

# Institutional factors influencing strategic decision-making in energy policy; a case study of wind energy in France and Quebec (Canada)



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## ABSTRACT

This article studies the different institutional factors that influence a strategic wind energy decision-making process through a comparative transnational study of Quebec (Canada) and France. Research confirms that political choices are dynamic and vary with a change in the wind energy context, the balance of power between pressure groups, supranational influences, energy evaluation approaches and social acceptance. Until the 90's, an initially unfavorable national energy context, combined with a neocorporatist culture, as defined by Szarka (2004) [1], limited the place of wind energy in both jurisdictions. In the 2000's, a political window opened when the private sector penetrated the market with the deregulation of the electricity sector, exogenous pressure from the European Union in France, endogenous pressure from social actions in Quebec, and a more favorable energy context in both cases. However, this political window was short-lived due to social acceptance issues. In Quebec, political will was stronger until 2013. Now, the social controversy surrounding wind energy has shifted from the local to the national level. Projects are better accepted locally because of local financial involvement, but an anticipated electricity surplus questions the relevance of new energy projects. In France, political support depends on the government in power. Between 2005 and 2013, the reduction in annual wind power installations from 1246 MW to 621 MW was due to the major influence of the anti-wind lobby on a right-wing government. After 2013, the left-wing government's arrival coincided with a phasing out of several regulatory and financial uncertainties. Today, both jurisdictions are at a crossroads and the future energy mix will depend on the relative influence of the institutional components identified. In our opinion, key solutions to more sustainable political choices are conditioned by an improvement in the way projects and policies, plans and programs are assessed.

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**Abbreviations:** BAPE, Bureau d'audiences publiques sur l'environnement (Public Hearing Office for Environment); CC, Climate Change; CE, conventional energy; CT, Call for Tenders; CRÉ, Conférence Régionale des Élus (Québec) (Regional Elected Representatives Conference); CSPE, Contribution au Service Public de l'Électricité (Contribution to Electricity Public Service); EDF, Électricité de France; EPR, new generation of nuclear plant; EP, energy policy; EU, European Union; FIT, Feed In Tariff; GHG, Greenhouse Gas; HQ, Hydro-Québec; HQD, Hydro-Québec Distribution; ICPE, Installations Classées Pour l'Environnement (Classified Installations for Environment); LA, local acceptance; MRC, Municipalité Régionale de Comté Comté (Regional County Municipality); PÉIE, Procédure d'évaluation et d'examen des impacts sur l'environnement (Evaluation Process and Review of Environmental Impacts); PPP, politics, plans, and programs; RCI, Règlements de Contrôle Intérimaire (Interim Control Regulations); RE, renewable energy; RTE, Réseau de transport d'électricité (Transmission Grid Network); SA, social acceptance; SEF, Sustainable Environment Federation; SRCAE, Schémas Régionaux Air, Énergie, Climat (Regional Patterns Air, Energy, Climate); SRÉ, Schémas Régionaux Éolien (Regional Patterns Wind Energy)

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## 1. Introduction: issues and research objectives

To address the problem of Climate Change (CC) and limit the global temperature increase in the range of two degrees Celsius, energy policies (EP) should encourage a transition from conventional energy (CE) to the full potential of renewable energies (RE) as soon as possible, in all sectors of the economy [2–6]. Unfortunately, EPs are not always necessarily well aligned with these objectives. Indeed, the principles of sustainability are not alone in dictating strategic energy decisions. In practice, many factors are hindering the large-scale distribution of RE and explain why EP is not as ambitious as it should be, especially in the field of electricity generation [7]. This research seeks to better understand the obstacles to the establishment of sustainable and acceptable energy policies based on the example of wind energy in France and Quebec (Canada).

In France, previous studies argued that the neocorporatist culture, an expression used by Szarka [1] and Evrard [8], was an institutional barrier to RE development through self-reinforcing mechanisms for nuclear power. Later, Szarka [9] added that the absence of political commitment to RE combined with structural regulatory problems resulted in the wind energy sector only reaching France's target in 2010. This was confirmed by Nadaï and Labussière [10–13], who confirmed that the development of wind energy faced an institutional battle at the national level and huge territorial dilemmas at the local scale that emphasize the social acceptance (SA) issues.

In Quebec (Canada), researchers primarily focused on social acceptance, trying to understand why citizens were opposed to wind energy projects during 2005. They underlined the limited outcomes of local projects, the local decision making process, but also national parameters such as the regulatory framework and the development model (financial mechanisms and type of ownership) [14–17]. They concluded that the SA of wind energy projects would be better if: 1) there was a better evaluation and planning of wind energy development by ex-ante policy evaluation, such as strategic environmental assessment [18]; 2) all types of developer can participate in a hybrid development model; this has now been the case since 2010 with the introduction of new financial and regulatory instruments [16,19]. A more recent study adds that the energy context, including the price of energy or the surplus or deficit situation, influences political will in Quebec to develop wind energy [19].

The variety of issues raised by previous studies motivates our efforts to find a holistic definition of the EP concept as no consensual approaches can be found in the scientific literature [18,20,21]. Therefore, we have developed a conceptual model to better understand the influence of institutional factors on energy policy (EP) with an emphasis on social acceptance (SA).

For agricultural water management, Valipour et al. [22–25] showed that nine quantitative indicators are the most important in predicting

the evolution of water resource development in various regions of the world. For wind energy policies, given the complexity of the social and political issues raised, researchers focused on qualitative variables, namely institutional factors, which can influence the dynamics of strategic decision-making and explain the historic national path dependency. For example, Toke et al. [26] studied the implementation of wind energy in several European countries. They considered different variables: 1) the planning system and the cultural aspects prevailing in the society; 2) tariff mechanisms; 3) landscape protection organizations and associated landscape values; 4) type of ownership of the projects and grass-roots movements. They concluded that all these institutional factors were affecting social acceptance at different levels. More recently, Fergusons-Martin and Hill [27] used the same approach to study the evolution of wind energy in four Canadian provinces, excluding Quebec. They concluded that several direct and indirect causal factors<sup>4</sup> influenced the two major diffusion conditions of wind energy development, financial viability and social acceptability. Finally, another comparative study between several European countries, including France, Germany and Portugal, concluded that the French planning problem is a cultural issue related to the way that landscape is evaluated, as traditions differ from one jurisdiction to another [28]. As these comparative approaches appear to be more meaningful from a social perspective, we chose a similar methodology. The selection of France and Quebec is justified by the similarities and differences of the institutional variables chosen, which give a better understanding of their relative influences on the strategic decision-making process.

One issue of our research is to clarify the importance of institutional variables that directly or indirectly influence the energy policy decisions in France and Quebec. For example, both jurisdictions had to wait till the early 2000s, when strategic policy makers began to develop wind energy, while pioneer countries such as Denmark and Germany began well before that, in the 1980s. Why these differences and a twenty years delay in the development of projects? Could this be explained by the historical influence of economic pressure groups and an initial unfavorable context of emergence [1,8,9]? How are the social and environmental movements and pressure groups positioned relative to the wind energy sector and how have they influenced the strategic decision makers? Was there a division between social and environmental groups, as in the United Kingdom [29,30], or was there a convergence of social groups in favor of wind energy, as was the case in the 1970s with the grass-roots anti-nuclear movements in Germany and Denmark [26,31]?

<sup>4</sup> The direct causal factors are related to the grid architecture, the type of ownership, the financial mechanisms and the regulatory framework. The indirect causal factors are related to incumbent generation technologies, electricity market structure, the Government electricity policy, political and social movements, and landscape values.

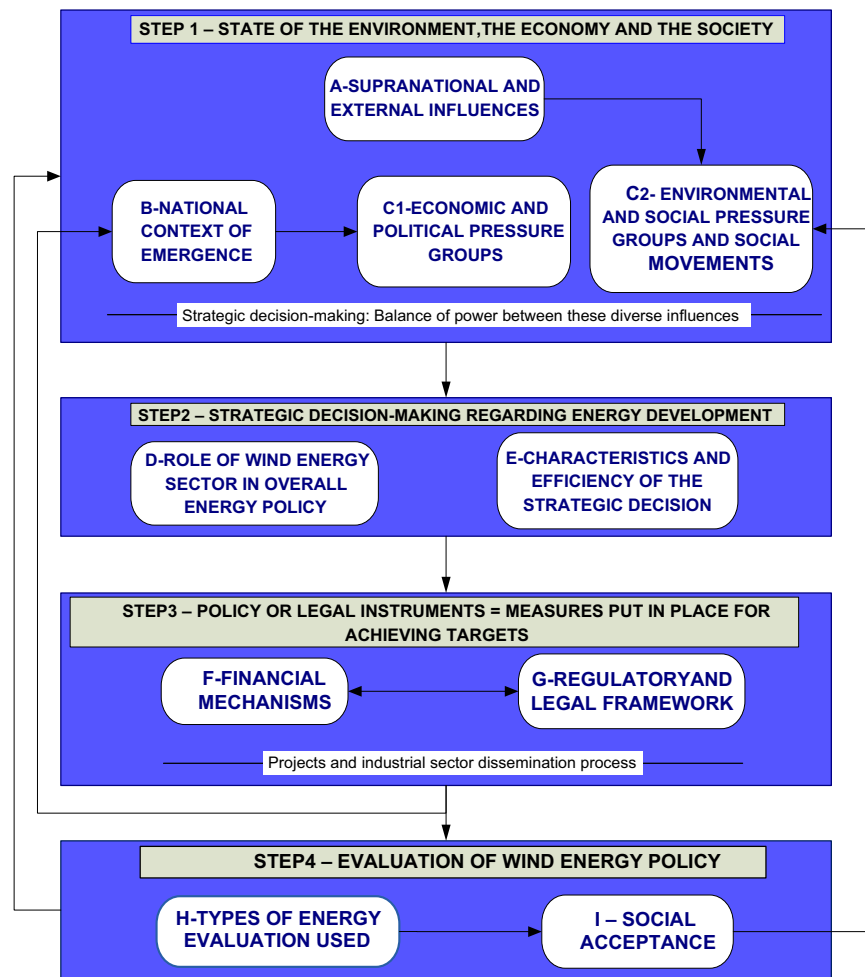


Fig. 1. Analysis conceptual model of a wind energy policy.

