

Social acceptability of biogas plants: Perceptions of local stakeholders and exploration of the potential for territorial compensation. Two case studies in the Hauts-de-France

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INTRODUCTION

- **Energy transition.** European countries have significant biomass potential for biogas production, particularly France (EEA, 2023).
- Despite its potential to contribute to renewable energy targets, **biogas plant projects** often face local opposition due to concerns about odors, increased traffic, and visual impacts (Capodaglio et al., 2016; Zemo et al., 2019).

CONCEPTUAL FRAMEWORK

- **Social acceptability** is the complex product of interactions between social norms, individual perceptions, and collective negotiation processes (Fournis and Fortin, 2017; Evensen et al., 2018).
- In France, developers implement compensatory measures to protect the environment, ensure social justice, and enhance social acceptability (Kermagoret et al., 2014). This "socio-environmental compensation" aims to internalize the negative externalities of public utility projects (Gobert, 2010). **Territorial compensation** better reflects local, natural and cultural dimensions, shaping stakeholder expectations and supporting the territorial integration of projects (Bell et al., 2005).

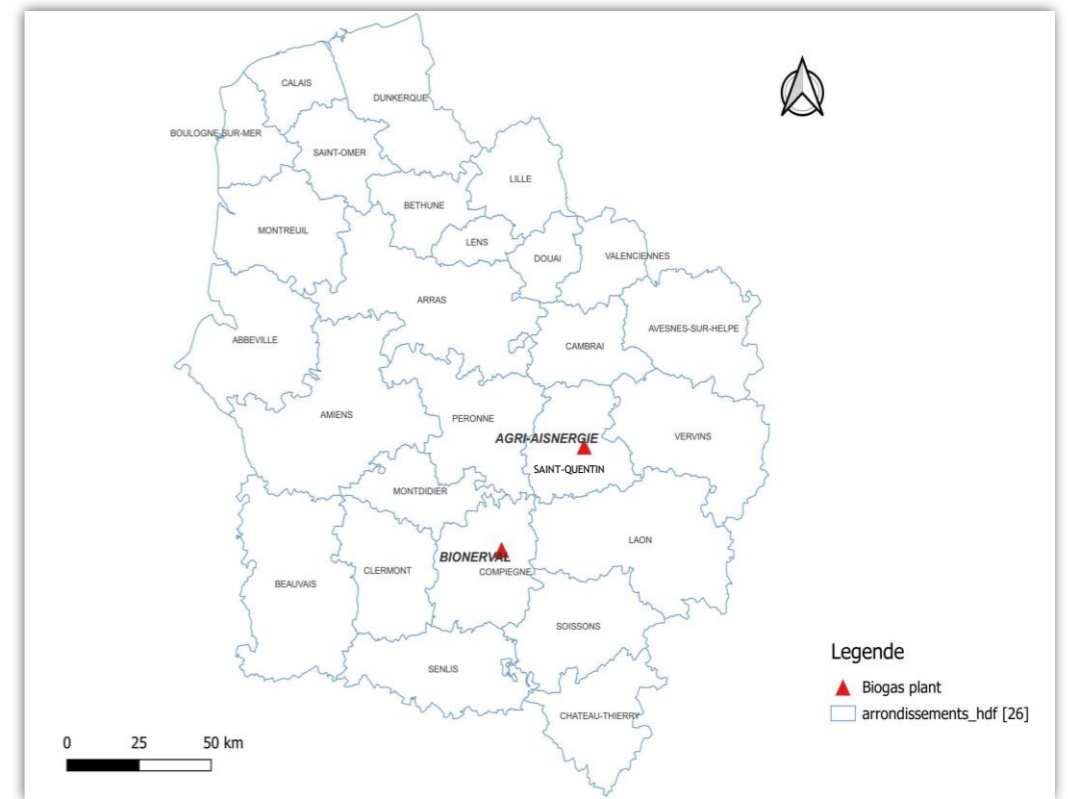
RESEARCH QUESTIONS

- What are the factors of social acceptability identified in each case study?
- How is the concept of compensation perceived by local stakeholders in each case?

METHODOLOGY AND FIELDWORK

- **Bionerval.** An industrial project led by ReFood where biogas from waste is used in cogeneration, with electricity fed into the Enedis grid.
- **Agri-Aisnergie.** A collective project led by three farmers where biomethane from agricultural waste is injected into the GRDF gas network.
- Methodology: **22 open-ended interviews** and **content analysis.**

Figure 1: Location of case studies



FINDINGS

CATEGORY	Factors	Bionerval	Agri-Aisnergie
SOCIAL PERCEPTION	Environmental and health concerns	Intense and frequent odors raise concerns about potential impacts on human health and the environment.	Concerns have been expressed about land-use competition and potential tensions between agricultural activities and energy production, as well as increased road traffic.
	NIMBY syndrome	Biogas production is accepted in principle, but its implementation is considered incompatible with proximity to residential areas.	The local population demonstrates either support or neutrality toward the plant.
	Previous experience	Comparisons with past experiences in the chemical industry and previous incidents reinforce doubts about the plant's potential impacts.	A preference was expressed for the biogas plant over the wind power project, due to its perceived lower visual impact on the local landscape.
	Relationship with the plant manager	The local population is unaware of who owns or manages the plant.	The manager is originally from the municipality and lives there; she is well known by the local population for her open and sociable personality, as well as for her former role as a municipal councilor.
PLANT CHARACTERISTICS	Territorial compensation	Some express outright opposition, others seek further information, and a portion demonstrate passive acceptance.	Mixed responses ranging from rejection due to low perceived impact, to indifference, to conditional acceptance when aligned with operational constraints.
	Location	The plant is located just a hundred meters from the residential areas, which explains the intensity of the odors perceived.	The plant is hidden by vegetation and situated in an area where a wind energy project is also implemented.
PLANT GOVERNANCE	Benefits	Job creation is not perceived as a major impact compared to other issues.	The plant provides financial stability to its owners, especially since the agricultural crisis of 2016.
	Information and communication	No consultation with residents was organized before the plant was established, the complaints raised were ignored, and residents were not invited to the annual meetings.	Organization of annual open house days.
	Management strategy	The biofilter was installed after several years of the plant's operation. This delay was accompanied by changes in management and unfulfilled promises.	The plant benefits from the support of GRDF and the Chamber of Agriculture.

Table 1: Main results

CONCLUSION

Beyond implementing basic technical measures before the project's launch, it is essential first to clearly explain the project's nature and all its associated impacts to the local community. This ensures that they can make an informed opinion about the project and assess the need for, or express their preferences regarding, options such as territorial compensation.

FURTHER RESEARCH

- Address sample representativeness.
- **Compare** the social acceptability factors identified in the case studies with those found in the international literature.
- Explore in detail the drivers of perception through **fuzzy cognitive mapping.**
- Investigate stakeholder **preferences** on territorial compensation.

INSTITUTIONAL INFORMATION

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