Waste to Energy in Circular Economy: Social Acceptance and Perceptions

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Introduction

Energy is one of the most important inputs to economic and social development.

Energy sector is primarily responsible for environmental pollution, as almost 95% of air pollution is due to the production, transformation and use of conventional fuels (EPA, 2017). The supply of sustainable energy is one of the main challenges that the planet is facing.

The increasingly urgent problem of climate change has focused attention on renewable energy, waste-to-energy (WtE), and combined heat-and-power (CHP) to reduce greenhouse gas emissions while bringing other sustainability benefits. Any technological solution of waste to energy should be accepted by the society prior to its implementation.

In January 2017, European Commission published guidelines on the role of waste-to-energy in the Circular Economy. European Parliament has played a key role in supporting the EU's transition to a Circular Economy (European Commission,2015). Several national policy documents support the transition to a Circular Economy and National Waste Management Plans towards meeting the EU's 2020 targets.

Material and Methods

This study aims to shed light on the features of waste-to-energy systems and their role in Circular Economy and to explore the levels of social acceptance.

The study is based on published papers and reviews, discussing societal and public perceptions of waste-to-energy, including highlights of the interdisciplinary and three-dimensional approach (socioeconomic, local, and market).

Three dimensions of social acceptance were examined in this study: public (socio-political), local community and market acceptance, inter-connected, and affecting each other.

Results and Discussion

Fears, caused by lack of information, knowledge, and environmental concerns on the emissions, often lead to conflicts, resistance, and low acceptance of such projects. The attitude which, a local community adopts the notion, is more dependent on its specific characteristics, plant's size and location, than on functional characteristics of the technology.

The study resulted that for the deploying of waste-to-energy, it is important to have clear insight into what would be done for enhancing the social implications, at various levels (Alasti,2011). These levels are the following:

- *Project planning and development level*

Social acceptance needs to be considered by the developers of the project, as well as related local and regional government policy makers. Involvement of the local community in planning and development, or even (co-)ownership, may lead to higher social acceptance.

- *Higher policy-making level*

Policymakers must consider social acceptance as one of the determining factors in the predictability of investments. Social acceptance levels may be influenced through for example information and transparency rules, campaigns, and support mechanisms.

- *Public level*

Social acceptance of waste-to-energy projects by the public is essential to the political legitimacy of the bioenergy industry, and the willingness of policy-makers to introduce or maintain such supportive policy schemes. The complex and multi-faceted supply chains of waste-to-energy projects call for careful consideration of sustainability issues and well-thought-out regulatory frameworks.

- *Local level*

The attitude which a local community adopts towards a waste-to-energy unit is more dependent on the characteristics of the specific local and wider society at state level than on the technology applied or its functional characteristics.

- *Investors level*

Waste-to-energy investments should be driven by technological analysis. Experts are the key persons who can provide new information to policy makers and public in order to enhance social acceptance.

Conclusions

Efforts are needed on waste-to-energy technologies, resources, and systems' spreading information, integrating policies, and implementing strategies, with focus on sustainability.

It is important to have clear insight into the specific elements that such as:

- awareness of climate change and knowledge of the technology,
- fairness of the decision-making process,
- costs, risk and benefits of a technology,
- characteristics of the local context,
- trust in decision-makers and other relevant stakeholders.

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