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Implementing EU renewable energy policy at the subnational level

Navigating between conflicting interests

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Abstract: The European Union (EU) has set targets for gradually reducing greenhouse gas emissions through 2050. One of the instruments involved is the 2009 Renewable Energy Directive, which specifies a 20 per cent renewable energy target for the EU by 2020. This paper reviews tensions and institutional innovations that can arise at local and regional levels within the context of the implementation of this policy. Drawing on empirical evidence collected in two regions, one in a federal country (Brandenburg in Germany), one in a unitary state (Aquitaine in France), the paper describes the factors that determine community and market acceptance of renewable energies, suggesting that appropriate multi-level governance schemes are instrumental in the successful adoption and implementation of EU priorities at the local level.

Keywords: European Union, renewable energies, Germany, France, forestry, multi-level governance

JEL classification: O21, Q23, R14, R52

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1 Introduction

The political economy of energy has undergone significant changes in Europe during the past 20 years. Energy has become a shared competence between the European Union (EU) and member states with the inclusion of a dedicated section of the Lisbon Treaty (signed on 13 December 2007). EU legislation has significantly expanded to promote energy efficiency and renewably generated energy, pursuant to Article 194(2). The EU has also set targets for curbing greenhouse gas emissions. The EU roadmap for a low-carbon economy suggests that emissions be reduced to 80 per cent below 1990 levels by 2050 (European Commission 2011). To reach this target, European emissions will need to be 40 per cent lower than 1990 levels by 2030 and 60 per cent lower by 2040. One instrument for attaining these objectives is the 2020 package—a set of binding rules established in 2007 that proposed three targets: a 20 per cent reduction in greenhouse gas emissions (compared to the levels in 1990), 20 per cent renewable energy in the EU, and a 20 per cent improvement in energy efficiency. In this context, a directive on renewable energy defined specific targets for each member state in 2009 (European Union 2009).

On the other hand, subnational authorities are also seeking to help shape the path towards a low-carbon economy. Because renewable energy makes local energy solutions easier, bottom-up energy policies have become increasingly common. European subnational actors are not only willing to curb energy consumption, they also wish to be suppliers. This not only impacts the energy mix in individual member states but also the management of the grids and the relationship between governance levels, whether in federal or unitary states. As a result, the transition to clean energy increases pressure on decentralization in centralized countries and affects multi-level systems of governance even in federal states. The interaction between the different levels of governance, as well as between stakeholders at the local level, is very often linked to the concept of acceptance, namely to the level of support enjoyed by renewables. The rise of the renewables is indeed the outcome of technological innovation, local initiatives, and legal as well as economic conditions provided at the national and European levels. Hence, the need to better understand how institutional arrangements may impact clean energy transitions at the local level.

Brandenburg (Germany) and Aquitaine (France) offer useful insights into these debates, as both regions are forerunners in renewable energies, but they are also exposed to rising discontent in terms of acceptance. Focusing on these two regions, this paper calls attention to factors that both inhibit and accelerate the implementation of EU policy for a clean energy transition at the subnational level in a federal state (Germany), and in a unitary one (France). The paper addresses the specific tensions arising in these two regions and discusses governance issues raised by the surge of renewable energies. We start by presenting theoretical insights related to the three dimensions of acceptance as suggested by Wüstenhagen et al. (2007) and to multi-level governance. We continue with lessons learnt from the comparative assessment of the two regions and conclude by suggesting how addressing the shortcomings of multi-level governance might help defuse tensions.

2 Methodology

Research on global climate change policy tends to focus on international negotiations and national policies. The role of local authorities in the energy planning process has recently become a significant research issue, however, and the need for both centralized and decentralized approaches has been recognized (Comodi et al. 2012). As Schreurs suggests (2008: 346), ‘It is at the local and regional level, in urban as well as in rural areas that many policy ideas are first

generated and that is where some of the most creative solutions are being tried out'. Local innovations have been the object of specific studies (Kern et al. 2005; Kern and Bulkeley 2009). However, alongside the innovative solutions put forward by subnational actors, tensions have also risen, and the social acceptance of renewable energy infrastructures has become a major concern.

