

Transdisciplinary Framework for Selecting Waste to Energy Technologies

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Abstract. Public administrators face the challenge of valuating waste to energy projects in a comprehensive fashion. The academic literature is fertile in methods involving technical, environmental, and financial independent valuations or combinations but scant regarding all stakeholders (financial institutions, government, citizens, entrepreneurs, health care system, among others) in a sustainable framework (economic, social, and environmental). Appropriate waste selection to energy technologies for a given region is paramount to enhancing economic development through alternative energy generation, public health improvement, and better living standards, among others impacts. Genichi Taguchi's loss function inspires this article. He computed a comprehensive quality cost function for society (manufacturer and customer). By expanding this idea in a transdisciplinary form, the valuation of waste to energy technologies must include all stakeholders, not only technological implementation costs (factory set-up and management) but also the impacts to the society at large such as the value of the energy generated, environmental gains by landfill savings and use (reduction of levels in current fields and impacts in real state value), impacts to public health cost, among others. The contribution of this work is twofold a) A transdisciplinary waste to energy economic valuation framework and b) an illustrative instance to show the mechanics of the framework in public decision-making.

Keywords. Decision-making, economic valuation, Taguchi loss function, sustainability, transdisciplinary analysis, waste to energy technologies

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