Finally, although wind energy has a positive image in public opinion, the implementation of several projects faced opposition from local populations on both sides of the Atlantic [11,15,18]. The reaction was very rapid in France and Quebec since objections were raised after only 4–5 years, while in Denmark and Germany they only began more than twenty years after the wind projects were launched [11,31–33]. How can these differences be explained? Is the support of local projects, as argued by Fortin [15], an essential condition for the sustainability of development in this sector? Or is it reasonable to believe that the problems originate from the centralized nature of decision-making concerning energy projects or the energy sector, and the associated environmental impact assessment processes [9,11,13,28]?

In the first part of the paper we describe our conceptual framework, the components and the analysis model for a wind energy policy. Then, we present the main results regarding the various components of EP and their influences (direct or indirect) on energy policy makers. Finally, we discuss the practical implementation of the main results of the study and conclude with the scientific contribution of this conceptual model.

## 2. Conceptual framework: an analysis model for wind energy policy

### 2.1. Model overview

We used an innovative conceptualization of energy policy to investigate under what circumstances a wind energy policy (EP) could

become more sustainable and acceptable [19–21]. It assumes that social acceptance (SA) is interacting with the EP, because: 1) energy projects originate from an EP that fix the conditions of its implementation; 2) SA influences the EP, as the implementation of the project results in either social acceptance or opposition that influences policy makers at the strategic level. This conceptualization requires a rigorous definition of the key concept in this research, namely the EP. This is done through an analysis model that illustrates the various interacting components of an EP, SA being one of them.

This model was built in four steps (numbered 1–4) and nine components (numbered A–I), as shown in Fig. 1. Strategic choices are directly influenced by the initial state of the environment, the economy and the society and indirectly affected by the projects and industrial sector dissemination process, social acceptance and the type of energy policy evaluation used. The nature of these relations is studied in the following detailed analysis of the main steps and components of this conceptual model of EP.

### 2.2. The components of a wind energy policy and their influence on strategic decision-making

#### 2.2.1. Step 1: direct influences on strategic decision-making

Step 1, or the state of the environment, the economy and the society defines pre-existing conditions for the establishment of a wind energy sector in a particular national context. As this industry is becoming more cost effective compared to traditional energy used for electricity production (such as conventional energies (CE), nuclear energy or hydroelectricity (hydro)), the

economic factor is not the only element that hinders development. Other socio-environmental, energy or political forces are exercised. These also influence strategic decision-making processes, which is the result of a balance of power between all these forces [7,34–38]. In this research, we used the direct influences of three components: 1) supranational and external influences (component A); 2) the national context of emergence (component B); 3) pressure groups in society and social movements (component C). Here we seek to understand the relative influence of these three components on strategic decisions and, therefore, the level of political commitment to wind energy. Specifically, we analyzed:

1. The way in which *supranational influences* influenced national wind energy objectives, the structure of the electricity market, the choice of development model or the choice of financial and legal instruments in France and Quebec. For example, the attitude of the Canadian federal government towards climate change and the significant presence of oil sands in Alberta do not help the various Canadian provinces to establish binding and ambitious Framework Laws for the development of RE or Greenhouse Gas (GHG) emissions, especially as it is not necessarily under their jurisdiction. This is in contrast to the situation in the European Union (EU), given that the EU has played the leading “climate” role since the early 2000s by imposing RE guidelines and reference targets on each member state [9,34,39,40]. In addition, the current context of globalization promotes neoliberalism in all spheres of the economy, including electricity production [41]. This has resulted in a gradual opening of the electricity markets in each national context. This deregulation has different effects on the emergence of RE based on the initial national situations (former state monopolies in France and Quebec) and the degree to which it is decided to open the market [27,34,39,42,43].
2. The way in which the *national context of emergence*, defined by the political style and the energy context,<sup>5</sup> has influenced and delayed the policy choice for wind energy in France and Quebec. Indeed, decentralized energy production of wind energy, for example, may seem difficult to integrate for public authorities when the modes of action and preferred policy instruments are part of a ‘top-down’ tradition of state intervention based on large-scale infrastructure programs and large industrial conglomerates, or ‘colbertism’, in which most decisions are made without real prior national debate [1,8,9,34,39]. In addition, both jurisdictions are characterized by low electricity prices in Europe and North America, additional needs for low power, and low GHG emissions in the electricity sector. However, Ferguson-Martin and Hill [27] established that the nature of the existing energy mix (and technologies) influenced national energy orientations as it affected national production costs and therefore the competitiveness of other RE, including wind energy. Many authors added that the need to guide the EP toward wind energy is more obvious when a jurisdiction uses CE (coal or oil) and must decarbonize its electricity production compared to countries primarily using non GHG-emitting sources (such as hydropower in Quebec and nuclear energy in France) [15,32,34,37,40,42,43].
3. What is the *lobbying force ratio in society* and how has the position of lobbies in favor or against the wind energy sector influenced the political choice for wind energy in France and Quebec?

In general, a new technology is expected to face well-organized opposition from the dominant existing economic lobby. This opposition to change depends on the national context of emergence

<sup>5</sup> We define the energy context by the price of electricity for residential consumers, the level of electricity required (surplus or power deficit) and the emission level of greenhouse gases (GHG) in the sector of electricity generation [21].

and largely determines the existence of a pro-environment RE [34,37,42]. In cases where established players have economic interests in competing industries, they take a strong position against wind energy and seek to slow its development, as they are concerned that this new industry could alienate market share [34,35,44,45]. More specifically, we will verify if the hypothesis of ‘neocorporatism’ is actually well-founded for the two jurisdictions studied [1: p. 21, 8]. The hypothesis stipulates that the dominant players act as a resistive force and help to keep the system in place through self-reinforcing mechanisms for existing industries (nuclear energy in France, hydropower in Quebec).

The strategic decision (or political choices) also depends on the *positioning of social pressure groups* in favor or against the wind energy sector [27]. We gave particular attention to the effects of collective actions, large or small, that could upset the established power balance and clarify the choice of energy sectors or specific projects. In particular, we studied the influence of the environmental ‘Grenelles’ (2008–2011) in France and the protest against the Suroît project (2004–2005) in Quebec on strategic decision-making.

In general, the development of wind energy is a new kind of environmental controversy since the spatial distance between the costs and benefits of a project has the potential to divide the environmental movement, especially when there is little perceived need for the development of wind energy [43,46,47]. This is what Warren et al. [30: p. 853] call ‘green-on-green’. In Germany, the firmly perceived need for a wind energy sector has resulted in strong support for these projects in civil society, which has long attracted a solid and sustained political will in favor of wind energy [31,35,48]. In France and Quebec, as the energy context is less favorable for RE, there is a good chance, and that’s what we will verify, that the perceived need for wind energy is less obvious, which strengthens opposition movements to projects and limits the political support for RE, as has been observed in the United Kingdom (UK) and Sweden [12,15,29,30,43,46,49]. In France, these divisions of the environmental movement may also be exacerbated by the presence of a strong cultural landscape, as was the case in the UK with the Country Side Garden [30,49].

### 2.2.2. Step 2: the strategic decision-making process regarding energy development

This second step concerns the strategic decision-making process (component D and E). The French and Quebec Governments give a relatively limited place to wind energy in their energy mix compared to Germany, Portugal, Spain, Denmark and Ontario. In both cases, wind energy is to reach 10% by 2015 (Quebec) or 2020 (France) [50,51]. In this article, we will try to analyze the reasons. To achieve this we characterized and analyzed *the level of political commitment to the wind energy sector* in France and Quebec in terms of:

1. The level and stability of the financial and legal instruments. Indeed, the efficiency of an EP is related to the financial mechanisms and their stability over time. More favorable financial incentives result in a stronger market expansion; predictable and continuous policy results in a stronger expansion as instability creates additional risk for developers. The selection of a sufficient and stable tariff mechanism is therefore an important issue for the development of wind energy [9,27,34,52–55]. In addition to the choice of financial mechanisms, EP also requires a stable institutional framework to be effective; while the success of the German EP is due to an unflinching political commitment from its origins in the 1980s, its lack of stability is a major barrier to the spread of projects in Sweden and the US [26,37,46,47,56–61].
2. The level of energy policy coordination and development planning. Indeed, the task of policy makers is to follow and coordinate public policies and plan the development of an

upstream sector for the projects [43]; the question here is: have governments planned the development of the sector upstream of the development of the projects?

