td>19.1</td>
</tr>
</tbody>
</table>

Source: Samsung Economic Research Institute (2008), unit: %

1.3 Resource degradation/usage and impact of environmental pollution in relation to current trends

Heavy chemical manufacturing is at the center of Korean industry structure. Heavy energy consumption, overuse of resource, and continuous increase in greenhouse gas emission are foreseen results. Since the late 1990s, the Korean industry’s energy consumption has been a bit stabilized as the proportion of high value-adding and low energy-consuming industries, such as telecommunication, is expanded. However, the overall energy consumption share is still solid, as the energy consumption in petrochemical and steel industries is constantly intensified (SERI, 2008, p.2).

Above all, high increase rate of energy consumption is because manufacturing industry still consist a large proportion. Particularly, petrochemical industry that consumes massive energy also consists a large proportion. In household and commerce sectors as well, size of houses became larger and electronics became large-scale. Since electricity is perceived as clean energy and low cost, people use more and more electricity, with a 6% annual increase on average (Korea Energy Economics Institute, 2011).

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\(^1\) Korean government designated ten focal industries; car making, shipbuilding, general machinery, steel, petrochemistry, textile, semiconductor, display, digital, electronics, and biotechnology.
Table 3: Energy supply and demand (unit: million TOE)

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>208.6</td>
<td>215.1</td>
<td>220.2</td>
<td>228.6</td>
<td>233.4</td>
<td>236.5</td>
<td>240.8</td>
<td>242.2</td>
<td>260.5</td>
</tr>
<tr>
<td>Coal</td>
<td>49.1</td>
<td>51.1</td>
<td>53.1</td>
<td>54.8</td>
<td>56.7</td>
<td>59.7</td>
<td>66.1</td>
<td>68.6</td>
<td>76</td>
</tr>
<tr>
<td>Petroleum</td>
<td>102.4</td>
<td>102.4</td>
<td>100.6</td>
<td>101.5</td>
<td>101.8</td>
<td>105.5</td>
<td>100.2</td>
<td>102.3</td>
<td>104.4</td>
</tr>
<tr>
<td>LNG</td>
<td>23.1</td>
<td>24.2</td>
<td>28.4</td>
<td>30.4</td>
<td>32</td>
<td>34.7</td>
<td>35.7</td>
<td>32.3</td>
<td>40.8</td>
</tr>
<tr>
<td>Nuclear</td>
<td>29.8</td>
<td>32.4</td>
<td>32.7</td>
<td>36.7</td>
<td>37.2</td>
<td>30.7</td>
<td>32.4</td>
<td>31.8</td>
<td>31.7</td>
</tr>
<tr>
<td>Other</td>
<td>4.3</td>
<td>5</td>
<td>5.4</td>
<td>5.3</td>
<td>5.7</td>
<td>5.9</td>
<td>6.4</td>
<td>7.2</td>
<td>7.6</td>
</tr>
<tr>
<td><strong>Final Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>160.5</td>
<td>164</td>
<td>166</td>
<td>170.9</td>
<td>173.6</td>
<td>181.4</td>
<td>182.6</td>
<td>182.8</td>
<td>195</td>
</tr>
<tr>
<td>Industry</td>
<td>89.2</td>
<td>90.8</td>
<td>93</td>
<td>94.4</td>
<td>97.2</td>
<td>104.3</td>
<td>106.5</td>
<td>107</td>
<td>115.6</td>
</tr>
<tr>
<td>Transport</td>
<td>33.8</td>
<td>34.6</td>
<td>34.6</td>
<td>35.6</td>
<td>36.5</td>
<td>37.1</td>
<td>35.8</td>
<td>35.5</td>
<td>36.6</td>
</tr>
<tr>
<td>Household and Commercial</td>
<td>34.3</td>
<td>35</td>
<td>34.8</td>
<td>36.9</td>
<td>36</td>
<td>35.9</td>
<td>36.2</td>
<td>36</td>
<td>38.2</td>
</tr>
<tr>
<td>Public et al.</td>
<td>3.2</td>
<td>3.6</td>
<td>3.6</td>
<td>4.1</td>
<td>3.8</td>
<td>4.1</td>
<td>4.1</td>
<td>4.3</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Source: Energy Statistics Yearbook (Korea Energy Economics Institute, 2011)

The ratio of consumption from domestic resources (fossil fuel, minerals for business and construction uses, and biomass) to the GDP is improving overall since 2005, but this is still insuffcient when compared to the EU countries. Korea’s per capita GDP is now beyond the line of $15,000 as of 2000, but decoupling between economic development and energy use have not taken place in Korea (Yoon Soon Jin, 2004).

Figure 1: Comparison of per capita Korea to international income and energy use
There are no visible signs of energy conservation or efficiencies in the Korean industry and economy. Therefore, energy use and greenhouse gas emissions are expected to continue increasing in the future. The Korean government predicts that the energy (electricity) demand will continue to increase until 2030-50. The government also projects the BAU of greenhouse gas emissions will continue to grow. It set a goal to reduce 4% of the 2005 level up until 2020, which faced criticism from the NGO sector for being too passive (Presidential Committee on Green Growth, 2009; LEE, Jin Woo, 2009).

**1.4 Achieved environmental advances in the industry and agriculture**

Serious environmental pollution and consequent diseases were frequent in the 1970s. Measures to protect the environment were adopted since the 1980s, but they generated limited achievements. According to the Environmental Performance Index (EPI), which is produced jointly by Yale and Columbia Universities, Korea ranks the 94th among 132 surveyed countries in 2000 and remains at the 45th in 2012. In case of SO2, the main air polluter, the government had a policy on low sulfur fuel supply since the early 1980s. In the 1990s, the emission was reduced as the government set an emission standard. Water and soil pollutions are improving, however, industrial sewage and wastes are constantly increasing (Environment Statistics by Korean Ministry of Environment).

![Figure 2: Korean Greenhouse Gas Emission Outlook and Reduction Goal](source)

Source: Presidential Committee on Green Growth

![Figure 3: Wastes of Korea (1996-2008)](source)

Source: Environment Statistics by Korean Ministry of Environment
Usage of agricultural chemical and fertilizer is in the decline. This trend is related to the fact that overall size of Korean agriculture is reducing. Size of agricultural land and number of farmers are decreasing. Other factors for agricultural decrease include the opening of agriculture market, aging farming population, and falling of family and small-sized farming. Recently, chemical usage per unit land has been reduced while environment-friendly and organic farming is on the rise (Ministry of Agriculture and Forest, 2011).

Recently, as a result of green growth, the economic growth consumes less environmental resources than before, the amount of basic/fundamental natural resources increased, and the environmental quality of life is on the rise. Also on the rise are indicators of green R&D and ODA and expenditure on environmental protection (Source: Korea National Statistical Office, 2011).

