

CHAPTER III

NATIONAL STRATEGY OF GREEN GROWTH

This chapter discusses about the reason behind the implementation of green growth as national strategy of South Korea through its Five Year Plan (2009-2013). The discussion will start with historical background of economic and environment of South Korea relating with the adoption of Green Growth, and also provides the fact from massive production of GHG emissions and climate change and energy security that imperatives for Green Growth. The discussion continue with declaration of “Low Carbon, Green Growth” by President Lee Myung Bak as a respond to current environment and economic conditions, following with the legal framework to pursue Green Growth.

This chapter also will use Green Growth some indicators from OECD to measure the current environment and economic issues in South Korea. Moreover give overview of policy respond toward the indicators and in the end this chapter and also will give brief information about outcomes from the policy.

A. Economic and Environment Background of South Korea

1. South Korea’s Economic Turmoil after Korean War

After the end of World War II, the first South Korean government that is established in 1948 the U.S. military government took over the southern part, while communist Soviet set up a Korean leadership in the northern part. The decolonization and political division made sudden distabilization of trade both with Japan and North Korea, furthermore it caused serious economic turmoil.

On June 25th 1950, the Korean War began when 75,000 soldiers from North Korea came across the boundary. This was the first invasion of military action during Cold War. After three years of war, in July 1953, the Korean War finally came to an end. It resulted in the split of the Korean peninsula as it is divided today. The war also killed half a million people and destroyed about a quarter of the capital stock during its three-year duration (Cha, 2008).

The war had caused economic uncertainty in South Korea that became one of the poorest countries in the world with only a per capita income of \$64. Following this condition, the South Korean government set up a stimulating program for economic growth by promoting internal industrial firms, like the other developing countries did.

The government implemented Import Substitution Industrialization (ISI), imposing trade barriers and prohibition on manufacturing imports. The policy aimed to improve internal productivity and create a self-sufficient market for the country. As a result, the policy caused unproductive profit-seeking that led to faltering efficiency and stagnant living standards. It also triggered the collapse of the first Republic in April 1960 (Cha, 2008).

2. South Korea's Economic Recovery

After a military coup led by General Park Chung Hee overthrew the Second Republic, under his administration, the South Korean government aimed to improve its economy by transforming from an agrarian country to an industrialized one and made a shift to a strategy to stimulate economic growth through export

promotion by implementing export-led orientation policy. Based on the policy, the firms could obtain low-interest loan to support their export performance. Having advantage over import substitution industrialization, the policy accelerated in advance by placing firms under the discipline of export markets and by widening the contact with the developed world (Cha, 2008).

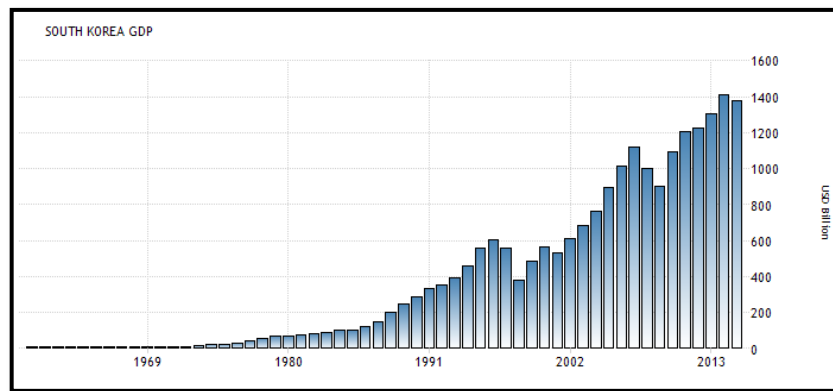
Following the implementation of export promotion, the efficiency growth was significantly faster in export industries than in the rest of the economy. Successful in industrial market, South Korea implemented another industrial policy in 1973, it was called Heavy Chemical Industrialization. Under HCI, six strategic industries were selected for major support. These industries included steel, nonferrous metal, shipbuilding, electronics, machinery, and chemical industries (K. Galbraith & Kim, 1998).

The essence of industrial policy under the HCI is to financial support, though more conventional measures such as tax incentives and the provision of industrial parks were also included in the policy package. The HCI in South Korea could be said as a successful policy related with the fact that GDP per capita South Korea had steadily increased until today.

