

Re – prioritizing Policy Options for Achieving SDG Goals 7 in Korea

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Abstract: This paper attempts to review and reposition policy instruments in achieving SDG Goal 7 in Korea. It is necessary to flexibly re-prioritize current policies in response to new circumstances. As in detailed indicators of SDG Goal 7, the expansion of renewable energies and the energy efficiency improvement policies have been steadily strengthened in Korea, and the recent achievements of green growth and climate change are significant. This study analyzes the current state of energy-related sustainable development policies in Korea and suggests policy implications to improve the SDG Goal 7 targets. Incentive structures should be expanded in regulatory and monitoring frameworks, including subsidy and financial support. In addition, financial support should be extended to SMEs whose potential is not sufficiently managed due to institutional difficulties. The cooperation between large and small enterprises in the energy and greenhouse gas management is difficult to achieve due to the subcontracting structure and asymmetric bargaining structure in Korea. To improve this, it is required to enhance the system in which financial support for SMEs is strengthened. To improve energy efficiency and expand renewable energy, policy makers must maintain consistency in setting regulatory targets considering long-term goals.

Key Words: Renewable Energy, Energy Efficiency, Financial Support, SMEs, ETS

I. Introduction

In September 2015, the UN General Assembly adapted ‘Sustainable Development Goals’ (SDGs), which would replace the ‘Millennium Development Goals’ (MDGs), for sustainable development of the world over the next 15 years. SDGs draws upon lessons learned from the Millennium Development Goals (MDGs), and proposes guiding

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principles to help countries navigate the SDG Agenda.¹⁾ The SDG agenda includes 17 Sustainable Development Goals, which set out quantitative objectives across the social, economic, and environmental dimensions of sustainable development, all to be achieved by 2030.²⁾ The goals provide a framework for shared action “for people, planet and prosperity,” to be implemented by all countries and all stakeholders, acting in collaborative partnership. 169 targets accompany the 17 goals and set out quantitative and qualitative objectives for the next 15 years.³⁾ The inclusion of broad targets in the SDGs and the domestic implementation of developed countries has led to the need for diverse stakeholder participation and considerable financial resources. The role of the government should be emphasized in planning and operating overall strategies, objectives and activities.

The main content of the SDGs includes a very comprehensive content of developmental categories and transition targets compared to the MDGs: economic development, social and human development as well as environmental sustainability. It includes not only developing countries but also developed countries. In particular, energy and climate change-related goals are a global challenge.

Most of the UN member countries around the world have been trying to implement SDGs by establishing new frameworks of policy instruments. In Korea, the “Sustainable Development Committee” has established and implemented related policy targets. The Korean

1) The United Nations, 2015, Transforming our world: The 2030 Agenda for sustainable development.

2) *ibid.*

3) SDSN, 2015, Getting started with the sustainable development goals: A guide for stakeholders.

government also has reinforced existing government policies and related legislation, while creating indicators for achieving individual goals of the SDGs.

Goal 7 addresses “by 2030, increasing substantially the share of renewable energy in the global energy mix and doubling the global rate of improvement in energy efficiency”⁴⁾ among others. This is most directly and closely related to the energy and climate change policies in Korea.

The role of energy in the sustainable development of the economy and society, articulated in Goal 7, is very important for Korea. Many studies that have examined the relationship between energy and economic development have led to the conclusion that in most cases the use of energy increases with economic growth and that the path of economic growth changes with the supply of energy. Since the 1960s, the importance of energy as a core resource for raising quality of life as well as a factor of production has been highlighted in Korea. Since the 1990s, discussions on the competitive structure of the energy industry, changes in the supply and demand structure of energy, and in particular the importance of demand management, have become important issues for the environment and energy.

In Korea, which ranks top ten in the world regarding energy consumption and GHG emissions, the need to achieve a harmonization among environment, economy and society, inevitably emerged as a top priority, even when we had not taken the pressure from the international community into consideration. In order to curb the increasing greenhouse gas emissions, the use of traditional fossil

4) The United Nations, 2016, Final list of proposed sustainable development goal indicators: Report of the inter-agency and expert group on sustainable development goal indicators (E / CN.3 / 2016/2 / Rev.1).

energy such as petroleum and coal should be regulated. In addition, the energy and material resources used in most industrial activities incur the depletion of scarce resources that should be reserved for the future generations. It is directly related to the issue of the intergenerational equity that SDG is emphasizing.

