

Cost and robustness analysis of the Korean government's renewable energy plan under varying scenarios

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In the ongoing global warming era, increasing the share of renewable energy systems (RES) in the energy portfolio has been a goal for many governments around the world. South Korea is not an exception and has employed numerous policy measures to promote adoption of RES. The latest renewable energy plan is one of those measures in which the target shares of RES are set for the coming decade. This study proposes a new mathematical model for assessing the total costs associated with installment, operation, and disintegration of the RES. The proposed model is applied to examine the Korean government's latest plan in terms of the four major RES—solar PV, wind power, biomass energy, and fuel cell power. Sensitivity analysis is also conducted to evaluate robustness of the plan with respect to changes in the price of fuels and CO<sub>2</sub> emission. The results illustrate contribution of various types of costs for implementing the plan and provide insights on numerous issues including key areas of research for minimizing the costs.