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Understanding the problems of biogas production deployment in different regions: territorial governance matters too

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Abstract

Despite the climate emergency, there is still no consensus on renewable energies, which have to confront forms of social opposition that may well affect the success of any project (especially wind energy and biogas). We propose an original analytical framework to go beyond the nimbyist approach, combining the proximity theory and the exit-voice model. This enables us to examine the thinking adopted by biogas production stakeholders and the ensuing associations in order to identify and understand the obstacles to the development of joint biogas production projects. Taking further other theories that highlight the importance of place attachment and place identity, we show that the challenges linked to a project's territorial governance can explain conflicts that may lead the project initiators to abandon a biogas plant's construction. We show that considering the local residents' interests and including them in the participative procedures are not the only factors that count, but also, more generally, coordination between all of the stakeholders. Our paper also highlights the need for an intermediary actor to play the role of facilitator in organising different types of proximity.

Keywords

Conflicts, cooperation, anaerobic digestion, territorial governance, proximity

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Introduction

There is overall consensus in the literature regarding the need for energy transition and, above all, the need to support it from a societal point of view (Davidson & Gross, 2018). In effect, while we might expect widespread support for renewable energy sources, the reality appears to be more complex. Finding new locations for environmentally friendly infrastructural facilities is not an easy task and a NIMBY (Not-In-My-Backyard) social resistance syndrome often feature alongside such efforts. Everybody wants to live in a nice place, but nobody wants to bear the associated cost. In the context of renewable energy, this widely discussed concept refers to a certain attitude by the population that supports renewable energy at global, national or regional level, but not at local level. The NIMBY concept has been the subject of widespread criticism, denounced as being over simplistic and inappropriate in the quest to understand the real reasons for resistance to such projects (Devine-Wright, 2005; Wolsink, 2006). The current literature has highlighted the concept of “place attachment”, which designates an emotional and symbolic bond that unites individuals with their neighbourhood (Devine-Wright, 2009) to explain any local opposition. Whenever such projects are located near residential areas, people frequently reject them. We also find more radical attitudes known as the BANANA (Build-Absolutely-Nothing-Anywhere-Near-Anyone) concept, when every type of construction is refused (Greenberg, 2014).

Despite the fact that there is a wide body of literature on the issue of the social acceptability of wind turbines (Fortin and Fournis, 2017), there have been very few studies on biogas production, despite the fact that its development is encouraged at both national and international level. For facilities treating organic waste for energy production, resistance from the local population has been identified as the biggest problem when it comes to siting a biogas plant. There is often an outcry from the local inhabitants who fear inconvenience from the smell (Soland et al., 2013), the risk of explosion, the increase in traffic and the loss in property value (Zemo et al., 2019). To date, there has been little research on this issue of social acceptability of anaerobic digestion (Schumacher and Schultmann, 2017), and how it affects negotiations regarding siting compromises with the concerned inhabitants, town councils and investors. Furthermore, there is no consensus in the literature on this issue. Indeed, while for Edwards et al. (2015), public exclusion in the decision-making process contributes to the development of opposition to biogas plants, Soland et al. (2013) argue that offers to participate in the process have no impact on local acceptance.

Furthermore, as Kortsch et al. suggest (2015), studies on social acceptability should not be limited to an analysis of inhabitants' attitudes to renewable energies, but should also include multi-actor analyses since the acceptance of key players and interactions between groups of actors involved in the planning and design of projects is just as important as its acceptance by local residents.

In this context, the purpose of our paper is to analyse how biogas production stakeholders reason in order to understand the obstacles and levers to its development. Proximity economics (Torre and Rallet, 2005), initially developed to deal with issues of productive coordination with the explicit integration of the spatial dimension (analysis of local productive coordination systems, the geography of innovation, firms' local embeddedness, etc.), has recently started looking into environmental conflicts of use (Torre et al., 2014), using this school of thought's underlying distinction between geographical proximity on the one hand, which deals with geographical distance, and organized proximity on the other, which deals with cognitive distance. We believe that this interpretive lens is useful to investigate why numerous projects find it so hard to reach fruition in France. Furthermore, we believe it is useful to combine this lens with the exit-voice model developed by Hirschman (1970 & 1986). Hirschman put forward an interesting typology to explore individual reactions when dealing with discontent, noting that actors may opt out, speak out, or remain loyal or apathic. The aim is to identify the deciding factors in the actors' choices, the elements that can lead the majority of them to opt for such or such behaviour at such or such a time as against another behaviour at a different time, etc. The theoretical framework of proximity helps us to understand these individual reactions by simultaneously harnessing the issue of geographical proximity (and so the related notions of location and distance) and the question of cognitive proximity (i.e., issues related to interpersonal knowledge and coordination between actors).

The theories we introduce help us to understand why the schemes have difficulty coming to fruition when promoting not only questions linked to place attachment and place identity, but also the issues linked to territorial governance of projects and coordination of the actors. Central to the concept of territorial governance, understood as a process involving different kinds of local and extraterritorial stakeholders, are two opposing but complementary and closely linked elements: i.e., negotiation and conflict. This concept is especially novel as it considers conflict and negotiation as the two main facets of governance. Conflict is viewed as an indication of the failure of governance processes but, on the contrary, as an indispensable step in the development process. Here we go

back to the idea developed by Torre (2014) according to which conflict is a form of expression for local populations that we should not attempt to eliminate.

After presenting the literature on the social acceptability of renewable energy projects on the one hand, and our analysis lens resulting from the mix of the exit-voice model and proximities on the other, we discuss the methodology applied. We then apply it to the case of biogas production projects developed in the west of France. We present our findings and end with our conclusions and some public policy recommendations.

1. Social acceptability and rejection of renewable energies

1.1. Renewable energies, local opposition and place attachment

First, we need to acknowledge that renewable energy projects are all very different, ranging from installing a photovoltaic system on house roofs to setting up large wind farms that produce several megawatts over several hectares. These projects differ in the scale of the facility, the risks they imply locally, the uncertainties of these risks, the type of ownership, the type of interest (public, private, agricultural, or a combination) and the actors involved in planning the facility. Despite these differences, renewable energy facilities have many common features that distinguish them from other energy-based facilities like nuclear power plants or oil wells. Renewable energy tends to be strongly supported by public opinion, while activities involving the use of nuclear and fossil energy, waste combustion and chemical factories encounter increasing resistance. Nonetheless, despite strong public support regarding the development of renewable energies, there is often strong opposition at local level.