South Korean government had been successful in implementing those policies. Over the last 30 years, South Korea experienced rapid industrialization. Based on the International Monetary Fund, South Korea's Gross Domestic Products (GDP) rose from just under \$88 billion in 1980 to more than \$1,000 billion in 2010. It has positioned the country as a global player in economic.

Numerous of economic expertises have taken South Korea as a great sample of the most successful country in economic growth (PCGG, 2012). South Korea's economic has grown rapidly, economic expertise usually give it name "Miracle on the Han River" (Zelenovskaya, 2015).

Figure 3.1 South Korea GDP from 1980 to 2013



Source: <http://www.tradingeconomics.com/south-korea/gdp>

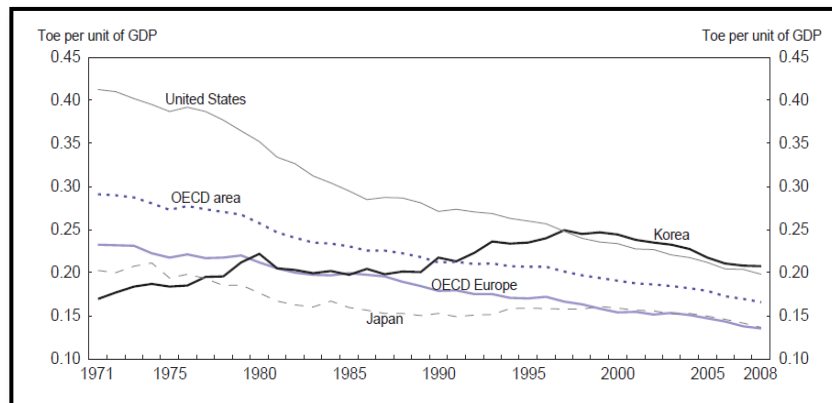
B. Imperatives for National Strategy

1. Massive Production of GHG Emissions and Climate Change

South Korea's economic has grown rapidly, economic expertise usually give it name "Miracle on the Han River" (Zelenovskaya, 2015). However, because the focus was only for short-term economic gain, the country is now witnessing the side effect of it, such as pollution, climate change, inequality, economic gap and corruption (Jung, 2015). Along with South Korea's economic growth, the country's energy use and GHG emissions have continued to increase since the implementation of export promotion, when industrialization began.

Rapid industrialization has caused to a significant pressure on environment and natural resources such as forest, water resources, biodiversity and the urban environment. Air condition is the most significant thing that is attained by effect of rapid industrialization (UNEP, 2010). Most of economic activities depend on fossil energy such as petroleum, coal and natural gas (NG), those have led Earth to climate change. The mature stage of economy and significant advance in economic development consume considerable energy (Jung, 2015).

Figure 3.2 Energetic Economy in OECD area



Source: Jones, R. S., & Yoo, B. (2011). Korea's Green Growth Strategy: Mitigating Climate Change and Developing New Growth Engine

The Korea Energy Institute reports that domestic coal made up on 1.8% of South Korea's total coal use and it was only a fraction of the country's total energy mix. In addition, to such energy security concerns, South Korea's Greenhouse Gas emissions almost doubled between 1990 and 2005, the highest growth rate in the Organization of Economic Cooperation and Development area (UNEP, 2010).

In 2007, Korea's carbon dioxide (CO₂) emission from fuel combustion reached 489 Mt which is 1.7% of the world's total and the 9th highest level in the world. Based on figure below, industry is the major sector which contribute on GHG emissions, with more than half GHG emissions in South Korea, like it is showed in figure below.

