

Feasibility and sustainability analysis for establishing a renewable energy source (RES) -based energy system of future Korea

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The world is facing energy problems related to unstable energy prices, dependency on energy imports and greenhouse gas (GHG) emission because of indiscriminate use of fossil fuel. 'Renewable energy' is taken into account a new energy resource to overcome these energy related problems.

In this paper, we analyze renewable energy source (RES) -based electricity system of future Korea under varying scenarios. We also evaluate sustainability of the designed systems from the viewpoint of economic, security and environmental impact. Upon the generated scenarios, we then combine the systems with practical strategies for encouraging different renewable resources (wind, PV, biomass and waste). We finally analyze the impacts of RES-based system with various criteria: the total required cost, the dependence on imported energy, CO₂ emission, land use, and energy efficiency. We also identify strength and weakness of the analyzed systems and provide relevant recommends for establishment of a sustainable energy system in Korea.