However, it takes time to have a significant shares of hydrogen, fusion, and solar energy in total energy consumption, replacing fossil fuel energy. It is necessary and essential to continuously develop new and renewable energy technologies, as well as energy saving technologies. However, notwithstanding the desirability of energy saving and new and renewable energies, energy users, industries and households, are faced by realistic questions favoring cheap energy sources. From the viewpoint of SDGs, it means that energy policy should be restructured to actively include environment-related policies, providing the economic incentives to the users of environmentally friendly energies.

In this paper, we review and suggest sustainable development policies in Korea from the perspectives of development and diffusion of renewable energies and improvement of energy efficiency, with detailed strategies emphasized in SDG Goal 7. Section 2 evaluates sustainable development strategies that Korea has been pursuing. In Section 3, policy linkage and improvement measures are discussed focusing on issues that are lacking or emphasized in relation to SDG Goal 7. Section 4 presents conclusions and implications of policy measures to achieve energy-related SDG goals.

II. Assessment of the Korean Sustainable Development Strategy

1. Basic Policy Framework

The policy framework for the SDG Goal 7 in Korea is based on the “Act on Low Carbon and Green Growth” enacted in 2010. This law aims at enhancing the quality of life of the people through the implementation of a low carbon society and contributing to becoming a leading nation that fulfills its responsibilities in the international community. The act combines the two key concepts of “low carbon” and “green growth” into one law.

“Low-carbon society” is a society that fulfills its responsibilities in the international community by aggressively responding to global climate change. Implementation of a “low-carbon society” is an obligation under international law that must be borne by the international community. The international regime in this regard includes the agreements by the United Nations and various international organizations, such as the 1992 Framework Convention on Climate Change, the 1997 Kyoto Protocol and the 2009 Copenhagen Accord, and subsequent agreements which are continuously expanding its jurisdictions.

“Green Growth” means using energy and resources as efficiently as possible while securing new growth engines through research and development of clean energy and green technology. “Green Growth” has direct links with international treaties on sustainable development in harmony with the environment, in particular, the “Rio Declaration on Environment and Development” in 1992, the Johannesburg Declaration on Sustainable Development in 2002 and the 2005 Seoul

Initiative Network on Green Growth.

Low carbon and green growth can go hand in hand usually, however, they may sometimes contradict to each other. If a country with a highly energy intensive industrial structure, including Korea, attempts to transform itself into a low-carbon society, it could cause a negative impact on the economy. On the other hand, “green growth” pursues economic growth together with environmental conservation, mainly via supporting green industries. A holistic consideration is required when pursuing both of these simultaneously. Such contradictions have caused many problems in the process of international conventions and in domestic legislation. The issue of controlling carbon emissions while keeping economic growth has become a political and legal challenge, both at national and international levels.⁵⁾

Oh (2010) scrutinized a few cases of legal arrangements in pursuit of both low carbon society and green growth in Korea. The first one is the change in the energy law system. The Energy Use Rationalization Act of 1980, Act on the Promotion of the Development and Use of Alternative Energy of 1988, and the Integrated Energy Supply Act of 1992 have been enacted and implemented.⁶⁾ Consumption of energy accounts for most of the carbon emissions. However, traditional energy legislation was focused only on the energy efficiency and was not related to the implementation of low carbon society. In 2006, the Energy Act was enacted and, for the first time, the environmental friendliness of energy use and responsibilities were incorporated in the law, but

5) Oh, J. K. (2010) and Han, T. W. (2013).

6) *ibid.*

specific measures for the implementation of low carbon society were not included in the law.⁷⁾

Act on the Promotion of the Development, Use, and Diffusion of New and Renewable Energy, enacted in 2015, is a conventional law modified to have links to low-carbon green growth in the energy sector. This law completely amended the previous Act on the Promotion of the Development and Use of Alternative Energy. The main content of the new law is to support the commercialization of new and renewable energy technologies and the establishment of new and renewable energy equipment installation companies. However, this law mainly focuses on providing basic features to support and manage new and renewable energy only at the level of the central government, lacking details for implementation.