1.5 What eco-industries exist?

1) Renewable Energy Industry

The proportion of renewable energy among all the energy sources is quite low (in 2010, it comprises only 2.4% of the entire primary energy and 1.24% of the generated amount). However, recently the amount is continually increasing, according to the Knowledge and Economy Ministry (2011). Renewable energy producing facilities are rapidly increasing, particularly those utilizing solar photovoltaic and wind. Employment and sales amount are also increasing (Ministry of Knowledge and Economy, 2011). Renewable energy equipment installation industry is on the rise and employment and sales are increasing as well. There were only 46 companies in 2004 and the number increased to 215 in 2010. On the other hand, the sales increased from 146.1 billion Korean won in 2004 to 13 trillion won in 2010. This is 55.7 times more than the level of 2004. The employment increased as well. From 826 employees in 2004 to 13,380 in 2010, it increased 16.2 times.

The statistics released in 2009 say that conglomerates account for 27% of the wind power sector and 70% in the fuel cell, whereas the proportion is 20% in the overall renewable energy industry. This indicates that conglomerate-dominated corporate governance has taken root in certain sectors of the renewable energy industry (Source: Korea Energy Management Corporation, 2010).

The number of specialty companies that install renewable energy equipment is rapidly increasing from 170 in 2006, 954 in 2007, and 8281 in 2009. Particularly due to Feed-in-Tariff (FIT) adopted in 2001, which was effective until 2011, companies that installed solar voltaic equipment increased from 267 in 2005 to 4860 in 2009 (Korea Energy Management Corporation, 2011).
Table 4: Reported new and renewable energy specialty companies (2009)

<table>
<thead>
<tr>
<th>Solar</th>
<th>Biomass</th>
<th>Wind</th>
<th>Water</th>
<th>Fuel Cell</th>
<th>Coal Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,860</td>
<td>258</td>
<td>900</td>
<td>154</td>
<td>154</td>
<td>104</td>
</tr>
<tr>
<td>Ocean</td>
<td>Waste</td>
<td>Geothermal</td>
<td>Hydrogen</td>
<td>Other</td>
<td>TOTAL</td>
</tr>
<tr>
<td>116</td>
<td>220</td>
<td>1,334</td>
<td>126</td>
<td>55</td>
<td>8,281</td>
</tr>
</tbody>
</table>


2) Resource Recycling Industry

Number of companies and employment in resource-recycling industry are on steady increase (ECPI, 2011). Number of recycling companies significantly grew from 1,647 in 1999 to 4,375 in 2009. The number of employees increased to 52,000 in 2009. Sales doubled from 1.8 trillion Korean won in 1999 to 3.8 trillion won in 2011.

![Recycling companies in Korea (1999-2009)](image)

Source: Korea Waste Association

3) Environment-Friendly Agriculture and Distribution

Environment-friendly agricultural products and market share are expanding and eco-cooperatives that deal these agricultural products are growing accordingly. The market for environment-friendly agricultural products made up 13.1% of the entire agricultural products. The farming household that participated in eco-friendly agriculture reached 16.6% and the size of the eco-friendly farmland was 11.6% of the entire farmland. The size of the market by 6.9% compared to the year before, which estimated to be 3.2 trillion won industry (Korea Rural Economic Institute, 2010). Hasalim, the largest supplier of organic agricultural products in Korea, is making a substantial leap. In 2009, they made 158.7 billion won in sales while providing more than a thousand green jobs (ECPI, 2011).
4) **The Situation of Eco-Industries in Korea**

The overall eco-friendly green business is rapidly growing in Korea. Nonetheless, related original technologies and core components come from elsewhere, which indicate that the fundamental basis of the industry is not as strong. The level of green technology is about 50 to 80% of those of developed countries. Meanwhile, venture companies in the green sector numbers around 1,800, and most of them are concentrated in the low value bracket of the economic sector, the lack of domestic demand for a larger green market stems from the following two factors; 1) export-driven conglomerates lead the Korean green industry, and 2) the supply of renewable energy is in shortage.

To make matters worse, there is no unified definition for the green industry. Official documents released by the Korean government fail to clearly define green industry. Yet in September 2009, the government categorized securing water resources and construction of small and medium-sized dams as part of the green industry in its Plan of Execution for Green New Deal Business Oriented for Job Creation (Source: Ministry of Finance and Planning and others, 2009). The Four Major River Restoration project was mainly oriented to construction business, including dredging bottom sediments of rivers and building levees. Nonetheless, this project has been executed as part of the green industry and was considered to be on par with renewable energy and energy efficiency businesses in the eye of the government. Dredging generates a large number of jobs in a short period of time, which helps increase estimates of the number of green jobs that will be created.

The Ministry of Employment and Labor claims that the number of green jobs in Korea will grow by 6% annually from 2009 to 2013, reaching 810,000 in the final year (Ministry of Employment and Labor, 2009). The four river project alone is expected to create two hundred thousand jobs. Dredging rivers and building levees have potential to devastate ecosystems, yet the government has labeled and executed the project as a green business on the pretext that it aims to secure water resources. This clearly demonstrates that green growth policies of the Korean government are not based on eco-oriented philosophy that pursues the sustainability of the natural environment.
2. Policies

2.1 Broad-based policies

1) Policies that Promote Resource-Intensive Economic Development

Manufacturing- and export-focused policy of Korea has allowed many privileges for factories by reducing costs of manufacturing and transfer of goods. And, in turn, this mechanism is responsible for energy consumption increase. For example, tax-free petroleum for agriculture and fishery, subsidies for public transit companies and recipients of national medal of merit, etc. encourages consumption increase because the subsidies provide 20-50% cheaper retail price. As of 2006, the total amount of these subsidies reaches 7 trillion won per year, which is about 10 times more than environment-friendly subsidies. There are also other financial support for overseas resource development projects being spent in the name of resource security, routine financial support for construction industry to vitalize construction market, etc. (Man-Ok Kang et. al. 2007).

Preferential electricity bill is also problematic. As the usage of industrial electricity has sharply soared, the annual increase rate of electricity usage from the 1990s to early 2000s set record high at 9.8% on average. Compared to electricity price for household, price for industrial use is cheaper. Industry sector saved more than 2 trillion won from electricity bill in 2010 only by cross-subsidy from households (Man-Ok Kang et. al. 2010). Light high-demand slot rate for industry sector resulted in enormous electricity consumption, for it supports for facility-intensive industry that requires 24-hour operation (Petrochem, steel, etc.). Special rate for late night electricity to use up leftover electricity from nuclear generation encouraged consumption as well (Hyun woo, Kim, 2011).

Extended investment on driveway and transportation and poor investment on railroad are also responsible for the energy guzzling. Korea ranks the 6th among the OECD countries in per unit area highway and national route systems combined. Railroad length, however, remains about the same since the ceasefire of Korean War. (Only in some parts of the country, high-speed railroad lines were added.) Nevertheless, the government’s investment on transportation facility during 2001-2005 shows that the 59% goes to driveway while only 22% goes to railroad. In addition, most of the budget, established by the energy/environment/transportation tax, which is assessed mostly on fuels for automobiles, is being invested in new roadways construction (60% of the 2004 budget). The investment in railroad or public transportation is relatively diminutive. In case of railroad, the investment amount is mere 18% of the budget. Investment in city public bus is ignorable (Hyun woo, Kim, 2009).

