

Study on the development cooperation program for energy supply in the CLMV countries

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Summary

While energy related issues are not directly included in the specific objectives of the Millennium Development Goals (MDGs), they are recognized as essential for the development of emerging countries. Recently, the Sustainable Development Goals (hereinafter the SDGs), which are the development goals of post 2015 framework succeeding the MDGs, included these related goals in its draft¹⁾. Under the global goals (Goal 7) “to ensure access to affordable, reliable, sustainable and modern energy for all”, specific goals were established ① to ensure universal access to energy, ② expand the portion of renewable energy significantly, and ③ double the speed of enhancement of energy efficiency by 2030. This study draws upon specific development cooperation programs in consideration of regional significance of the CLMV countries located in the Mekong basin and the high demand for energy supply

1) UN(2014), Report of the Open Working Group of the General Assembly on Sustainable Development Goals.

essential for the countries' developments, as well as regions and sectors together. At the same time, this study explores ways to realize Korea's comparatively advantageous programs designed by the government to assist emerging countries in addition to detailed supporting measures for each country.

The results of this study are expected to provide not only implications for those who set up the development cooperation policies and those who operate the program, but also provides local information and guidelines concerning promising programs to Korean energy companies hoping to penetrate into the regions. The current state of infrastructure establishment is poor in general, but the current state in Vietnam is better than those of the other three nations that were included in the UN's list of world's poorest countries in 2014. When looking at the portion of energy supply by each source of primary energy, the three nations excluding Vietnam have 70% portion of biomass while in Vietnam, fossil fuels such as oil, coal and natural gas represent 70% of the supply of primary energy. While Vietnam has a high electricity penetration rate equivalent of 98%, other countries still have low penetration rates including Cambodia (31%), Laos (63%), and Myanmar (49%). Cambodia has high solar insolation and especially abundant solar energy resource potential in the south-western region. Based on goals stated in the country's master plan for rural electrification, the country aims to reach 100% of electrification of rural towns by 2020 and 70% of grid-connected electrification by 2030. In order to achieve that goal, it is required to update energy related government policies and systems and create supporting measures to encourage participation of the private sector, such as policies

including feed-in tariffs. Laos holds a large portion and has high potential of hydroelectric power generation, and almost 100% of power generation is hydroelectric power. The electricity market has a contradictory structure in which electricity generated from hydroelectric power generation is very abundant, making it the second largest export item of Laos, but at the same time electricity is imported from neighboring countries since there is not enough electricity available to meet the demand of Laotians. Furthermore, it is urgently required to improve the electricity grid as transmission voltages are low, and the electricity grid is old. In terms of the portion of primary energy supply in Myanmar, biomass and natural gas represent roughly 90%. Myanmar plans to increase the portion of renewable energy to 15-18% of the entire capacity of electric power facilities. Myanmar had the Electricity Act legislated in 1984 and now is in the course of revising the Act. Support should be planned to address the country's weak fundamentals in terms of policy aspects such as energy related policies and master plans. In Vietnam, consumption of fossil fuels has been definitely growing since the 2000s, centered on oil and coal. Vietnam is planning to expand the portion of renewable energy in its entire electric power generation to 6% by 2030. Southern coastal areas and insular regions have higher wind power resource potential than surrounding countries.

Central and Southern regions in Vietnam have enormous potential for solar power generation. Starting from 2015, the rapidly surging energy demand in Vietnam is expected to exceed the energy supply; therefore, it is required to improve the energy efficiency to ensure sustainable energy supply in the country. This study aims to

explore projects centered on demands and also develop a methodology to formulate a development cooperative program to supply energy enabling the systematic design of supporting projects under close coordination with partner countries during the initial stage. In particular, throughout the cycle of an aid project, on the focus is on developing a methodology that would serve as a guideline in selecting and designing energy supply program at the stage of exploring projects. The methodology sets a logic model for programs by figuring out a partner country's energy demand after analyzing and then utilizing energy related conditions in the country. The methodology selects programs by considering established logic models and Korea's capability, but depending on the conditions, it determines whether to focus on policies or infrastructure when providing support. For aid programs that focus on infrastructure, it is needed to separate the types of supplied energies in terms of domestic use or for manufacturing/towns, as well as differentiating electricity infrastructures from grid-connected and distributed.

This study suggests a checklist first to strengthen efficiency of the comprehensive analysis on the current state of energies in each country. The checklist subdivides the entire parts into subcategories including energy in general, government policies and systems, institutions and organizations, technologies and resources, private sectors and financial supports. Because energy demands and urgent issues are determined as a result of analyzing energy related conditions in a country, there comes a stage designing program in which a logic model of supporting program is set and a type of program is selected. In short, suggested results by each stage include input, activity, output, achievement and impact of supporting

program to supply energy in emerging countries. According to the logic model, the objectives to be achieved through energy supply can be summarized by expansion of modernized energy supply, improvement of sustainable energy use and enhancement of energy efficiency. Those goals contribute to the achievement of higher development goals in countries including enhancement of life quality, improvement of productivity, reduction in greenhouse gases and concentration of air pollution, and securing of energy security. Furthermore, support for the program is first provided through financial support and technological cooperation. In addition, the logic model presents activities required respectively to expand the modernized energy supply and to increase the sustainable use of energies and energy efficiencies, which are to be the achievements of the program and the subsequent first output.

After setting the program objectives and the results of each stage through the logic model, detailed implementation measures are set according to the type of program. In short, a decision is made whether the program is for establishing policies or supporting infrastructure, for home or for production/towns, or grid-connected or distributed in case of an infrastructure supporting project. Those types are not exclusive to each other and can be double-selected. Energy related conditions in the CLMV countries and the methodology to draw development cooperation programs to supply energy in this study can be used to suggest programs that are appropriate for Korea in supporting each of the CLMV countries. This study proposes a 'program supporting non-grid connected and regionally distributed solar energy' for Cambodia, where solar energy resources are abundant throughout the year while the electrification

rate in its rural areas is still very low. This is in accordance with the national development strategy of Cambodia and Korea's Country Partnership Strategy for Cambodia.

To help Laos boost its energy supply by utilizing its abundant water resources, as the country has focused on the development of hydro power generation, this study suggests a 'program to enhance the efficiency of hydro power energy through improving transmission and distribution of electricity'. This is in relation to the 7th mid-term development plan of Laos and major areas of cooperation in Korea's Country Partnership Strategy for Laos.

In Myanmar where there are many ongoing projects to develop energy backed by overseas capital and support, coal and gas power plants are under construction as they can easily have impact in terms of generation capacity. In order to avoid indiscriminate energy development and pursue a sustainable development direction, this study suggests a 'program supporting non-grid connected and regionally distributed solar energy' and a 'program to create an environment for developing smart grid' in Myanmar.

For Vietnam, where final energy demands are surging and energy basic units are gradually increasing due to rapid industrialization, this study proposes a 'program to design an energy-saving system through management of demands and to enhance capacity for operation.' It is expected that the program would be helpful for the Vietnamese government to acknowledge how urgent the energy efficiency issue is and to implement related programs and measures in the country to efficiently save energy. Lastly, the study suggests ① active participation of and interests from governments in emerging countries, ② convergence with other development

goals and policies, ③ guaranteeing participation of local residents and organizations, ④ policy supports and capacity building as part of the success factors for expansion of effective energy supply in emerging countries.