Debates about social acceptance are not new to the energy sector. Numerous decisions relating to the siting of nuclear power plants have sparked protests in several European countries. However, as Wüstenhagen et al. (2007) contend, social acceptance as a part of the implementation of renewable energy technologies was neglected in the 1980s when policy programmes were launched. Most stakeholders were paying little attention to local concerns in a context in which national surveys showed high levels of support for renewable energy technologies. Carlman (1984: 339) was among those who pointed out that siting wind turbines was also 'a matter of public, political, and regulatory acceptance'.

Because the concept of acceptance is not easily definable, Wüstenhagen et al. (2007) suggest differentiating between socio-political acceptance, community acceptance, and market acceptance. Socio-political acceptance is social acceptance on the broadest, most general level. Several indicators demonstrate that public acceptance for renewable energy technologies and policies is high in many countries, especially in Germany. This positive overall picture is, however, misleading. Moving from global to local, from general support for more renewables to effective siting decisions, some conflicts may arise. Community acceptance refers precisely to the specific acceptance of siting decisions and renewable energy projects by local stakeholders. People's actual motives may vary (Bell et al. 2005; Wolsink 2006) and may not be the same before, during, and after the project is completed. Opposition may increase or decrease with the degree of being directly affected by a specific wind power project (Simon and Wüstenhagen, 2006). It can be underpinned by different factors—those related to distributional justice (how are costs and benefits shared?) and procedural justice (is there a fair decision-making process giving all relevant stakeholders an opportunity to participate?) (Gross 2007) being the most relevant in the case of wind energy in Brandenburg.

Finally, Wüstenhagen et al. (2007) stress the importance of market acceptance being understood as the process of adoption of an innovation and refer in this respect to literature on diffusion of innovation (Rogers 1995). We would argue that market acceptance can also refer to the growing competition between different uses of wood resources. Forest biomass has long been perceived as non-controversial since the total volumes of wood available in Europe far exceed the demand. However, intensifying the use of forest biomass can affect other forest functions. Conflicts are now common in the governance and management of forests: they can be observed at different levels and with varying dimensions and intensities. Research on forest-related conflicts has thus developed considerably in recent years. Although there is certain convergence in how different authors define conflict in this area (Söderberg and Eckerberg 2013), motives and challenges differ from one case to another. In Aquitaine, we would argue that conflicts refer to 'one group impairing the activities of another' (Glasl 1999 quoted in Mola-Yudego and Gritten 2010).

Gómez-Vázquez et al. (2009) tend to argue that more frequent forest conflicts occur in areas with a growing population, and with a higher fraction of active and new rural inhabitants. Mola-Yudego and Gritten (2010) identify many 'conflict hot-spots' in areas with high forest-ecological values. In this context, Aquitaine provides an interesting insight as the region is neither an area with fast growing population, nor a region gifted with specific ecological values or lacking forest resources. The region is, however, home to a significant pulp-and-paper industry. Thus, renewable energy supply is to be balanced with overall competitiveness of the forest sector and with biodiversity protection, generating conflicts in establishing trade-offs

between these different demands. The changing patterns and increase in competition over forest resources are, however, not always considered in national forest policies. To find sustainable governance solutions at different levels to defuse tensions is thus very much needed.

Conflicts may be studied from many different perspectives. Institutional factors are emphasized in many forest conflict studies (Ibarra and Hirakuri 2007; Idrissou et al. 2012). Since the revival of institutionalism in the 1980s, this theoretical approach has become prevalent in research on forest conflicts (March and Olsen 1995). Under the heading of ‘from government to governance’, it has helped to understand the role of the different stakeholders and to embrace the significance of both the institutions and of the relationships between stakeholders. In this respect, the concept of ‘multi-level governance’ reflects the fact that every level is guided by its own actors, institutions, and proceedings, and that they are interconnected vertically and horizontally, as well as territorially and functionally (Grande 2000: 11). This concept fits well the issue of renewable energies as the decision-making process is structured around a (binding) European framework, its implementation through laws and support schemes at the national level, and the involvement of local and regional actors.

This paper focuses on community acceptance (with respect to wind farms in Brandenburg) and market acceptance (concerning forest biomass in Aquitaine). In our analysis, a mixed approach was adopted consisting of the analysis of secondary data (e.g. project reports, website materials) and around 30 in-depth, semi-structured interviews with key stakeholders (e.g. representatives of forest biomass and wind sectors, civil servants at the local and regional level, business representatives, NGOs) during 2015 both in Aquitaine and in Brandenburg.