### 2.2.3. Factors indirectly affecting strategic decision-making

**2.2.3.1. Step 3: policy and legal instruments, and their role in project implementation and the industrial sector dissemination process.** Once strategic decisions are made, we have to define appropriate ways to achieve the objectives. This is the role of the financial and legal instruments that define how the projects and the industrial sector can expand into the territory, and thus define the rhythm of diffusion of wind energy.

On the one hand, *the financial policy instruments (component F)*, particularly tariff mechanisms, are intended to trigger investment in new production capacity, and thus reduce their cost difference with CE [27,47,62]. These are the main financial mechanisms used in Quebec and France. Feed In Tariff (FIT) have been used in France since 2001; Call for Tenders (CT) have been used in Quebec since 2003, with an obligation to include provincial or regional content and other criteria [20,63]. On the other hand, *the regulatory and legal framework (component G)* includes the various administrative procedures that govern the implementation of projects and their location. In France, this is part of the 2014 joint building permit procedure and 'Installations Classées Pour l'Environnement (ICPE)', supplemented by the 'Schémas Régionaux Éolien (SRÉ)' included in the 'Schémas Régionaux Air, Énergie, Climat (SRCAE)', since the Brottes law [64] abolished the rule of five minimum masts,<sup>6</sup> and the 'Zone de Développement Éolien (ZDE)'. In Quebec, this corresponds to the call for tender process coupled with the environmental impact assessment and review process or 'Procédure d'évaluation et d'examen des impacts sur l'environnement (PÉIE)', and the state land allocation policy on public land and the 'Règlements de Contrôle Intérimaire' (RCI) on private land. In both jurisdictions, these processes include a public hearing, the 'Bureau d'audiences publiques sur l'environnement' (BAPE) in Quebec, and a public inquiry in France. In a previous article, we analyzed the impacts of pricing mechanisms in terms of installed capacity, cost to society and SA for onshore wind. We also made the assumption that financial and legal instruments were two complementary tools to achieve the goals, both in industrial development and installed capacity [19,63,65].

**2.2.3.2. Step 3: evaluation of wind energy policy: types of energy evaluation used and social acceptance.** There are several types of energy evaluation (component H) used in different national contexts [66]. 'Ex-ante' assessments are sometimes performed before the EP is established. The idea is to choose the best possible scenario for the future based on existing knowledge or experience from abroad. Practice shows that the strategic assessment requirements are important in several states because this type of evaluation is often inefficient or non-existent [30,38]. This was also the case with wind energy in Quebec and one of the main conclusions of the study of Saucier et al. [18]. 'Ex-post' assessments are intended to measure the EP implementation results in terms of economic, environmental and social impacts to improve their practical results [38,67]. Where they exist, these assessments can influence the strategic actors to rethink their choices, so this is an important indirect factor affecting the EP. In our research, we wanted to know if our respondents were aware of existing evaluation mechanisms, how they should be improved, their effect on SA and how they have influenced (or not) the strategic policy decisions.

Regarding social acceptance (component I), as there is no holistic conceptual approach based on a common theoretical framework,

most authors prefer to speak of constitutive factors [18,43,68]. The originality of our research is based on the analysis of interaction between EP and SA. We thus defined SA by means of three constituent dimensions: 1) wind power acceptance seeks to determine whether the wind energy sector is relevant or not in a national context (sector level); 2) proponents acceptance explores how promoters are accepted by the population (meso-social level); 3) local acceptance (LA) refers to the acceptance or rejection of a specific project (project level). In the latter dimension, we distinguish considerations related to procedural (or decision-making process related to the project) or distributive (distribution of costs and benefits of projects) justice [21,69] (cf. Fig. 2).

In this article, we will see that SA is another indirect measure of the implantation results of a wind EP because the strategic decision makers can be influenced indirectly by SA. For example, the energy context, which may be unfavorable, can strongly influence the relevance of the sector in the national electricity mix [21]. In addition, the supranational context of liberalism<sup>7</sup> influences the choice of development model and the nature of ownership (private, community, state, mixed), and therefore the proponent's acceptance, especially if the project leaders are exogenous to the project implementation territory [71–73]. Moreover, the level of economic and regulatory planning can affect the predictability of the location of wind turbines, and thus affect local acceptance [18]. Finally, financial and legal instruments have a strong impact on the type of ownership, the characteristics and the location of projects, and hence LA [19,63,65]. In the end, a favorable or unfavorable conjunction of these elements can initiate an opposition (or support) to wind energy and influence significantly the strategic decisions. The challenge for policy makers is therefore to install a large wind capacity within the operating constraints of electricity supply systems, and without a spark of significant local resistance [9]. In this article, we will evaluate the dynamics of SA in France and Quebec, explaining the nature of their influence on the national policy decision makers. We will particularly focus on:

- 1) Wind power acceptance, as various institutional factors may affect the place given by politicians to wind energy in the electricity mix. We will see that these factors are particularly linked to the level of relevance of the national energy context, the financial viability of technologies (how the price of electricity is calculated and how the environmental costs are internalized) and the current energy strategy (priority given to energy efficiency (EE), other RE or historical technologies) [1,11,15,34,45,46,61].
- 2) Modalities of decisions concerning projects, including the territorial level of decision and the nature of public participation, as these two aspects strongly influence the procedural issues related to the local level of SA. Local Acceptance (LA) is a dynamic co-construction of a project by the various local stakeholders. It depends on how these actors are involved in the decision-making process [11,13,15,17,18,26,37,68,69,74–83]. But these procedural issues are embedded in a regulatory and institutional framework that defines public participation in an environmental assessment process and assigns each territorial level decision to the project authorities. In the context of wind development in France and Quebec, we analyzed: 1) the importance of public consultation in the decision-making process associated with the project. Does it come too late, as might be suggested by Saucier et al. [18] or Nadaï and Labussière [11]?; 2) the territorial level of decision-making. Is this suitable for wind energy? Is there not a dilemma at the territorial level of decision-making, as assumed by Nadaï [13]? On the one hand, development can be initiated by a variety of local and regional structures for citizen participation, as is the case in Germany or Denmark. This is called

<sup>6</sup> The minimum requirement of five masts was implemented in the second Grenelle Environment in 2010. It stipulated that only projects of 5 towers or more could benefit from the purchase obligation (FIT).

<sup>7</sup> Liberalism is an ideology and policy model that gives the market to primary basis, with for allied the private sector and the free competition' [70].

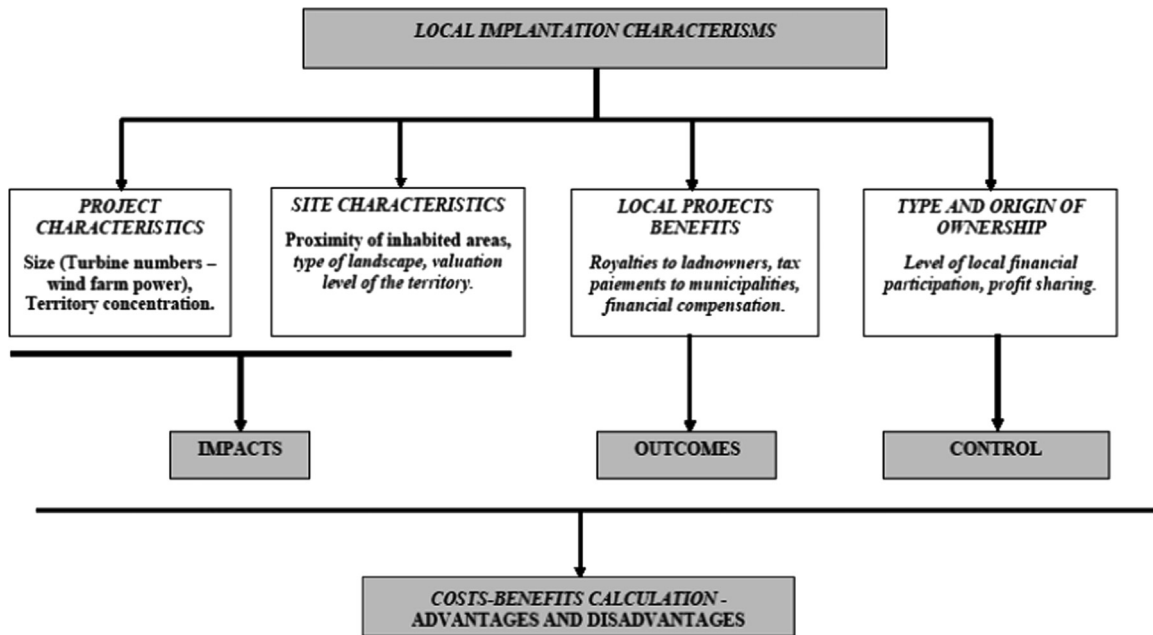


Fig. 2. Cost-benefits calculation of a wind energy project. Source : adapted of (HYPERLINK \l "\_ENREF\_2" \o "Saucier, 2009 #336" Saucier et al., 2009 : p.39) - the changes are in italics.

"bottom-up development." If local authorities have good control over the decision-making process and can decide the future of the project, local networks have a great power of influence and strong heterogeneities can arise. On the other hand, development may be authorized and initiated by the central government: this is called "top-down development" [43]. Centralized management is more homogeneous and can prevent unfair treatment between regions, but it could result in adverse effects in the realization of the projects when decisions do not respect local priorities. Local people with no control over an imposed development project may resent it, leading to increased opposition [84,85].