Figure 3.3 South Korea Energy Consumption

| | Average annual growth rate (per cent) | | | Composition (per cent) | | | Percentage-point change 1997-2007 |
|-------------|---------------------------------------|-----------|-----------|------------------------|-------|-------|-----------------------------------|
| | 1971-97 | 1998-2007 | 1971-2007 | 1971 | 1997 | 2007 | |
| Industry | 8.9 | 4.0 | 7.3 | 43.9 | 45.0 | 51.7 | 6.7 |
| Transport | 10.6 | 2.2 | 7.7 | 15.6 | 23.7 | 20.6 | -3.1 |
| Residential | 3.2 | 6.9 | 3.8 | 35.3 | 9.0 | 12.6 | 3.5 |
| Commercial | 15.1 | 0.9 | 10.2 | 4.1 | 17.6 | 12.5 | -5.1 |
| Other | 14.8 | -1.9 | 9.3 | 1.2 | 4.7 | 2.7 | -2.0 |
| Total | 8.8 | 3.3 | 6.8 | 100.0 | 100.0 | 100.0 | 0.0 |

Source: Jones, R. S., & Yoo, B. (2011). Korea's Green Growth Strategy: Mitigating Climate Change and Developing New Growth Engine

Thus, it contributed on air pollution which is led into climate change and remained as a formidable challenge to South Korea's government (Jones & Yoo, 2011). South Korea is more vulnerable than average to the effects of climate change and more exposed than most to fossil fuel dependence. It is proven by the rise in temperatures of South Korea. During 1912 until 2008, average surface temperatures in South Korea rose 1.47°C, which was above the world average (PCGG, 2012).

2. Energy Insecurity

In terms of supply and demand of energy, South Korea faces many challenges, such as dependency and excessive use on fossil fuel, soaring gasoline price, global energy market changes, and international cooperation to solve climate change issues.

Lack of natural resources, South Korea considered as 10th largest importer in the world. South Korea has a high dependence on import of capital goods, raw materials and industrial supplies. The country is also the 5th largest importer of oil in the world, with 3.074 million barrels imported per day (Economywatch, 2010). As one of the largest oil importer, in 2008, a 60% rise of the cost of South Korea oil imports because of impact of financial crisis, had driven country into deficit for the first time since Asian crisis (Wachter, 2008).

To curtail the reliance on fossil fuels, South Korea will make efforts to acquire new sources of the energy, improve energy efficiency and promote the adoption of an energy saving lifestyle by its citizen (PCGG, 2012). South Korea will reduce the use of fossil fuels by making massive investments in the new and renewable energy sector and begin to find new way to improve energy independence.

Furthermore, the government sought for alternative energy resource and enhanced energy efficiency with the development and implementation of basic plans for energy-use rationalization and new and renewable energy, and promotional strategies for the green energy industries. Moreover, the government can avoid the impact of fluctuation in the global oil in the future (PCGG, 2012).

3. Adoption of New Vision, Lee Myung Bak's Declaration of "Low Carbon, Green Growth"

Regarding to the environmental and economic issues that mentioned above, South Korea begin to take its seriousness to solve the issues. Furthermore, on the

60th South Korea Independence Day, former president Lee Myung Bak had declared “Low carbon, green growth” as a new nation vision for development strategy for next 50 years (Jones & Yoo, 2011). It was presented to the nation as paradigm for development and aimed to reduce GHG emissions and environmental pollution. In the Independence Day, President Lee Myung Bak was saying:

“Today , when we mark the 60th anniversary of the foundation of th republic of Korea, i would like to present low carbon green growth as the axis of a new visio. Green growth is sustainable growth that will reduce greenhouses gasses and environmental pollution. It is the paradigm for new national development that will create new growth engines and jobs through green technology and clean energy”

It is expected that by adopting Green Growth as national strategy, the government can sustain the growth by create new growth engines and jobs through green technology and clean energy.

C. Set Green Growth as National Strategy Through Five Year Plan

South Korean government annouced in July 2009 the “National Strategy for Green Growth” up to 2050 and it is implemented through its five year plan. The strategy is including three main strategies with ten policy directions. In addition, to implement the agenda as national ststrategy in systematic and consistent manner, the government developed the five year plan 2009-2013 (GGGI, 2015) (Dae, 2013).

South Korea is the first countries that implement Green Growth in its national strategy (World Bank, 2012). The government believed that if the Green

Growth was adopted into practice of five year plans, it would dwindle as the South Korean economy embraced market economy principles. It also believed that they are useful for national consensus building and to incorporate Green Growth spending in the national budget (PCGG, 2009).