3 Two regions with high potential for renewable energies and growing tensions

3.1 Two pioneering regions

Table 1: The ratio of renewable energies in the energy mix in Europe

	Ratio of renewable energies in the energy mix in 2005	Ratio of renewable energies in the energy mix in 2012	Ratio of renewable energies in the energy mix in 2020	Ratio of renewable energies in the energy mix in 2030
Germany	5.8 %	12.4 %	18 %	30 %
France	10.3 %	13.4 %	23 %	32 %
European Union	8.5 %	14.1 %	20 %	27 %

Source: Author’s illustration based on data from German Ministry of Economy and Energy (2010), European Commission (2015), and Official Journal of the French Republic (2015).

Both Germany and France are implementing the EU Directive on renewable energies, albeit with slightly different targets set by the 2020 package (see Table 1). In the case of Germany, the energy transition (*Energiewende*) is giving rise to a growing number of bottom-up initiatives and a new institutional landscape is emerging (Libbe et al. 2011; Matecki and Schulten 2013) in response to the *Energiewende*. The re-municipalizing process has strengthened the role of *Stadtwerke* (municipal public companies) in energy management (Becker et al. 2015) and, contrary to the four main energy companies,¹ citizens are massively involved in the development of renewable energies. Although there were only 66 energy cooperatives in 2001 in Germany and 77 in 2005, their number soared to 239 in 2009 and to 888 in 2013 (Renewable Energies Agency 2014b).

¹ E.On, RWE, Vattenfall, and EnBW are labelled ‘the Big Four’.

According to the German federation of cooperatives (DGRV 2014), by 2012, 130,000 people had invested €1.2 billion in installations producing 580 million KWh of green energy annually.

Brandenburg is a pioneering region in terms of wind energy (in proportion to the size of its population, it has the greatest number of wind turbines of any German *Land*: there were 3,300 in 2015 and over 100 are being built every year). Indeed, Brandenburg enjoys numerous advantages for the creation of wind farms: there is significant wind power, demographic density is low, and the region's economic fabric has been weakened since reunification (in 2013 GDP/inhabitant was €23,751 in the region, compared to €33,335 in the entire country (Eurostat n.d.)). In 2008, 2010, and 2012, the *Land* was awarded first place in the ranking of the most dynamic regions in Germany for its policy in support of renewable energy (Renewable Energies Agency 2015). The Energy Strategy for 2030 (Ministry of Economy and Energy of Brandenburg 2012) predicts that by that date, final energy consumption will be reduced by 23 per cent with respect to 2007 figures, as 40 per cent of the *Land's* final consumption will be covered by renewable energies and CO₂ emissions will be reduced by 25 million tonnes (a 72 per cent reduction compared to 1990).

The Brandenburg government has enshrined its strategy in a long-standing energy tradition (it pictures itself as an *Energieland*) that dates back to communist times, when lignite mines and thermal power plants located in the Lusatia area provided a significant share of the energy for the former GDR (German Democratic Republic). Open-air lignite mines and power stations still make Brandenburg one of the three principal mining regions in reunified Germany. Mining activities have brought drastic changes to both the natural and cultural landscapes, but they have also provided a sense of pride—as well as high salaries—in an area with few employment alternatives. In order to support the development of wind power while preserving the mining activities, the State of Brandenburg has coined the expression ‘bridge-technology’ (*Brückentechnologie*) to refer to its brown coal industry (von Hirschhausen et al. 2012).

In France, several laws have been adopted during the past ten years in support of renewable energies in order to reach binding EU objectives. Several laws have broadened local responsibilities such as the Brottes law in 2013 (*Loi Brottes*) or the law on energy transition in 2015.² The overall political economy of the French energy sector is also experiencing structural changes in the context of the opening-up of the energy sector at the European level. Energy policy can no longer be primarily supply-based and top-down. The transition to clean energy implies new stakeholders, weakened monopolies, behavioural changes, bottom-up initiatives, and increasingly decentralized management of the whole network. The institutional landscape is thus evolving, although at a slower pace than in Germany.