2) Policies to Reduce Resource Intensity and Environmental Effects of Economic Development

The Korean government declared Low Carbon Green Growth as a new national vision on 15 August 2008. Ever since, the government has developed and executed policies under a new framework that seeks symbiosis between economy and the environment. President Lee Myeong-bak announces and promotes “Low-Carbon Green Growth” in June 2008. Then, in 2008, the president presented low-carbon green growth as a new national vision for the next 60 years of Korea. He evaluated that “Green Growth is a sustainable growth reducing greenhouse gas and environmental pollution, and a new national development paradigm creating new growth dynamics and jobs with green technology and clean energy.” Thereafter, the Korean government formed the presidential committee on green growth in the early 2009. In 2010,
enacting ‘Low-Carbon Green Growth Act’ formed a systematic basis (The website of the Presidential Committee on Green Growth).

The green growth vision was first proposed in 2005, when South Korea suggested Seoul Initiative on Environmentally Sustainable Economic Growth (Green Growth) at the 5th Ministerial Conference on Environment and Development in Asia and the Pacific, which was attended by members of UN Economic and Social Commission for Asia and the Pacific (UNESCAP). A Korean representative stated during the conference that South Korea shall lead the endeavor to build a network required to implement green growth projects, host policy forums, and develop capacity-building programs for developing countries, all of which aim to enhance the environmental sustainability, further improve environmentality, and contribute to fostering environmental industries. With the announcement, Policy Consultation Forum of Seoul Initiative Network on Green Growth has been held every year since 2006 (source: Ministry of Environment, 2008). In the process, Korea has successfully promoted itself as a leader in Green Growth, which was declared a national vision in 2008.

![Figure 7: Unfolding of Low-Carbon Green Growth Policy](source: Presidential Committee on Green Growth)

Along with Low Carbon Green Growth, the Korean government also unveiled First National Energy Action Plan that boosts energy efficiency to improve energy intensity and increase the supply of renewable energy. The action plan underscores that the Green Growth vision has set new priorities; to focus on energy policies and reducing the emission of greenhouse gases. As a result, reduced consumption of energy and environment-friendly energy policies were suggested as new main pillars. The Green Growth policy was further developed into specific policies under the National Strategy for Low Carbon Green Growth released in July 2009 (Source: Presidential Committee on Green Growth, 2009).
Some of the Three Strategies & Ten Orientations are as follows; efficient reductions in the emission of greenhouse gases; “ecologizing” industries and promoting green industries; fostering green industries, and constructing green territory and transportation. The 10 orientations show the main pillars of Green Growth policy environmental policies that conserve the nature and seek symbiosis.

Table 5: Korean low-carbon green growth strategy

<table>
<thead>
<tr>
<th>Three Strategies &amp; Ten Orientations of Green Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Change Adaptation and Energy Independence</strong></td>
</tr>
<tr>
<td>1. efficient reductions in the emission of greenhouse gases</td>
</tr>
<tr>
<td>2. energy independence: moving beyond fossil fuel</td>
</tr>
<tr>
<td>3. strengthening adaptation capacity</td>
</tr>
<tr>
<td><strong>Creating A New Growth Engine</strong></td>
</tr>
<tr>
<td>4. developing green technology as a new growth engine</td>
</tr>
<tr>
<td>5. ecologizing industry and promoting green industry</td>
</tr>
<tr>
<td>6. enhancing industrial structure</td>
</tr>
<tr>
<td>7. constructing basis for green economy</td>
</tr>
<tr>
<td><strong>Improving Life Standard and National Status</strong></td>
</tr>
<tr>
<td>8. constructing green territory and transportation</td>
</tr>
<tr>
<td>9. green revolution in daily living</td>
</tr>
<tr>
<td>10. leading green growth in international community</td>
</tr>
</tbody>
</table>

Source: Presidential Committee on Green Growth

Meanwhile, the global economic crisis erupted in America in late 2008 prompted the Korean government to set an additional target – creating jobs to surmount the economic crisis – in addition to the previous target of seeking symbiosis with the environment. Consequently, the government ended up announcing its own Green New Deal in January 2009 before completing the development of the five-year plan for Green Growth. Inspired by the Green New Deal announced by UNEP, the Seoul authorities devised its Korean version with the following contents; fostering highly efficient and low-carbon industrial technologies; investment in eco-friendly Social Overhead Capital (social infrastructure), and investment in businesses that encourage green, environmentally friendly lifestyles to create jobs.

The Korean government announced that Green job policy of Korean Green New Deal was constructed around (1) Green projects with the most promising future and effect in creating new jobs among “Korean ‘New Deal’” and “New Growth-driven Industry” projects, and (2) the one that can create maximum number of new jobs among all the Green Projects.
The government estimates that around 960,000 jobs could be created from 2009 to 2012 if 50 trillion Won is allocated to projects under the new deal during the four years, including Four Major River Restoration project, the construction of small- to mid-sized dams, establishment of green transportation network, and development of green vehicles.

The government announced that it would invest five billion Won until 2012 to create 950,000 jobs; 18 trillion won to create 280,000 jobs in Four Main Rivers and related projects; 11 trillion to create 160,000 jobs in Green Traffic Network; three trillion to create 230,000 jobs in Forest and Biomass projects; and nine trillion to create 150,000 jobs in construction of energy-saving houses, green schools and offices.
Table 6: Budget for Green New Deal Projects and Anticipated jobs to be created

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Budget Size (Hundred Million Won)</th>
<th>Number of Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spent ('09)</td>
<td>Additional (-'12)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core Projects (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Four Main Rivers</td>
<td>4,881</td>
<td>139,895</td>
</tr>
<tr>
<td>Green Traffic Network</td>
<td>18,349</td>
<td>78,187</td>
</tr>
<tr>
<td>Nation Space Information System</td>
<td>250</td>
<td>3,467</td>
</tr>
<tr>
<td>Mid-sized Dam</td>
<td>1,845</td>
<td>7,577</td>
</tr>
<tr>
<td>Green Car and Clean Energy</td>
<td>3,209</td>
<td>17,318</td>
</tr>
<tr>
<td>Recycling of Waste Resource</td>
<td>506</td>
<td>8,794</td>
</tr>
<tr>
<td>Green Forest Protection</td>
<td>3,131</td>
<td>21,043</td>
</tr>
<tr>
<td>Green Car and Clean Energy</td>
<td>-</td>
<td>80,500</td>
</tr>
<tr>
<td>Eco-River</td>
<td>52</td>
<td>4,786</td>
</tr>
<tr>
<td>Related Projects (27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disaster Risk Area Maintenance</td>
<td>5,137</td>
<td>19,901</td>
</tr>
<tr>
<td>Clean Korea</td>
<td>437</td>
<td>1,666</td>
</tr>
<tr>
<td>Green Waterside Area</td>
<td>331</td>
<td>7,669</td>
</tr>
<tr>
<td>Bio-Mass Energy</td>
<td>362</td>
<td>10,858</td>
</tr>
<tr>
<td>Disaster Prevention, Forest Restoration</td>
<td>786</td>
<td>6,541</td>
</tr>
<tr>
<td>Public Facility LED Replacement</td>
<td>-</td>
<td>13,356</td>
</tr>
<tr>
<td>Green IT Technology Test-Bed</td>
<td>-</td>
<td>1,100</td>
</tr>
<tr>
<td>Other</td>
<td>4,350</td>
<td>35,208</td>
</tr>
</tbody>
</table>

