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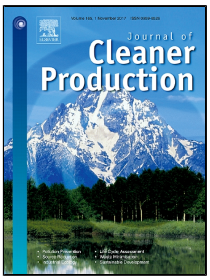

The Hidden Costs of Renewables Promotion: The Case of Crop-based Biogas

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Abstract

This paper finds that specific characteristics of bioenergy investments – namely long times to build, relatively high variable costs, and the managerial ability of corrective actions during the project – help bioenergy producers to respond to market uncertainties. This effect is shown to compromise the economic effectiveness of bioenergy policies. The paper compares the effectiveness of financial and regulatory incentive programs aiming to stimulate production of crop-based biogas. A stylized stochastic real-options based investment model is developed to analyze the investment behavior of biogas producers under alternative policies. The model is solved by a numerical approach combining stochastic simulations and the genetic algorithm technique. Unless bioenergy schemes account for structural characteristics of the bioenergy industry, they will tend to encourage investments in unused production capacities. This would cause additional welfare costs and benefit mainly crop producers.

Highlights:

- Impacts of investment characteristics on bioenergy policy effectiveness.
- Crop-based biogas as an example.
- Overinvestment bias at higher uncertainties due to project characteristics.
- Crop producers as the major beneficiaries of bioenergy schemes.
- Comparative economic efficiency of regulatory policy instruments.

Key words: bioenergy policy, crop-based bioenergy, biogas, investment, welfare costs.