### 3. Research methodology

The research presented in this article is based on qualitative data. This is a transnational comparative approach which studies institutional variables in the context of the development of onshore wind energy in France and Quebec [20,21]. So it is a "cross-site" approach like that of Miles and Huberman [86], and is particularly suitable for the study of complex decision-making processes as it is rich in meaning and high explanatory significance [26,27,31,87]. In our study, we used documentary research combined with qualitative semi-structured individual interviews of key informants. A representative sampling of 36 respondents was made in France and in Quebec, 72 respondents in total, thus achieving data saturation [88]. These were divided into four categories of actors: 1) political and institutional; 2) professional; 3) pressure groups; 4) project leaders (private, cooperative, citizens or municipal). Data analysis was performed through content analysis and a coding system to describe the manifest content of communication using a systematic approach [89–91]. In Quebec, data collection was carried out in 2010 when the results of the third community CT were not yet known. In France, it took place in 2011, during a regulatory transition (the ICPE and SRE were just being adopted). Since then, we have consulted various documents in order to update the data and reflect the temporal evolution.

### 4. Research results

Here we will first present our analysis of the direct influence of the state of the environment, the economy and society on the level of political commitment to wind energy. Then we will study the indirect influences on policy makers, i.e. the effect of the project diffusion process, SA and the type of energy evaluation carried out, whether on projects (environmental assessment process) or the EP.

#### 4.1. Direct influences on the level of political commitment to wind energy

Research shows that the historical-institutional trajectories of France and Quebec have interesting similarities. Basically, the delay in wind energy development compared to the pioneering countries is the result of past policy choices made in the years 1960–1970. These choices led to the emergence of a single player with an almost complete monopoly and a predominant energy system in each national context. These are: 1) Hydro-Québec (HQ) and hydroelectricity (hydro) in Quebec, which provided 94% of the provincial electricity in 2012 [92]; 2) Électricité de France (EDF) and nuclear energy in France, which accounted for 77% of national electricity in 2014 [93: p.11]. This crucial weight of one energy sector and one actor was much greater than in other countries. In an originally closed electricity market, this lobby had a privileged access to the strategic decision circle. Thus, resistance to change has emerged which has been institutionalized in France and Quebec by the national technocrats. In a context of a highly centralized political decision making process with very few stakeholders involved, this lobby was afraid of losing its influence with the arrival of new players. Therefore, they contributed to the delay in the emergence of new energies, thinking that these new sectors would undermine their economic, industrial and financial interests. Moreover, migration toward more decentralized RE production sites was against the existing energy mix culture that tended towards large infrastructure projects. The 'colbertism' approach, in which an actor and some promising huge projects provide work for many outsourcing companies, was judged incompatible with RE development.

In both jurisdictions, the political choices of the years 1960–1970 also led to an unfavorable energy mix for the development of wind energy in the 1980s, when it was taking off elsewhere in Europe. Indeed, nuclear energy and hydropower have led to low average production costs (among the lowest in North America and Europe), a lack of immediate electricity needs, and an electricity mix that is up to 90% decarbonated. In comparison, wind energy was more expensive to produce and less competitive in terms of cost than elsewhere. In addition, the overproduction context ensures that the interest in generating electricity from other sources was considerably lower, whatever the source. Both these elements contributed to delay the development of the wind energy industry until the late 1990s and prevented the establishment of a favorable financial and regulatory framework. Wind energy projects and the industrial sector were stalled and investment in research and development was at a minimum for RE.

In other words, research confirms the neocorporatism thesis of Szarka [1,94] in France, and suggests that it also plays a role in Quebec. Together with an energy context that is unfavorable to wind energy, this neocorporatism constitutes the most important factor in the 20-year delay in the development of wind energy projects and a wind industry sector when compared to the pioneering countries. This research also questions whether neocorporatism is still active today because the weight of historical economic groups remains dominant in strategic decision-making. Indeed, even if supranational influences, large collective actions and a more favorable energy context managed to "momentarily" shift this power struggle in the early 2000s, the level of political will for wind energy has fluctuated somewhat since 2005. This manifests itself in a lack of continuity in financial and legal instruments and national investments, which are still mainly oriented towards nuclear power in France or hydropower in Quebec.

First, supranational influences meant that wind energy entered the two national energy mixes in the 2000s. Indeed, the liberalization of the electricity sector that has prevailed since the mid-1990s in both jurisdictions has forced the market to open and put an end to the monopoly on the production of electricity. This regulatory change allowed private producers to enter the market, which otherwise would never have happened given the unwillingness of the existing actors to abandon their economic monopoly. To this we must add external pressure in France and internal pressure in Quebec.

In France, the European Union (UE) gave the necessary impulse for wind energy development during two separate policy windows. Without this, the objectives and financial resources available would have been much more limited. Under the left-wing government of Lionel Jospin and of the green minister Yves Cochet, the country applied the first European directive and fixed indicative targets of 10% RE by 2010. The feed in tariff (FIT) was introduced in 2001 to achieve these goals, which truly marks the kickoff of wind energy in France. In 2007, a second window opened when Nicolas Sarkozy decided to respect his campaign goal of realizing the Grenelle Environment, which will lead to binding targets of 23% RE by 2020, representing about 19 GW of onshore wind power and 6 GW of offshore wind power (or 10% wind power).

In Quebec, there was a rather important endogenous collective action that provided the necessary impulse for wind energy development and induced the government and Hydro-Quebec (HQ) to open a call for tenders (CT). Following a difficult economic context, a regional mobilization took shape in the Gaspésie in the late 1990s and called for implanting the industrial sector in its territory. The government agreed in 2003, deciding on a first CT with compulsory regional content of 1000 MW. Several respondents assimilated this more favorable context for wind energy to the proximity between the Council of Ministers and the Gaspésians elected through the Gaspésie Recovery Committee. In 2004, following the decision of HQ to implant several combined cycle plants, a protest movement appeared: this would be the battle of the Suroît. This large environmental movement gained a strong popular mobilization that forced the Liberal government to open public hearings with the power regulation agency, Régie

de l'énergie, on these questions. Following the conclusion of these debates, the government replaced these gas projects by a second 2000 MW wind energy CT. This political choice resulted in the decision taken in 2005 to include a target of 4000 MW (or 10%) of wind energy in the national grid in the 2006–2015 energy strategy.

In both cases, the renewed political and social interest observed for wind energy in 2000s also coincided with a more favorable energy context. Indeed, the construction of new energy infrastructure had been stopped during the 90s and strategic decision makers anticipated greater needs in electricity supply by 2015–2020. Moreover, the marginal costs of wind energy were reduced with its increasing use in Europe and it became more competitive, even compared to new hydro projects in Quebec (like the Romaine project) or the new generation of nuclear plants in France (including the Flamanville new generation of nuclear plant (EPR)), which have seen their costs rise. Financial sustainability was less and less a problem for the development of the wind energy sector.

However, this important decision-making power of the pro-wind lobby did not last in Quebec and France. Over time, local opposition to projects caused a division among environmental groups in relation to the wind energy issue, as suggested by the work of Warren et al. [30] in the literature.

In Quebec, several projects were delayed, moved or canceled; almost 700 MW will not be completed in the 2006–2015 energy strategy, in particular because of local opposition [19,63,65]. Environmental groups had difficulty convincing the population that wind energy reduces GHG emissions in a context where the CT development model was widely criticized in the regions, especially during the early stages of its development, when it involved exogenous private multinationals that left little royalties to local communities [18].

In France, many projects quickly started to follow the establishment of FIT in 2001. However, the regional authorities responsible for examining applications were quickly overwhelmed by the large volume of connection requests. This led to an increase in opposition to projects, including from regional administrations. The protest movement rapidly extended to the national stage, with the formation of an anti-wind energy lobby. This was represented in particular by Vent de Colère (Wind of Anger), The *Federation Environnement Durable* (Sustainable Environment Federation (SEF)), as well as landscape and heritage associations. They radicalized the criticism of wind energy around the costs of wind programs, the concentration of wind turbines in inhabited territories or "urban sprawl", and industrial wind power, and tried by all means, in particular legal recourse, to prevent the development of wind energy [95]. The role of the lobby was effective in managing the opposition, mainly due to its internal organization as it coordinated the activities of nearly 1000 local associations and present political and media relays at various levels [96]. With a right-wing government in charge between 2005 and 2012, this lobby had a significant influence on policy decisions.

In both cases, the lack of continued support and long term political commitment is a major limitation for the transformation of the sector; fragile, it mainly depends on the governing political party in power, the balance of power between pressure groups, their proximity to power and the energy context, which constantly recomposes the dynamics of the stakeholders.

In France in 2011 a large majority of respondents felt that there had been "beautiful" official speeches, but contradictory decisions only complicated and slowed down the development of the sector. Regulatory constraints were progressively extended to two years and ensured that the annual rhythm of implementation was halved between 2010 and 2013, when it should have remained stable to successfully achieve the 2020 targets [97]. Several respondents explained this by the balance of power between anti- and pro-wind lobbies and by the way policy decisions were made between Grenelle 1 and Grenelle 2 Environment<sup>8</sup>.

During Grenelle 1, the five parties representing civil society held discussions around the same table. This procedure allowed a shared vision and a rather consensual attitude towards wind energy development to emerge. Moreover, a framework law was unanimously voted in the National Assembly. However, this favorable position for the wind energy sector did not materialize in regulations promoting its development. Indeed, the results of Grenelle 2, adopted by a simple majority, are more controversial and inconsistent with Grenelle 1. For a majority of respondents, this was the consequence of a return to a routine decision-making process in which the policy technocracy, under the influence of the anti-wind lobby, regained control of development, while the various pro-wind groups were not directly involved in the legislative process.

