STAKEHOLDER INCLUSION IN THE GOVERNANCE OF INNOVATION: THE CASE OF BIOMETHANE PRODUCTION IN GERMANY

Hyunjin Park

hpark@atb-potsdam.de

Leibniz Institute of Agricultural Engineering and Bio-economy, Max-Eyth-Allee 100, 14469 Potsdam

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Hyunjin Park[1]

Abstract

Innovative technologies for biomethane production that use agricultural residues and waste can contribute to methane emission reduction in agriculture and the expansion of renewable energies. Since the introduction of a greenhouse gas quota in Germany that requires mineral oil companies to reduce their greenhouse gas emission, biomethane produced from residues has received growing attention. Simultaneously, the planning and construction of biomethane projects have triggered resistance from the affected stakeholders such as residents and environmental groups. We analyzed local newspaper articles, policy documents, and statements from citizens' initiatives to identify the constraints to stakeholder inclusion in local biomethane governance. We employ a multiple case study approach, which deals with two biomethane plant projects in Brandenburg and Lower Saxony. The findings of the study show that climate, environmental, and energy regulations shape the economic and political interest of the powerful stakeholders and hinder the coordination of stakeholders, sectors, expectations, and interactions over temporal scales, which resulted in compromised inclusion of local stakeholders and their concerns.

Keywords

Biomethane, inclusive governance, networks of action situations, network analysis, biogas

1 Introduction

Biomethane, methane generated from biomass, can be produced by purifying biogas (ABDALLA et al., 2022). With the strengthening of the greenhouse gas quota on transport fuel in Germany, demand for biomethane produced from manure, which has a favorable greenhouse gas value, has been steadily increasing. Furthermore, since the gas crisis induced by Russia's attack on Ukraine, the contribution of biomethane to energy security has been highlighted. Since a few years ago, there have been several biogas plants and biogas upgraders to biomethane in the planning and construction phase in Germany and the EU, which aim to produce biomethane for transport fuel purposes. Although there are opportunities for public participation in the decision-making process of an energy project in Germany that are legally guaranteed, stakeholders' dissatisfaction with the local biomethane project governance has been evident. In the literature on biogas and biomethane projects, the barriers to inclusive governance have been mostly analyzed at the local level with a focus on the interactions between operating companies and residents only, although an energy project is governed by a diversity of institutions at multiple levels. In the energy transition literature, the focus is often on the points of exclusion, the effect of (different forms of) participation, and drivers of participation, but less often on the root causes of exclusion (SIMCOCK, 2016). We aim to close the research gap by studying the multilevel and polycentric governance arrangements in large-scale biomethane plants in Germany and identify constraints to inclusive governance of commercial biomethane project planning and implementation.

[1] Leibniz Institute for Agricultural Engineering and Bioeconomy, hpark@atb-potsdam.de

2 Study design

2.1 Study case: two biomethane projects in Germany

This article is based on the investigation of two case studies of biomethane projects in Karstädt, federal state Brandenburg and Friesoythe, federal state Lower Saxony, in Germany. The two cases were carefully selected as they show similar results (i.e., dissatisfaction about the inclusion of stakeholders in the decision-making process) (YIN, 1989). They deal with a large-scale biomethane plant project, and the project developers and the authorities showed a high willingness to engage stakeholders.

2.2 NAS and inclusive governance

We draw on the concept of networks of action situations (ASs), which is the networks of "events, venues, or physically interdependent instances of decision-making" (KIMMICH, BALDWIN, et al., 2023, p. 11). The NAS approach is especially useful in our study context, as it can reveal the interdependency of multiple decision-making situations that shape interactions of actors and governance outcomes (KIMMICH, EHLERS, et al., 2023). We apply the lens of inclusive governance to the networks of ASs approach in order to identify how different decision-making situations shape the inclusivity of local-level biomethane project planning and implementation, which is the "focal" AS of the study. We consider the following working components of an AS: actors, rules, and outcomes. We identify a connection between ASs if an outcome of an AS influences another AS.

2.3 Data collection and analysis methods

We found regional newspaper articles, reports, and gray literature that dealt with biomethane projects at the local level with a keyword search. A total of 262 articles for the two cases were retrieved and analyzed. We identified ASs, their working components, and linkages to other ASs presented in the articles. The linkages recorded in a Microsoft Excel format were converted to network graphs by using the network analysis and visualization software *gephi*. The collected data was also qualitatively analyzed with ATLAS.ti to identify the constraints to inclusive governance, their causes, and strategies to address them. Statement of stakeholder groups, documents for project approvals, and public announcements complemented the qualitative analysis. In addition, the first author attended a conference in 2023 in Potsdam, Germany, where the Shell project was presented.

3 Data collection and analysis methods

We found that higher-level regulations such as energy, climate, and environmental regulations have an influence on the multiple ASs including approval decisions made by authorities, biomethane operators' decisions as well as public participation process. High awareness of climate and environmental problems, corresponding to multiple policy targets, combined with technology-focused approaches in the regulations, compromises the inclusion of residents and their concerns about the biomethane projects. Next, the regulations do not sufficiently facilitate coordination between different sectors and stakeholders such as livestock holders, existing biogas producers and users of agricultural residues. Furthermore, the regulations do not ensure the interaction between key ASs such as biomethane project implementation and public participation after the approval process is concluded. The results point towards several coordination gaps to be filled: (i) coordination between the authority and citizens' initiatives and NGOs (ii) coordination between current and future users of feedstock, (iii) coordination of the interactions across temporal scales and (iv) coordination of expectations about biomethane project and public participation process.

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