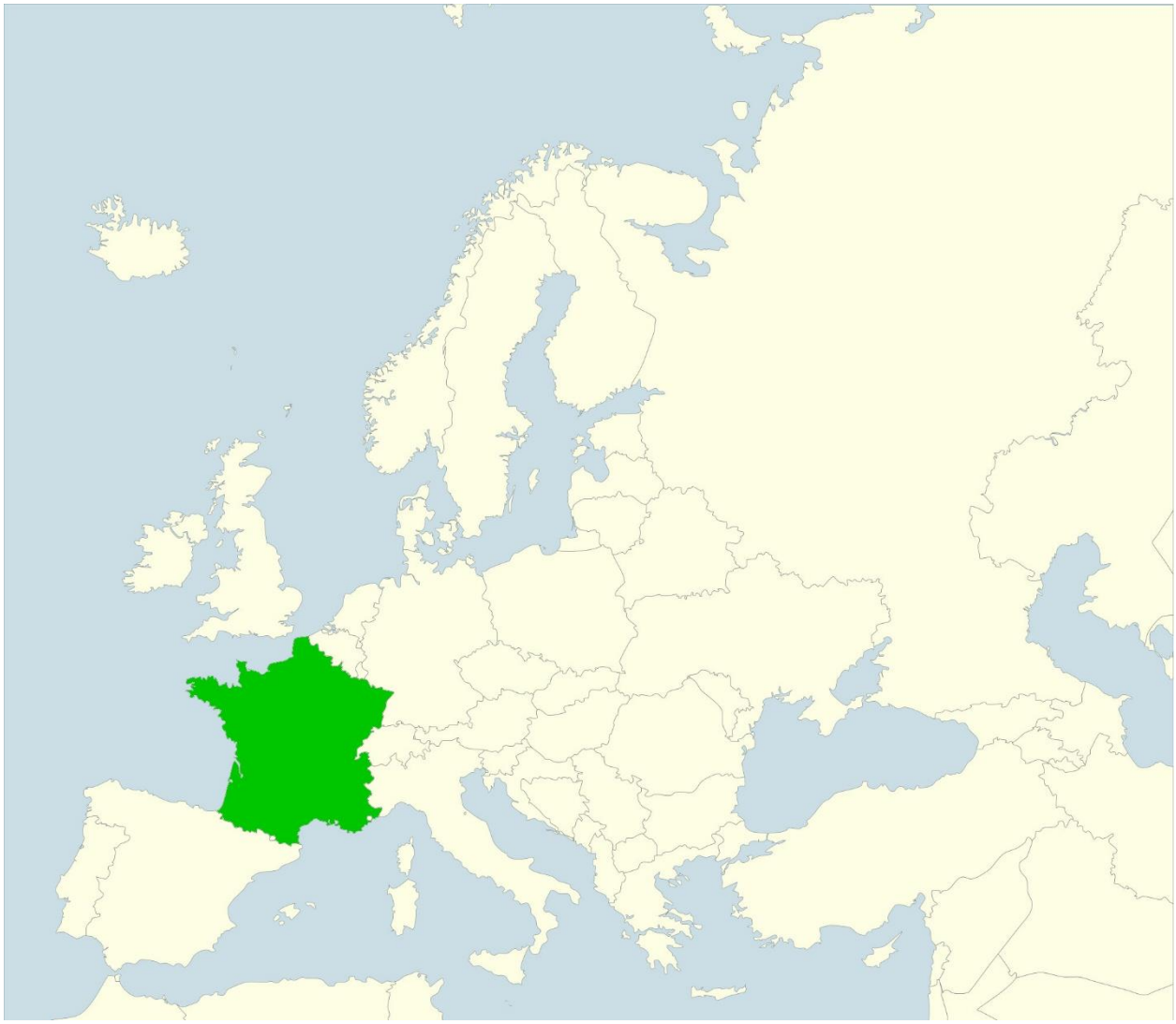
urop. Countrys. · Vol. 13 · 2021 · No. 4 · p. 715-733
DOI: 10.2478/euco-2021-0038

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COMMUNITY ACCEPTANCE OF WIND ENERGY: LESSONS FROM A CASE STUDY ON A LOCAL PARTICIPATORY PROJECT IN PAYS DES MAUGES (WEST FRANCE)

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Received 13 October 2020, Revised 4 June 2021, Accepted 25 June 2021

Abstract: This article focuses on the community acceptance of wind parks in a rural territory in western France, in a country where they are not much developed yet. We hypothetise that their set-up stems from a specific pattern, embedded in the territorial rural context of the case study. Semi-structured interviews with 30 actors aimed to analyse this citizen-led project, in line with their representations of this territory and its sustainable development. Results show that citizen-led investment is not a prerequisite for community acceptance in this case. The sense of a rural place that is fit for technologies kept up to date by the green industry, and the fairness of the process, are the strongest drivers for acceptance of wind energy, *in general,* in this case. Subsequently, the confidence obtained from previous fundraising actions can foster new participatory wind projects. An early communication with inhabitants, and a construction fit for a rural development that makes sense to the locals can bring an essential sense of trust for energy projects within the community. However, given the different definitions, it seems also critical to assess their true community dimension in order not to jeopardise the sense of fairness if the outcomes are not largely shared.

Key words: wind energy, community acceptance, participatory projects, rural, Mauges, France

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Résumé: Cet article porte sur l'acceptation locale d'un parc éolien participatif en territoire rural, dans l'Ouest français. Pour les campagnes, la transition énergétique est autant une opportunité qu'un risque, pour les habitants, de subir les externalités négatives des éoliennes sans compensation. Cela peut se traduire par un sentiment d'injustice et / ou d'inadéquation au territoire. Définir un modèle spécifique d'acceptation locale des projets éoliens, nécessite d'étudier le contexte territorial au niveau le plus local, par une étude de cas conduite au moyen d'enquêtes qualitatives approfondies. Ce projet éolien collectif local traduit une dynamique positive envers l'énergie éolienne, dans un pays où cette énergie est peu développée, notamment sous sa forme participative. Or, le modèle d'acceptation de l'éolien relève d'une combinaison très spécifique entre la nature du projet (et le rôle donné à la communauté locale), la représentation que les habitants ont de leur territoire rural, et de la façon dont les industries vertes et les nouvelles technologies cadrent avec sa trajectoire de développement. Pour expliquer le soutien local à l'éolien, les représentations que les habitants ont du développement de cet espace rural industriel, renouvelé par les technologies vertes, semble peser davantage que le caractère participatif du projet, d'autant que la dimension participative peut faire débat.

Mots clés: énergie éolienne, acceptation communautaire, projets participatifs, rural, Mauges, France

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Highlights:

- Insights into a local pattern of community acceptance for wind-energy in a rural space
- Consensus on the purposes of rural development is a driver for community acceptance
- The sense of a rural agricultural and industrial place fit for green technologies is critical
- Citizen-led projects are not always a pre-requisite for wind-energy community acceptance
- Community acceptance proceeds in stages: public participation for trust; collective experiments for local empowerment

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1. Introduction

Rural spaces are highly sought after in the field of energy transition as a source of renewable energy resources, providing factors such as plots of land and the remoteness needed to set up facilities. Energy transition is as much an opportunity for rural development as it is a risk for the locals to bear disservices from wind turbines that benefit certain external interests. It can result in a feeling of unfairness and the opinion that these facilities are not fit for this place, which generate risks for opposing wind farms at the local level (Nadaï et al, 2015).