Studies on the reasons for the development of local opposition essentially come to the same conclusions, namely, concerns about the impact of the facility, lack of trust in the developer and lack of opportunity for citizens to influence the project outcome (Wolsink, 2010). In most cases, the issue of social acceptability is raised (Fortin and Fournis, 2017), with people very worried about the possible impact of the facility and tending to see the project as non-environmentally friendly. The fact that projects concern renewable energies does not mean they will be automatically welcomed by everyone. In fact, lessons regarding the inclusive and participative planning processes are as important here as in the setting up of other facilities. Research shows that individuals opposed to such projects are not generally against the development of renewable energies, but they

criticize the sites selected and the way in which they were chosen and sized (Batel et al., 2013). Opposition also emerges due to a lack of consultation and involvement by local populations in the projects' development (Edwards et al., 2015). Other scholars have floated the idea of place attachment. In introducing this concept, they criticise the idea of NIMBY (Wolsink, 2006 and 2007) which is viewed as over simplistic and delegitimising individuals and groups that oppose the project, labelling them as 'deviant' and 'needing to be won over' targets rather than as conveyers of another rationality (Aitken, 2010). The NIMBY explanation is based on the notion that individuals act in a rational way and are driven by their own interests, in line with the conventional theory of social dilemmas (Olson, 1965). However, recent empirical studies have shown that actors involved in a social dilemma do not necessarily seek to maximise their individual benefits. What they find important, for instance, is the way others behave as well as the values, behavioural codes and social norms at stake. In addition, it would appear that emotions play a crucial role in individual decision-making, and these are generally far from purely rational.

With regard to the acceptability of renewable energy projects, the literature to date has emphasised the concept of 'place attachment', which describes the affective and symbolic link between individuals and where they live. Devine-Wright (2009) explains that the so-called 'NIMBY' responses should be reconceived as place-protective actions that are founded on processes of place attachment and place identity. In the case of biogas production, opposition to a specific project is often linked to the local residents who have a negative idea of anaerobic digestion, but it is also affected by the limited opportunity they have to influence the planning process. However, the literature remains unclear on the issue as, while some scholars have shown that the exclusion of citizens from a project's construction process contributes to the development of local opposition (Edwards et al., 2015), other authors (Soland et al., 2013) argue that consultation with the inhabitants in the decision-making process has no impact on social acceptability.

1.2. From local opposition to an understanding of the territorial governance of biogas production projects

Analysing the territorial governance of a biogas production project and understanding how conflict can be settled involves relying on a more general theory of coordination between actors. To this end, we adopt the exit-voice model developed by Hirschman (1970 and 1986), adding several elements to it from the school of proximity research (Torre and Rallet, 2005). The interest of this combination lies in its capacity to identify all the conceivable ways of settling conflicts related to

the setting up of a biogas plant, on the one hand, and to show what all the available solutions boil down to, depending on the situation of the actors in a specific geographical and cognitive space. This theory of proximity is closely linked to the concepts of place (spatial/geographical/social) and social identity (values, cognitive distance, etc.). From this perspective, it can be paralleled – or even interwoven – with the work of Devine-Wright (2005 and 2009) and Devine-Wright & Devine-Wright (2006) who place the notion of place attachment and place identity at the centre of their explanations.

In the case of anaerobic digestion projects, the actors' decision-making process is logically influenced by their localization (geographical proximity) and the type of relations they have with the other actors affected by the project (organized proximity). We have therefore based our work on the most recent literature on proximity economics, applied to conflict analysis between users and between neighbours (Torre and Zuindeau, 2009; Torre et al., 2014), and have used the notions of geographical proximity, which can be endured or sought, and organized proximity, with the notion of similarity and belonging (Gilly and Torre, 2000). Endured geographical proximity relates to situations where actors are burdened with the geographical proximity of people, activities, technical objects or places, without being able to move and change location. This is the case for biogas plant projects where the setting up of a plant is imposed on some inhabitants near their home. Organized proximity concerns different ways in which actors are close (outside the geographical aspect), especially cognitively. According to the logic of belonging, relations between actors are easier if they belong to the same organization or institution and sometimes have shared values. For example, cooperation between inhabitants belonging to the same association is theoretically easier to develop than if they belong to different associations or if they do not belong to any association. The logic of similarity refers to a mental adherence to shared categories. The similarity experienced is created around shared projects, identical values, shared knowledge exchanged within a network, etc., within a reciprocal relationship. This is the case of farmers, for instance, who share common values and techniques; they may be located far from one another (long geographical distance) but the cognitive distance separating them is very short as their reference systems are similar.