The second one is regarding the industrial policy. In 1996, the Act on the Promotion of the Conversion into Environmentally Friendly Industrial Structure was introduced. This act introduced financial measures, including supports to capital expenditure for equipments and R&D, to facilitate the transition towards an environmentally-friendly industrial structure. It was initiated to enhance the role of industry in sustainable development as stated in the documents adopted at the United Nations Conference on Environment and Development in Rio in 1992. Although the law contains some measures for GHG mitigation, it included only passive and insufficient countermeasures for responding the Framework Convention on Climate Change,

As defined by the “green industry”, goods and services that can improve the efficiency of energy and resources and improve the

7) The National Law Information Center, 2018, The law was revised to energy act in January, 2018.

environment include various sectors and activities including businesses management, finance, construction, traffic logistics, agriculture, forestry and fisheries, tourism, and so on. The jurisdictions for these sectors and activities are unsystematically scattered in various laws of the Ministry of Strategy and Finance, Ministry of Land, Transport and Maritime Affairs, Ministry of Agriculture, Forestry and Fisheries and Ministry of Culture and Tourism. In order to achieve “low carbon green growth,” it is necessary to systematize the policy measures and to give the legal stability to the industrial sectors.

The third major legislation, the Act on Low Carbon and Green Growth was enacted in 2008 and announced in January 2010. This law designates the relevant official organizations responsible for the promotion of green growth. It creates the legislative framework for mid- and long-term emissions reduction targets, cap-and-trade emission trading, carbon tax, carbon labelling, carbon disclosure, and the expansion of new and renewable energy. The green growth committee, established by this law, deliberated a green growth national strategy in order to efficiently and systematically promote low carbon green growth via measures of promoting green industries, green buildings and green life-styles. However, the law and related policy frameworks are criticized for the lack of the vision on the quality of life in low-carbon society and dynamic consideration on the changing world, as well as the questions on the ambitious goals and numbers.

2. Evaluation of the Korean Policies Regarding SDG Goal 7

The energy sector lies at the core of both SDGs and domestic

policies for climate change. Achieving sustainable economic development in Korea will require the prudent use of resources, technology, appropriate economic incentives and strategic policy planning at the local and national levels. The increasing use of energy mainly due to the energy-intensive industries including iron and steel, petrochemical, cement, and non-metal mineral industries. In addition, fossil fuels such as petroleum and coal still account for a high proportion in energy use. Fossil fuel energy consumption in Korea was reported at more than 80% in 2015, according to IEA. Under these circumstances, major government departments, including the Ministry of Environment, established various greenhouse gas and energy policies to reduce carbon emissions and build environmentally-friendly energy system.⁸⁾

At the international level, the inclusion of sustainable development and climate change into the energy policy seems to have started in 1992 at the UNCED at Rio de Janeiro. In Korea it was in 1998, when the Korean government has set up a systematic and legally supported governmental policy mechanism for UNFCCC. This mechanism included industries, academics, and research institutes, and NGOs, as well as the government itself. Korean government prepared a comprehensive strategy to fulfill the duties given by the Framework Convention on Climate Change, focused on key issues such as negotiation strategies and diffusion of greenhouse gas emission reduction efforts to the various areas of Korean society. It has become a starting point that linked greenhouse gas reduction and energy policy in Korea.⁹⁾

8) Ministry of Environment, 2018, Establishment of national sustainable development goals (K-SDGs) progress and detailed goals and indicator system (Plan).