This single case study located in the west of France is quite original, as it is one of the few examples of a community renewable energy project (CREP) in France. Therefore, France has the second greatest wind potential but is only the fourth largest producer of wind power in Europe, with production of almost a quarter of that of Germany (EurObserv'Er, 2020[3]), despite a strong growth momentum since 2017 (Observatoire de l'éolien[4]). The long-lasting span of procedures and the lack of stability in public regulation do not help. In 2005, then in 2010 (following the Grenelle Environment Forum), various energy-saving and renewable energy laws were adopted in France, which culminated in the 2015 Energy Transition Law for Green Growth (ETLGG). In addition, the 2016 Energy Programme' law (PPE) set out to double installed wind power capacity by 2023. Nevertheless, community investment in wind energy remains low in France, although its development was boosted by the ETLGG, and its incentives bonuses, especially for wind parks with less than 6 wind turbines. In 2019, the new climate-energy act established the notion of "a community for renewable energy" (art. 40), "*controlled by shareholders nearby a renewable energy project which it has developed*".

This article aims to analyse the specific pattern of community acceptance of wind energy projects in a rural area. Important scientific literature has provided insights into the local opposition to wind farms, even though the drivers for acceptance of wind energy have drawn more attention in recent research (Caporale et al., 2020). Community-centred projects and local ownership are recognised as means to foster wind energy support, but France has provided few examples of citizen-led investments, so far (Enevoldsen and Sovacool, 2016). In this respect, the case study is an original feature, firstly in the context of support for wind parks in general, and secondly, in terms of implementing a participatory project. Our research hypothesises that support for wind energy is embedded in the history of local development (economy, geography, social networks, stakeholders' viewpoints), especially in France, due to the policy framework that ties developers to local decisions, more than in other countries, such as Germany (Jobert et al., 2007). Therefore, a single case study, and the qualitative interviews, are relevant in accounting for this rural context.

The pattern of local acceptance of wind farms is envisioned as the result of a specific combination of the nature of the project, the role given to the rural community and to the social networks, and the locals'perception of the fairness of the process and its outcome. Moreover, the locals' opinions towards renewable energy as an environmental issue, in line with their depictions of the rural territory, and how technology facilities are fit for it (Woods, 2003), are also critical. The comprehension of the specific pattern of local acceptance could help to determine the community acceptance' conditions for wind projects, inasmuch as it would reflect how the territorial resources are to be organised, therefore fostering local capacities for future projects. As such, the issue interests public energy policies, rural communities and energy developers.

After defining the state-of-the-art and notional backgrouds on the issues of community acceptance of wind energy (I), the qualitative methodology applied to a single case study (II) is presented. Then, the results analyse the local pattern for community acceptance (III), which is discussed in part IV, before the conclusion.

[3] https://www.eurobserv-er.org/; checked 12/12/2020

[4] www.fee.asso.fr; checked 12/12/2020

2. The local pattern of acceptance of participatory wind energy projects

Community acceptance is considered by scholars to be both a driver for local acceptance of wind projects, as well as one of the three dimensions of the social acceptance. Since the risks of protests against wind energy generally come from the local level (Jobert et al, 2007, *op.cit*.), community acceptance (Wüstenhagen et al, 2007) has been defined as the specific acceptance of siting decisions (Devine-Wright et al., 2017) by local stakeholders, residents and local authorities. Community acceptance is part of the social acceptance (Caporale et al, 2020, *op.cit*., for a literature review), as are market acceptance, and socio-cultural and political acceptance, at the general level.

Social acceptance has been analysed in many ways (Breukers and Wolsink, 2007; Nadaï and Van der Horst, 2010; Wolsink, 2018), frequently highlighting the conditions for opposing wind energy at a local level (Nadaï, 2007; Ek et al, 2012; Hall et al, 2013, Anderson, 2013, Bidwell, 2013). Moving from general support for technologies to siting decisions results in contradictions within environmental values that fuel both support and opposition to wind farms, since global environmental perspectives (climate change) can contradict the local ones (Bidwell, 2013), that are more driven by place-protective actions (Devine-Wright, 2005b; Wolsink, 2006, *op.cit*). Indeed, the "Not In My BackYard" notion, especially though up for wind-energy (Van der Horst, 2007) has been recast as "place protective action" (Devine-Wright, 2005a; Devine-Wright, 2009), given that the drivers for acceptance highlight the local inhabitants' perceptions of wind farms (Caporale et al.; 2020, *op.cit.).* According to A. Jobert et al (2007, *op.cit*.), not only are institutional conditions decisive, but site-specific context also, such as local economy (tourism and economic situation), geography, and landscapes or the visual impacts that have been intensively reported since the 1980's (Brittan, 2001; Nadaï and Labussière, 2018). These include the former use and perception of the territory, comprising the social networks and the actors' beliefs system on environmental issues, conditions of ownership, public and financial participation of the residents, creation of a local support network, local integration of the developers, trust and social justice (Suškevičs et al, 2019; Van der Horst and Toke, 2010, for an overview of the many criteria). The role of intermediaries (local design office, brokers, regional and national networks promoting renewables) and their embeddedness in the local context is critical, as they provide stakeholder trust (Warbroek et al, 2018).

By community acceptance, M. Wolsink (2007), P. Devine-Wright and B. Wiersma (2020) highlight the importance of community participation, as other scholars underline the importance of a community-centred approach in achieving acceptance (Azarova et al, 2019, Graham et al., 2009; Gross, 2007), highlighting the role of participatory governance at a local level. Procedures and patterns of governance, such as citizen-led or "Community Renewable Energy Projects" (CREP) are receiving more attention (Gross, 2007; Colvin et al, 2016; Landeta-Manzanoa et al, 2018; Van der Waal, 2020), even in France where citizens' participatory processes have been only recently fostered (Sebi and Vernay, 2020, *loc.cit*.). In particular, for relatively undiversified rural economies, participation in local energy projects is expected to be both a source of empowerment for the community and a way to strengthen social and economic capital (Van der Waal, 2020, *loc.cit.*). Financial profit is only one of the many factors affecting community acceptance (Breukers and Wolsink, 2007, *op.cit*.); others include the residents' ownership of the rented territory of the installations (Christen et Hamman., 2014; Nadaï et al., 2015, *op.cit*.), the community fairness framework (Gross, 2007, *op.cit*.) or the quality of communication with local stakeholders (Maillebouis, 2003). Local participation is likely to promote distributive (equity in the sharing of burdens and results) and procedural justice (fairness in the decision-making process) to facilitate the acceptance of energy transition (Lienhoop, 2018), although some scholars have associated high wind farm approval with vulnerable communities (Van der Horst, 2007, *op.cit*.), thus questioning the environmental justice in renewable energy development. Indeed, community projects can also face local opposition (Simcock et al, 2016)

However, community acceptance is a complex set of "*individual and collective preferences rooted in institutional and socio-political arrangements*" (Scherfhauer et al, 2017). As there are several levels and contents of participation (Lienhoop, 2018, *loc.cit*.) at multiple stages of the project (location of wind-turbines, technology or planning permissions; Simcock, 2016, *op.cit*.),

differences can be observed between acceptance and support (Garcia et al, 2016), on the one hand, and between many participation models, on the other. Acceptance seems a positive, but quite passive, behaviour to something external, while support would imply more commitment from actors (Batel et al, 2013, *op.cit.)*. CREP has received a definition by the UE commission (defined for the first time in Art. 22 of the revised Renewable Energy Directive – RED II –, 2018; Sebi and Vernay, 2020, *op.cit*.), as a "*group of citizens or social entrepreneurs, public authorities or community organisations who participate directly in the energy transition by jointly investing, producing, selling and distributing renewable energy*" (*Ibid*.). CREPs are part of Local Energy Initiatives ("*decentralized, non-governmental initiatives of local communities and citizen to promote the production and consumption of renewable energy with the ability to participate financially in a project"* (Van Aalderen et al, 2020, *op.cit*.). Thus, a clear distinction has to be established between local initiatives with participatory financing only (led by industrial developers with crowdfunding platforms for citizens to invest but not to have a say in the decision-making process) and CREPs involving participatory investment into a local cooperative (crowd-equity; Rüdinger, 2019) where the citizens not only buy the installation, but access to the project governance; these are, for the French Federation of CREP's ("Energie Partagée Association"; EPA), the only acceptable definitions.