In this context, the anti-wind energy lobby had the ear of the political power, with the active participation of several right-wing representatives who were strongly opposed to wind energy, and who notably filed a controversial report at the right time. Indeed, the first Grenelle 2 draft was favorable to wind energy, broadly following the framework of Grenelle 1, but things changed following the filing of the Ollier report [99]; parliamentarians severely amended the law by adopting point by point all the legislative measures recommended by this report. The political influence of the anti-wind lobby peaked at Grenelle 2, thus resulting in reinforced regulations against wind energy, like the ICPE procedure or the five minimum masts rule [100]. In doing so, the regulatory framework for wind energy eventually became ineffective because "too" restrictive and unusually complex. It was one of the most stringent in the world for many respondents, which offset the positive effect of FIT in terms of installed capacity normally observed elsewhere in Europe. This certainly explains why the average development time of for projects has increased over the years and was around 6–7 years on average in 2011, or 10 years if there was a legal recourse.

However, it seems that the influence of the anti-wind lobby on strategic decisions has been rather cyclical and linked to the political party in power. Indeed, Hollande's government has changed this policy since 2012. Various measures to simplify the regulatory and financial framework of the wind energy sector, such as the Brottes Law [64], the introduction of the single permit initiative in several regions, and the temporary<sup>9</sup> renewal of FIT after confirmation of their legality by the European Commission [102], show that the will of the left-wing government is oriented toward RE and the reduction of uncertainties surrounding their development. These adjustments were effective and resulted in an increased pace of installation from 621 MW in 2013 to 927 MW/year in 2014 [103]. This renewal of political commitment to wind energy peaked in September 2015 with the adoption by the deputies of the "energy transition and green growth" law, which seals the Hollande government's commitment to reduce the nuclear generation share from 75% to 50% by 2025 and to increase the RE share to 40% of the electricity mix by 2030 [104]. This law is, once again, the result of a third political window opened by the UE and the third energy-climate package [105], especially as Paris hosted the World Climate Conference on Climate Change in December 2015.

In Quebec, wind energy was developed in an "energy window" between 2000 and 2010 thanks to the strong political support of the various governments that decided on three successive CTs for wind energy. However, the future of the industry is more uncertain given the current energy situation of an anticipated electricity surplus and a supposed low selling price for export. Indeed, the world economic

crisis of 2008 resulted in HQ consumption forecasts being largely overestimated, and now a major electricity surplus is expected until 2017. This situation is the consequence of the drop in demand for electricity in the US. This was also the result of a reduction in export prices (as the United States began the exploitation of shale gas to produce electricity) and increasingly marginal costs of wind energy production<sup>10</sup>. This certainly explains why some opponents pretend that Quebec's electricity is now selling at a loss on foreign markets. Since then, the political support for wind energy has shifted under pressure from some anti-wind campaigners or consumer associations and institutional players who felt that electricity costs have become too high. Therefore, there is a political uncertainty about the future of wind energy in this context, characterized by a discontinuity of the CT. The government took more than three years to launch a fourth CT to replace the 800 MW that was not completed in the current 2006–2015 energy strategy. This explains why the role of wind energy has still not been confirmed in the new EP, which will start after 2015, even though the price of electricity in the last CT was much lower<sup>11</sup>.

#### 4.2. Indirect influences on strategic decision-making: social acceptance and types of national energy evaluation used

##### 4.2.1. Social acceptance of wind energy (dynamic evolution)

In France and in Quebec, research shows that the level of social acceptance of wind energy is dynamic and has varied over time. Although no one can predict the future with certainty, a majority of respondents felt that opposition to the projects would become less of an issue in Quebec unless wind farms continue to be concentrated in populated areas. In a context where the population density is high and there is much less space, particularly with less local ownership than in Quebec, the feeling was more divided among French respondents.

In both cases, the opposition to wind energy is increasingly based on strategic aspects as most local issues have been answered, except those concerning large birds of prey or bats. This confirms results in the literature to the effect that a justification of wind energy based on financial arguments, greenhouse gas emissions or electrical needs, is more difficult in countries where there is a significant contribution of hydropower or nuclear energy to the energy mix, because: 1) social pressure to reduce GHG emissions from the electricity sector are lower than elsewhere; 2) electricity production costs are historically low, which creates social resistance to new technologies that seem to be more expensive; 3) the fact there is no energy shortage contributes to the absence of a sense of urgency [11,15,83].

However, wind energy was still considered relevant by a majority of respondents in both jurisdictions. Indeed, the presence of highly interconnected grids with neighboring countries/provinces, coupled with a significant proportion of hydropower, ensures there will be no major technical and economic limits to the installation of a wind power share providing up to 50% of the electricity supply. The challenge is more in terms of what place wind energy will occupy in the future energy mix, particularly in view of the historical share of the electricity supply, other RE and energy efficiency progress. Wind energy would not necessarily be brought to play an important and stable role in a long term perspective because the anti-wind energy lobby and the established economic actors are seeking to question and discredit this sector at the national level.

<sup>8</sup> The Grenelle Environment is a major environmental process. It was initiated in 2007 by President Sarkozy and included several consultation steps and two Grenelle Laws. The first, or Grenelle 1, dated 3 August 2009, sets out the objectives for the RE; the second, or Grenelle 2, dated July 12, 2010, describes the regulations for achieving these goals [98].

<sup>9</sup> With the 2014 decree, the onshore wind energy FIT is effectively renewed at the same tariff until 2018. After that, the FIT must evolve into a mixed pricing system, in light of the new EU guidelines on the subject [101].

<sup>10</sup> For La Romaine, the last hydro-project in Quebec under construction, respondents differed on its marginal costs: they went from 12 ¢/kW h (environmental groups) to 7–8 ¢/kW h (HQ). The third community wind CT has doubled the production costs compared to the first CT (from 6.5 ¢/kW h to 11.3 cents/kW h).

<sup>11</sup> The fourth CT was finally launched in December 2013: bids were received by HQD in September 2014. They felt back in the same order of magnitude as the first CT in December 2014 (6.3 ¢/kW h) [106].



In Quebec, the majority of respondents believed that opposition to projects will probably be on a case by case basis depending on their location (inhabited areas or not) and how the decision-making process is conducted (behavior of local stakeholders). In a context where there is no lack of space to implement projects, no cumulative impacts have been identified, except maybe in the Matane MRC region, where several wind farms are close to each other. Besides, projects that are unacceptable for the local communities have been displaced by Hydro-Québec Distribution (HQD) to areas where communities were more favorable to the project [19].

In the accelerated learning process that has prevailed in Quebec, developers seem to be more conscientious, and both citizens and elected officials seem to be better informed and aware of how projects should be developed. The regulatory and financial framework has also been stabilized, most of the *Municipalité Régionale de Comté* (MRC) now have their RCI regulation in place, option contracts have been enhanced by HQD and the government since 2007 [107,108], and the fourth and last CT provides statutory royalties to municipalities and MRC of \$5000/MW installed [109]. Moreover, since the third CT, there is a larger share of the financial participation of the communities in which at least 30% of the profits remain in the communities. This ensures that even if the CT development context has not changed, the financial benefits are greater for the local stakeholders (landowners, municipalities, residents), who are more involved in wind farm development and layout, reducing uncertainties about the location of projects and turbines.

In addition, the decision-making processes are better as developers consult more decisions upstream to the implementation of wind farms. Local promoters are certainly more open to the concerns of local citizens because most elected representatives are involved in the development of these community projects. These elements increase the benefits perceived by the local population while reducing negative perceptions of the impact. While all of the first CT projects went through the BAPE process, the fact that most community projects have not been submitted to public enquiry is an indicator of this recent trend towards greater acceptance of community projects [110].

However, it seems that in Quebec the wind energy controversy has moved to the strategic level of the relevance of this sector. Hydropower is already a RE and its role should never be questioned. Furthermore, the context of a supposedly electricity surplus and low export costs raises questions about the need to produce more electricity, whatever the supply source. This issue will be important for policy makers in the development of the next 2015–2025 EP, particularly for the industry's future. The issue is whether it should double output to reach 20% of wind power on the grid by 2025, as has been requested by the industry since 2010 [111]. Indeed, the industry requires a sufficient domestic market of 350 MW/year so that investments made in Gaspésie and the Matane MRC can continue in the long term, at least until the "repowering" of the first wind farms established 20 years earlier. The survival of the industrial cluster may depend on the ability of the existing industrial actors to maintain an adequate domestic market after 2015 and break into the export market.

Beyond the final position of the government, it is clear that there is a need to redefine how we develop wind energy policy because the justification of new infrastructure based on electricity exports will be increasingly questioned by pressure groups, regardless of the types of energy, as it is claimed by some that electricity is sold at a loss on foreign markets. Therefore, there is no consensus among stakeholders about the future of wind energy. Some see it as an excuse for not developing wind energy as the need is not justified on the domestic market. Others, the majority in 2010, predict that wind energy will continue to be relevant in the medium term if we find enough opportunities for electricity to justify its implementation, either on riskier export markets (Quebec could become the green lung of North America) or the domestic market (with the

electrification of transportation and the need to reduce the dependence on fossil fuels, particularly in the field of transportation) [21].