Amongst other factors, France relies on biomass for the implementation of its energy transition. The sector represents roughly 60 per cent of renewable energy production. Without including biofuels, this percentage can still be considered significant at about 50 per cent, and wood fuel alone represents half the exploited biomass in France. Forest covers 43 per cent of the surface of Aquitaine (Conseil Régional d'Aquitaine, INRA 2012). Although French forests can be characterized by a significant diversity (137 species), and although hardwood trees represent

² Four major bills have been adopted since 2009: Grenelle I (*Loi de programme relative à la mise en oeuvre du Grenelle de l'environnement*) (2009) stated the principles of the Grenelle process, addressing issues of climate change and environmental policy in France; Grenelle II (*Loi portant engagement national pour l'environnement*) (2010); the law on transition towards a more efficient energy system as well as on water pricing and wind farms (*Loi visant à préparer la transition vers un système énergétique sobre et portant diverses dispositions sur la tarification de l'eau et sur les éoliennes*) (2013); and the law on energy transition for green growth (*Loi sur la transition énergétique pour la croissance verte*) (2015). The law also commits the country to reducing its 1990 levels of greenhouse gas emissions by 40 per cent by 2030, its 2012 energy consumption by 50 per cent by 2050, and to achieving a 32 per cent consumption of renewables in energy by 2030.

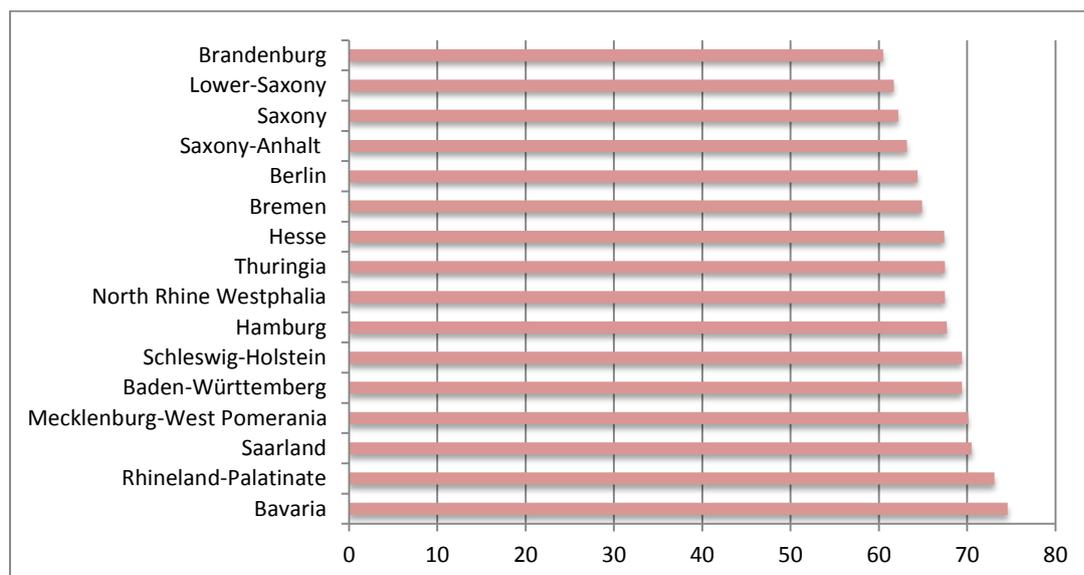
around 71 per cent of the nation's wooded surface (29 per cent for coniferous trees), maritime pines constitute the majority of the Landes Forest (one of the three wooded areas in the Aquitaine Forest). This single-species profile, however, is a positive asset for the industrial exploitation of the resource and for that reason is a significant part of the regional industrial fabric that has developed, based on the abundance of forest resources.

3.2 Two regions where tensions are developing in the context of a transition to clean energy

Since the late 1990s, the question of acceptance has become a major topic in research relating to wind energy in Europe, as evidenced by papers dedicated to Sweden (Carlman 1988), the Netherlands (Wolsink 2000), and France and Germany (Jobert et al. 2007). A number of authors contend that the NIMBY ('not in my backyard') reflex does not fully explain the perception of the proximate population (Musall and Kuik 2011), who are sometimes less hostile to wind farm projects than populations residing further away (Simon and Wüstenhagen 2006). Other researchers argue in favour of a dynamic approach and refer to projects whose acceptance has developed according to a U-shaped pattern between the initial and final stages of the project (Wolsink 2006). Analysing three French and two German projects, Jobert et al. (2007) question the reasons for the success or failure of a project in terms of its acceptance. They argue that two classes of factors prevail: on one hand, the institutional framework (regulations, economic and financial stakes), and, on the other, local conditions (the site's economic and geographical context, the implementation of concertation processes and planning processes).

