Biogas at the Crossroads of Energy Transition and the Circular Economy: Opportunities and Obstacles



DOI reference: 10.1080/13673882.2020.00001060

By Sebastien Bourdin, EM Normandy Business School (France) Metis Lab, Department of Regional Economics and Sustainable Development, France

National, European and international institutions now consider energy transition as unavoidable (UNO, 2018). The European Commission's latest report on economic, social and territorial cohesion (2017) underlines the need to fight climate change and bring about an environmental transition notably through the

development of renewable energies. With relation to this, the Europe 2020 Strategy sets specific goals: (i) reduce greenhouse gas emissions by 20% compared with the levels in 1990, (ii) increase the share of renewable energy to 20 % and (iii) increase energy efficiency by 20% compared with the energy consumption forecast for 2020. A strong energy transition is, therefore, in high demand.

The biogas: local production and consumption of energy using regional resources

Anaerobic digestion (production of biogas), like the other sources of energy, is nevertheless subject to controversy, especially from a socioeconomic perspective with positive and negative consequences. First, anaerobic digestion has several advantages for different stakeholders. It enables local authorities to recycle biomass waste and produce (i) electricity, which can then be used for public lighting for example or (ii) to heat the water in a community swimming pool, or to heat a city hall or a school. It therefore enables the operating costs of public administration to be reduced. This is an important argument in a context of strong tension with respect to local authorities' budgetary restrictions. The same is true for the industries where anaerobic digestion is helping firms to lower their energy bill and the cost of waste treatment. From this perspective, anaerobic digestion enables the local production and consumption of energy using the region's resources, and can, thus, be considered as a form of circular economy and decentralized production of sustainable energy.

Furthermore, as anaerobic digestion plants rely on local biomass resources, they favor the local rooting of the economy more than other firms do. They also participate in the embeddedness into the life of rural communities by creating employment at local level. Guenther-Lübbers et al. (2016) analysed the effects of the increase in production of biogas on employment and the value added in rural areas of Lower Saxony, and identified a significant, positive impact of anaerobic digestion on the studied regions. For farmers, it provides additional, stable income, it enables heat autonomy in a context of the increasing cost of fossil fuels, and encourages a decrease in the purchase of fertilizers as it valorises digestants.

Problems posed by the deployment of biogas units

There are nevertheless also socioeconomic disadvantages of anaerobic digestion,

especially the fact that it often arouses fear among local inhabitants and local public opinion (Capodaglio et al., 2016 ; Bourdin et al., 2019). Indeed, despite the fact that the local population interviewed often agrees with the principle of a need to fight climate change at local level, it is often not ready to welcome facilities meant to do this on its territory, let alone when they are located near their homes. The refusals expressed by local populations and associations of inhabitants of the regions welcoming anaerobic digestion projects are most often focused on questions relating to: (i) stench and noise impact, (ii) congestion of roads due to trucks carrying raw materials to the biogas plant or (iii) the issue of the drop in value of the properties located close to the biogas plant.

From local opposition to an understanding of the territorial governance of biogas

The territorialisation of energy projects – such as those linked to anaerobic digestion – requires fresh social compromises (Fournis and Fortin, 2017) as a large majority of the population is in favour of energy transition, but not always in favour of what it involves. Our studies (Bourdin et al., 2019; Bourdin and Nadou, 2020) confirm the idea of the importance of the territorial governance of biogas projects as a key success factor. Territorial governance is by nature complex and involves mobilising relations of proximity in order to foster the coordination of very different groups of actors and prevent some of them from leaving the territory (exit), prevent impeding or obstructive confrontation (voice). In our research, we showed that the projects are contingent on the territorial context.

Negative externalities linked to the production of biomass energy are mainly local, and affect the direct individual wellbeing of the inhabitants, but they are also reversible. These externalities can be minimized through education, consultation and choosing a ‘safe’ location. Even if dialogue with the inhabitants does not necessarily imply a joint decision, involving local citizens in the project design stage can help to develop trust and prevent a feeling of injustice. Explaining how the project will be rolled out and its likely impact is important in boosting acceptance. Whatever the situation, ignoring citizens’ concerns regarding the visual impact, the impact of noise and/or smell and potential risks – whether sanitary or industrial – is not the solution, and is often a source of increased tension.

Accompanying the deployment of the energy transition: the need for local

fairness

Overall, objections to biogas plants can be lessened by the fair distribution of the benefits renewable energy facilities can offer. This “local fairness” can take many forms. A reduction in local taxes linked to an increase in the municipal authorities’ tax revenues, a reduction in the cost of electricity for local residents, damages for home owners living near a facility, partial or total ownership of a project by citizens or community groups who distribute the benefits, and tightening the law to prevent such green facilities from being set up too close to housing. At the same time, the financial benefits should not be used to mitigate the potential (sanitary and land-related) risks generated by biogas plants. These issues need to be discussed irrespective of the financial benefits.

References

Bourdin, S., Colas, M., & Raulin, F. (2019). Understanding the problems of biogas production deployment in different regions: territorial governance matters too. Journal of Environmental Planning and Management, 1-19.

Bourdin, S., & Nadou, F. (2020). The role of a local authority as a stakeholder encouraging the development of biogas: A study on territorial intermediation. Journal of Environmental Management, 258, 110009.

Capodaglio, A., Callegari, A., & Lopez, M. (2016). European framework for the diffusion of biogas uses: emerging technologies, acceptance, incentive strategies, and institutional-regulatory support. Sustainability, 8(4), 298.

Fournis, Y., & Fortin, M. J. (2017). From social ‘acceptance’to social ‘acceptability’of wind energy projects: towards a territorial perspective. Journal of environmental planning and management, 60(1), 1-21.

Guenther-Lübbers, W., Bergmann, H., & Theuvsen, L. (2016). Potential analysis of the biogas production–as measured by effects of added value and employment. Journal of cleaner production, 129, 556-564.