In France, respondents are much more uncertain about the acceptability of wind energy in the future. At the local level, anti-wind associations are increasingly structured and publicized by the national federation. Is this the result of a mechanical effect due to the increase in the number of wind turbines, or are we observing a real increase in the opposition to projects in the French countryside? Moreover, what is the part played by the strong mediatization of wind energy conflicts?

On the one hand, several respondents felt that anti-wind energy groups, even though they are not necessarily numerous and represent only 5–10% of the population, have and will always have a high nuisance value. These groups are increasingly well-structured and have hardened their stance and their legal opposition by multiplying the number of recourses in relation to projects or the regulatory framework (on the SRCAE, the FIT, etc.). As the number of wind farms increases and the forests of turbines are densified across the territory, there could be a problem of progressive saturation of the landscape due to the concentration of wind turbines in inhabited areas. In addition, arguments against wind energy are certainly a bit more effective than in Quebec at the local level since the territorial anchorage of projects is more uncertain, with less local financial participation. Finally, with the FIT and the *Contribution au Service Public de l'Électricité* (CSPE), the contribution of taxpayers to the public effort for the development of RE is greater than in Quebec. This certainly explains why the anti-wind energy lobby is trying increasingly to discredit the wind energy sector in economic and industrial terms, particularly in the current financial crisis in France: it is claimed that industrial wind power would cost the taxpayer too much and would be a financial scandal for electricity consumers who would pay, via the CSPE, for private investors, who are often foreigners.

On the other hand, many respondents stated that surveys remain favorable for wind energy year after year, even though the percentage of support is decreasing slightly. The experience gained by the population and developers ensures that the media hype of anti-wind associations should have less impact locally since most of the arguments dealing with the local situation can be refuted by an on-site visit to examine the real impacts of wind farms already installed. Several respondents added that it was difficult to measure the actual level of acceptance of projects due to media bias: how many local associations who oppose and bring legal cases against the projects are representative of the local population? Do these not constitute a non-silent minority that makes a disproportionate amount of noise? According to those respondents, the majority of the population concerned by a specific project is silent, passive and does not express itself. On the contrary, opponents are more active and can quickly organize a local opposition movement through effective structures coordinated between the national federation and local associations. This enables them to quickly mobilize people from outside in order to organize mass public meetings and provide media power.

At the strategic level, the wind energy sector would need to play a more important role in the medium and long term because nuclear energy is not a RE and its role in the energy mix should be reduced in the future because of the risk of explosion, and the problems of waste storage and the dismantling of plants. What makes the debate a source of potential conflict, as suggested by several authors in the literature such as Devlin [46] and Wang [61], is the nuclear phase-out period (in the context of a possible extension of the lifespan of existing reactors) and the long-term role of nuclear energy in the national energy mix. While those who decided to abandon nuclear energy (such as Belgium, Germany, Switzerland and Japan) following the 2011 Fukushima accident are now taking important decisions in favor of RE, those who decided to

renew their nuclear park and subsidize their CE are not encouraging the development of RE [34,37,39,45,59,83,112,113].

In France, the political influence of anti-wind groups seems to be more favorable in 2015 thanks to the Hollande Government and the organization of the COP21 in Paris. However, the dynamics of SA could evolve positively or negatively, depending upon: 1) The attitude and behavior of local stakeholders (developers, local representatives, citizens) and the quality of the consultation prior to projects: who will win the local power struggle? 2) The nature of the project promoters in the territory: will there be more or less community wind farms? 3) The change in the national political context: with the energy transition law, the government seems to want to keep its election promises to reduce the nuclear share to 50% by 2025 and to set ambitious targets for RE for 2030; but what will be the consequences of a political change after the next elections in 2017? Is the wind energy regulatory and financial framework really going to be stabilized in the long-term? Will it enable France to achieve these ambitious objectives announced for 2030?

In a context where less territory is available than in Quebec, the presence of a saturation point and a maximum concentration of projects may result in increasing social opposition as a limiting factor for the industry's future, since projects will increasingly face patrimonialized areas of the territory.

#### 4.2.2. National types of evaluation used (projects and sectors)

Research shows that the way we evaluate a policy or a project has an important indirect effect on SA. In a highly centralized and/or decentralized<sup>12</sup> state decision-making culture, the French and Quebec States retain substantial decision-making power over projects and energy policy directions. This raises questions as to procedures and local opposition to projects when seeking to set up a decentralized sector such as wind energy.

As mentioned in the literature review [11,18], some respondents in Quebec and in France have criticized public participation in the environmental assessment process. The decision making-process is considered to be poor and allows only minor adjustments to projects during the later phase. In Quebec, projects are already accepted by HQD before they are submitted for a public enquiry, the BAPE audience. However, the energy to be delivered is already determined by a contract between the distributor and the developer, and the latter will have to pay fines if these terms are not respected. This makes it difficult to remove wind turbines from a project. In France, although the decision to hold a public inquiry depends on the prefecture, it can also be held at the end of the authorization process when the project is almost complete, after 4–5 years of development. So, in both cases the population is involved only at the end, and this is detrimental to local acceptance (LA). A majority of respondents would prefer to be consulted and to participate in decision-making ahead of the formal public participation process, in order to reach a collective agreement on the desirability of the project before taking a statutory decision on its fate. Knowing this, what should be done to improve public participation in the projects? Would it be worth decentralizing more decision-making and/or institutionalizing prior public participation in the environmental assessment process?

Although it may appear desirable in theory that State decision making on projects is more neutral, a majority of respondents in both jurisdictions considered that the territorial decisional level is too centralized in practice. They invited both governments to consider the benefits of decentralization to the territorial meso-level to facilitate regional dialogue through greater proximity to citizens, and to improve popular participation in the project planning process.

In Quebec, most of the respondents argued that this decentralization should be done based on the MRC's powers for territorial planning and the regional consultation role of the Conférence Régionale des Élus (CRÉ)<sup>13</sup>. For instance, several elected officials criticized the fact that the Municipal Affairs Ministry had too much control over the RCI, citing a perceived lack of flexibility. Another crucial aspect mentioned by respondents was to restore credibility and relevance to the BAPE. Indeed, some of them question the fact that the BAPE only has an advisory role. Ultimately, the Council of Ministers can decide not to consider some of the BAPE's recommendations, which was the case for projects strongly contested at a local scale, including the "Maple project". Nevertheless, is it normal that this project, the most contested locally in Quebec, will now be built?<sup>14</sup>

In France, the regional prefect's decisions are sometimes considered by respondents to be arbitrary since they have the power of life and death over projects; differences in attitudes, more or less intentional, largely explain the strong regional heterogeneities observed in terms of installed capacity or regional planning. A majority of respondents estimated that the current measures to strengthen the regional prefect regime by the SRCAE, the ICPE and the suppression of ZDE could be counter-productive. Several of them said it would be better to decentralize decisions on projects to an intermediate territorial level between the Communauté de Communes and the Departments, whether at the level of the country or regional parks. This result is in line with the recent work of Nadaï et al. [10,28] and other authors, who stated that a planning system would be more acceptable if it allowed more space for the participation of local stakeholders in open and collaborative regional planning [10–12,15,18,30,37,49,61,68,69,75,76,78,84,115,116].

On energy policy, respondents in both jurisdictions criticized the lack of systematic evaluation of the established EP (every 4–5 years) and the lack of transparency of centralized energy policy decisions, which they argue are not sufficiently debated, consensual and participatory. Local controversies arise with multiple energy systems, including wind energy, shale gas, oil exploration and pipelines, because national strategic choices are too ambiguous. It would be the only way to hear the citizen's voice because there would not be enough time in the environmental assessment process to discuss the relevance of new energy sectors before the implementation of the projects; it would be a case-by-case environmental assessment without enough upstream strategic planning.

In Quebec, despite the good overall efficiency of the PÉEIE in assessing the impacts of a specific project, many respondents complained that the evaluation process was not sufficiently effective in questioning the relevance of an energy sector and evaluating how the new sector should be framed before the development of projects. The problem is by nature political and legal, as the Environment Minister has discretionary power and defines the powers and missions of the BAPE. The fact that wind energy projects have only been assessed on a case by case basis is a consequence of a lack of political will, because it is the policy that determines the nature and scope of the mandate. The environment minister could have decided to launch a strategic environmental evaluation upstream of the development of wind energy projects. The problem is that this has not yet been done.

<sup>13</sup> The recent removal of CRÉ, ie the regional territorial decision-making level, overcomes this desire for greater regional dialogue. However one question remains unanswered: how should it be done now?

<sup>14</sup> For the Council of Ministers, which decides the fate of the projects, it would seem that citizens groups are not as representative and legitimate as territorial representatives (mayors, councilors). The acceptance by the Council of Ministers of the Maple project and the refusal of the Valentine project are pretty striking examples of this conceptualization of mainly representative democracy. For the Valentine project, the opposition came from elected representatives, and although popular mobilization was smaller in proportion than in the Maple MRC, in the end the project was not authorized.

<sup>12</sup> Deconcentration is an organizational technique that consists in distributing skills within the same legal personality [114].

Several respondents added that the government's non-consensual energy policy choices were also a consequence of the exclusion of electricity production and exports from the mandate of the Régie de l'énergie with Law 116 in 2000, which decoupled the authorization framework for hydropower from that of wind energy. This law was also contrary to the public debate on energy in 1995. In other words, the energy choices related to electricity since then have been the preserve of the government and HQ, politicized and therefore rather arbitrary because under the influence of lobbies. It is like a poorly regulated monopoly situation reinforced by recurring institutional and structural bias towards traditional sectors. This is done to the detriment of fair competition between the various energy sectors and without a preliminary review of economic competitiveness and complementarities.