In Germany, support for renewable energies has remained elevated despite increased energy prices since the *Energiewende* was implemented. Community acceptance may, however, differ from social acceptance. Opinion varies according to the technologies used and the individual states. Opposition is increasing in some regions, amongst them Brandenburg. In spite of its role as a pioneer, it is the German *Land* with the lowest rates of social acceptance (Figure 1). A 2014 survey indicated that 93 per cent of the population of the *Land* believed that it was important to promote renewable energies, but that only a little over 60 per cent of those questioned would accept a plant near their homes (Figure 1). No other *Land* had such a low figure. The acceptance rate was particularly low for biogas (39 per cent) and wind power (44 per cent). It was high only for solar energy. In the mining region of Lusatia, Keppler and Töpfer (2006) note a lack of hostility towards renewable energies but considerable scepticism concerning their ability to provide as many jobs as lignite mining operations. Schöbel (2008) observes that 80 per cent of the population of the Havelland-Fläming region (in the same *Land* of Brandenburg) believes that wind farms are responsible for degrading the landscape. Half of the inhabitants living close to a wind farm consider it a disturbance. In Brandenburg, citizen initiatives have been launched, such as *Rettet Brandenburg*, an umbrella organization that regrouped about 80 opposition movements throughout the *Land* in 2015.

Figure 1: Responses to question 'would you agree to a renewable energy facility in the vicinity?', (%) (2013)



Source: Author's illustration based on data from Renewable Energies Agency (2014).

In terms of existing research, the case of Brandenburg enables more in-depth analysis of the factors that influence community acceptance for wind farms. In addition to usual criticisms relating to noise, declines in real estate values, threats to landscape amenities, and the risks of ultra-sound emissions, other factors appear. In this *Land*, where the political party *Die Linke*³ enjoys a strong electoral base (20.6 per cent in the regional elections in September 2014), nostalgia for a rural landscape free of wind farms is fuelled by a distrust of capitalism. Criticism essentially focuses on institutional developers and investors who come primarily from the west of Germany. Recriminations about the reunification of Germany are thus reactivated by the wind farms debate. Opponents advance an additional argument: Brandenburg exports energy but still supports the development of wind farms to supply the *Länder* that limit their development (such as Bavaria). ‘The *Mark Brandenburg* district uses 1.6 GwH/year electricity but produces four times as much’ as one member of the organisation *Vernunftkraft* explains.⁴

Hostility towards wind farms is not expressed through large-scale demonstrations or changes in the political landscape (with the exception of the *AfD*⁵ communicating opponents’ arguments concerning wind farms within a larger strategy aimed at uniting the widest possible spectrum of discontent). However, in opinion polls (by comparison with other German regions), this hostility is reflected in an increasing number of claims and legal actions, and in local representatives’ positions.

In Aquitaine, conflicting views about competition for forest biomass have emerged since pulp-and-paper industries are determined to protect this resource against producers of biomass-based heat and energy. For the entire EU, standing timber has been evaluated at around 20 billion m³, with an annual biological increase estimated at approximately 710 million m³. 330 million m³—less than half the yearly biological increase—are harvested each year (Insee 2014). In terms of

³ *Die Linke* is a leftist political party that originated with the association of the PDS (Party of Democratic Socialism), which followed the SED (Socialist Unity Party of Germany), a GDR party, and the WASG (Labour and Social Justice, the electoral alternative).

⁴ Conversation with the author, May 2015.

⁵ *Alternative für Deutschland* (AfD) is a Eurosceptic political party created in 2013.

French territory, forest covers around 30 per cent of metropolitan France, an area that has continuously expanded over the past 150 years. Only 60 per cent of the annual natural growth is harvested each year (CEMAGREF 2009). Thus, at the European, as well as at the national level, the potential of wood for energy is considerably higher than the demand. Since collective heating networks are currently providing only 5 per cent to 6 per cent of the heat used in the country, local decision makers have been quick to make full use of incentive schemes implemented by the national government to create new heating networks powered by forest biomass.