In 2009, the Korean government established the Presidential Committee on Green Growth, which oversees policies and strategies relating to climate change, sustainable development, and energy policy.¹⁰⁾ The committee and its policy decisions were controversial due to not being systematically based on the principles of sustainable development, which is in principle considered to be a superstructure over the newly introduced concept of the green growth.¹¹⁾

The 20th General Assembly of the United Nations Framework Convention on Climate Change in 2014 has adopted a set of Intended Nationally Determined Contributions (INDC) to be implemented starting from 2020. The INDC means each country's voluntary reduction targets, action plans, and adaptation to climate change responses and international community contribution plans for climate change. It was later renamed Nationally Determined Contributions (NDC). The government has adjusted the demands of various sectors and set the greenhouse gas reduction target in 2030 at 37% of BAU (851 million tons at the time) and submitted it to the international community. After the discussion of the Green Growth Committee, the government established the Basic Plan for Responding to Climate Change. In 2018, the Basic Roadmap for 2030 National Greenhouse Gas Reduction, a revision of the 2014 plan, are being implemented after the amendment.¹²⁾

9) Boo, K. J. et al., 2013, Economic development experience modularization project: Energy policy, KDI Graduate School.

10) The Presidential Committee on Green Growth, 2009, Green growth strategy and five-year plan.

11) Han, T. W., 2013, A study on the sustainable development and green growth development, (Green Growth Study 13-23-19), Seoul: Korea Legislation Research Institute.

12) The Korean government announced an amendment to the national roadmap for reducing greenhouse gas emissions. The greenhouse gas reduction roadmap

Key approaches to achieving these goals include linking greenhouse gas reduction and energy policies to sustainable development. Key policy instruments include: expansion of renewable energy, energy conservation and energy efficiency, management of greenhouse gas reduction targets by individual companies, establishing carbon trading market, establishing and promoting reduction measures by industry sector, building greenhouse gas statistics and strengthening international cooperation. These domestic policy instruments are consistent with the recommendations in the SDG Goal 7.

In reviewing relating indicators of SDG Goal 7, renewable energy policy is an approach to improve the practical constraints of domestic greenhouse gas emissions in the energy sector. Since 1997, the Korean government has established and implemented a basic plan for the development and dissemination of new and renewable energy technologies with the help of a large market potential. The introduction and application of related technologies is relatively easy. Wind power, photovoltaic, and fuel cells are major policy targets¹³⁾

Korea set up renewable energy supply targets by technology and region. The government provided various types of subsidies, financial support, tax benefits, and R&D to advance technologies and commercialization. These policies are considered to have contributed substantially to the diffusion of renewable energy in Korea. The share of renewable energy in total primary energy consumption in Korea has steadily increased from 1.03% in 1998 to 2.61% in 2010 and 3.8%

plans to reduce emissions to 536 million tons, as in 2014 plan, by reducing emissions by 37% from 850.08 million tons in 2030. The biggest change is that Korea decided to reduce its overseas reductions to 1.9% (16 million tons) and increase its domestic reduction to 32.5% (276 million tons) from 25.7% in 2014.

13) The Korean government, 2017, 8th Basic plan for electricity supply and demand.

in 2016. By 2030, the government has set a goal of 20% of total power generation.

However, there is a fundamental limitation that waste and hydropower account for more than 70% of the total renewable energy. In addition, there is a controversy about the potential amount of major renewable energy sources in achieving the target in future such as local landscape damage, incidental environmental damage and civil complaints.

The improvement of energy efficiency is not only for pursuing sustainable development but also for enhancing industrial competitiveness after two oil crises in the 1970s and other resource risks. The energy conservation policies include the expansion of investment support for energy saving facilities, the expansion of collective energy supply, the energy technology development, the rationalization of energy price system for inducing market-friendly energy saving, and the development of energy saving companies (ESCOs). Policies to strengthen energy efficiency standards for various energy-using equipment and facilities, which are direct regulatory methods, were also introduced. As a result, the energy intensity of Korea has been steadily decreasing since it recorded the highest in 1997.

