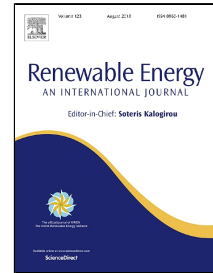


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The effect of Research and Development incentive on wind power investment, a system dynamics approach

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1           **The effect of Research and Development incentive on wind power**  
 2                                   **investment, a system dynamics approach**

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5       **ABSTRACT**

6       Due to high and unstable fossil fuel prices, air pollution arising from conventional power  
 7       plants, and the need for higher levels of energy security, the necessity of using renewable  
 8       energy, especially wind power have increased. But barriers such as high investment cost and  
 9       uncertainty in generation, limit the participation of investors in this respect. Therefore,  
 10      different incentives have been considered to speed up the development of renewable energy  
 11      units. Most of these incentives focus on compensating the high investment cost and  
 12      uncertainty in the future revenue of these units. On the other hand, this paper proposes a new  
 13      approach based on supporting research and development activities to reduce the investment  
 14      cost of wind units. Accordingly, a fixed amount is paid to the wind units proportional to their  
 15      installed capacity but they should spend this fixed amount on research and development  
 16      activities. These activities lead to lower construction costs due to technology maturity.

17      In order to study the performance of the proposed incentive, the long-term behavior of  
 18      electricity market was simulated by a dynamic model followed by a sensitivity analysis to  
 19      investigate the effect of different factors. The results indicated the effectiveness of the  
 20      proposed incentive compared to other known incentives.

21      **Key words:** Electricity market, capacity investment, system dynamics, wind units,  
 22      investment incentive, research and development.

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