Although French forestland appears to be statistically under-exploited, the actual quantity of wood is in fact uncertain and only provides a vague indication of the effective available wood resources. Various studies of this issue have been conducted, notably in 2009 (CEMAGREF 2009) and in 2014 (ADEME, IGN, FCBA 2014). The first study highlights an availability of 28.3 million m³ IWEW (Industrial Wood and Energy Wood) per year and 8.1 m³ of wood residue. The second establishes the average yearly availability of wood in the years 2006–20 at 71 million m³/year, of which 46.1 million m³/year are readily available, and 14.9 million m³/year of wood residue, of which 1.6 million m³/year are readily available. A report by the *École Nationale des Ponts et Chaussées* (2011) has, however, provided a lower estimate of this potential, explaining that an area of fewer than 4 hectares cannot really be considered readily available because management costs render it uneconomical. And finally, the IFN (2010) believes that difficult access to certain plots means that up to 30 per cent of French forests are unavailable to be harvested. The true potential of French forests is therefore unclear, and regional forecasts in Aquitaine, home to one of Europe’s largest cultivated forests, indicate that supply is proving inadequate in the face of anticipated demand (see Table 2).

Table 2: The ‘standard’ scenario for maritime pine in Aquitaine

	2012–015	2016–17	2018–20	2021–25
Roundwood				
Availability	8,050	5,030	4,730	4,730
Demand	7,600	7,700	7,800	7,950
Softwood lumber	3,650	3,650	3,650	3,650
Industrial roundwood	3,700	3,700	3,700	3,700
Energy wood	250	350	450	600
Sawmill products + forest residue				
Availability	2,540	2,500	2,460	2,440
Demand	2,400	2,800	2,970	3,170
Bark mulch	370	370	370	370
Softwood lumber	1,350	1,350	1,350	1,350
Energy wood	880	1,080	1,250	1,450
Saldo	+390	-2,970	-3,580	-3,950

Source: Author’s calculations based on data from ADEME, IGN, FCBA (2009).

In this context, ‘market acceptance’ appears critical, with competition between wood energy and other uses of forest resources gradually increasing.

3.3 Market acceptance in Aquitaine

In Aquitaine, the forest products industry is the fourth employer in the region, with 9 per cent of the region’s industrial jobs (Dumartin 2009), a far higher share than the renewable energy sector (see Table 3). This sector has approximately 40,000 employees in various trades, which, because of constant diversification, have different dynamics. Wood energy is developing while demand for saw timber is decreasing, and as demand for less noble tree products is increasing among a growing number of the region’s economic actors.

Table 3: The economic and social dimensions of renewable wood and energy

	Jobs
Logging industry	7,300
Machines	900
Sawmills	11,720
Construction	11,240
Furniture	2,490
Pulp-and-paper industry	4,210
Transport	4,470
Wood sector	42,330
Renewables	1,600

Source: Author's illustration based on data from Insee Aquitaine (2014).

Until the 1980s and 1990s, a high level of complementarity between the various uses of forest products prevailed, with high demand for lumber from the furniture and flooring industries and by-products employed by the pulp industry. Some markets for maritime pine timber have subsequently declined, particularly construction, flooring, and solid wood furniture (Dumartin 2009). Construction is traditionally under-developed because of the specific nature of maritime pine. This has contributed to a drop in the market share for lumber and corresponding gains for paper, packaging, palettes, and green chemistry sectors in market share. Ultimately, the consumption of industrial wood increased by 20 per cent between 1999 and 2009, whereas the consumption of saw timber has decreased by the same percentage (Dumartin 2009). This represents a significant challenge to the pre-existing balance between economic activities that enabled complementary use of forest resources. With increased demand in the wood energy sector, competition has replaced the logic of complementarity, because wood energy and wood for industry both require small wood shavings, trimmings, and residual products.

As a consequence, the packaging and palette sector is concerned by wood price increases and argues that the development of bioenergy may trigger a loss of competitiveness in the long run. According to its representatives, public support for renewable energies has disrupted the market for wood, which is known for having very little elasticity.⁶ Indeed, in the forest products sector, strong demand does not necessarily trigger an increase in available supply. Unlike other industrial sectors, outlets do not necessarily structure production, in part because the raw material belongs to a large number of forest owners who are not necessarily encouraged to actively manage their forest tracts. The fragmented ownership structure is thus one of several obstacles to mobilization for wood supplies that is required by the increasing demand. Forest biomass is indeed used for heating, for biofuels as well as for bioproducts that help to cut emissions and to overcome the volatility of fossil fuel prices. Given the support provided by national governments to second generation biofuels (i.e. biofuels produced from non-food material such as cellulose) (Johnson 2011), competition for forest resources is expected to increase (Hammarlund et al. 2010). Hence, up-dated forest management policies that tackle supply-side challenges without harming biodiversity and soil protection are requested in parallel with the support provided to clean energies by local and national actors.