1. Legal Framework of Green Growth

In previous chapter, it is already said that people are still worried about the economic growth under the scenario where greenhouse gas emissions are reduced to mitigate climate change and generate new growth engines, such as green technology, green industries, and green jobs. Because they are afraid this model advance will be an obstacle in economic growth. Following to that fact, South Korea's pursuit of Low Carbon Green Growth, in four milestones:

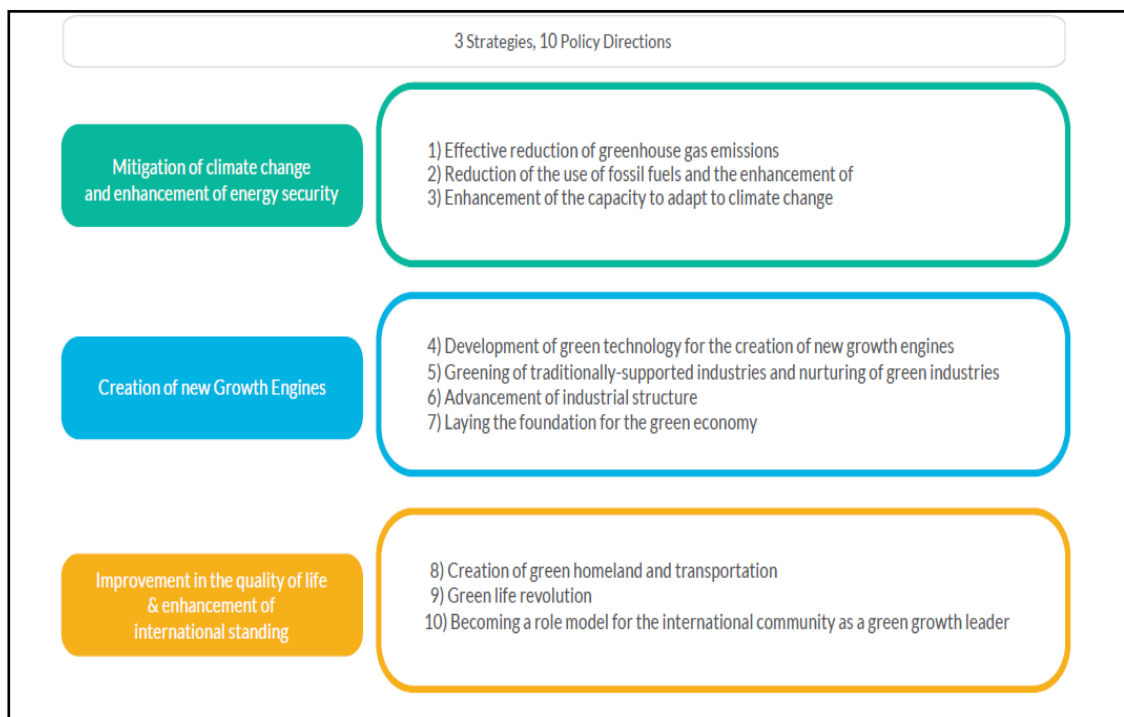
- i. Building the solid governance framework for Green Growth by establishing the Presidential Committee on Green Growth (PCGG) in 2009
- ii. Strengthening the legal enabling environment for green growth by enacting the Framework Act on Low Carbon Green Growth in 2010
- iii. Mobilizing various ministries to formulate comprehensive green growth plans at various levels (sectorial, national and local, including national strategy for Green Growth (2009-2050) and five year plan (2009-2013)
- iv. Honoring Korea's commitment in global climate change agenda by setting an ambitious GHG reduction target of 30% by 2020 (GGGI, 2015).

From these milestones, South Korea created a strong environment for green growth, such as institutional, legal, and programmatic platform for Green

Growth. The Framework Act on Low Carbon Green Growth has succeeded in institutionalizing Green Growth as a domestic policy and provided a good template for other countries in formulating a comprehensive and proactive policy that integrates economic, environmental and social objectives in one framework (GGGI, 2015).

The Framework instructs the government to prepare and enforce a basic plan for energy every 5 years for a planning to achieve mid-term target in 20 years. The plan should include aspect of energy security and independence, as well as targets for energy supply from renewable sources and energy (LSE, 2010).