It seems that research on the community acceptance of wind-energy could delve deeper on some points, which we aim to contribute to in this article. Indeed, very few academic publications have been written about CREPs in general in France (Sebi and Vernay, 2020, *op.cit.,* for a literature review), compared to other national contexts, both in terms of publications and the number of participatory projects (Munday et al, 2014) even for wind-parks, and examples include theNetherlands (Van Aalderen et al, 2020, *op.cit*.), Denmark (Kooij et al, 2018[5]), Austria (Schreuer, 2016[6]) or Germany (Oteman et al, 2014). In France, only a few studies show the interest in participatory projects to encourage French wind development (Jobert et al, 2007, *op.cit*.; Nadaï, 2007, *op.cit*.; Sebi and Vernay, 2020, *op.cit*.), most likely because this is a recent move. Moreover, since the french CREP movement emerges (2015, ETLGG), it is experiencing only few examples of wind cases, as most of the projects are photovoltaic clusters. At the same time, the context for active support is not much documented; we consider the mere existence of a CREP as a sign of support, and not only of acceptance.

Taking into account that all French territories face the same institutional conditions, we hypothetise that the very originality of community acceptance of wind-energy derives from the local, or even regional, context that gives the CREPs the opportunity to develop. This "typical pattern of local acceptance" (Scherhaufer et al., 2017, *op.cit*.) stems from a combination of the nature of the project (industrial characteristics; the nature of "participation" which is a factor in the perception of "fairness"), the history of the local rural development, in addition to the social networks, the embeddedness of stakeholders (Rattinen, 2019), their environmental beliefs, and how energy facilities make sense, in accordance with the representations they have of their "rural place".

As "place matters" (Devine-Wright and Wiersma, 2020, *op.cit*.), reconstructing the history of each project with the help of a case study seems relevant (Anderson, 2013; Schumacher, 2019). Although it exposes research to the peculiarity of places, it also provides an insight into the finer community dynamic of participation (Van Aalderen et al., 2020, *op.cit*.), especially in France, where community-led wind projects are still emerging.

3. Methodology and context: a single case study

The surveys carried out from 2016 to 2020 are part of a research programme supported by the University of Angers (France) since 2014, on "local cooperation" for rural development. Selection of this case study had been expected for some time thanks to the knowledge authors had of the local peculiarities on renewable energy, due to their participation in six focus groups

[5] In Denmark, in 2017, 20% of the installed wind-energy capacity is owned by citizen cooperatives, farmers and local landowners (Kooij et al, 2018).

[6] In 2010, collective citizen initiatives accounted for around 40 to 50% of total installed wind-energy capacity in Austria.

held as the Pays des Mauges land planning scheme (Figure 1) was implemented. The focus groups revealed the representations that forty stakeholders (associations, politicians, entrepreneurs, development officers) had on this territory in 2013, just before the participatory wind-park financing process. It brought useful information on the context (geographical, political, social, historical) of installation of wind farms, and to the sense of place shared by many stakeholders, for whom the issues of renewable energy proved to be critical for rural development. Some key-informants were revealed at this stage. Other key-stakeholders and actors have been selected through a “snowball effect”.

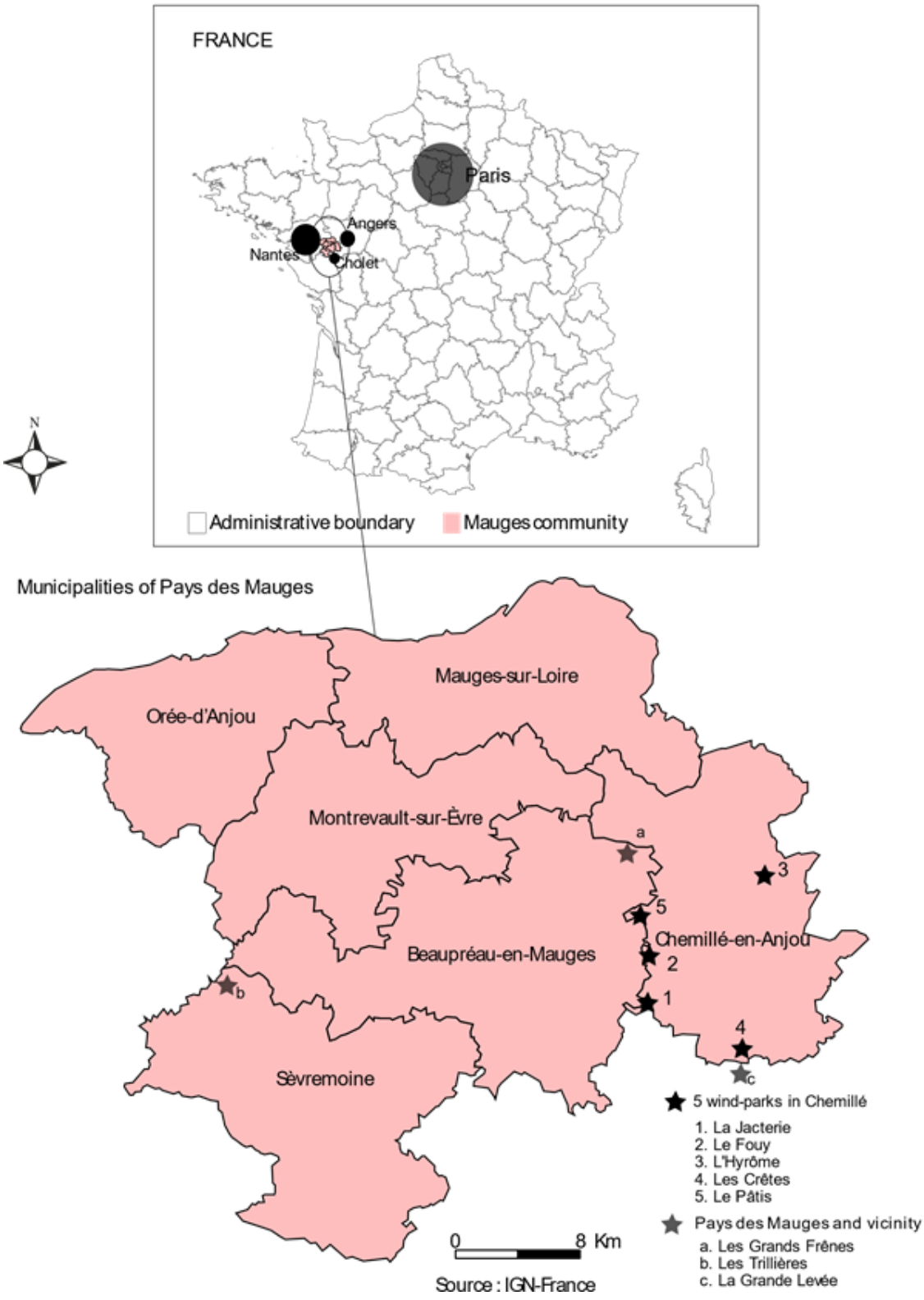


Fig 1. The area under study. Source: Mauges Communauté; https://www.maugescommunaute.fr; checked 12/12/2020