Cabinet Council Report Data
Budget resource: National treasury + local governments and civil allotment

3) Gaps in Policy Framework that Require Actions

The appraisal of Green Growth policies released by the Presidential Committee on Green Growth states that despite some achievements, the green growth policy fails to make an even match between the demand and supply for green, demand for new and renewable energy is low, and it is not enough to solely rely on energy-conserving habits or purchasing energy conservation equipments. Green area patents and green management are relatively good. But, there is very little private investment in the green energy sector.
Equally lacking are measures to vitalize the green economy, such as green certification system. The economic growth and emission of greenhouse gases have not decoupled, and people continue to excessively consume energy (Presidential Committee on Green Growth, 2012). The same was observed on the partnership front; the intra-governmental cooperation system needed further improvement, and in sum, it is the failure of policy integration. Overall the gap continues to exist between the policy for promoting the green industry and the existing policy that pursues resource-intensiveness. One primary example is the Four Major River Restoration project, which was one of the flagship projects under the Korean New Green Deal. This project has been executed to dredge bottom sediments of the four major rivers to secure water and prevent floods. However, contrary to the government’s claim, the project is faced with criticism from the civil society that it is an “anti-environmental” business that destroys ecosystems and deteriorates water quality (Park, Chang-Gyun, 2009).

In its ‘Korean Green Growth Policy Report’ of 2010, the UNEP evaluated Korean Green New Deal, Green Growth Strategy and the five-year plan as an innovated example that motivates changes in the international community. Korea plans to invest 107 trillion won, which is 2% of its GDP, in the green economy from 2009 to 2013. Korea was highly regarded in the second quarter of 2009 because it made the highest growth rate in green investment among OECD countries. However, most of the investment plan was for the environmentally controversial Four Main Rivers project. Korean environmental organizations and opposition parties point out that the UNEP did not take this point into consideration. The budget item ‘Climate change adaptation and energy independence’ makes up 50% of the total budget, among which 63.7% (14.4 trillion won among the 50 trillion of entire New Deal budget) is involved with Four Main Rivers.

cf. Four River Project Initiatives (FRPI)

- FRPI, which is called as Four Major Rivers Restoration Project by Korean government is the core of the green growth strategy.
- FRPI’s budget is about 20 billion USD, which amounts to 8% of the annual national budget of the Korean government. To raise such a big money for FRPI, budgets for public services are curtailed.
- The core of FRPI is to construct 16 small dams at four major rivers (Han, Nakdong, Geum, and Yeongsan) in Korea, to dredge deeper and wider with 6 meter depth and more than 200 meter width and to construct banks at both riversides.

In reality, the original intent of seeking symbiosis between economy and the environment has lost its focus on protecting the environment as the priority shifted to creation of jobs. The weakened focus on the environment is also well demonstrated in the energy policy. The authorities have targeted to secure more clean energy and thus planned to increase the supply of new renewable energy. In addition to this
plan, the authorities also devised and implemented a plan to raise the share of nuclear power to 60% of total national output/production (Source: Ministry of Knowledge and Economy, 2010a). Radioactive waste generated during the production of nuclear energy pollutes the environment and thus it is controversial whether nuclear power is environmentally sound. Nonetheless, the Seoul authorities classified nuclear power as clean energy and provide financial support that is almost equivalent to the budget allocated for renewable energy. In 2010, the government announced that it aims to expand nuclear power at home and abroad, with slogans like let’s win the contract to build a nuclear power plant in United Arab Emirates and make the first export of nuclear power to the country and the strategy for exporting nuclear power at an industry level (Jin, Sang Hyeon, 2011).

Such disparity stems from the hierarchy within governmental organizations. Ministry of Knowledge and Economy, Ministry of Foreign Affairs and Trade and some other ministries put economic growth over environmental conservation. These ministries wield far more influence on the decision-making process than Ministry of Environment and other agencies that are responsible for protecting the environment. To make matters worse, the Presidential Committee on Green Growth is not granted the authority required to coordinate conflicts among different ministries during decision-making processes (Kim, Sung-Wook et. al., 2010). The lack of authority further solidifies the conventional framework of power among organizations under the executive branch of the government during a decision-making process.

At the same time, the same is witnessed in other sectors of the Korean society. Conservative political parties prioritize growth over the environment, and economic entities such as conglomerates want to maintain the existing resource-intensive economic structure that is based on conventional sources of energy. They continue to dominate the social landscape, whereas the civil society and liberal political force are not empowered enough to facilitate the development and implementation of green growth policies that truly seek ecologically oriented transformation.

The carbon trading system was to be introduced as part of the endeavor to cut carbon emissions, but the opposition from conglomerates postponed the time of enforcement from 2013 to 2015. Carbon tax and other more aggressive policies have not been discussed as public social agendas. The industrial sectors account for the largest proportion of carbon emissions, yet National Mid-term Action Plan for Cutting Carbon Emissions set higher emission targets for buildings and the transportation sector instead (Seo, Min-a, 2011). The Green Growth vision of the Korean government talks of ecologizing the industry, but when an actual discussion for a decision-making begins, green policies continue to be relegated to backwater agendas behind growth policies.

2.2 Ecological industrial policies

What policies are in place for promoting environmental technologies / industries and green energy technologies?

Environmental technologies and support for environmental industries are being strengthened at an accelerated pace under the framework of Green Growth. As part of 3 Strategies & 10 Orientations of Green Growth, many programs have been implemented with the two objectives; 1) to invest more in clean production technologies, technologies for resource recirculation, technologies for prevention of environmental degradation, and water treatment technologies, and; 2) to raise the levels of renewable energy and energy efficiency technologies to meet the levels of the same technologies in developed countries (Presidential Committee on Green Growth, 2012). Two trillion Won will be spent solely on the program...
for supply of green vehicles and clean energy by 2012. Furthermore, 1.1 trillion Won was allocated to the project on conversion of biomass into energy.

The government is promoting ‘Foundation Reinforcement for Green Industry Development’, under which R&D and human resource is to be fostered. Through this plan, 1,000 small- to mid-sized green expert businesses will be raised and green R&D investment will be increased to 3.5 trillion won up until 2013. Specific measures and strategies have been enforced since 2009 to strengthen R&D in green technologies, such as comprehensive Measures for R&D in Green Technology, and strategy for Developing & Commercializing Green Technology. These measures and strategies are being linked to policy programs for promoting green industry, including promoting Entrepreneurship for Small Green Business and support for Investment in Green Business.”