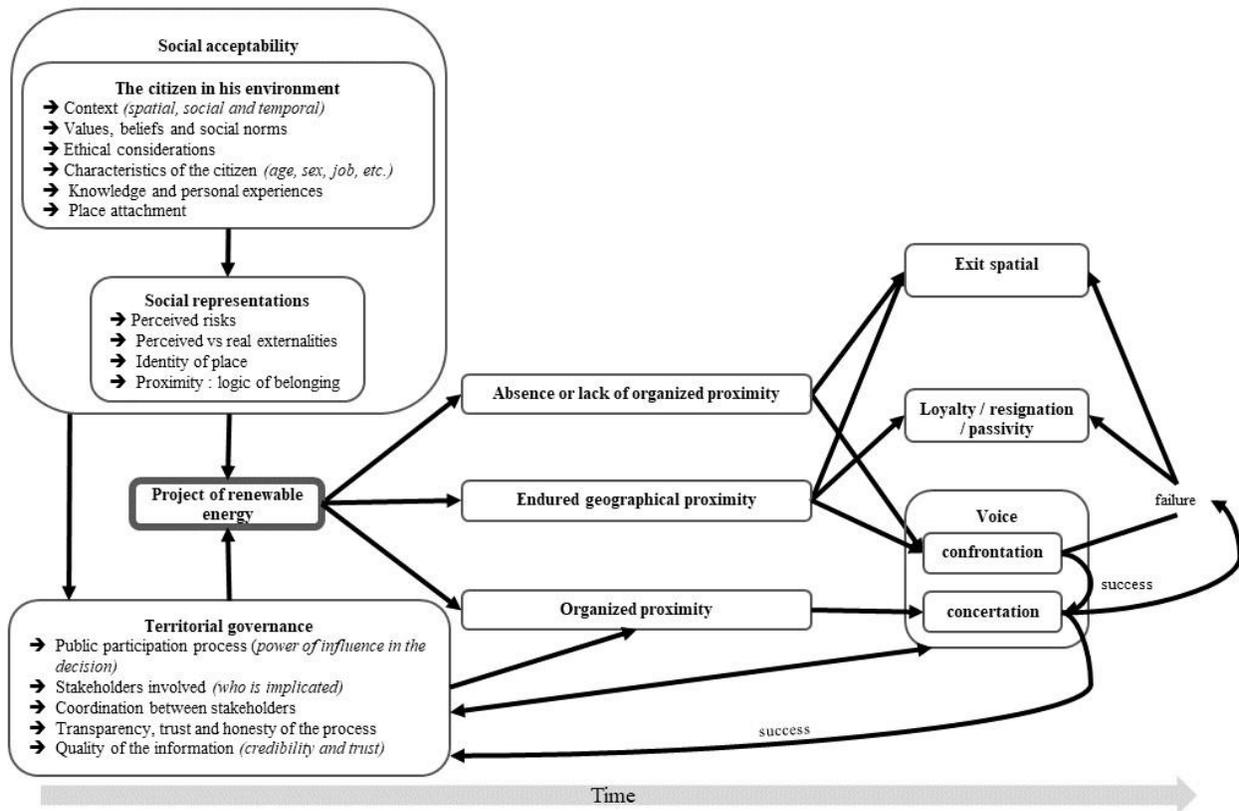
Comparing Hirschman's model and the proximity theory enables us to understand the form that conflicts and the factors explaining opposition to biogas production projects can take. When there is geographical proximity, the actors are restricted to their localization, and spatial exit is virtually

impossible. In the case of biogas production, spatial exit is made difficult by the fact that the fall in house prices linked to proximity to a biogas plant leads to the cost of opportunity to move becoming too high. In fact, the residents only choice is to make their voice heard (speaking out). Organized proximity, seen as a facilitator of relations, will have an impact on the type of voice observed. It leads to the development of attempts at consultation between the actors (voice consultation) and makes them more effective, while the lack of organized proximity invalidates this type of solution and coincides more with the development of confrontation between the actors (voice confrontation).

In the event that organized proximity between all the stakeholders is high and there is a form of belonging and/or similarity between them, the actors may resort to voice consultation. The choice of one solution over another will depend on the cost/benefit balance made by the actors and, to re-iterate Hirschman's analysis, on the members' loyalty toward the organization. The three different possibilities (exit, voice, loyalty) cannot be seen and used as equal behavioural options since they are connected to different trade-offs (change of values and behavioural costs, advancement of the project, level of the citizens' involvement in the territorial governance, etc.) as Torre (2014) pointed out. When coordination proximity is low, voice consultation is no longer effective, and the actors only have the choice between voice confrontation or spatial exit. In their research combining a survey and interviews, Kortsch et al., (2015) showed that coordination between the actors is decisive and the quality of the information delivered plays a key role in the trust given to the actors involved in biogas projects.

Our aim is thus to test the assumption according to which territorial governance matters to explain the success or failure of biogas projects. More specifically, we investigate whether involvement in the consultation process or, on the contrary, in confrontation, depends on the effectiveness of the coordination mechanisms and the degree of organized proximity that already exists. If these mechanisms fail, the actors may turn to confrontation. If, on the other hand, the mechanisms turn out to be effective, the actors will be inclined to adopt consultation, leading to greater social acceptability. This investigation is important because project stakeholders often think of the profitability of anaerobic digestion units and the technology used as key factors in a project's success, and yet the question of territorial governance also plays a major role.

Figure 1. Analytical framework to understand the success and failure of renewable projects



In the long run, the theories used in this review of the literature complement one another and help to mutually explain the complex nature of opposition to territorial governance projects and the related challenges. Figure 1 summarises the theoretical determinants resulting from the complexity of individual and collective behaviours that can evolve over time according to the territories and the outcomes of their expected impact on acceptance and protest. We thus distinguish the influence (i) of individual and collective attitudes of individuals derived from a socio-psychological approach, and (ii) the organisation of territorial governance processes.

