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Cost-benefit analysis of agricultural waste recycling in Taiwan

Esher Hsu

National Taipei University, Taiwan

Along with the development of circular economy, the waste recycling of agriculture in Taiwan has received much attention. Major recycling types of agricultural waste including energy recovery and compost which can not only reduce waste pollution, but also create economic benefits. However, the cost efficiency of agricultural waste recycling has been argued in Taiwan. This paper intends to evaluate the feasibility of recycling agricultural waste in Taiwan through cost-benefit analysis of different recycling types, and further provides policy suggestions of recycling. The study results show that the cost of energy recovery of agricultural waste is about twice of the benefit for biogas power plant in Taiwan; whereas, compost recycling has relative low cost but the quality of compost is unstable for fertilizer use. Moreover, high investment costs of biogas power generation equipment and relatively low of the grid-connected electricity price could not provide investment incentives for energy recycling of agricultural waste which thus reduces recovery efficiency of Taiwan's waste energy recycling. Study results suggest that (1) adjusting the FITs of biogas power generation to compete with other renewable energy, such as solar photovoltaic to increase the energy recovery efficiency, (2) improving the quality of compost through technical reform to increase recycling efficiency of compost.

Recent Publications

1. Hsu E., Kuo CM. (2017) The Energy Recovery of Livestock Waste in Taiwan. In: Zhang L. et al. (eds) Energy Technology 2017. The Minerals, Metals & Materials Series. Springer, Cham. 2017: 123-129.
2. Hsu, Esher, Wan-Tzu Chang, Chin-Yu Chen (2016). An Application of EM and MCMC for Multi-source Incomplete Time Series Data. Journal of Statistics and Computing, 17:1-21.
3. Hsu, Esher (2015). A Policy Simulation of the Impact of Increases in Both Gasoline and Electricity Prices on the Agricultural Sector - An Application of Energy Consumption Survey Data. Survey Research-Method and Application, 33:33-70.
4. Hsu, E., and Kuo, C.-M. (2014) The Estimation of Waste Packaging Containers Generated by Households in Taiwan. EPD Congress 2014. PA, USA: TMS. 2014: 595-601.
5. Hsu, Esher and Wolf, Wolfgang (2013). A simulation study for the impact from rising world cereal prices on agricultural sector in Taiwan and responding countermeasures. International Journal of Innovative Management, Information & Production (IJIMIP). 4(2),17-33.

Biography

Esher Hsu is an associate professor at National Taipei University in Taiwan. She specializes in sampling survey, environmental statistics and agricultural policy. She has participated in several projects on solid-waste recycling funded by the EPA in Taiwan and has developed a Taiwan Agricultural Policy System (TWAPS) funded by the Council of Agriculture in Taiwan. Now her research focuses on waste recycling and renewable energy.

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