Tab 1. Interviewees and characterization of stakeholders. Source: own sources

	Date of ITW	nom	Function and role for the project	Type d'enquête (face to face)	autre	duration
1	20/04/2016 13/11/2018	Mr. R	Farmer ; local leader for renewable energy ; local representant of the main farmer union (in his 50's)	Semi-structured ITW Semi-structured ITW	Key-stakeholder ; pdt of the SAS La Jacterie actualization)	1 h 45 1 h 00
2	21/04/2016	Mr B	Farmer ; involved in renewable energy project (in his 50's)	Semi-structured ITW/in-depth ITW	Involved in solar clusters and La Jacterie projects	2 h 40
3	22/04/2016	Mr. C	Farmer ; involved in local solar and wind energy projects (in his 40's)	Semi-structured ITW	Involved in the set-up of wind planning scheme	21h 10
4	06/05/2016	Mr Bo.	Farmer ; member of Horizon Bocage association (in his 40's)	Semi-structured ITW	Involved in the La Jacterie project	1 h 35
5	09/05/2016	Mr Av	Farmer ; Member of Horizon Bocage association (in his 40's)	Semi-structured ITW	Not involved in La Jacterie Project	1 h 10
6	26/04/2016 15/11/2018	Mr Va	Farmer ; Local elected (Mayor) ; President of Pays des Mauges/"Mauges Community" till 2012; (in his 50's)	Semi-structured /in-depth ITW	Key-stakeholder in local renewable energy project ; main animator of the wind energy local planning scheme (2003-2006) ; lives next to a wind park	2 h 05 0 h 55
7	11/05/2016 14/11/2018	Mr. D	Farmer and local elected (mayor); retired	Semi-structured ITW	Part of the La Jacterie Project ; there is a wind project in its municipality	1 h 30 0 h 40
8	16/05/2016 15/11/2018	Mr. Ru	Farmer and part of La Jacterie project (in his 40's)	Semi-structured ITW/ in-depth ITW	Part of a solar cluster ; then member of La Jacterie	2 h 20 0 h 50
9	06/06/2016	Mr Ga	Farmer and President of Horizon Bocage association	Semi-structured ITW/ in-depth ITW	Involved in wood-energy and in La Jacterie project	2 h 15
10	06/05/2016	Mr Du	Farmer (in his 50's)	Semi-structured ITW/ in-depth ITW	Involved in the local solar cluster and in La Jacterie	1 h 55
11	18/04/2016	Mr and Mrs Ch.	A "young" (30 to 35 years old) local (engineer) and his wife	Semi-structured ITW	Involved (Him) in many renewable energy projects in Chemillé since 2010; investor in La Jacterie with his wife; he has been the manager of a local cooperative for renewable energy in Chemillé.	2 h 00
12	15/11/2016	Mr Dab	Local elected ; retired	Semi-structured ITW	Involved personally in La Jacterie project	1 h 10
13	15/11/2016	Mr and Mrs Vi.	Local inhabitants in Chemillé ;	Semi-structured ITW	Involved personally in La Jacterie project	1 h 15
14	22/11/2016 16/11/2018	Mr Ca	Local inhabitant ; teacher ; Ex member of the local cooperative for renewable energy; (in his 30's)	Semi-structured ITW	Involved personally in La Jacterie project	1 h 20 0 h 45
15	23/11/2016	Mr Pa	Local inhabitant (in his 30's), civil servant	Semi-structured ITW	Involved personally in La Jacterie project	1 h 00
16	02/06/2016 16/11/2018	Mr. X	Local development officer; Director of the community center of Chemillé	Semi-structured and informative interview	He is a promoter and even initiator of energy projects in Chemillé	2 h 20 1 h 05
17	02/06/2016	Mr. W	Local development officer in the community center of Chemillé	Semi-structured and informative interview	He animates and promotes environmental and circular economy projects in Chemillé	1 h 30
18	02/04/2016	Mr Fa	Local development officer in the departmental Chamber of Agriculture	Informative interview	He is the head of the departmental and cooperative project for wood energy	1 h 10
19	04/07/2016	Mr Bou	Local development officer ; Director of the local Chamber of Agriculture in Mauges Communauté	Informative interview	He supports farmers in their business development projects	1 h 30
20	02/04/2016 17/11/2018	Mrs Lo.	Local development officer in the departmental Chamber of agriculture	Informative interview	Her role is to promote energy saving projects and renewable energy initiatives among farmers	1 h 30 0 h 45
21	20/04/2016	Mr CP	Development officer in an environmental association « CPIE »	Informative interview	This association has been strongly involved in the set up of the wind energy planning scheme in Mauges; and is present in Mauges renewable energy projects since the early 2000's	1 h 40
22	04/11/2016 12/07/2020	Mr Dr.	Director of «Mauges Communauté »	Informative interviews	He has observed and accompanied the entire context of implementation of renewable energy in Mauges Communauté and their role for the local development.	1 h 40 1 h 10
23	04/11/2016 12/07/2020	Mr Xa.	Local development officer for environment and town planning in Chemillé	Informative interview	He knows the context of siting decisions and their local impacts on the population ; animates the setup of the local town planning in Chemillé (approved in 2019)	1 h 20
24	07/07/2016	Mr Gar.	An employee of the local design office and energy developer David Energy » in Chemillé (a local "broker")	Informative interview	He has followed the process of the setup of La Jacterie project	1 h 30
25	20/05/2016 12/07/2020	Mrs Fr.	Local development officer in environmental transition in Mauges Communauté	Informative interview	responsible for the climate, air energy and territory plan in Mauges Communauté (since 2017)	1 h 20 1 h 00

Five other data sources were collected. The consultation of desk information, web sites and other institutional reports, from 2016 to 2021, has helped to establish the national, regional, and local context around renewable energy development and to confirm the peculiarity of Pays des Mauges and the Chemillé case study, and of CREP La Jacterie.

The qualitative methodology provided us with empirical data from different sources. The core of the research was based on semi-structured, face to face (except for n° 28, table 1, by phone) interviews conducted in 2016, with an actualisation in 2018 (8) and 2020 (6 interviews); (table 1). The study selected ten farmers as key-stakeholders for local energy projects (1 to 10 on table 1; in-depth interviews were conducted with five of them), five private individuals (11 to 15 on table 1) who were involved in the participatory process and fifteen local development officers. Two of them represent the social centre of Chemillé (16, 17; table 1), three of them come from the chamber of agriculture (18, 19 and 20, table 1), and four from local, regional, and even national (ADEME) agencies and associations for CREP or renewable energy (21, 26, 27 and 29). Three local town planning development officers in Chemillé and Mauges (22, 23, 25), a local design officer and local energy developer (24) and a sociologist (Angers Catholic University) – focusing on the social and historical context of local development – were also interviewed. Three other, more informal, inquiries were conducted. One was a collective interview with six members of the "Horizon Bocage Association" (HBA), in 2016; another was an informal discussion with five inhabitants (mostly women) living next to a wind park, in Chemillé (2016); and the third inquiry included short interviews (5 to 15 minutes) conducted at certain events, such as the inauguration or celebration day of the wind park, (November 2016; September 2018).