And, policy promotion is taking place for technology development of new and renewable energy and its utilization and supply. By 2020, grid parity of new & renewable energy is to be reached. The plan is to invest 39.2 trillion won up until 2030 targeting at gradual increase of supply rate of 11%. The plan includes development of strategic technology to raise daily usage rate of the targeting areas of new & renewable energy (solar voltaic, wind, fuel cell) and one million green homes by 2020. In addition, adoption of Renewable Portfolio Standard (RPS), expansion of new and renewable energy supply in public and civilian buildings, and new urban area, and export project and supporting new overseas market are all part of the plan.

Specific programs have been developed to facilitate developing ecological industries; encouraging eco-friendly innovation in the production of steel; pioneering a market for eco-friendly materials; developing green home electronics, and; zero-waste manufacturing. In addition, the following ideas have been proposed; ecologically oriented taxation; developing & providing green financial products, and; creating green industrial funds to encourage more investment in green industries. Other policies that would help ecological industry develop are; Green Purchase System (setting public supply ratio), Extended Producer Responsibility (EPR), support and certification programs on eco-agriculture/environment-friendly building certification, policies on greenhouse gas emission control, energy efficiency, and energy welfare (Presidential Committee on Green Growth, 2009).

The aforementioned programs help grow the number of businesses in the renewable energy sector and accelerate innovation in green technologies in order to develop ecological industries. Nonetheless, the programs fail to go beyond the growth-oriented framework. The Green Growth policy of Korea is dedicated to nurturing green industries as a new growth engine, instead of seeking ecological transformation of the existing industries. These policies are in line with their predecessors in terms of putting big companies first.

In case of green technology R&D, the 21% is by large corporations while 17% is by small- to mid-sized or companies (Presidential Committee on Green Growth, 2012). As the goal of developing green technology turned out to be fostering export industry, large corporations intensively make investment on solar cell and fuel cell R&D with their technology power. Large corporations also lead the LED industry, which gets supported by the government through public purchase. Most of the green-certified companies were conglomerates, and this fact illustrates that the government’s policy favored behemoth-sized businesses (Digital Times, 31 May 2010). Large refining companies are participating in the biofuel sector with new & renewable energy support policy by the government. As for Four Main Rivers project, the ten large construction companies received orders for 54% of total construction budget.
Such preference for conglomerates hindered fostering venture companies and over 1,000 small- and medium-sized corporations in the green industry. The policy to assist green venture companies also failed to meet the target; green ventures did not perform as well as non-green ventures did. The personnel support was planned for green small and medium-sized companies, but they continue to experience the shortage of human resources in technological innovation.

The approach in the renewable energy sector has a similar issue. The government seeks to foster renewable energy industries without transforming the existing energy supply system. In other words, policies have been developed and implemented to secure a domestic market as the groundwork for gain dominance in the global market. To rapidly expand the domestic market for renewable energy, the government abandoned Feed in Tariff, which had been in place from 2002 to 2011. It was replaced by Renewable Portfolio Standards in 2012, which gives electricity utilities quotas to tap renewable energy generate a certain amount of electricity. Renewable Portfolio Standards were adopted on the ground that it addresses the uncertainty of Feed in Tariff and lift the fiscal burden of the government (Lee, Chang-ho, 2008). Feed in Tariff had enabled small local utilities to grow briskly, demonstrating the potential in the ecological transformation of energy supply. Nevertheless, the promising system was scrapped, and the utilities were forced to fill the given quotas in a cost-efficient manner. That is why the previously small-scale utilities began to provide renewable energy-based electricity on a large scale, which fueled social conflicts over the large-scale generation of tidal power (Lee, Heon-seok, 2010). Renewable Portfolio Standards also shrank small-scale business of installing devices for photovoltaic power generation.

2.3 Policies for green jobs

2.3.1 Green job policies

The comprehensive measure for Green Growth was preceded by Green New Deal for Job Creation. This shows how much the Korean government was preoccupied with creating green jobs. According to a source from Korean government (Ministry of Employment and Labor, 2009), there are 101 green careers in 64 industries and it is estimated that there are 610,000 green jobs. (Cf. The total employment in Korea is 24 million with employment rate of 60% and unemployment rate of 3.4%). Specifically, 24,000 jobs in the field of energy source, 54,000 jobs in energy high-efficiencizing, 251,000 jobs in greening of industry and workplace, 102,000 jobs in environment protection and resource cycle, 179,000 jobs in low-carbon economic activities, etc. The government prospects that from 2009 to 2013 the green jobs would increase by 6.0% per year. This rate means 810,000 green jobs in 2013.

The government also predicted that the followings will facilitate the creation of green jobs; increased investment in renewable energy and nuclear power; green vehicles and other green transportation; increasing the number of green buildings, and; nurturing specialized fields like environmental protection, resource recirculation, and environmental health. In November 2009, the government unveiled measures to create green jobs, with a view to ensure quality control of the jobs and provision of human resources needed for innovation of green technologies.

Other governmental programs include New Start for Youth and Elders and municipality-driven programs for creation of jobs. However, these programs have not been as successful as they were expected to be. For instance, the expanded governmental spending on R&D for renewable energy has helped boost the demand for researchers in the field of wind power by around 10% annually (Korean Employment
Information Service, 2010). However, Green New Deal programs have failed to demonstrate expected performance in terms of creating green jobs.

It has been one year and six months since the launch of Green New Deal. Only 140,228 jobs have created since, taking the government's estimation up to July 2010 for granted. It is 47.7% of the government’s goal (Prime Minister's office, 2011). Green New Deal has re-categorized many existing projects. In other words, many of the some 140,000 jobs are not newly created.

The authorities targeted creating green jobs that perform decent work, but their policies have not produced decent jobs. The working condition of created green jobs is uncertain. Government’s source specifies salary levels and employment period for only 250,000 jobs (26%) projects. High proportion of short-term irregular jobs: Among the jobs that do have specific employment period and salary, 140,000 jobs are for 10 months or less (14.8%). There are many jobs that are paid only 60,000 won per day, which is just beyond the minimum wage. In addition, frequent work accidents are taking place in ‘Four Main Rivers’ project sites (ECPI, 2009).

2.3.2 Interaction of employment and other social policy goals with greening policies

Korea is also witnessing the interaction between the policy for “greening” industries and other social policies as environmental industries produce new policies that combine employment and Corporate Social Responsibility. Particularly, Social Enterprises are growing in recycling industry. They provide jobs for those who are low-skilled and disadvantaged in the labor market. Social Enterprises in recycling business made 4.5 billion Korean won in sales in 2006 and 18 billion won in 2009. Employment also increased from 248 employees to 650 (ECPI, 2011).

**Table 7:** Employment of member companies of Recycling Federation of Solidarity Enterprise

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (Billion Won)</td>
<td>4.5</td>
<td>7.6</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Employees (Person)</td>
<td>248</td>
<td>353</td>
<td>480</td>
<td>650</td>
</tr>
</tbody>
</table>

Source: Recycling Federation of Solidary Enterprise

The Korean government is struggling in integrating green jobs policies. Roles between the Labor Ministry and other government bodies are not controlled organically.