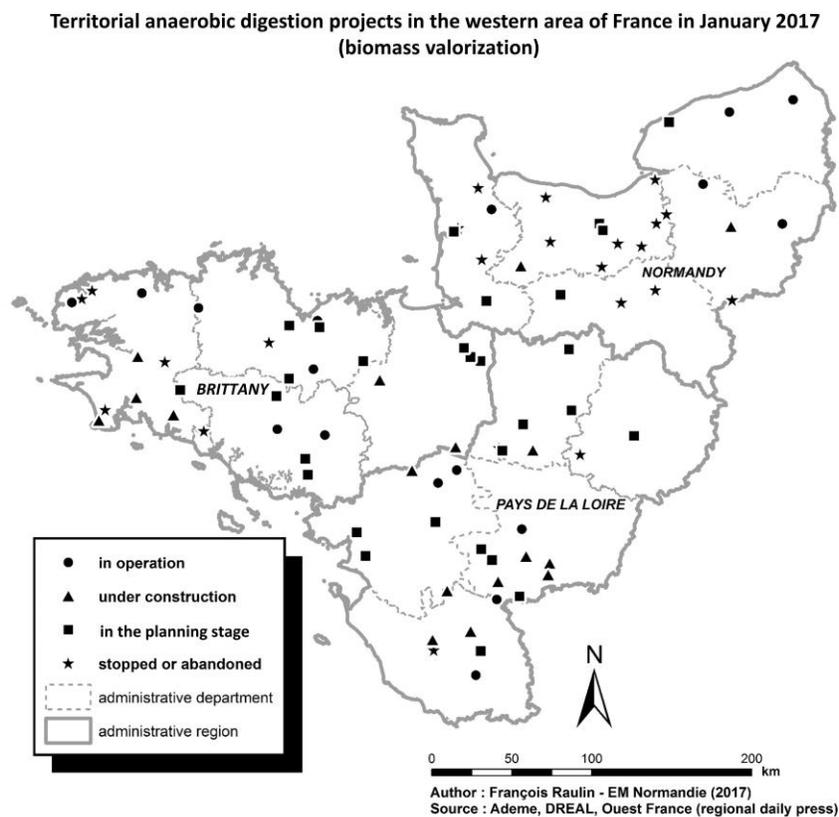
2. Methodology

Our area of study stretches across three administrative regions in France: Normandy, Brittany and the Pays de la Loire.¹ These regions are part of the French “Great West”, a geographical area

¹ These three regions make up the area of operation of the PSDR IV GO (western France regional development) research programme

characterized by agricultural production, where breeding accounts for nearly half the national turnover in this sector. Indeed, the agri-business industry is strongly represented in this area, especially in Brittany and the Pays de la Loire which are respectively first and second agri-business regions in France in terms of employment (source: *INSEE* - French Institute for Statistics and Economic Studies). Since the beginning of the 2000s, there had been 86 joint anaerobic digestion projects with partial or exclusive recycling of waste from biomass in the French “Great West” by January 1st 2017 (figure 2). Unlike ‘farm-based’ projects where one farm decides to recycle its agricultural waste², joint projects have a territorial dimension with the participation of different stakeholder profiles (farmers co-operatives, agri-business industry, “*syndicat mixte*” (joint ventures between various public authorities) for waste, citizens, elected officials, etc.).

Figure 2. Territorial anaerobic digestion projects in the western area of France in January 2017



² Even if these farmers often collect other types of waste with high anaerobic digestion capacity elsewhere to power their biogas plant

We conducted a campaign with anaerobic digestion actors between July 2016 and February 2018. The semi-structured interviews had two main aims: to identify the obstacles and levers of the project, and to examine the territorial governance by analysing the different forms of proximities between the stakeholders and their position/opinion with regard to the projects under study. The present study focused on an analysis of three of the numerous projects identified. The first project “*Coutances Agricultural High School*”, was still at the planning stage and was initiated by a school. The second, “*Percy Biogaz*”, has now ended and was led by a farmers co-operative. The third project, “*Biogaz de Gaillon*”, has been operating since 2013 and was started by a local authority together with an environmental industrialist; Percy Biogaz in Percy-en-Normandie, agreed upon and initiated by a farmers cooperative. 49 interviews³ were conducted in total. More specifically, the interviews were conducted with fourteen territorial entities (Chamber of Agriculture, ADEME, etc.), eleven local residents living near collective biogas plant, seven associations (pro and anti-anaerobic digestion), eight companies (business ventures and stakeholder), seven elected officials (mayor, president of local municipalities and member of parliament) and eight farmers (business ventures and stakeholders).

The interviews (between 45 min and 2h15) were recorded and then transcribed in order to facilitate the analysis. They were then coded through a themed analysis of the content of the verbatim using a software package to help us identify the shared and cross-sectional themes and sub-themes from all the interviews, structured around the analytical framework presented in our review of the literature. A triple coding process was used to check the validity of the coding.⁴

3. Successes and failures of projects: territorial governance and proximities matter

3.1. The difficulties of territorial governance of joint anaerobic digestion projects: badly organized proximities

We used the corpus of interviews to look into the challenges involved in implementing territorial governance for these projects as a possible factor to explain the failures of certain projects.

³ 77 people were contacted in total, and 49 of them gave a positive response to our request for an interview. The main reason for refusal was linked to the fact that we wanted to interview actors involved in projects that had succeeded as well as those that had failed. However, it is more complicated to question individuals whose projects have failed (it is easier to speak about your successes than your failures). Other actors did not want to reply for reasons of confidentiality, discretion or fear of losing their anonymity.

⁴ A very satisfactory intercoder agreement rate of 86.5 % was obtained, ensuring the validity of the initial coding.

We first examined the geographical proximity analysis as experienced by residents or inhabitants faced with a nearby anaerobic digestion scheme. Several of the fears or inconveniences inherent in such unwanted geographical proximity can be illustrated by some verbatim accounts taken from our campaign of interviews. Several of the residents interviewed mentioned the pollution (smell, noise, etc.) created by the proximity of a biogas plant in operation as has been documented in the literature (Schumacher & Schultmann, 2017; Zemo et al., 2019):

Indeed, at the beginning, it smelt like a dead rat. Now, it's different. It's a really persistent smell. Now, it's more like vegetables, cabbage, like rotten cabbage! When there's an easterly wind, of course! When there's no easterly wind, we can't smell anything (resident near the Percy Biogaz plant).

When the project was set up, we didn't have a choice. We suffer from the smell (resident near the Biogaz de Gaillon plant).

The potential to see a biogas plant set up nearby also raises residents' fears, especially concerning the increase in road traffic from an oversized plant, as in the case of Percy Biogaz (verbatim accounts).

Biogas is a good thing, but we're a bit like everyone else... in fact, as the project was opposite our house, we were somewhat against it as there could have been smells, but we would have been more disturbed by the traffic because they were going to redo the road opposite our house, and that was going to have a direct impact on our farm (resident near the Percy Biogas project).

Our analysis shows that lack of communication or consultation between the different actors, especially by the project initiators, can be a real obstacle to a project's smooth running. Indeed, being part of the same territory (logic of belonging for organized proximity) and having shared reference bases (logic of similarity for organized proximity) is insufficient for a successful project. It is just as important for the stakeholders to be sufficiently open (principle of copresence developed by Grabher et al. (2018)) regarding the socioeconomic and environmental stakes of the biogas project, going beyond their individual interests to demonstrate the joint interest for the territory as a whole in the introduction of such a project. Whenever inhabitants feel ill-informed or uninvolved in a project's construction process, they make their voice heard by objecting to it (voice confrontation) and by organizing themselves into local associations (logic of belonging to facilitate organized proximity).