The semi-structured interviews occurred as follows: the farmers (1 to 10) were asked to tell stories and give examples of situations and events involving the processes that they experienced with regard to renewable energy, as well as their involvement, motivations, opinions on the outcomes and the fairness of the procedures, in relation (or not) to their opinion on sustainable farming, energy savings, and the rural territory. Local inhabitants involved in the CREP La Jacterie (11 to 16) were asked about their opinions on local renewable and wind energy, their personal motivations, their beliefs in energy transition, on the fairness of wind projects (process and outcome) and how these fit the sense of the rural place; in addition to their opinion on the role that citizens must play in the process and the key-actors involved. To analyse these interviews, a table was drawn up to collect empirical data contained in the interviewees' various statements, in accordance with the main themes cited above.

The fifteen other interviewees were mainly consulted for information purposes, so as to establish the territorial, historical, sociological, and institutional contexts that led to the participatory wind park, the stages of the process, the actors involved and their networks, and the role played by certain intermediaries (18 to 29), and a local industrial developer (24). The local development officers helped to determine the role of certain intermediaries in helping to provide collective information and knowledge on renewable energy. Informal interviews and focus groups were used to finalise the local opinions on wind-energy and its acceptance, and to confirm or not, certain representations of the CREP, its fairness and the sustainability of this specific pattern of development.

Why is this case study in Chemillé so peculiar? Chemillé is part of "Pays des Mauges[7]" (western France, in the Pays de la Loire region, figire 1), a rural territory of 120,000 inhabitants located in between three towns (Angers, Nantes, Cholet) connected by motorways. Its population density is 90 inhabitants/km² (compared to the average French rural density of 60) and its demographic growth has been 1% per year since 1999 (INSEE, 2018), which is twice the French national average. The local inhabitants are mainly workers, employees and modest retirees, most of whom are, or have been until recently, related to rural industries. Indeed, among the diversity of rural spaces in Europe, in relation to their socio-economic and cultural/functional situation (Figueiredo, 2009; Halfacree, 1995; Mormont, 1990; Woods, 2003, *op.cit*.), this territory is a "productive" one, for both agricultural and small industries. Despite a strong residential dynamic, Pays des Mauges is emblematic of issues that emerged in the "productive countryside" (Bioteau and Prugneau, 2014) in the 1990s, after it experienced thousands of job cuts in the textile and shoe industries. Moreover, the productivist agriculture (cattle breeding, pork and poultry) is facing economic

[7] Due to the French Territorial Reform of 2015, Pays des Mauges has become « Mauges Communauté ». For the sake of simplicity, we use the terms « Pays des Mauges ». Chemillé is a municipality that belongs to this territory.

difficulties, and environmental criticism, resulting in the need to diversify revenues, thanks to green energy.

Despite encouraging public policies with guaranteed feed-in tariffs from 2001 to 2016, disputes against wind energy have remained significant in France, largely due to the national context of development dominated by external developers and big investors (Nadaï et al, 2015, *op.cit*.). According to ADEME (2016; Interwiewees 2016, 2018) and the "énergie partagée association (EPA[8])", from among 236 operating CREPs involving 11,000 citizens, only 13 correspond to operating wind energy facilities, in France; 23 have been underway since 2019.

Tab 2. Characteristics of the five operating wind-parks in Chemillé. Source: David Energie; https://davidenergies.eu

N°	Name of the park	Operating since	Number and characteristics of wind turbines	Installed capacity	production	Funding/Investment/exploitation
1	La Jacterie	2016	5 wind turbines Nordex for 2.5 MW 150 meters high	12 MW	23 GWh/an Equivalent to 10,000 households supplied	16 millions Euros. 100% citizen bought 380 shareholders in a local stock company La Jacterie SAS (3,3 million Euros) Exploitation realised by « VSB énergies nouvelles », private external company AND La Jacterie SAS
2	Le Fouy	2009	4 wind turbines Nordex for 2.5 MW 125 meters high	10 MW	21 GWh/an Equivalent to 8,400 households supplied	Investment and exploitation by a private external company (Falck Energies renouvelables)
3	L'Hyrôme	2020	5 wind turbines Nordex for 2.4 MW 150 meters high	12 MW	32.6 GWh/an Equivalent to 13,000 households supplied	26 million Euros with 1.5 million euros for « EPA » Investment and exploitations:crowd equity and citizen-led project in partnership with local communities/territories (SEM Mauges Energie); gestion and exploitation: Local and collective (public sector and local/citizen stock company) SAS Cit'Eole, Mauges Communauté, Alter Energie et Energie Partagée (public and local stock company)
4	Les Crêtes	2009	4 wind turbines Nordex for 2.5 MW 125 meters high	10 MW	22 GWh/an Equivalent to 8,400 households supplied	Private company for investment and exploitation: Falck Energies renouvelables
5	Le Pâtis	2014	3 wind turbines Nordex for 2.5 MW 150 meters high	7.5 MW	18 GWh/an Equivalent to 7,200 households supplied	Private external company for investment and exploitation: Epuron-ERG Group

Like other rural territories, Chemillé is representative of proactive dynamics emerging since 2010, within the territorialisation of energy and climate policies (Lundqvist and Biel, 2013), in France, especially in the regions Pays de la Loire and Britanny whose wind-energy capacity is not very high (These regions are respectively the 5th and 7th in France for wind capacity) but represents the first two regions in France for CREPs (14 and 9 projects respectively).

While France is characterised by a legacy of nuclear power and highly concentrated energy production and distribution system, Chemillé is remarkable, given its renewable energy projects. Within this rural territory of 21,000 inhabitants, five wind parks have been built (3 to 5 wind turbines for each park) since 2008, including one of the few operating participatory wind parks of its kind in France (table 2 and figure 1).

4. Results: a local support for wind energy as a driver for local development, and conversely

In this case study, we analyse the multi-level territorial conditions, and the local development processes that led to the participatory La Jacterie wind park in Chemillé. Inaugurated in 2016, this park was financed by loans through a 100% citizen-led fundraising scheme, which raised 3.3 million euro, for a total cost of 16 million euro (Table 2).

This park is the culmination of ten years of effort in Pays de Mauges, then in Chemillé, where the first wind-farm was set-up in 2008, alongside photovoltaic (since 2004) and wood-energy facilities (2008). The site-specific conditions and the motivations, the role of stakeholders, in the local cooperative process, are reflected in the support for wind power implementation.

[8] https://energie-partagee.org; acessed 10/05/2021

4.1 Conciliating planning decisions in Pays des Mauges, with siting decisions in Chemillé: a local procedure that aims to be fair for locals

Conciliating local planning deliberations in Pays des Mauges, with siting decisions in Chemillé, is at the core of the community acceptance process. However, at the beginning of the 2000s, local politicians feared the risk of competition between municipalities and between farmers, to host the installations, over the risk of inhabitants opposing wind-farms (Interviewees 1, 6, 7, 12, 19, 22, table 1; 2016 and 2018 for 1, 6, 7). When feed-in tariffs for renewable energy were set up in France, local electives noticed how farmers were being pressured by industrial developers. Within Pays des Mauges, they decided to submit renewable energy projects to collective brainstorming, an operation from which Chemillé benefitted (Map1). The Pays des Mauges wind energy planning scheme (2006), the first of its kind in the Pays de la Loire region, is a graphic document on the possibilities for wind-turbine installations; it is followed by methanation (2012) and solar energy planning schemes (2013).