The monitoring has not been properly done on the implementation of policies for creating green jobs. Statistical reports have also not been made on newly created green jobs (Korea Development Institute & Korea Labor Institute, 2012). Any statistical reports only deal with estimated effects on employment spurred by the increased governmental spending. The investment has increased in the renewable energy sector, but the increased investment has limited impact on boosting employment. This illustrates that policies are fragmented. Meanwhile, the increase in investment has stalled in areas such as photovoltaic power with a goal for export; bio energy, which has a huge potential for job creation, whose investment is concentrated on wind power and fuel cell bio energy, and; solar power. Furthermore, these areas have been cited to provide strengthened support for conglomerates, which lessened the support for small-
and medium-sized companies and thus created a limited employment effect. In other words, this calls for more support for small and medium-sized enterprises to produce more employment effects (Korean Employment Information Service, 2010).

It is also important to use domestically produced equipment parts and create a domestic demand for the parts to ensure a long term employment in the renewable energy industry. The domestic market for photovoltaic power was of 150MW size in 2011; a mere one percent of the global market size (Korea Energy Management Corporation, 2011).

It is forecast that the decreased consumption of fossil fuel and jobs in excessive energy-consuming sectors will cause job insecurity in the relevant sectors. However, there are no comprehensive measures to address the issue, such as Green Skills to existing career pathways. It is argued that a wide diversity of education programs and financial aids need to be developed to ensure a just transition.

<table>
<thead>
<tr>
<th>Evaluation Framework</th>
<th>Major Evaluation Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Policy Integration?</strong></td>
<td>• The Labor Ministry played a minor role. Lack of information share with other branches on policy goals</td>
</tr>
<tr>
<td></td>
<td>• Absence of report and evaluation following up green jobs creation plan</td>
</tr>
<tr>
<td></td>
<td>• Gap between policy goals for reducing resource/energy consumption and implementing related regulations</td>
</tr>
<tr>
<td></td>
<td>• Goals for environment restoration, lowering greenhouse gas, and energy efficiency are ambiguous and not practical</td>
</tr>
<tr>
<td><strong>2. Decent Job?</strong> (Four Main Rivers)</td>
<td>• Figures mechanically calculated by applying employment &amp; caused variable exaggeration</td>
</tr>
<tr>
<td></td>
<td>• Quality of jobs are inadequate (low income, unstable employment)</td>
</tr>
<tr>
<td></td>
<td>• Industries with high employment impact (e.g. renewable energy industry) are considered secondary</td>
</tr>
<tr>
<td><strong>3. Considered any change in employment structure?</strong></td>
<td>• Possibility of jobs decrease due to green economy transition was not taken into consideration</td>
</tr>
<tr>
<td></td>
<td>• System and budget to deal with Just Transition is insufficient</td>
</tr>
</tbody>
</table>

**Table 8: Absence of integration of green jobs policy (ECPI, 2010 revised)**

2.3.3 Training and performance improvement programs for green industry

However, for the new & renewable energy companies there are difficulties in securing manpower. According to a survey by Korea Research Institute for Vocational Education and Training, they face difficulties because there usually are not enough workers with required level of technology (41.9%) or not enough workers with necessary experience (34.4%). Particularly, considering the short career cycle of the new & renewable energy industry, career development programs for the newly employed, current and former employees are not satisfactory.
Currently the government is supporting job trainings that are specialized by sectors; new and renewable energy, LED and intelligent electrical network, eco-friendly architecture, etc. The government also supports fostering specialists who develop core components for technologies like fusing green vehicle technology and IT. In addition, specialized education curriculum for LED is also on the list of governmental support. The government also announced that it would construct a job training system for laborers in green transition according to green progress that exiting main industries (such as car, steel, or shipbuilding) are making. The government plans to support with training cost and wage for those corporations who implement the education and training (Ministry of Strategy and Finance etc., 2009).

In addition, in order to foster new & renewable energy industry, there are efforts to train professionals accommodating demands and for specific level. For the R&D and designing manpower, the government supports training for critical and original technology of different new & renewable energy sources, master and doctorate programs of interdisciplinary technology research, and specialized department/school, and industry-school partnership education programs. For skilled manpower, the government is looking into running a service education programs and systemizing national skills certification. New licenses will be created for specialists in solar power and carbon trading. Furthermore, energy efficiency and other additional conditions regarding green technology will be added to qualifications for the existing specialists, including auto mechanic(Ministry of Strategy and Finance etc., 2009).

3. Perception/Discourse

3.1 Policy debates related to the green growth vision

There are controversies over the vision on Green Growth. Many principally agree on the vision, for it was the first time that the government set ‘efficient reduction of greenhouse gas,’ ‘strengthening the adaptability to climate change,’ etc. as core of national policy direction.

The debate takes place because the policy is dominantly about ‘growth’ rather than ‘green.’ Doubts are raised whether or not it is mere a ‘green’ outer layer of the success-oriented policy. Criticism points out that currently the Green Growth potentially embraces economy, economic fundamentalism which emphasizes the industrial value of the environment only, and regards environment as economic leverage and tools for growth. The policy suggests adaptability to climate change as its goal, but this was ultimately to gain an opportunity for new economic growth through developing new & renewable energy and green industry. The policy for reducing carbon emissions is another example which shows that economic growth is the true priority for the government. The mid-term national goals for greenhouse gas reduction alleviated the goal for the industry with most emission, but instead raised the goal for public buildings and transportation. This example shows that the move is for growth than green.

The make-up of policy governance was also condemned as well. Twenty one percent of all members were representatives of the civic society at Committee for Sustainable Development established by the Participatory Government. However, the proportion sharply fell at the Presidential Committee on Green Growth created by Lee Myung-bak Administration. Only one out of all 50 members represented the civil society at the committee on green growth, and the vast majority of other members from the private sector were scholars in management and economics. Therefore, it was inevitable that they shared the value that economic growth should precede other values(Yun, Soon-jin, 2008).
Such exclusion of citizens is evident in the process of developing policies. Environmental groups and NGOs voiced the concern that the abandonment of Feed-in Tariff will diminish opportunities for citizens to participate in ecological transformation of the energy supply. Since the FIT system was scrapped in 2005, an NGO-led movement to build power plants for citizens was weakened. The green growth policy does emphasize the need for citizens to be involved in practicing green lifestyles. Nonetheless, the designed policy failed to encourage such voluntary participation. The Project for Building Bio Energy Neighborhood reveals how the government views citizens in its vision for green growth. The project supposedly planned to increase equipments for bio energy in over 600 rural towns. However, it has been executed in a top-down manner and ended up causing conflicts among local residents (Lee, Jung-phil, 2011).