The project-related documents were nearly completed when we got to hear about it! We couldn't let them get the better of us (resident near the biogas project in Coutances).

Lack of communication between the project initiator and the other stakeholders involved is also a sign of low organized proximity, leading to territorial governance issues. The potential rallying among socioeconomic actors is not optimized in such cases.

[The project initiator] forgot to invite us! [...] They had the meeting, except that they forgot about us (farming partner of the biogas project in Coutances, Manche).

The lack of organized proximity can also be seen when the project initiators are faced with organized opposition. In such conflict situations where the interaction between actors is dysfunctional, the actors outside the organized proximity group together in a different organized proximity process in order to thwart the project's development:

The town council and the inhabitants were up in arms about the project for the town. The mayor wanted to have an informative meeting with the neighbourhood and the council. Three of us from Percy Biogaz went to see the town's mayor to present the project. The discussion was very heated for Percy Biogaz, with respect to the fears of the neighbourhood, and the mayor and his councillors who told us: "You hid this from us! You waited until the last minute!"

In the light of these examples, a lack of communication or coordination between the project's different stakeholders is the outcome of a low logic of belonging and a low logic of similarity, which contributes to the deconstruction of connections between local actors. This lack of connection is directly related to the actors' shortcomings when it comes to organizing forms of proximity, making it much easier for other actors to use their voice confrontation.

3.2. Analysis of three case studies

Joint biogas projects struggle to see the light of day despite the fact that they are likely to have a positive impact on the regions as regards energy transition. At local level, these complex projects, encompassing several actors from various horizons, tend to encounter social challenges. Coordination issues and social acceptability between the actors are often dysfunctional, leading to a chain of negative impacts that disturb the projects' progress.

Figure 3. Social map of the actors involved in the biogas project of Coutances Agricultural High School from 2010 to 2014 (t=0) (on the left) and from 2015 to 2017 (t=1) (on the right)



Key			Types of link		Scales of action	
● Public establishment	● Business	● Neighbors	— Supply of raw materials	— Funding	△ Local stakeholders	
● Local authority	● Public regional authority	● Project owners	— Supply / Recovery of materials	— Biomass valorization / Energy	○ Regional stakeholders	
● Agriculture	● Association	● Opponents of the project	— Territorial facilitation / Leadership	— Information / Guidance	□ National stakeholders	
			— Study / Design / Construction	— Institutional		

3.2.1. Coutances: A territorial project lacking local coordination

Coutances Agricultural High School (figure 3) was the focal actor in a two-stage biogas project involving other actors, with the first stage running from 2010 to 2014 ($t=0$), and the second from 2015 to 2017 ($t=1$).

Despite the fact that Coutances Agricultural High School, as the institution initiating the project, strengthened its organized proximity connections during the period 2010-2014 ($t=0$), the majority of these connections thinned out towards the end of this period until many of the actors became inactive from 2015 onwards ($t=1$). This followed many obstacles encountered over the course of time linked to technology, regulations, social aspects and funding, which had a major impact on the project dynamics.

For example, given the lack of funding for the project, Naskéo (in its capacity as designer/builder working on the project's technical aspects) persuaded the agricultural high school to change course, which in turn required a change in logistical choices and consequently affected the partnership with the local agricultural equipment cooperative. In other words, the school decided to change its processes and end its partnership with the farmers (logic of exit experienced by the farmers). Thus, a problem of financing led to a technical choice that affected the partnerships between actors.

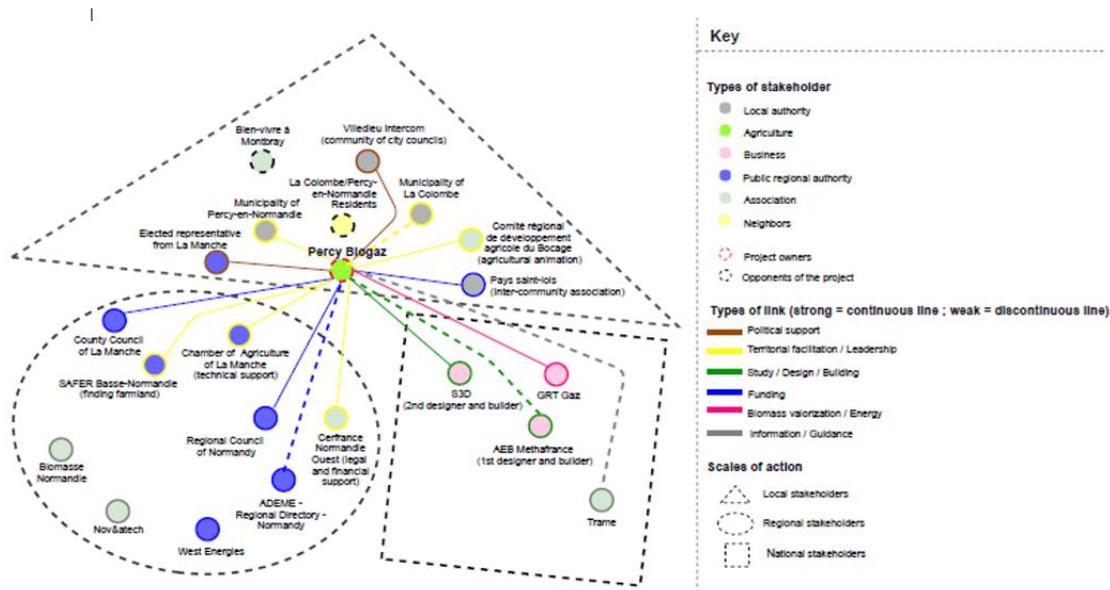
Despite the obstacles encountered, the loss of partnerships are, above all, a sign of a low logic of belonging to the project in the territorial governance process. Indeed, as the project initiator, the agricultural high school played the role of focal actor and brought together local partners (input and/or biomass/energy regenerator suppliers) as well as the other actors concerned. These actors were, however, only occasionally and temporarily involved in setting up the school's biogas production project in the period 2010-2014. Furthermore, our analysis of the stakeholders invited to the project meetings shows that these actors, especially those who might have been opposed to the project, were never convened together. In this situation, the partners involved found themselves without a global vision of the project's progress and without knowing all of the actors. The way they cooperated was sporadic and one-way, and therefore failed to create real collaboration or strengthen the feeling of belonging to a joint project. In addition, the logic of similarity shared by the high school and the various actors was somewhat low since the reciprocal, distinct representations and ways of working did not involve much collaboration or the fulfilment of joint actions when the energy system was set up, despite the fact that the geographical proximity had managed to bring them together. This was all the truer given the specific nature of each actor's professional activities.