Through collaboration between local representatives of Pays des Mauges, and local environmental associations, a procedure for industrial developers was set up; all building permits for wind-parks were studied in accordance with this scheme, before being validated at the local level by the state authorities. In exchange, the local electives of Pays des Mauges carried out a communication campaign in each municipality, involving inhabitants, paving the way for the acceptance of wind energy. A farmer living in Chemillé, who was also a local community representative and the President of Pays des Mauges in the 2000s, explained "*Any building permit presented to the local competent authorities has been examined by us. Our conditions have been respected and for the people around, the application has been somehow validated, and we have limited the opposition*" (Interview, 6, 2016). Indeed, this methodology provides a very specific resource to wind developers: the promise of preventing disputes (Interviewees 1 (2016); 18, 21, 26, 2016 and 2018).

As several levels of participation are possible (from information to cooperation; Lienhoop, 2018, *op.cit*.), in Pays des Mauges, mainly information and collective discussion were primarily implemented through meetings with inhabitants, from 2003 to 2006. Locals were informed of the planning process very early on, and "*their point of view has been taken into account*", according to local administrative and environmental association representatives (Interviewees 6, 20, 21 and 22). Nonetheless, there is a consensus between local electives and governmental administration representatives that the wind planning scheme "ends the discussion", as it takes into account landscape and environmental issues, military zones and house-distance rules (Interviewees 6, 22 and 26 in 2016). This document was then to be used in the municipalities for the siting decisions.

The reflection undertaken among all the municipalities of Pays des Mauges has its origins in certain habits of collective work, which pre-exist renewable energy dynamics (Interview 30); (Marais, 2009). In 1975, local representatives, municipality mayors and economic stakeholders created a "Carrefour des Mauges" think-tank aiming to facilitate local entrepreneurship. Since the beginning of the 2000s, it has initiated actions on climate and energy issues. Thus, collective trust between locals, especially between local electives and stakeholders, but not only, is at the core of the procedures. For instance, an ethical rule was imposed. Elected people, the majority of whom are farmers, have refrained from hosting wind turbines on their own fields while accepting them near their farms and so, bearing the disservices like other inhabitants (interviewees 1, 8, 14, 16, 2016), thus reinforcing trust-based relationships (George and Reed, 2015).

4.2 A collective learning process initiated and supported by key-stakeholders, in which some farmers played a pivotal role

A collective community learning process is at the heart of the large increase in wind parks in Chemillé but is also one of its outcomes (Table 2). This dynamic took place since two groups of actors, an environmental association and a group of farmers, converged, in 2011, in the "Atout Vent" association (Graph1). They represent two social networks that operate in parallel, and sometimes overlap, thanks to interconnecting key-stakeholders.

A first group was organized in the 1990's, around the community centre of Chemillé, an orgnisation that has developed environmental concerns for some years, and one of its first environmental action was the creation of the "Horizon Bocage Association" (HBA), uniting inhabitants and certain farmers to maintain a rural landscape typical of western France (Collective interview with members of HBA in 2016); (Interviewees 4, 5, 9, 5, 11, 16 and 17, 2016). In 2002, the director of the community centre suggests converting a local brownfield site into a building devoted to professional reorientation programmes, with the installation of solar panels on the roof to cover the costs. Given the success of this initiative helped along by public subsidies, why not repeat it with private, though collective and local, investments? A think-tank uniting technical professionals, local politicians and association representatives, farmers and young people (Interviewees 11, 16 and 17, 2016), local companies, led to a renewable energy cooperative being established in 2007. In 2011, reflections both within this cooperative and HBA, converged to propose a participatory fundraising for the La Jacterie wind-park in Chemillé (Interviewees 4, 5, 9, 11, 16, 17, 18, 21, 22, 2016).

The second group is a network of "productivist" farmers (Interviewees 1, 2, 3, 6, 7, 8, 10). When the feed-in tariffs were introduced at the beginning of the 2000s, they were solicited by sales representatives to install solar panels on their farm roofs. A farmer involved in solar projects (since 2007), who is also a local representative of the main agricultural trade-union, was contacted by four colleagues to collectively organise a solar cluster (Interview 1, 2016) and to work with local companies (a roofer and an electrician). Consequently, « *Through the trade-union, the local cooperatives, the neighbourhood, all agricultural networks, they inform their colleagues* » (Interviewees 1 and 2, 2016).This group united 50 farmers who invested 8 million euro in photovoltaic panels, in order to seize an economic opportunity (Interviewees 1 and 2, 2016). These farmers, all united in the same professional union, share beliefs on environmental issues in farming and the same expectations regarding economic target. Some of them, who are also local representatives in the municipality of Chemillé, have helped to increase communication about renewable energy projects, as they have access to useful information and can interconnect different networks. One leader told his colleagues: "*I am in favour of having more wind turbines in our area if it has a local impact*" (Interview 3, 2016). Thanks to their experience with photovoltaic energy, this group of "farmer entrepreneurs" feels confident when considering participatory financing for a wind-farm (Interviewees 1, 2, 3, 6, 7, 8, 10; 2016). However, in order to fundraise three million euro, a broader partnership is needed with the local population.

As these two networks converged in 2011 by activating bridging links into the creation of the "Atout Vent" association, they divided them into two public limited companies (that of farmers and that of individuals). The average investment amount (1,500 euro) is not high but nevertheless quite selective for many inhabitants, while avoiding monopolisation by big contributors (the maximum contribution is 20,000 euro), whether external or not. Involving the local population gives the project a citizenship-related dimension, guaranteeing support from the national Energie Partagée Association (EPA) which promotes local and citizen investments in renewable energy in France, with the possibility of acquiring shares at 100 euro. However, EPA holds less than 10% of the pre-invested amount in La Jacterie.

The experimental local energy investments that have been made in Chemillé since the 2000s have empowered many stakeholders in the territory, and not only farmers (Interviewees 1, 8,14, 16, 2016 and 2018). Like in many other rural places, the pivotal role of farmers is underlined (Woods, 2003, *op.cit.)*, as they played a key-role in the promotion of renewable energy among locals. Their experience of collective entrepreneurship for solar energy outdoes their professional network in connecting other networks, at different levels. One farmer who is the main leader of the participatory wind park (and previously, the main promoter of the photovoltaic cluster) connects productivist farmers (bonding ties), local political representatives, industrial and local entrepreneurs, members of a local cooperative for renewable energy, local and regional administrations (bridging ties), and EPA (linking ties), at the national level (Interviewees 16, 20, 26, in 2018 and 22, in 2020).

In Chemillé, inhabitants' awareness of energy transition issues is also the result of actions undertaken by the community centre since the 1990s. From HBA to the local energy cooperative

(Graph 1), the same stakeholders are involved, reflecting a certain proximity of "beliefs" among them (Interviewees 9, 11 and group interview with EPA, 2016).

5. A consensus on a local development project in a rural place fit for industries that have been updated by green technologies

In 2007, a farmer relayed the community's concerns while several wind parks were under construction in Chemillé: "*Who do they belong to? If we do not go for it as citizens, others called pension funds will! The added value goes away*" (Interview 3). As the wind-energy planning scheme was set up in 2006, the locals failed to consider the fairness of the outcome given the inconvenience borne by the inhabitants, and it took them ten years, after many wind-parks were installed (Interviewees 1, 2, 7, 8; 2016) to become aware of the balance between the disservices they bear, and the benefits that they can obtain from wind-energy.

The idea of gathering together to recover local resources coveted by external economic interests reached a general consensus. However, this does not mean that individuals and farmers share the same beliefs about wind energy (Bidwell, 2013, *op.cit*.). During the participatory process, inhabitants committed with the community centre of Chemillé, driven by environmental beliefs, have been associated with farmers seeking to optimise their income, above all: "*Our group of farmers is a driving force because we have a corporate culture. Farmers do not have exactly the same expectations as individuals do. It is important for us to have our own private company"* explains a "productivist" farmer (Interview 3; 2016). This group had been collectively organising since their first solar cluster (2008) and acted in response to an economic opportunity rather than to a genuine concern for environment; "*even if someone feels strongly about the environment, nobody would invest 50,000 euro if it is not profitable*" (Interview 1; 2016).