Figure 4.3 Three Strategies and Ten Policy Directions of South Korea Green Growth



Source: GGGI. (2015). *Korea's Green Growth Experience: Process, Outcomes and Lessons Learned*. Seoul: Global Green Growth Institute.

1. Action Framework of Three Strategies and Ten Policy Directions

Based on the Framework Act on Low Carbon Green Growth, South Korea government set the policy framework for the first Five Year Plan and then proposes new measurement to achieve the mid-term target later on (Statistic Center, 2012). Figure 3.4 talks about three strategies that South Korea wants to achieve, first is mitigating climate change and promote energy independence. Second is creating new engines for economic growth, and the last is improving the quality of life and enhance Korea's international standing (GGGI, 2015).

There are ten policy directions as specific framework to be followed by the country. *Effective mitigation of greenhouse gas emissions*, the government will pursue mitigation strategies for buildings, transport and industry, require reporting on emissions and promote forestation. *Reduction in the use of fossil fuels and the enhancement of energy independence*, South Korea will reduce energy intensity to the OECD average, increase the use of renewable energy and expand nuclear power capacity (Jones & Yoo, 2011).

Strengthening the capacity to adapt to climate change, South Korea will launch the "Four Major Rivers Restoration Project" in which the restoration focuses on four major rivers in South Korea (Han, Nakdong, gem and Yeongsan River) and increase the share of "environmentally friendly" agricultural products to 18% by 2020. *Development of green technologies*, the government will pursue

the development of important green technologies, boosting its world market share in the relevant sectors to 8% within five years (Jones & Yoo, 2011).

The “greening” of existing industries and promotion of green industries, the government commit to exports of green goods in the major industries will rise from 10% in 2009 to 22% in 2020 and the government will help small and medium-sized enterprises (SMEs) green their business. *Advancement of the industrial structure to increase the role of services,* the government will develop health care, education, finance, contents industry, software and tourism as the core of high value-added services. *Engineering a structural basis for the green economy,* the government will gradually introduce an emissions trading system, make the tax system greener and extend the public credit guarantees to green industry (Jones & Yoo, 2011).

Greening land and water and building the green transport infrastructure, the share of the passenger travel by rail will rise from 18% in 2009 to 26% in 2020, and metropolitan mass transit from 50% to 65% over the same period. *Bringing the green revolution into our daily lives:* Carbon footprint labelling will be enacted, the government will increase mandatory procurement of green goods and education on Green Growth will be expanded. *Becoming a role-model for the international community as a green growth leader,* Korea will actively engage in international climate-change negotiations and increase the share of green ODA from 11% to 30% in 2020 (Jones & Yoo, 2011).

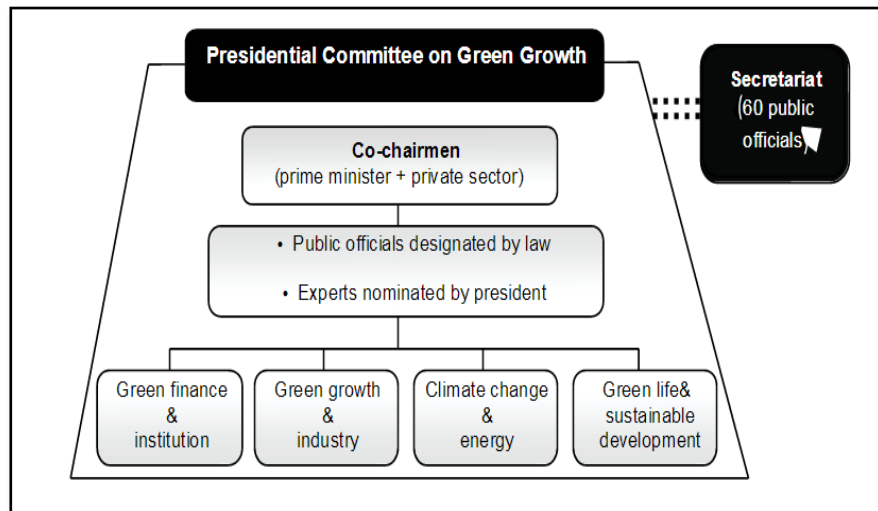
2. Organization Framework for Presidential Committee on Green Growth

Beside giving policy directions, Framework Act on Low Carbon, Green Growth also included the organization that expected to manage the President Lee Myung Bak administration's Green Growth policy (Jung, 2015). The government formed the organization that is called Presidential Committee on Green Growth (PCGG). Based on the Framework Act on Low Carbon Green Growth, the roles of the PCGG are deliberation on the government's major policies and plans related to Green Growth and matters concerning the the policies and plans, coordination with administrative agencies and local government, discussion on various subjects relevant to pursues Green Growth and the last, participating in the global Green Growth dialogue and international negotiations (UNESCAP, 2010).