3.2 Coalition for socially just and environmentally sustainable model

Major stakeholders in the green economy and Green Growth policy can be categorized as shown in the following diagram; the industry, civil society and government. Other stakeholders include committees under the National Assembly and political parties, who connect the government and industry; social enterprises and cooperatives positioned in the middle between the civil society and corporations, and; labor unions and farmers’ organizations that have different interests from those of the civil society. Stakeholders in the industry are divided into two groups, depending on the standpoint on green growth policy. Associations of renewable energy and eco-friendly corporations, including Korea Photovoltaic Industry Association, enthusiastically support green growth policy. On the other hand, the Federation of Korean Industries and businesses in the refining, chemical, steel, auto and other industries that rely on fossil fuel attempt to postpone the implementation of policies such as carbon trading and environmental taxation.

The similar conflict of interests is observed among governmental agencies. The Ministry of Knowledge and Economy, Ministry of Land, Transportation and Maritime Affairs, and Presidential Committee on Green Growth put more focus on economic growth even under the framework of green growth. On the other hand, Ministry of Environment and other environmental public agencies prioritize preservation of the environment. Under the circumstance, the governmental agencies collide over the different policy priorities. The same collision occurs among the Committee on Knowledge and Economy, Special Committee on Climate Change, and Committee on the Environment and Labor under the National Assembly.

The civil society in Korea comprises big environmental groups like Korean Federation for Environmental Movement and YMCA; Center for Energy Alternative, which specializes in energy issues; small NGOs such as Energy Justice Actions and their network body, Korea NGO’s Energy Network, and; Energy & Climate Policy Institute. These members of the civil society criticize the government for giving too much weight to the growth of private enterprises in energy and climate areas and call for ecological transformation of the Korean economy. Hansalim Cooperative and other social enterprises organize their own environmentally friendly production and consumption activities as a way to call to revise institutional framework and increase financial aid concerning green economy. Labor unions and farmer’s organizations experience fluctuations in job opportunities when green growth policies are implemented, and thus they are stakeholders as well. However, green growth policy has not been a key issue within the groups. Recently, Korean Confederation of Trade Union and Federation of Korean Trade Unions have paid attention to policies on climate change and green jobs. The two organizations have dispatched their representatives to a Conference Of Parties, attended educational courses on climate change, and commissioned external groups to perform research on green jobs (EPIC, 2009).
Ecologically minded stakeholders need to work together in solidarity to develop green growth policies that will trigger ecologically oriented transformation of the society. Then, how can we encourage such solidarity? The need for solidarity is urgent between the civil society and labor unions, but the two parties have rarely conducted joint programs on environmental agendas. They have taken joint actions on only three occasions; carbon disulfide poisoning at Wonjin Rayon, construction of a disposal facility for radioactive waste at Buan-gun, and the movement to oppose divestment of the division of electricity generation. But that is the end of their cooperation.

However, the lack of solidarity is about to change; Solidarity for Climate Justice in Korea was recently founded for mutual response to climate change issues. This suggests a possibility for a strengthened solidarity between the civil society and labor unions, which will contribute to developing a new green growth policy (Today Energy, 24 May 2011). Labor unions, however, still remain lukewarm in tackling climate change, and the outside communities do not support the unions; the corporate sector is hostile against the unions and the government develops anti-labor policies. Furthermore, most of the key forces in the labor union are in auto, ship-building, power generation and other sectors that heavily consume energy and resources. Meanwhile, workers in ecological industries like renewable energy are not organized to the equal extent, which makes the solidarity between workers of the two groups more difficult. For example, all laborers who work at a plant of Hyundai Heavy Industries that manufactures turbines for wind power in Koonsahn are irregular workers and they are not allowed to join labor unions. Above all, labor unions, too, have been led to believe in economic growth and thus have low perceptions about ecological transformation of the economy and climate change.
On the other hand, we need to pay attention to co-op movement and potentiality of social economic zone. These are places where multiple goals (environment protection and job creation) can be pursued interactively. Social Enterprise ‘Nonamegi’ fixes houses, especially those of low income families, to boost energy efficiency and offer solar power generators. The enterprise is funded by Korea Energy Foundation to remedy housing of low income families and contribute to cutting carbon emissions. (Wonju Today, 6 December 2010) As such, social enterprises are capable of creating employment opportunities and responding to climate change simultaneously. Social Enterprises can participate in resource recycling projects to create green jobs for those with low income. Eco-cooperatives create green jobs while they produce, distribute, and consume more eco-friendly organic products.

Quite a large number of Koreans gathered together on streets with lit candles in their hands to protest against the import of US beef in 2008. Afterwards, farm animals were killed on a massive scale during the outbreak of foot-and-mouth disease. The two incidents have sparked public interests in food safety, which led to the increase in the membership of cooperatives that connect organic farming and consumption of organic produce. The increased membership attracted more social attention as well. The numbers of social enterprises and cooperatives are steadily on the rise since 2006, and if they work in unison with the civil society, such solidarity will accelerate the formation of a socially just and sustainable model.

To create such a model, a political force needs to be established that advocates the model. Two major political parties in Korea do not see beyond the framework of economic growth and have not presented a vision of a just and sustainable green economy. On the other hand, liberal parties that have progressed since 2000 and Green Party, which was founded very recently, argue that the Korean society should transform into an environmentally sustainable one in a just way. These parties are also critical of Korea New Green Deal and pro-nuclear power policies and at the forefront of developing alternative policies (EPIC, 2012). They have yet to secure a firm ground in the political landscape, but they could take flight nonetheless; liberal- and reform-minded leaders at municipal governments, local parliaments and National Assembly have hinted that they could embrace such ecologically oriented policies (e.g., Mayor Won-soon Park of Seoul).

Korean civil society witnessed the nuclear accident in Japan from the closest distance. As social consensus grows on need for less -and eventually no-nuclear power dependency, green energy is being highlighted. In response to this, reformative leaders of local autonomous governments who are closely cooperating with civil society movement are joining the movement and announcing their political support. In February this year, 45 leaders of local governments, which are 25% of nationwide local government leaders, adopted Declaration of Nuclear-Free City.

In fact, some leaders of municipal government have already begun to politically realize a sustainable society since the nuclear disaster at Fukushima. In February 2012, political representatives of 45 municipal governments -- about 25% of all municipalities -- announced Declaration for Non-Nuclear Energy Transformation of Cities, in which they declared that they would shift away from centralized, nuclear power-driven energy supply towards decentralized, renewable energy-driven energy supply. The leaders said localities should be driving the development of energy policies and enacting an energy ordinance to facilitate citizen-led movement for cooperatives. They also said that this, in turn, will dramatically increase the supply of renewable energy, which will allow ensuring green employment and maintaining incomes (Hankyoreh, 13 February 2012). Unlike the central government, it seems possible for the solidarity between
the civil society and these representatives and political parties to produce an achievement that will enable the ecological transformation of energy supply.

In the meantime, one question needs to be tackled in the solidarity-driven modeling of a sustainable society; that is, a discussion on the qualitative aspect of green jobs that will be created as a result of transformation into the green economy. The Korean society is generally vulnerable when it comes to protecting the workers’ rights, and a newly created green industry will form new working conditions. Discussions should take place on the questions of whether green jobs provide appropriate wages, safe working environment and ensure laborers’ rights. This is the point where labor unions can play an important role. At the same time, it also needs to be taken into account that youth unemployment is widespread; established labor unions fail to represent unemployed youth or irregular workers. Against the backdrop, it is equally necessary to encourage new social actors to partake in resolving the issue to fill the void.