To this effect, while a return on investment was anticipated by the high school, it was agreed that the farmers would supply their organic resources with no financial compensation. This example clearly highlights the difference in interests between the two stakeholders involved. In the end, the logic of belonging and that of similarity were barely developed and unable to foster relations of organized proximity. Since they were not consolidated during the project development phase, and given the numerous constraints encountered, it inevitably led to the deconstruction of the connections established between the different actors. As a result, the Coutances Agricultural High School project is no longer a joint project, but instead an individual one. Having said that, as it is still in the design stage, the connections that existed may possibly be revived, or other social connections created. Thus, our analysis shows a weakness in the project's governance processes that involved several local and extraterritorial stakeholders, which could explain why expectations for the project were lowered.

3.2.2. Percy-Normandie: Local governance struggling with organized opposition

The Percy Biogaz project was initiated by a group of 25 farmers that formed an association in 2012 in order to Percy commercialize injected biogas. Like the Coutances Agricultural High School's project, Percy Biogaz is the focal actor and as such, is at the centre of a process that generates social relations with other actors. Figure 4 represents the social mapping of the actors involved in the Percy Biogaz project between 2012 and 2017.

Figure 4. Social map of the actors involved in the Percy Biogaz project from 2012 to 2017



As part of the analysis of proximities relating to development projects such as that of Percy Biogaz, it is important to take the project's social acceptability into account and, more specifically, the population's acceptance of the place where the future biogas plant will be located in the town, given the short distance between the plant and local housing (endured geographical proximity).

More precisely, Percy Biogaz began publishing articles in the local press to inform the population of the project's progress before the latter had been informed of the possible location. When the project was still at the design stage, the local population had no particular reaction.

As soon as the first potential site for the plant (on a piece of farmland not far from housing) was revealed to the inhabitants, there was a strong reaction. At the end of a meeting held by Percy-en-Normandie town council, the inhabitants continued to express their strong hostility to the project. While their reactions were identical, not all the reasons were the same. Some inhabitants lived just next to it and were worried about the daily disturbance. Other inhabitants, for different reasons (theoretically negative with regard to agriculture; involvement in environmental associations, notably against wind power) did not want their wellbeing and quality of life to be affected. In all these cases, the actors did not want to encourage a project that would change their locality or disrupt their lives in terms of smell, views or sound, and set up a coalition, as had already occurred in the past when wind turbines were installed (Mander, 2008).

In the end, the town council voted against the choice of site due to the potential impact on the neighbourhood, despite the fact that the town's mayor had originally been in favour of the location. This is the NIMEY (Not In My Electoral Year) phenomenon, already noted in the literature on renewable energy production projects (i.e. Holtz, 2013). It involves contradictory reactions that lead political decision-makers to take hostile public opinion into account when making their final decision. In light of this situation, the inhabitants did not even need to form a group but only had to speak up to get their voice heard (voice confrontation). Furthermore, the group's existence was not called into question, although the organized proximity between the farmers who had agreed to the Percy Biogaz project was slightly weakened when some of them left, leading to a slight destabilization of the way the group was run internally. Indeed, thanks to the logic of belonging and of similarity shared by the supporters wishing to carry on with the project launch, the group's organized proximity remained strong enough to overcome the difficulties encountered. Percy Biogaz, however, had no other choice but to make a spatial exit in order to find another site for the biogas plant.

Another site was finally found in the town, but some inhabitants rallied together to circulate a petition against the project as they were again afraid the plant would have potentially negative effects – bad smells, visual pollution, heavy road traffic, fall in house prices, risk of explosion, threat to the economic feasibility of local, professional activities, etc. These actions signalled the beginning of local coordination to express opposition to the project. In other words, the population grouped together to facilitate the emergence of organized proximity, but against the project. In the end, Percy Biogaz was forced to once again make a spatial exit as there was so much opposition to the project. Faced with a new problem of social acceptability, the association experienced further loss of supporters, reducing the group to 17 farmers.