The PCGG provides the overall direction of Green Growth activities at the national level by monitoring the implementation of National Strategy for Green Growth and the Five Year Plan. The PCGG was the outcomes that merger of three bodies: The Presidential Committee for Sustainable Development, the Presidential Energy Committee and the Special Task Force for Climate Change (Kim and Thurbon, 2015).

The government established the PCGG as the highest inter-ministrial institution. The organization structure of the PCGG uses co-chairmen system with the prime minister represents ex officio member and commission expert member appointed by president. It is composed of public officials and experts commissioned by the president including several ministries that related with green growth plans.

Figure 3.5 Organization Structure of Presidential Committee on Green Growth



Source: UNESCAP. (2010). *Low Carbon Green Growth Roadmap for Asia and the Pacific. Case Study: Republic of Korea's Presidential Committee on Green Growth.*

3. Fiscal Framework to Adjust Green Growth in Policy Actions

During President Lee Myung Bak's administration, Green Growth was priority. To link the administration's agenda with public spending, the Ministry of Strategy Finance (MOSF), the central finance and planning agency in South Korea formulated medium-term expenditure plans and compiled annual budget. Thus, financial request for Green Growth was reflected on Five-Year National Fiscal Management Plan (2009-2013).

South Korea's government established rule that would spend about 2% of annual GDP to finance it (Jones & Yoo, 2011). The budget allocation was not small during that time, since in the 2008 the financial crisis led to global recession in 2009 and uncertain prospect for the coming years (OECD, 2012). Instead of invest

budget in the firms to boost their productions, the government spend its money for making investment in Green Growth.

In January 2009, the government launched Green New Deal¹, which is the project focused on renewable energies energy efficient buildings, low carbon vehicle and railroads, and water and waste management. For this New Deal, the government established an investment plan of KRW 50 trillion (USD 38.5 billion) for 2009 to 2012 (Dae, 2013). At the same time, the supplementary budget was prepared, of which the green stimulus package, including infrastructure, investment to revitalize the economy and create green jobs. It is aiming to generate 960.000 green jobs to overcome with global crisis. During 2009, the government allocated 17.9 trillion to invest in many Green Growth-related programs. It was noted as the largest in South Korea's fiscal history (Dae, 2013) (GGGI, 2015).

2. Policy Programs as South Korea's Government Responses towards Green Growth Indicators

¹ Is a term used to discribe any stimulus package that aims to tackle both financial crisis and environmental issues such as climate change.