However, since the current energy efficiency policy is operated in a manner of command and control type scheme, it has limits in inducing continuous incentives and motivations for saving energies. There has been a discussion that the price mechanism is still insufficient to induce innovation for energy saving, though it is partially improved in reorganizing energy prices, including the increase of electricity price for industry. However, there is still a large

gap in energy intensity compared with major countries even considering the factors such as temperature and industrial structure¹⁴⁾

The emission trading system is a policy instrument in which Korea manages greenhouse gas emissions. The system has capacities in reducing fossil fuels and increasing the use of renewable energy. If a firm over-or under-emit than emission allowance, it can benefit by trading the emission credits with other firms, which would reduce the emission reduction costs. Based on the result of Phase I, ended March 2017, the emission trading system of Korea is showing a unsatisfactory performance due to insufficient trading volume. The trading volume of Korea's carbon credits market is quite insignificant, at 0.8% (2015) and 1.9% (2016) of the final quota. In addition, there has been a severe discrepancy on the desirable level of the total reduction target between businesses and environmental groups.

III . Policy Suggestion for Legislations and Initiatives for Achieving SDG Goal 7

1. Legislative Suggestions

Effective coordination of laws and regulations is necessary to link individual policy measures to the strategies for the attainment of SDG Goal 7 in Korea. First of all, the Act on Low-Carbon Green Growth should be carefully reviewed in light of the Sustainable Development Act. The Act on Low Carbon Green Growth is a fundamental law that

14) Comparing energy intensity (toe / USD) to Korea = 100, the EU average is 41, UK 34, Germany 45, France 49, and Japan 43 as of 2014 (Source: Energy balances of OECD countries, IEA, 2014).

individual laws are based on. The Act contains the principles to define what the Korean government should pursue to achieve low-carbon green growth targets. There are various sub system of implementing legislations and often run counter to each other in formulating specific policies for green growth. There should be coordination of the responsible authorities, names and contents of relating laws, based on the Act,

Regarding the green industry, policies should be guided to set goals for promoting, fostering and supporting the green industry to be converted to a new growth engine. It is necessary to formulate precise measures to foster and support to transform current industrial structures to the green ones. The current legislation does not provide specific information on what the “green industry structure” is, what it implies, and how to support it. As the government promotes green industries, its contents must be specifically articulated. The government needs to find out the contents of the “green industry” first.¹⁵⁾ Both the reduction of carbon emissions and the adaptation of climate change must be balanced.

“Clean Production”, “Clean Consumption”, “Clean Life”, and “New Life” may possibly include insurance industry for various industrial damages stemming from climate change, new industries related to emission trading, and climate change forecasting and adaptation. More importantly, those may have industry related to the production, distribution, and consumption of energies from bio energy, waste energy, and microbial energy.

In particular, legislative supplementation and the administrative support mechanisms listed in the Act need to be specified

15) Oh, J. K. (2010) and Han, T. W. (2013).

individually. Legal instruments for financial support in Article 28 of the Act should be firmly prepared. It is the government's obligation to establish and enforce financial measures such as financial support for the green economy and green industries, the opening of the carbon market, and the active transactions. In widening carbon market, there should be more specific legal grounds on how to open.

Second, specific legal basis for the operation of the tax support system prescribed by Article 30 and Article 31 of the Act should be established. In order to enhance the green industry through tax exemptions, specific regulations should be introduced in related laws such as Restriction of Special Taxation Act and Act on Local Taxes.

Third, the advancement of the regulation prescribed by Article 36 of the Act needs a regulatory reform. The reforms include green technology, standardization and certification of green industry, mandatory purchase of public institutions (Article 32), support of SMEs (small and medium enterprises) (Article 33), support of green technology and green industry cluster and complex (Article 34), and financial support for job creation (Article 35).¹⁶⁾

2. Strengthening the Role of the Financial Eector in Fulfilling the SDG Target

The successful implementation of SDG Goal 7 can be achieved by establishing a system that can realize individual targets, such as intellectual property rights and financial systems. A financial system can lead to efficiently achieve expanded use of renewable energy and improved energy efficiency by a package of improved financial system, financial support for environment and greenhouse gas derived

16) Oh, J. K. (2010) and Han, T. W. (2013).

financial businesses.