For example, how is it that three new hydropower projects will continue to receive massive investments (including La Romaine and Petit Mécatina), despite the current electricity surplus, without a preliminary examination of their opportunity costs, their business and financial risks and possible alternatives? At the same time, HQ claims that wind energy alone has been responsible for the increase in electricity costs since the summer 2013, without mentioning the impact of new hydropower projects. However, it could be argued that the accounting and financial games that skew electricity pricing in the domestic market are making the wind energy sector a perfect scapegoat. Furthermore, many respondents explained the need to introduce an independent energy regulation to assess in particular the economic relevance of the different energy sectors in order to legitimize strategic policy decisions which, they claim, currently lack accountability and transparency [117,118].

In France, many of the respondents linked the continuity of policy choices in favor of nuclear energy since the 1970s to the centralism of strategic energy decision-making; this political choice has been imposed on the population from the beginning and the situation remains the same today. It is as if we could not objectively debate about the nuclear option because too many economic interests are involved. This was a state decision that could not be challenged by the citizens. Until now, the population has never been directly involved in strategic decision-making, except perhaps during Grenelle 1. In contrast to Italy, the Fukushima nuclear accident has not resulted in a referendum on the issue. In addition, most respondents criticized the various public debates organized in the past: they were always biased, both those on the EPR in 2003 and 2005, and those in 2011 (the Expert Committee of the 2050 Energy consultation was rather pro-nuclear environmental organizations did not participate). Would it be the same thing for the current debates on energy transition? As a consequence, nuclear power remains very opaque today and the studies and reports that are published on this issue are not necessarily credible because it is difficult to find independent and impartial representatives and agencies.

## 5. Discussion

In France and in Quebec, the implementation of a more sustainable and acceptable EP will not be easy to achieve as this would require several important cultural and institutional changes that depend on political change. This ecological modernization of institutions suggested by a majority of respondents should be based in particular on: 1) greater internalization of environmental costs in the electricity sale price; 2) greater decentralization of power; 3) sustainable evaluation of projects and policies, plans, and programs (PPP) by the creation of an independent energy regulator; 4) informed public debate prior to the development of the whole EP. In a context where strategic decisions are mainly controlled by politicians and the most influential economic pressure groups, who do not necessarily want these institutional changes, are these changes

unrealistic? How to get there in practice? In our opinion these elements reinforce the importance of social movements, who are the guarantors of participatory democracy.

First, the literature states that the political support for RE is more difficult to achieve when the production costs associated with the combustion of fossil fuels are not internalized. If we put an end to this distortion of the market, which scientists have been demanding for a long time, this would automatically favor the selection of RE at the expense of "dirty" technologies, and wind power would then be the most economically attractive form of electricity [32,34,37,40,45,53,59,112,113].

In both jurisdictions, many respondents agreed with this statement and believed that wind energy continues to be relevant in their energy mix and should now be preferred to hydropower or nuclear energy for any major new electricity production project. For them, wind power is the RE which is currently and for the foreseeable future the most economically rational. They base this on figures taking into account the real costs of dismantling nuclear plants and the storage of nuclear waste and compare similar size projects (by pro-format studies). In other words, financial sustainability should be less and less a problem for the wind energy sector. The problem is that there is greater misunderstanding of the current cost of this technology by policy makers, established economic operators and part of the population (including anti-wind lobbies), as hydropower and nuclear energy have historically been less expensive to produce than wind power. In addition, current strategic planning practices examine the potential advantages of new energy sources on the basis of average production costs and not on marginal costs. This is contested by many professionals and pressure groups. It takes a calculation method based on marginal costs to achieve more sustainable and less biased strategic choices! Why compare the potential advantages of technologies on the basis of past production costs? If we do not change this calculation methodology, there is a good chance that future strategic choices will continue to favor older technologies at the expense of new technologies.

A more transparent strategic decision-making process and greater accountability of policy makers requires the establishment of an independent regulator and durable assessments of PPP. This would provide neutral and objective information, limit the disinformation efforts of different stakeholders and depoliticize debates. However, policy makers do not necessarily want to establish systematic evaluation mechanisms, which would open the door to a possible challenge to their political decisions. They no longer want prior consultation committees to be legally instituted before the development of each EP as this would limit their powers and possibilities of action. Moreover, they feel they have been democratically elected and are legitimate representatives of the people. This behavior leaves room for the influence of pressure and lobby groups. Knowing this, would it not be a good idea to have more control over the relationship between lobbyists and politicians? If this could be achieved, decisions made by politicians would be more transparent, participatory and less subject to backstage games.

Quebec could certainly learn from the French experience in the field. Even if we have already seen that the neutrality of many organizations has been criticized and the EP evaluation system is perfectible, the vast majority of respondents highlighted the work of one organization, Réseau de transport d'électricité (RTE), which most of respondents considered to be independent. With the deregulation of the electricity sector in 1996, RTE became independent from EDF and took over the management of the electricity supply. Since then, RTE has sought to communicate technical elements on their responsibility in the most neutral way possible, especially with their projected annual supply balance sheet. This limits the potential risk of misinformation for the various pressure groups.

Indeed, RTE considers several arguments of the anti-wind lobby to be false or incomplete and has responded to them publicly. For example, some opponents say that: 1) RE fluctuate; 2) they cannot be effective in reducing the need for nuclear energy; 3) 1 MW of wind power requires 1 MW of thermal power to compensate for its fluctuations. RTE responded by saying that wind energy also involves risks, but these are more predictable because modern technical tools enables us to predict production in advance and better manage its variability. They added, with supporting evidence, that scenarios replacing nuclear energy by wind energy and RE are not technically unrealistic. Finally, they demonstrated that the installation of 1 GW of wind power "reduces thermal power needs up to the average load factor, that is to say 0.25". In other words, 1 MW of wind power does not need to be compensated for with 1 MW of thermal power; instead, it removes the thermal power peak. That is to say that "20 GW of onshore wind, which should be installed before 2020, would remove 5GW of thermal power" ([119]: p. 71]).

This is far removed from the situation in Quebec, where the existing institutional organizations, such as the BAPE or the Régie de l'Énergie, do not have the technical knowledge or the mandate to respond to opponents beyond the assessment of specific projects. This ensures that Quebec politicians often refer to the technical expertise of HQ, with all the possible biases that may involve. For example, several institutional respondents felt that the wind energy share could not be technically superior to 10% in Quebec. This seemed a very conservative estimate for most of the professionals we interviewed, given the strong interconnection capacities in Quebec and the complementarity between hydropower and wind energy. In addition, for reasons of stability and power quality, HQ requested and obtained the connection of wind farms (whatever their size) to the transport grid. However, according to a network specialist, this was not necessarily justified, was more complex and laborious than initially believed, and over-evaluated the grid connection costs<sup>15</sup>. Finally, HQ claimed it is largely wind power that drives up the electricity bill in Quebec. Several independent experts have tried to answer these attempts at disinformation, but how much influence will they have compared with HQ? Is this not a case of David against Goliath?

## 6. Conclusion

According to Rifkin [120], renewable energies (RE), including wind energy, will be the basis for the next industrial revolution of the XXI century. They are part of the flow of history. The question is how can these new energy systems take the place they deserve in the world's energy mix. We hope this article will help with this and will improve our understanding of: 1) how to better develop more acceptable and sustainable energy policies (EP); and 2) the various direct and indirect institutional factors that influence energy policy choices. To achieve this, we offers an innovative definition of an EP through a conceptual analysis model [21].

Experience with wind energy in France and Quebec helped us to validate the proposed model. The nine variables and their suggested interactions are relevant and explain the development of an EP. There are significant correlations between the institutional factors of an EP and the strategic energy decision-making observed in both national contexts, especially in a context of a lack of "ex-ante" and "ex-post" evaluations. As the relation between the different stakeholders was dynamic and variable over time, we will summarize the different lessons learnt in terms of interactions.

<sup>15</sup> In Quebec, the 4 GW wind power grid connection is valued at \$CAN 3–4 billion [50]. By comparison, in France RTE evaluated at € 1 billion the cost of implementing the remaining 12.5 GW targeted by Grenelle, that is to say 12.5 times less than in Quebec (wind farm connections are made on the distribution grid) [119].

First, the balance of power between pressure groups, the national energy context and supranational influences strongly influence the level of political commitment to wind energy and its evolution with time.

Indeed, the neocorporatist culture in both jurisdictions and an unfavorable initial energy context, characterized by low electricity production costs, the lack of significant electricity needs and electricity mix that is up to 90% decarbonized, have delayed the political choices in favor of wind energy compared to other jurisdictions. The wind project dissemination process was thus stalled for a lack of adequate financial instruments to promote its expansion. It was not until the late 1990s that the balance of power reversed and wind energy projects really took off in both jurisdictions, as a result of: 1) the liberalism context and the associated deregulation of the electricity grids, which opened the market to private producers and broke the existing monopoly; 2) a more favorable energy context, characterized by a reduction in wind energy production costs and an anticipated energy shortage; 3) the collective influence of pro-wind groups in Quebec or the supra-national influence of the European Union (EU) with RE directives in France.

Therefore, both past national wind energy path dependencies can be explained by similar institutional factors. However, some of these institutional factors changed over time, such as the energy and social contexts, which resulted in a differentiation of the national historical path dependencies.