4. Conclusion and Recommendations

The Korean economy recorded an unprecedented quantitative growth in a short period of time based on the government-led, export-driven policy in the heavy chemical sector. The growth had largely relied on the virtuous cycle of economic growth and job creation led by Chaebol until 1990s, when this paradigm was challenged by the Asian Financial Crisis in 1997. The manufacturing industry had served as a growth engine with the support of the Korean government. Cheap energy and resource costs facilitated the expansion of the manufacturing industry, which, as a result, became resource-intensive.

The industrial structure has centered on the auto, petrochemicals and other chemical sectors since 1980s. This has resulted in the economy that excessively consumes resources and energy, with subsequent rise in the emission of greenhouse gases. Since 2000, the priority has shifted to the efficient and reasonable consumption of energy, which contributed to the development of environmental industries and heightened environmental indexes. The improvement, however, has not offset the increased consumption of resources and energy and subsequent increase in the emission of contaminants. Green industries have been promoted as part of a governmental policy, including environmental industries and eco-friendly farming. Nevertheless, such policy has not had impacted growth-oriented policy that maintains the fossil fuel-based industry and economy, including subsidies for fossil fuel, provision of electricity at cheaper costs to industrial corporations, and enormous assistance for road infrastructure.

Meanwhile, for the first time, symbiosis between economy and the environment emerged as a key economic discussion in Korea since the Lee administration declared Low Carbon Green Growth as a new national vision in 2008. Major policies have been developed and implemented, including adaptation to climate change, reductions in carbon emissions, fostering green industries, and expanding the supply of renewable energy. The current green growth policy does not seek building a green economy based on the ecological transformation of the economy and subsequent growth of employment. On the contrary, anti-environmental policies have been executed under the framework of green growth.

For instance, Four Major River Restoration project has a great possibility to devastate natural ecosystems, but nonetheless it was a main pillar of Korean Green New Deal. Moreover, nuclear power has been promoted as a clean energy source. Many programs for energy and development of environmental technology aim to gain a competitive edge in the global market, with the focus on fostering industries as a new growth engine. This means that green growth policy is a government-driven endeavor that relies
on green industries to pioneer new markets with a perspective of economic growth. With this limitation, green growth policy is another manifestation of Chaebol dominance in the Korean economy with their vast financial and human resources. The policy also continues to incorporate energy policy into industrial policy and pursue governance of a narrow spectrum that excludes the civil society.

Despite the problems, the green growth policy has successfully developed major agendas, created new systems, nurtured new human resources for the industry, and accumulated knowledge. All of these achievements can be tapped strategically by stakeholders who wish to create a just and sustainable green economy. A momentum has been built to go for a green economy; what are the strategies to strengthen the momentum to actually realize a green economy?

First, the perspective of a sustainable and just green economy needs to be incorporated into re-arranging the following main agendas: energy policy for adaptation to climate change; greening industries that have previously focused on efficiency of resources and energy, and; nurturing sustainable ecological industries like renewable energy and building a financial support system. It is essential to combine the abovementioned agendas with the task of surmounting conglomerate-centered growth.

A strategy for adaptation to climate change needs to be developed based on building an energy system of small- and medium-sized power generation that aims to ensure the supply of diversified renewable energy. A system needs to be put in place to assist the small utilities in terms of research and personnel and attract investment to these utilities.

It is necessary to augment industrial productivity and efficiency during the shift to renewable energy. In the process, small and medium-sized businesses need to be considered first in devising a strategy for energy efficiency. It is becoming increasingly important to seek harmonious existence between conglomerates and small and medium-sized companies. Against the backdrop, it could be crucial to blend the agendas of green growth and of founding an ecosystem where small enterprises can survive. Enterprises in the renewable energy and eco-friendly business sectors, Korea Council of Medium Industry, liberal political parties and civil society could be allies in developing aforementioned strategies.

Second, it is vital that green growth and green economy issues emerge as political issues and agendas. Traditionally, issues have successfully become political agendas among the public via routes such as political campaigns waged by the civil society, general or presidential elections, and discussions at the National Assembly. The civil society has progressed as the Korean society has become democratized, and has continuously participated in policy governance via the vehicle of NGO. The Korean society has recognized climate change as a challenge that needs to be tackled, and ecological environments and the symbiosis between economy and the environment are joining the list of social challenges. Moreover, the nuclear disaster at Fukushima in 2011 sparked the question whether the energy supply buttressed by nuclear power is sustainable. In this regard, some civic groups have begun to devise a scenario on alternative energy in separation of the government’s work and raise the voice that the Korean society needs to change its energy system. The civil society can also present issues regarding green economy – expanding the supply of renewable energy and subsequent creation of green jobs – as political issues. Voters and the political community will pay attention to green economy once it is argued that renewable energy industry focused on small and medium-sized enterprises and projects for heightening energy efficiency. This is because one of the issues in the Korean economy is jobless growth. It is needed to turn the issue of green economy into a political agenda as a potential solution to address problems of the Korean economy.
Third, it is essential to demonstrate economic potential of green economy and its integrated effects, while developing measures to maximize such effects. As mentioned before, each source of renewable energy showed different rates of job creation, and levels of impact on the environment by Feed-in Tariff and Renewable Portfolio Standards differed. Introducing social enterprise to renewable energy or recycling enabled the achievement of two goals; environmental protection and giving more job opportunities to people of low income social brackets. Policies on green economy should be devised to accomplish both goals as well. The current version of green growth policy heavily depends on top technical experts at conglomerates to gain more market share globally in the area of renewable energy. From a viewpoint of increasing green employment and environmental conservation, the present policy centered on nurturing nuclear power industry should be amended completely.

Fourth, governance needs to be developed that enables designing sustainable green economy policies. If true ecological transformation is to be sought unlike Presidential Committee on Green Growth, governance needs to be set up that involves stakeholders across the spectrum, such as civil society, labor unions, small and medium-sized enterprises and liberal political parties.

Existing think tanks and research institutes under NGO, liberal political parties and labor unions need to comprehensively review previous green growth and environmental policies to explore and discover major agendas of green economy. They also should promote such agendas in the political arena to heighten the public awareness. Equally urgent is to revise the current pro-fossil fuel taxation and Renewable Portfolio Standards that marginalize small-scale power generation. Such direct intervention is deemed necessary to create an environment favorable for the green economy to flourish. In addition, the institutional framework needs to be remedied for small- and medium-sized enterprises in the renewable energy sector to survive competition in the market. This means that an environment should be created where stakeholders who could play an actual role in governance can grow.

The Korean society has not had much experience in designing and executing such joint strategies. The growth-oriented green growth policy of the government continues to be enhanced as its envisioned institutions take shape in the reality. If the socially just and sustainable society is to replace such institutions, stakeholders across the spectrum are called into taking actions in solidarity, including the civil society. Mutual discussions on the vision of green economy could be the beginning of taking joint actions.
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