Recently, the UK government decided to establish a green investment bank to invest in green business. The bank chooses eco-friendly projects, such as photovoltaic and wind power generation. Those sectors are difficult to get funding sources at initial stage due to low rate of return, and need to be provided by public investment. The UK government and the private sector decided to raise matching fund. The public-private cooperation in funding can reduce the risks from the uncertain initial investment. The funding approach is expected to attract the private sector to invest in environmentally-friendly markets.¹⁷⁾

The UK government recognized the importance of financial system to achieve green growth, and to invest actively in the environmental industry.¹⁸⁾ It emphasizes that financial support at the early stage of developing green industries must be properly carried out and, at the same time, appropriate government intervention is needed to facilitate investment in the environmental industry. It is noteworthy that the governmental intervention is mediated by a financial system rather than a direct subsidy to attain more efficient outcomes from the investment.

Finance for the environment or green projects is very critical to the success of the project. For example, in implementing renewable energy projects, contributions utilizing a financial system may operate in three areas: banks, green funds, and carbon finance.¹⁹⁾ The

17) Lim and Han (2011).

18) The environmental industry is defined broadly in UK and the financial support policies include most efforts that involve all costs of environmental regulation and environmental conservation pressures.

19) Refocus, 2002, Financing renewables: Report from the 4th annual RE finance forum.

financial contribution through banks operate early in the project. At this stage, banks may hesitate to lend to the renewable energy business considering the risks. It would be helpful if a country has a bank specialized in green projects such as renewable energy. In addition, government policies such as tax exemptions are a critical help to facilitate early projects.

However, there are new approaches of financing in addition to the lending of funds through banks. They include specialized financial institutions established from the perspective of government or social responsibility. In addition, it may widen funding sources by selling carbon emission credits generated through the renewable energy businesses. The value of the generated carbon finance is determined by the trends in the global emission credit market such as CER. The financial services such as futures and insurance may be derived to hedge the risks involved renewable energy projects.

In order to achieve SDG Goal 7, the domestic financial approach should proceed in the following direction. It is pivotal to enhance the effectiveness of the emission trading system. ETS is a practical framework to harness the development of renewable energy and energy efficiency improvement industries. Emissions trading, in the perspective of sustainable development, aims to change the behavior of producers, consumers, and investors so as to mitigate emissions, but in a way that provides flexibility on reduction actions and methods. The system needs to be designed to stimulate innovation in technology and practice and finally to generate environmental, health, economic, and social co-benefits.

There are many opportunities to design an ETS to reflect the Korean specific circumstances and needs. Relevant aspects include:

local priorities; the motivation for choosing an ETS relative to alternative policy instruments; the existing regulatory environment and confidence in market mechanisms; the size, concentration, growth, and volatility of the economy; trade and competitiveness concerns; institutional strengths and weaknesses; and relationships with potential linking partners.

On the other hand, the ETS leads to interactions that additional policies in sectors covered by the system can counteract, distort, or duplicate the impact of an ETS. For example, other abatement policies such as renewable energy and energy efficiency policies may lead to emissions reductions in ETS sectors at costs above the ETS's carbon price. It means that the ETS will not deliver least-cost mitigation as a whole. Therefore, the ETS should be set within a broader climate change and sustainable policy package in its design.

Financial system including such actors as banks and other institutes has played a variety of important roles in emissions trading. Financial institutes act as intermediaries to facilitate trading and taken on a role similar to brokers. They provide liquidity to the market by as market makers and, in addition, may lower transaction costs by aggregating trading activity of smaller entities. Finally, financial institutes can develop and offer derivative products to help manage price risk for regulated firms.

3. Strengthen the Role of SMEs in Fulfilling SDG Goals

SMEs have a leading role to play in meeting both economic energy goals of the SDGs such as promoting inclusive and sustainable economic growth, employment, and decent work for all as well as promoting sustainable industrialization and fostering innovation. It is

well-known that technology innovation and productivity improvement can be achieved by the decent growth of SMEs. We can find an example from a growth model pursued in Germany.²⁰⁾ Larger firms and SMEs, in Germany, together have achieved the sustainable growth in the manufacturing and service industries. Statistical analyses of the structural business statistics illustrated that SMEs play a crucial role in the German economy as measured by their shares of key indicators such as the number of enterprises, the annual turnover or the gross fixed capital investments, and technology innovation.