The categorisation of farmers conceals the complexity of this social group, in which renewable energy development is fuelled by different beliefs. The economic diversification of the revenue, a motivation relayed by the group of "productivist" farmers, results in a "green growth" approach to energy transition. Conversely, some farmers who belong to an alternative French trade-union and who are involved with HBA, seemed to be genuinely more interested in environmental issues, and preferred joining the partnership of "individuals" because they opposed the vision of the "productivist" farmers, who they found mainly concerned with profit (Interviewees 4, 5, 9 and group interview with six members of HBA, 2016).

Even if farmers and individuals fuel this project with different beliefs, they share the same opinion about their "rural place". The promise of economic relocation, thanks to renewable energy, is a consensual argument, highlighted by local electives (Interviewees 6, 7, 12, 16 and 17), presidents and members of environmental associations (Interviewees 22, 23 and 25), and local entrepreneurs (24). Thus, the Leader Programme (2014–2020) in Pays des Mauges intends to "*make energy transition a driving force for the development of the territory, to relocate jobs through the exploitation of our potential in terms of renewable energy*". This echoes the recent history of industrial crises in Pays des Mauges (in the 1980s and 1990s). The shared vision of the rural territory results also in a productive representation of the countryside – "*we like having a productive landscape here*" (Interview 6, 2016) – updated now by a modernised representation of this industrial area, thanks to green and new technology. which could contribute to shaping the image of the territory. In this case, wind energy fits into a familiar landscape (Interviewees 11, 14, 16 and 23 in 2016 and 2018 for 14 and 16).

Nevertheless, the idea that energy relocation could be a driving force to keep resources for the economic benefits of the territory can be challenged. The number of investors in Chemillé (246 households out of 21,000 inhabitants) is still limited, although many have since been asking to join the partnership (Interview 1, 2018; 25 and 26). According to our survey, executives or entrepreneurs are the most commonly represented people among individual investors[9]. Besides the idea of an "*action using a participatory process for the local territory*" (Interview 1; 2016 and

[9] They represent a minority in this population of 21.5% labourers (12.9% on average in France), 17% employees , 27% pensioners, and only 4% executives (INSEE, French national statistics).

2018), it may result in a group of shareholders, with a certain level of social, financial and professional capital. This challenges the true participatory nature of the La Jacterie wind-park, as it comes under an hybrid combination of participatory financing and participatory investment (Sebi and Vernay, 2020, *op.cit.*). Although the locals are buying 100% of the wind-park, the siting decisions, the choice of technology, and the construction depend on private, partly external, companies; but the exploitation comes from a partnership between La Jacterie local stock company and a private company (Figure 2). Moreover, fearing the financial risks, local municipalities did not choose to invest in this inaugural park; the benefits are not yet guaranteed, so far, since the investors primarily have to bear refunds. CREPs are also very sensitive to public support and the length of their set-up (6 years in La Jacterie, 10 years for an inaugural CREP in Beganne, Brittany) is quite discouraging, even if the French Transition (2015) and climate-energy (2019) laws intend to foster their implementation by incentive bonuses and the shortening of procedures.

The La Jacterie wind park is a turnkey purchase operation negotiated with a local developer, which helps to bring trust among the locals; indeed, few intermediaries (Warbroek and al, 2018) are involved in this process, except for on the financial side, through networking activities with EPA (information on regulations, shared experiences with other local groups). Moreover, if the wind-park leads to a fair distribution of the outcome, it is hard to confirm the true earnings for the territory, given that in the still centralised french electricity system, production is sent to the national grid. Local distribution systems and cooperatives for green and citizen-led energy consumption, are still emerging (Interviewees 26 to 29, 2020), and even if their progression is fast, La Jacterie, as quite an experimental stage in participatory financing in France, did not benefit.

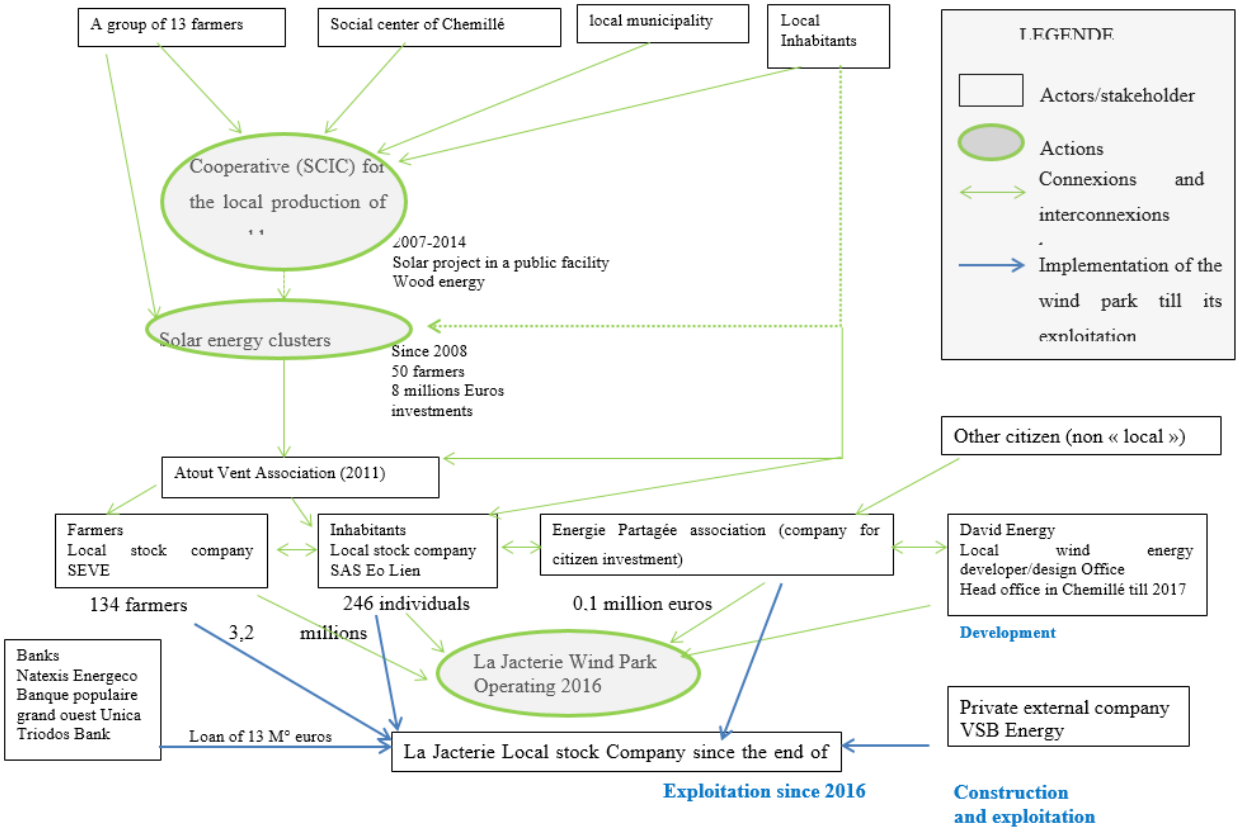


Fig 2. Steps, actors and actions leading to the implementation of the CREP La Jacterie in Chemillé. Source: own sources and personal surveys

The knowledge and success brought by this first installation gave confidence to the local authorities to invest, in partnership with citizens, in new projects. Thus, a recent participatory park in Chemillé (L'Hyrôme, table 2) has kept its gestion and exploitation to the locals through a semi-

private company run by local authorities along with a citizen stock company (Interview 20, in 2018; 27 in 2020). Its electricity is partly sold by means of a national cooperative for green and local energy (Interviewees 1, 6, 7, 8, 14, 16, in 2018).

