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The renewable power market

Renewable power sources have drawn considerable attention in recent years, covering the generation of electric power with the use of input fuels and including wind, solar, geothermal, tidal and hydroelectric power. The motivation for investigating these power sources is the diversification of energy sources beyond fossil fuels and nuclear power, as well as the drive to reduce emissions. Wind power generation alone increased roughly 40 percent from 2008 to 2009 in the United States. This growth has been spurred by diversification and greener energy, along with the use of government subsidies and incentives for investment.

Unfortunately, times have not always been ideal for this type of investment. There are many solar and wind sites that were developed in the 1970s and 1980s that have since been abandoned, leaving behind eyesores. In the study, "An Exit and Entry Study of Renewable Power Producers: A Real Options Approach," K. Jo Min, Chenlu Lou and Chung-Hsiao Wang examine the exit and entry decision-making process of this industry. Min is an associate industrial and manufacturing systems engineering professor at Iowa State University, Lou is a Ph.D. candidate at Iowa State and Wang is a financial engineer and model analyst for Louisville Gas and Electric Co. and Kentucky Utilities Co.

They determine critical threshold values, such as the optimal operations and maintenance cost to exit and the maximum initial operations and maintenance cost to enter, with respect to various parameters such as electricity price and renewable site capacity. Furthermore, their insight provides valuable input for government policies, including subsidies and penalties with respect to some key parameters such as the initial investment and exit fee.

Using a real options approach to model the decision problem, the authors identified some key findings. For example, an exit fee imposed by the government will help prevent premature exits from a renewable energy site. It is also expected that shifting subsidies from the initial investment possibly to cover some of the lifetime O&M costs can extend the economic life of these investments.

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