In Korea, SMEs are located all over the country and growth of SMEs is an important way for improving a balanced national development, a goal of SDG. Moreover, the material and parts of the final products of major industries such as automobiles and shipbuilding are supplied by SMEs through the industrial division of labor chains. The international competitiveness of final goods is essentially determined by the competitiveness of the entire supply chain.

One of the biggest concerns for SMEs are usually cost and return on investment in pursuing sustainable development targets. Another big challenge is lack of resources and time unlike larger firms. It is therefore very important to recognize those interventions that reduce a business's negative impact, like reducing carbon emissions and improving energy efficiency, can also be a saving in cost. Therefore, SMEs in Korea need to change how do business if they are going to tackle the environmental and social challenges. Engaging with the SDGs provides a clear way to differentiate with better performances and offer a way to efficiently implement policy instruments.

20) Sollner, R., 2014, "The economic importance of small and medium-sized enterprises in Germany," *Wirtschaft und Statistik*, 1, pp.40~50.

A first step for both the government and SMEs is reviewing the SDG goal 7 and identifying the top priorities that really resonate. Goal 7 is to provide affordable energy and take action to mitigate climate change and its impacts. There are several ways for SMEs activities such as energy audit to identify how to save energy and cooperative opportunities with larger firms. Collaboration between larger firms and SMEs as well as academia in achieving Goal 7 is key for a successful sustainability approach.

The industry-academia-government cooperation system will be a more progressing alternative. It is very effective for the government to adopt employment support measures for advanced technology personnel of SMEs.²¹⁾ The creation of an innovative ecosystem through industry-academia-research cooperation can play a key role in creating job as well as achieving SDG goals. The cooperation increases the possibility of successful technology fusion. For those cooperation, the technology-linked platform needs to be built. Under the technology-oriented cooperation system, SMEs can efficiently resolve technological difficulties and lack of technical experts.

It is also very significant to build a system in which innovative ideas of SMEs can be economically compensated by strengthened protection of intellectual property rights. If an energy saving project for sustainable development in SMEs is carefully selected and properly managed in intellectual property, the direct R&D support for the projects can make profitable results.

By creating strong SMEs with innovative technology and cooperation, SMEs can produce fruitful outcomes comparable to larger firms in achieving SDG Goal 7. The SMEs strengthen Korea's

21) Han, T. W. (2013).

international competitiveness and secure excellent manpower at the enterprises, which are consistent with SDG targets.

IV. Conclusion and Implications

The key to achieve SDG Goal 7 in Korea lies in reprioritizing strategies and policy measures in response to new and changing circumstances, rather than sticking to existing policy priorities. The energy efficiency and renewable energy policy in Korea should be more oriented towards technology, small and medium enterprises, and finance. In energy efficiency management policies, top policy priority should be the creation of better incentive structures in support and assistance, regulatory and monitoring systems. Loans and subsidies are insufficient for SMEs despite the considerable potential for energy efficiency improvement and GHG mitigation due to institutional difficulties. To break through these difficulties, it is required to strengthen the financial system for SMEs.

Renewable energy is an attractive in reducing greenhouse gases as well as achieving SDG Goal 7 policy. Moreover, the renewable sector is a high priority area in that it is a future-oriented choice including employment, exports and growth engines. Judging from the overall energy supply structure of Korea, it is difficult to change dramatically the current situation that nuclear and coal are relatively heavily weighted. Nonetheless, current target-based policy such as RE3020 should be continuously proceeded.²²⁾ The renewable energy is also

22) RE3020 means that Korea are planning to achieve proportion of renewable energy in electricity generation will account for 20% in 2030 (The Korean Government, 8th basic plan for electricity supply and demand, 2017).

considered to be widely linked such social issues as intergenerational equity and regional balance. In the renewable energy, it is necessary to make flexible judgments about technological progress and applicability.

The emission trading system is a representative and practical policy instrument for achieving SDG Goal 7 in Korea. The system responding to the expansion of renewable energy and the improvement of energy efficiency depends heavily on the choice and expectation of participating parties. From the perspective of establishing a long-term goal of greenhouse gas regulation and implementing stable policies, the policy authorities need to maintain a firm stance for policy consistency in setting regulatory goals.

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