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A PROPOSAL FOR NEW MECHANISM TO FACILITATE CARBON-FREE TECHNOLOGICAL DEVELOPMENTS FOR CLIMATE CHANGE

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Overview

It is widely recognized that while there are many ways to reduce greenhouse gases (GHGs) it is necessary to introduce new clean energy technologies in order to have sustainable development. Many countries, including developing countries, recognize importance of technological developments for mitigating GHGs in the future. For example, Asia Pacific Partnership on Clean Development and Climate Change has been established by 6 countries (USA, China, Japan, Australia, South Korea, and India) recently to promote various clean energy technologies.

However, there has not been any international mechanism to give incentive in large R&D projects, as many energy markets are under liberalization. Besides, under the current Kyoto Protocol, there is no system to provide credit to R&D projects.

The paper outlines new proposal for international cooperation to promote carbon-free energy technologies for post-Kyoto era. Instead of individual CDM/JI projects, this approach is intended to provide carbon credits to international demonstration projects of carbon-free

Technologies, such as advanced nuclear reactor and carbon capture and storage (CCS). Through this approach, large transaction costs of CDM/JI and political uncertainties could be avoided and technological developments will be stimulated.

Methodology

First, we survey various legal documents related to Kyoto Protocol, especially the Marrakesh Accords, which outline conditions to provide incentives for climate change mitigation technologies. Based on that survey, we will explore possible incentive mechanisms under the Marrakesh Accords for research and development projects. This paper will investigate the following issues; (1) stage of R&D projects (pilot, demonstration, commercialization), (2) technology (CSS, advanced nuclear reactor, renewable, innovative energy efficiency technology), (3) target countries (ANEX I, developing countries, non-member industrialized countries), (4) sources of fund (government, private sector, donor organization).

Possible incentive mechanisms are the following: (1) short term credit to R&D investment (like tax incentives, developers can receive certain carbon credit in order to reduce financial risks) (2) carbon reduction credit for successful demonstration (developers can receive carbon credit based on estimated carbon reduction if demonstration project is successfully developed) (3) license carbon credit for commercialized carbon free technology (like a commercial license fee, developers can receive certain percentage of carbon credit from future licensed parties).

Results

The paper will quantify the effects of three different mechanisms described above, and compare those mechanisms with current other carbon credit systems. Through this analysis, we will conclude the feasibility of such incentive mechanisms for carbon free technologies.

Conclusion

While CDM/JI systems have been introduced to facilitate GHG reduction measures, few examples were found to utilize such systems to facilitate R&D projects. For those who want to develop carbon-free technologies, current international scheme does not provide enough incentives. We found that it is possible to develop such incentive mechanisms to facilitate carbon-free technological developments. Therefore, we believe such systems should be considered by member of parties to be included as a new incentive mechanism to facilitate carbon-free technologies.