In France, a hardening (and instability) of the regulatory framework for wind energy between 2005 and 2012 was mainly the result of the national anti-wind energy lobby's influence over a predominantly right-wing government in power. However, a predominantly left-wing government in power since 2012 has reversed this balance of power in favor of wind energy. This is reflected by the adoption of measures to simplify wind energy regulation, such as Brottes Law [121], the establishment in 2014 of a single permit in several regions, and a temporary end to the legal uncertainty of the feed-in tariff (renewed until 2018), which relaunched the annual wind turbine installation pace in 2014 and 2015. This favorable attitude to RE has also been strengthened in the French context by the fact that Paris hosted the COP21 in December 2015; the French government thus adopted the energy transition law using an emergency procedure [104], even though there is a right wing majority in the Senate. This position is ambitious since it is expected to reduce the nuclear energy share from 75% to 50% by 2025 and increase RE share to 40% (of electricity) by 2030. As argued by Nadaï [13], it seems that the energy position of the French government, whether during the POPE Law in 2005, the Grenelle Environment in 2009–2010 and now in 2015 with the law on energy transition, continues to depend critically on the political party in power and its ability to win the parliamentary political battle. To that major influence, we also need to add the supranational influences related to the leading role played by the EU in global climate negotiations, as they were asked to define a 2030 minimum target of 27% in the energy mix with the UE Third-Climate Energy package [105].

In contrast to France, the political support for wind energy in Quebec between 2000 and 2010 is gradually fading in an alleged context of electrical energy surplus and low export costs. This political uncertainty is reflected by a lack of continuity for the calls for tenders (CT) and a renewed national opposition to wind power. It has taken three years, for example, to revive a fourth CT to fill the unused MW of the current 2006–2015 energy strategy. This has also meant that the future of wind energy is not certain in the next EP for 2015–2025.

In other words, the lack of continued and long term political support is a major limitation for the future of wind energy in France and in Quebec; fragile, this support depends primarily on the political party in power, the balance of power between pressure groups, the national energy context, and supranational influences which constantly recompose the dynamics of the actors.

Secondly, research confirms that the level of social acceptability (SA) of wind energy and the types of energy evaluation indirectly influence strategic energy policy choices. Indeed, strategic decision-making related to energy are influenced by SA, which is dynamic and evolving. For example, we would not have had the political commitment to reach 10% of electricity supply in Quebec without a massive opposition to the use of combined cycle gas power plants during the Suroît project.

However, there is no solid and sustainable popular support for wind energy in France and in Quebec, contrary to the case in Germany and Denmark with the pro-wind and anti-nuclear social movement of the 1980s. This can be explained by a greater division of the environmental movement due to a poorer energy context, an exogenous development model which originally only favored the private sector, and the priority given by some environmental groups to the impacts of local projects.

Thirdly, research shows that the way in which EP or projects are evaluated has a significant effect on SA, thus indirectly affecting strategic energy choices. With their highly centralized state culture, France and Quebec retain the power to decide or have significant control over the projects and strategic energy orientations. This leads to local opposition when attempting to implement a decentralized sector such as wind energy. Concerning the specific evaluation of projects, criticism concerns the role of public participation in the environmental assessment process, which is considered to intervene too late in the process to have any bearing. Concerning specifically the evaluation of EP, respondents criticized the lack of systematic evaluation of established EP and the lack of transparency of the decision-making, which is not sufficiently open, consensual and participatory. Local opposition is therefore the only way for citizens to make their voice heard because there is not enough space to discuss the relevance of projects or energy sectors upfront.

Finally, research demonstrates that sustainable project evaluation of the EP is sorely lacking in both jurisdictions. Citizens should be more involved and have a more direct effect on the development of the EP or upstream of the implantation of projects, which is not the case as often as should be. This requires a radical change in the way things are done, a sort of ecological modernization of institutions, which would provide : 1) more strategic planning, that is to say more regulatory and economic framing, before launching a new energy sector; 2) large public debates prior to the development of the whole EP, carried out in a transparent and objective manner and with complete information; 3) the creation of an independent referee to analyze the various electricity issues (production, distribution, export, transport). The question is how to do it in practice, in a context where the dominant economic and institutional players, who have strong media and political influence, do not necessarily want these institutional changes and always try to focus on existing technologies to the detriment of RE.

In terms of perspective, the current period (2015–2016) is crucial for the future of wind energy in Quebec and France, as both jurisdictions are at a crossroads and on the eve of major new policy decisions. In France, energy policy choices are being made for 2030, and these will decide the duration of the energy transition and the final share of nuclear energy versus RE in the energy mix. In Quebec, the current energy strategy will expire in 2015. An important issue for the government will be to decide if it is appropriate to increase wind energy development by doubling its share in the electricity mix, as required by the industry, in the context of an anticipated major electricity surplus.

In our representative democracies, a change in political majority usually means a change in political vision, and therefore in EP. In 2012, the election of "progressive" governments in France and Quebec appeared in this sense to be a potential source of new ideas. But will this optimism be short-lived?

In France, with the energy transition law and the various wind energy regulatory simplifications, the Hollande government wants to keep the promises made in the 2012 presidential campaign, which led to the currently favorable political climate for wind power. But how will this political situation evolve in the upcoming presidential and legislative elections planned for 2017? Can we expect a return to misleading speeches and contradictory regulatory acts? Will there be changes made to the RE support mechanisms with a right-wing government back in power? Despite the regulatory concessions made, the planning system remains a major challenge in France in 2015, as 10,000 MW of RE projects (6700 MW of wind power) were still pending electrical connection at the beginning of 2014 [103]. According to professionals, many obstacles still exist (including the military radar or the ICPE procedure issues) that could prevent the wind power sector reaching the annual rate of 1650 MW/year required to achieve the 2020 objectives.

In Quebec, the 2013 former Marois government proposed an ambitious transport electrification policy. Québec Solidaire was also going in this direction during the election campaign in 2014. In 2015, the action plan for the electrification of transport recently announced by the majority Liberal Couillard government is encouraging [122], but does it not lack ambition in the context of an anticipated energy surplus? The level of incentive offered to citizens, for example, is significantly lower than in Norway, one of the first hybrid automobile markets in the world.

There are societal choices to be made keeping in mind the need to develop a pioneering vision. Quebec was visionary in the years 1960–1970 when it nationalized HQ and embarked on the hydroelectricity adventure before anyone else. It took up this challenge with honor. Quebec is currently the only jurisdiction in the world to have the "energy" opportunity to overcome its oil dependency thanks to its electricity surplus. Why not take advantage of this situation, because the cost of this dependence for society will continue to rise? These strategic choices surrounding the drafting of the future PE 2016–2025 will be important, especially for the future of the Quebec wind energy industrial network. The challenge, in our view, is related to the historical and cultural perspective of neocorporatism, which still seems to be present in Quebec. If new big infrastructure projects are to be planned by the government, it would be logical to favor wind power development instead of new hydroelectric projects in view of its better economic profitability. The issue is to confront Hydro-Quebec and the pro-hydroelectric lobby [118].

From a scientific perspective, this study is, in our opinion, the first attempt to find a holistic definition of EP. The conceptual model we developed, inspired by the transformation of wind energy in France and Quebec, identifies the interactions of institutional factors that influence strategic decision-making for EP and thus contributes to a better and more complete understanding of the dynamics surrounding these decisions. These concepts can be applied to the development of other energy sectors to improve the sustainability and the acceptability of energy policies:

1. *Financial and regulatory instruments* must be built before the implantation of the project. These must enable acceptable compromises to be reached between costs and benefits at both levels (local and national). As illustrated by wind energy development in France and Quebec, these two elements are essential to improve social acceptance issues;
2. *Type of ownership* is one essential institutional factor that should be debated and eventually imposed at the strategic (political) level. The Quebec communitarian wind energy development is a good example of this;
3. *Local and strategic decision making processes* depend essentially on the behavior of stakeholders and must be judged fair and equitable by the population in order to be legitimated. Consultation and true debate with neutral, objective and complete

information should take place before the implantation of every EP. These processes may question the relevance of every new energy sector that the government wants to develop;

4. The environmental assessment processes related to projects and politics, plans and programs should take into consideration all the different elements previously mentioned.

From a Quebec perspective, the new hydrocarbon development issues suggests that the political and industrial learnings have not yet been sufficient to overcome the environmental controversies that still arise. Indeed, even if new strategic environmental processes<sup>16</sup> are created before the elaboration of a new EP, criticisms still remain. In the context of majority liberal provincial and federal governments that seem to encourage these sectors, there is a doubt as to how the population concerned will be included in the final law, as the objectives of consultation seem to limit SA issues without fully addressing the relevance of the different hydrocarbon projects planned.

Future developments of this study should try to expand these results in other energy sectors and regions. The purpose would be to analyze the temporal evolution of the main relevant institutional factors chosen in those cases, the main challenge being to identify them. Another would be to improve the methodological approach used. The qualitative data collected from interviews with key informants appeared to us to be particularly suitable to gaining an understanding of all the nuances in human and social research. However, the dynamic aspects of the variables were difficult to follow as they rapidly evolve over time. In this sense, perhaps it would be better to proceed by undertaking several shorter interviews in distinct time periods. It would also be interesting to add a systematic analysis of quantitative indexes representative of the different institutional factors, which should reduce the uncertainties of this study while refining the nature of the interactions between the variables.

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