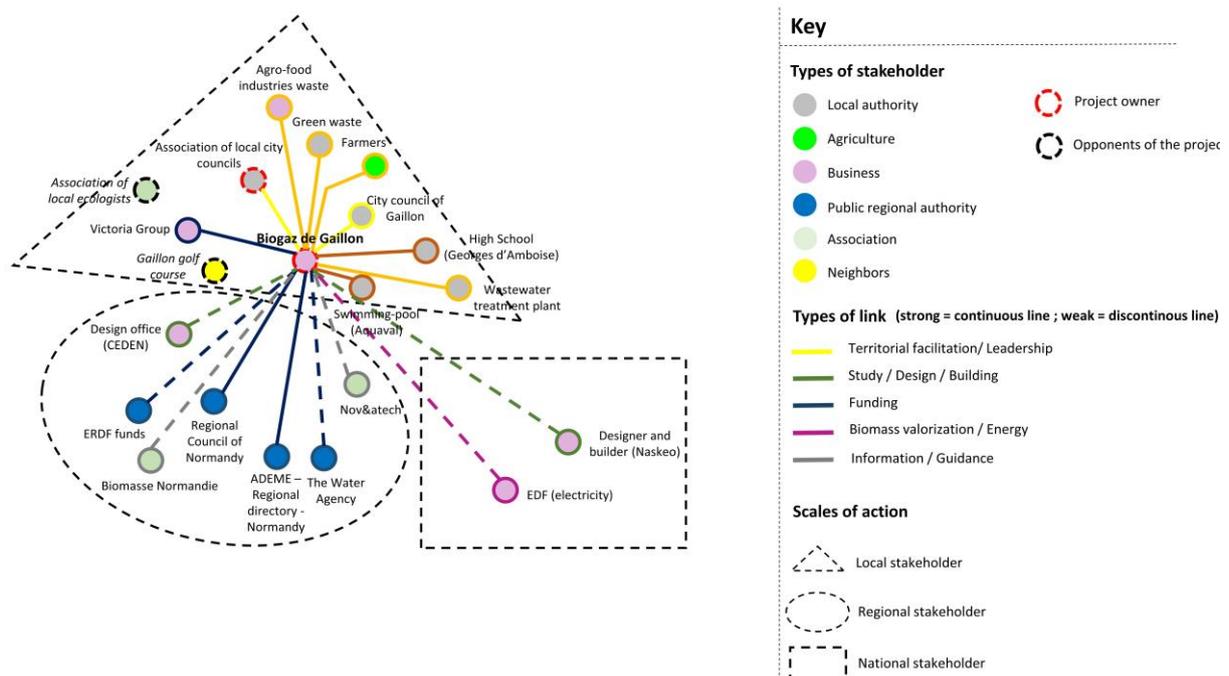
In parallel with this movement, Percy Biogaz's organized proximity was weakened with the loss of 8 members, including the mayor of La Colombe who had provided political support. Without this support, the association initiated new organized proximity with the mayor of Percy. It also developed communication tools in order to make discussions easier, but this move was unsuccessful.

All in all, the convergence between the geographical proximity sought by the project initiators and the geographical proximity potentially endured by the residents, and more widely by the population, whether of La Colombe or of Percy-en-Normandie, reveals weak organized proximity at local level as the two categories of actor do not share the same logic of belonging or of similarity. On the one hand, the group of farmers would have benefited from seeing the plant up and running, whereas the population only gained potential disadvantages from the geographical proximity sought. Faced with this conflict situation and strong voice confrontation, the project has now been interrupted. The siting and social acceptability issues encountered changed some of the social relations that existed between the various inhabitants of the towns of La Colombe and Percy-en-Normandie. Indeed, their stand for or against the project altered the existing interaction dynamics and led to a loss of social ties. Our analysis of this case illustrates how a territorial governance process arises as an outcome of continual interaction between forces driving conflict and others that foster cooperation.

3.2.3. Gaillon: geographical and organized proximities activated for a generally well-accepted project

Our third case study involves the “Biogaz de Gaillon” plant located in the town of Gaillon (Normandy). The project initiators successfully adopted the two types of proximity (geographical and organized) with the various actors (figure 5).

Figure 5. Social map of the “Biogaz de Gaillon” anaerobic digestion project in Gaillon (Normandy)



Biogaz de Gaillon has been in operation since 2013 and is operated by a private company (Victoria Group) which also manages a local transport firm. This joint biogas project was in fact initiated and managed by the *Communauté de Communes Eure Madrie Seine* (a local federation of small towns). Two environmental issues needed to be addressed by the public authorities at the time: i.e., the extension of the inter-community water treatment plant and the water park. The choice of biogas made sense as it enables the sludge from the WWTP to be treated and exploited as electricity (and sold to the EDF electricity company), and also allows the water in one of the water park’s pools to be heated by the construction of a heat network. This construction activated geographical proximity and also enabled the secondary school next to the plant to be heated. The high school premises will be heated in this way in the near future. As a result, opposition to the project was practically inexistent, apart from some reluctance shown by employees and members of the golf course next to the plant, and a local ecology

association, and the biogas plant seems to be generally accepted by the local population. Furthermore, the fact that the plant is sited in the middle of an industrial area around 500 meters from the first houses appears to be another reason for the project's acceptance by the population.

As regards organized proximity, Biogaz de Gaillon enjoyed Victoria Group's waste transport firm's network to power the plant's digester. The plant handles sludge from the inter-community waste treatment plant (49% of total input), effluents from local farmers' breeding (21% of total input) and agro-industrial waste (30% of total input). While this waste is mainly collected within a close radius (60% under 45 kilometres from the plant), 40% of it is collected from further afield, sometimes up to 100 kilometres, such as coffee grounds from Nestlé near Dieppe in the neighbouring region of Seine-Maritime. The project initiators fostered regional organized proximity by organizing several meetings to discuss the project with the stakeholders, including the financiers (ADEME (French Environment and Energy Control Agency) – Normandy region, Seine-Eure Water Agency, ERDF funds) and the dedicated technical supporting structures (Nov&atech, Biomasse Normandie, the CEDEN design office). The mayor was at the origin of continuous dialogue with the inhabitants who felt he listened to them (voice consultation). Our analysis of the interviews confirms that there is a strong connection between the various actors, ultimately making the social acceptance and success of the project easier. Moreover, the connections between Biogaz de Gaillon and the Normandy Region are still active since the "Plan to develop anaerobic digestion in Normandy" in April 2018 was launched on the Gaillon site in the presence of Hervé Morin, President of the Region. This simultaneous use of geographical and organized proximity, termed "territorial proximity" (Torre and Wallet, 2014), enabled Biogaz de Gaillon to embed its governance locally with the various actors concerned, ultimately resulting in a smoothly-run project.

Discussion

The study of the positions and strategies of stakeholders in anaerobic digestion projects indicates that voice confrontation – mainly examined in the literature in relation to the negative dimensions of geographic proximity – is not the only strategy available, thus justifying our analytical study that adopts the exit-voice model to deal with territorial issues. In other words, the usual conflicts dealt with in studies on the theory of proximity, which correspond in our typology to the category of voice confrontation, are only one form of action among others. In this vein, reference to the Hirschman diptych appears a useful avenue to gain new insights into the forms of coordination that can emerge from the co-localisation of actors. Moreover, our

empirical investigations enabled us to show that the strategies adopted are highly dependent on a project's timeframe and the conditions in which territorial governance is organised.