6. Discussion

Community acceptance of wind-energy is the result of a complex combination of the nature of the project, the fairness of the procedures and the outcomes, public participation, in line with the network of stakeholders, the motivations of actors, and their representations of the rural territory and its sustainable development.

Two stages of observation are needed to determine the drivers for community acceptance. The first one is between the Pays des Mauges' dynamics for wind energy (planning) and how they are translated into siting decisions in Chemillé. The second one considers the very specific situation in Chemillé. Five wind-parks are now currently in operation in Chemillé, ranging from internal awareness to renewable energy, leading to a diversity of projects, and finally to consensus among locals on the very interests of fostering rural development with the help of wind-energy, and then, with participatory financing. A cooperative model, encompassing not only a share of benefits within the local community, but also ownership and influence in the decision-making process, is important.

However, as many scholars evoke the primary role of financial participation (Breukers and Wolsink, 2007, *op.cit*.) and household compensation (Garcia et al, 2016, *op.cit*.) to accept wind-parks, the Chemillé case study represents another perspective. Whereas it attests to a strong commitment, even support, for wind-energy, the participatory purchase of the La Jacterie park occured only after four wind farms had been installed whithout opposition. So, in Chemillé and for the majority of wind installations in Pays des Mauges, local financial participation has not been a prerequisite for achieving "community acceptance" of wind-parks. Moreover, collective investment can constitute a risk, given the lack of stability or continuity in energy regulations, or in the financial incentives.The first step, and the first driver for wind energy acceptance, at Pays des Mauges's level and at Chemillé's, derives from the specific participatory procedure implemented at the beginning of the Pays des Mauges wind-energy planning scheme, leading to the determination of places fit for facilities. Early communication has helped to achieve higher acceptance levels, as stated in other situations (Langer et al, 2017, *op.cit*.). However, was this acceptance difficult to attain as the wind-energy planning scheme of Pays des Mauges was intended more to pacify competition between municipalities and farmers, who wished to set up facilities, than to guard against disputes from inhabitants?

The overall participation in the Pays des Mauges wind energy procedure has coincided, in Chemillé, with the endogenous awareness for local development and the climate and energy issues that have been emerging since the 1990s. The institutional and local capacity to facilitate the decision-making process and to pool efforts with the help of a community policy which brings together stakeholders, knowledge and resources on a given issue (Breukers, 2007, *op.cit*.), is critical. Nevertheless, the question is to clearly determine the given issue that motivates collective mobilisation. This relies on the many elements of acceptance such as who are the main actors, and what are their motivations and their environmental beliefs, in line with the representations they hold of their rural place, and the true nature of public participation. At the La Jacterie wind-park, the role that the numerous experiments, the knowledge of renewable energy, and the familiarity between locals and wind-parks, played undoubtedly, led to this entrepreneurial collective dynamic, which was very expansive in terms of cost, of time, and of effort. Thus, a double consensus among farmers, inhabitants and local electives has to be underlined, as the notion of "a project for local development" reflects the "sense of a rural place" fit for technologies, especially if it contributes to renewing the image of the territory, with the help of the green economy. As some scholars have stated (Devine-Wright and Wiersma, 2020, *op.cit*.), the positive perception of wind power for rural development may be favoured in municipalities with an industrial heritage, and even a high unemployment rate. But, Chemillé represents a more nuanced picture as, locally, job growth did well, in the 2000s, and this rural area is far from being remote and vulnerable (Figure 1). However, the loss of thousands of jobs in the 1980s and 1990s

is still on everybody's minds; wind energy has appeared as a means to renew employment perspectives and bring local added value. The fact that high technology helps to revive a rural development's path fuelled by productivist representations, seems critical in determining community acceptance.

Nonetheless, this double consensus is fuelled by different beliefs on the meaning of wind-energy for local development. The pivotal role of "productivist" farmers is significant in fostering the entrepreneurial dimension of a project tailored for the local territory. These farmers tends to view collective financing in renewable energy – in which they took the lead and helped bring to the locals their experiment – as a green growth operation with the aim of diversifying their revenue. Although we argued that financial benefit could not have been the first driver for community acceptance of wind-farms in Pays des Mauges, in general, it has become a real motivation for some actors for the participatory purchase of La Jacterie. As the collective financing project grows in importance, economic motivations are more openly displayed, in relation to sustainable local development and energy transition, although Chemillé's individual investors – most of them whom are committed to HBA – defend more environmental-oriented stances.

The participative nature of the La Jacterie wind-park comes under a hybrid combination of crowdfunding and crowd-equity, with a fairly high level of financing corresponding to most wind-energy CREPs in France (Sebi and Vernay, 2020, *op.cit*.). In Chemillé and in Pays des Mauges, the La Jacterie CREP is an inaugural step towards a greater opening for the participation of inhabitants, and not only "productivist" farmers, in local energy projects, by promising to control local resources and to relocate revenues. The specificity of this single case study questions the possibility of generalising the pattern, as the La Jacterie community has become a local capacity builder (*ibid*.), which has been able to catalyse the emergence of other CREPs. However, for now, this has been only done in its vicinities – within a similar territorial and socio-economic context –, by mutualising its collective knowledge, thanks to this inaugural experience.

7. Conclusion

The Chemillé case study determines two stages of observations for analysing the drivers for community acceptance. The first one is the early communication made during a regional wind-energy planning procedure, which incited a feeling of trust among the locals, thanks to public participation, to envision siting decisions locally. Moreover, the "sense of place", whose rural industrial path to development can be kept up to date by green technologies that fit in a familiar landscape, reached a general consensus. This explains the "community acceptance" of wind farms *in general*, whether they derive from a citizen-led process or not. Subsequently, a collective entrepreneurship for renewables, thanks to key-stakeholders including many productivist farmers, constitutes a second step that gives actors the confidence to envision the La Jacterie CREP. Although this project is fuelled by different beliefs, the prevailing consensus is on local development concerns in a "productive countryside" originating from an industrial legacy. However, the participative nature of the project is at stake, as limitations from French regulations and a very centralised power distribution system can offer financing participation and return on investments, but neither self consumption in a local energy circle, nor energy autonomy, can be guaranteed. Thus, the equity of the projects rests primarily on the sharing of financial investments and results.

Clearly, this is only one case study and additional research is needed, in other territorial contexts, to validate the findings. Further research could also scrutinize the perceptions of those who remain silent and do not actively participate in decision-making processes (Bell et al., 2005), to better gage the range of acceptance. Likewise, the evaluation of the fairness of the participatory process and of its outcomes, a few years after the set-up of the project, along with the empowerment of the community, constitute perspectives for further developments. Indeed, from now, such projects are expanding within Pays des Mauges, but using another pattern, with investment from municipalities (semi-private companies) along with individual shareholders. The model of participation and its fairness is at stake as much as to maintain trust among locals as well as to bring empowerment to the community and share its experiments beyond its territory.

Acknowledgement

We gratefully acknowledge the comments and suggestions made by the two anonymous referees.

We express our gratitude to the University of Angers which has funded the CODESOL program that has enabled this research.

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