Table 4.1 Three Strategies and Ten Policy Directions of South Korea Green Growth

| No. | Policy Directions | Action Programs |
|-----|---|--|
| 1. | Effective mitigation of greenhouse gas emissions | <ul style="list-style-type: none"> • The government setting long-term reduction target (30% reduction by 2020, BAU) (2009) • Target management system (2010) • Emission trading system (2012) |
| 2. | Reduction in the use of fossil fuels and the enhancement of energy independence | <ul style="list-style-type: none"> • Renewable portfolio Standard RPS replacing Feed in tariff system in (2012) • Establishment laws and institutions for smart grid in (2011) |
| 3. | Strengthening the capacity to adapt to climate change | <ul style="list-style-type: none"> • Selection of 27 key of green technologies (2012) • Expansion of resource and development investment |
| 4. | Development of green technologies | <ul style="list-style-type: none"> • Basic plan for resource recirculation (2011) • Setting targets for resource productivity and resource recirculation rate • 8 projects of ecological industrial parks |
| 5. | “Greening” of existing industries and promotion of green industries | <ul style="list-style-type: none"> • Establishment of national climate change adaptation center (2009) • National climate change adaptation plan (2010) • Development fo national standard climate change scenario and weather resource maps (2011) <p>South Korea will launch the “Four Major Rivers Restoration Project” in which the restoration focuses on four major rivers in South Korea (Han, Nakdong, Geum and Yeongsan River) and increase the share of “environmentally friendly” agricultural products to 18% by (2020)</p> |
| 6. | Advancement of the industrial structure to increase the role of services | <ul style="list-style-type: none"> • Development of cutting-edge convergence technology • Increase in investment and sales in high value added service industry |
| 7. | Greening land and water and building the green transport infrastructure | <ul style="list-style-type: none"> • Certification of green technology, products and companies (2010) • Plan for Green job creation and training (2009) |
| 8. | Engineering a structural basis for the green economy | <ul style="list-style-type: none"> • Sustainable Traffic and Logistics Development Act (2009) • Green Building Support Act (2012) • Total Maximum Daily Loads for energy consumption of buildings (2011) |
| 9. | Bringing the green revolution into our daily lives | <ul style="list-style-type: none"> • Expansion of public-private partnership for green life movements • Educating green leaders and supporting their activities • Green growth education • Promotion of green products purchase |
| 10. | Becoming a role-model for the international community as a green growth leader | <ul style="list-style-type: none"> • Agenda setting about green growth during G20 Summit (2010) • Holding Global Green Growth Summit (2011-2013) • Attracting GCF Secretariat and making GGGI an international organization (2012) |

Source: Jones, R. S., & Yoo, B. (2011). Korea's Green Growth Strategy: Mitigating Climate Change and Developing New Growth Engine

Policy actions and programs are the progress from South Korea responding green growth indicators that had been measured using OECD's indicator. Interpreted by the writer, from comprehensive data in the report from Korea's Green Growth Based on OECD Green Growth's Indicator by Statistic Korea, among the groups of indicators, 23 indicators were selected to be applicable in South Korea. Following the result of measurement, it has intended for government to take actions plan. Though, some of the indicators showed positive result, the government still wanted to maintained and expected to the greater result of improvement for better quality of life. To respond the result of indicator measurement, South Korea launched the action programs based framework ten policy direction. The table 4.1 above shows ten policy directions with action programs from South Korean government.

3. Current Outcomes

The national strategy of Green Growth has been implemented since 2009, a number of policy actions and programs have been pursued by government to promote the strategy. therefore, some policies have resulted visible achieve, for instance, in energy efficient and renewable energy programs.south korean companies with technologies in new and renewable energy sector have grown 2.2 times in total number and 3.6 times in term of number of employment, 6.5 times in sales, 5.9 times in exports and 5times in private-sector investment (Zelenovskaya, 2012)

Besides on the new and renewable energy, green technology and innovation programs are giving positive outcomes. Government investments in

green technology research and development activities increased steadily, reaching 3.04 trillion KRW (US\$ 2.8 billion) in 2013 (GGGI, 2015).

The other outcomes is making improvements in reducing household consumption of basic necessities, such as the consumption of energy in household remained well below on 0.434 TOE/day/ than OECD's average which is 0.6 TOE/day/person (GGGI, 2015).

In addition, from industries programs, the government's pursuit has been showing positive results, they are development of green production technology and products, reduction of air and water pollutants, cutting down on energy and resource usage. The other are South Korea's material consumption per unit GDP has continued to decrease over the years (GGGI, 2015)

In the green homeland and transportation, the energy consumption by major metropolitan city increased. In contrary, the green city planning show positive result, such as greening of parking areas, ecological restoration of the city's main stream, and construction of artificial waterways in Chanwon and Jeonju. For the transportation sector, the government has provided high-speed rail system, Korea Train eXpress (KTX) with the additional of new line from Busan to Seoul (GGGI, 2015).

For green building sector, the government made significant changes in engineering practices and investment decision-making, because its stritch building certificationa scheme (GGGI, 2015).

Beside positive achievement, in low carbon society programs, the reduction of GHG emissions show the unsatisfying results, since the number of GHG emissions have continue increase each year (excuding in 2009), the number of GHG reached 6888.3 million tCO₂ in 2012. This still remain as formidable challenge for South Korea (GGGI, 2015).