By combining the exit-voice model and the economic input of proximities, our framework aims to identify the options available for actors facing failed territorial organisation. First, it helps to incorporate the key factors regarding the individual behaviour adopted by actors, and second, to identify the tools for collective action by examining the mechanisms that underpin the introduction of new rules in the territorial governance process. It also shows that all the potential forms of voice and exit strategies theoretically envisaged to overcome weaknesses in the process are not always applicable, and proposes a meticulous examination of the causes of a reduction in the number of potential options. We attempt to apply this theoretical construction to the common conflicts linked to the setting up of a territorial anaerobic digestion plant project. Finally, following the comparative analysis of three case studies at three different stages (project abandoned, project in progress, project up and running), we highlight the solidity of the theoretical framework drawn up to deal with the various shortcomings and to update the specific mechanisms involved in territorial dynamics. Consequently, we suggest that a Hirschman approach combined with the theoretical framework of proximities could be used to reframe the coordination issues between actors that occur in various territories regarding projects that could potentially be challenged by the local population.

Our analysis thus contributes to the literature as it goes beyond the nimbyist explanation by demonstrating the importance of place attachment and place identity (Wolsink, 2006; Devine-Wright, 2005 and 2009), highlighting the importance of territorial governance and the need for coordination and collaboration (or even confrontation) between the actors. Like Kortsch et al. (2015), we believe that it is crucial to develop a multi-actor analysis to understand why and how biogas projects are accepted, and why some succeed while others fail. Moreover, our case study confirms the work of Edwards et al. (2015) who argue that including local residents in the construction of projects has a positive impact on their acceptability.

One underlying question about conflict emanating from the siting of a biogas plant is to determine whether it is a 'healthy' project that has been interrupted due to the influence of a small group of individuals who want to preserve their own interests, or whether it is a badly designed/poorly finished project which has been shelved thanks to active local democracy and committed individuals. Various actors have diverging and sometimes contradictory perceptions of the planning process. We can often see a situation in which all the main actors have lost something to some degree, a situation that could have been avoided if there had been more

consultation and well presented information. In our study, the members of the opposition group were often ignored and feared that the project would be conducted without their being able to influence the situation, leading them to object to the plans (voice confrontation; lack of logic of belonging). As a result, some town councils had to abandon the construction of a biogas plant in their area, despite the fact that the elected representatives were in favour of it. Involving all the stakeholders (including the (potential) opponents of the projects) in the governance process and encouraging participation to avoid conflict - or at least to reduce it - is fundamental to the success of projects. In particular, the role of intermediaries and neutral local authority actors is decisive in successfully implementing projects. They need to build up the stakeholders' trust and show the usefulness of biogas plants for the local area using an educational approach. From this perspective, future research could look specifically at the role of intermediary actors (especially local authorities) to support proximities between the actors together with appropriate coordination. It could thus be applied within the analytical framework of other theories on social acceptance, particularly that of procedural justice (Gross, 2007) where transparency and public involvement play a major role.

Going beyond the analysis of the semi-directive interviews, future research could also investigate how place attachment can influence the coordination processes between actors (via studies involving all the stakeholders in a large number of biogas projects), where individuals move towards voice concertation or, on the contrary, confrontation, depending on the parameters linked to their geographical and cognitive proximity.

Conclusion and Policy Implications

The territorialisation of energy projects – such as those linked to anaerobic digestion – requires fresh social compromises (Fortin and Fournis, 2017) as a large majority of the population is in favour of energy transition but not always in favour of what it involves. Our study confirms 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). It also contributes to the development of widespread coordination measures with joint decisions on future avenues for the development of renewable energies within the territories.

In order to understand the importance of territorial governance and the interactions between actors that ensures the success or failure of anaerobic digestion schemes, we analyse the projects' proximities in order to enhance our understanding of the coordination processes between actors taking part in the three territorial energy projects (Coutances, Percy-en-Normandie and Gaillon). Firstly, the Coutances Agricultural High School project experienced a lack of local coordination between the project initiator and the stakeholders, while the Percy Biogaz project reported a lack of convergence between the geographical proximity sought by the entity setting up the project and the geographical proximity potentially endured by the inhabitants/residents. This situation also illustrates low organized proximity at local level. Finally, the Biogaz de Gaillon project used both types of proximity (organized and geographical) to develop its biogas plant with the different actors (local and regional), with little opposition from the residents/inhabitants.

Our analysis of the semi-structured interviews highlights the fact that anaerobic digestion projects are often initiated without any real communication or consultation with the inhabitants concerned, and the proximity of the facilities to residential areas has a negative impact on the ideology behind it. The convergence of endured geographical proximity and weak organized proximity generally leaves no potential for finding a way out of the conflict. Resorting to demonstrations to get their needs heard, opponents adopt voice confrontation behaviour. From this perspective, the mix of the proximity theory and Hirschman's exit-voice model allows us to better determine the origins of environmental conflict between users and how to manage it.

The governance of territories is thus not restricted to an idyllic vision of economic and social relations, i.e. forms of cooperation and shared constructions. It also involves interaction between the powers pushing for cooperation and others pushing for conflict. Far from being a smooth process, territorial development processes and their progress over time involve periods of negotiation, collaboration and peace-making, but also periods that are far more heated and even conflictual, during which certain groups or categories of actors conflict, sometimes violently, to define the markets and the options to be adopted. The governance process of territories thus presents two complementary sides whose reciprocal importance varies depending on the periods and situations. It is driven by these opposing trends (Glazer & Konrad 2005) whose essence shapes the definition of future avenues for the territorial management of renewable energy development. In view of this, our study illustrates the fact that it is more useful to ask ourselves what we can learn from projects that did not go well, how to avoid planning processes perceived as negative by all the parties involved, and how to implement

processes that are both democratic and time-saving. From this perspective, our analytical framework identifies geographical and organized proximities, helping us to understand the different ways stakeholders group together or create social conflict. It goes without saying that these applications need to be systematized in order to assess the mix more precisely and to amend it if necessary. Finally, relations between project stakeholders are clearly illustrated through the construction of social maps based on interviews and using the analytical framework to examine the role of territorial governance when explaining the success and failures of biogas production projects.

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