3.4 In Brandenburg, unequally shared profits affect community acceptance

In Brandenburg, community acceptance is at stake (rather than market acceptance as in Aquitaine), but socio-economic factors also matter, the key question being how the benefits generated by the surge of wind farms are distributed. Hübner and Pohl (2014) argue that citizen profit-sharing is a far more significant determiner of public perception of wind farms than distance between inhabitants and wind farms. Other studies have also shown that profit-sharing

⁶ Conversation with the author in Aquitaine, October 2015.

influences acceptance rates, particularly if residents are able to become stakeholders (Brunt and Spooner 1998; Wolsink 2006). Wilfried Bockholt, the Mayor of Niebüll (a town in Brandenburg), confirms that ‘participation leads to acceptance’ (Renewable Energies Agency 2012), while Zoellner et al. (2008: 4138) contend that economic considerations—‘seen as weighing costs against advantages made by each individual’—are important factors in determining acceptance.

In Brandenburg, the landowners of wind farm sites negotiate leases that vary from one case to the next but have a return of between €30,000 and €40,000 per wind turbine per year (Ministry of Economy and Energy of Brandenburg 2014). The plots are sometimes divided among a variety of owners, farmers, and pensioners. In this case, there are numerous beneficiaries in a neighbourhood who stand to enjoy substantial revenue increases over a period of at least 20 to 25 years. In other instances, beneficiaries are not neighbours but investors that have purchased ex-GDR land after reunification.

Financial implications of wind energy for neighbouring towns can be direct (via professional tax and property tax) or indirect (via the share of income tax and turnover taxes given to the towns). The *Deutscher Städte-und Gemeindebund*⁷ (Ministry of Economy and Energy of Brandenburg 2014) conducted a survey, between August and September 2014, of local Brandenburg authorities to determine wind farm profits made by local communities. The major finding was that profits vary considerably but tend to be quite modest. The most significant long-term consequence of wind farms for municipalities might therefore be limited to income taxes on residents with wind farm leases. Property taxes, however, do not generate over €1,000/town and can be considered insignificant. This disparity between the income collected by landowners and that earned by towns (when they do not own the land on which wind farms are installed) illustrates a lack of ‘procedural justice’ that some authors (Gross 2007) have cited as a factor in determining acceptability.

The Brandenburg example contextualizes the idea that one important attribute of the *Energiewende* is citizens’ financial involvement. At the national level, German citizens are highly implicated in the energy transition since they own about 47 per cent of the production capacities for renewable energies (Morris and Pehnt 2012). Citizen involvement has taken the form of investment funds, associations, and cooperatives. However, most of the cooperatives are situated in Bavaria, Bade-Wurtemberg, and Lower-Saxony. They remain rare in Brandenburg and in most ex-GDR States. As a consequence, wind farms are owned by investment funds or developers and the electricity produced by wind farms is essentially injected into the national electricity grid, and not consumed by those who produce it. The German model has also changed since the 1990s, and institutional investors gradually absorb movements that began as citizen initiatives. Technological progress, high purchase feed-in tariffs, and the increasing complexity of energy laws have encouraged the growing presence of economic forces with the necessary expertise to profit from energy markets. A survey conducted between 2012 and 2014 showed that citizen initiatives represent no more than 16 per cent of the wind energy projects initiated in Germany (BWE 2015).

It also appears that the argument that renewable energies create jobs has not proven effective in generating widespread support among the general population. Over 370,000 German jobs are in the renewable energy sector (Lehr et al. 2015), with 25 per cent of them in the former GDR. Although 1 employee in 1,000 works in the renewable energy sector in Germany, the number soars to 27/1,000 in Saxony-Anhalt, 23.2/1,000 in Mecklenburg, and 18.8/1,000 in Brandenburg

⁷ German Association of Towns and Municipalities.

(German Ministry of Economy and Energy 2015a). Renewable energies thus enjoy a larger share of overall production in the eastern part of the country than in the west. The photovoltaic sector has, however, lost approximately 20 per cent of its workforce in Brandenburg due to declining prices and Asian competition (German Ministry of Economy and Energy 2015). With over 6,000 jobs in the wind energy sector, Brandenburg is one of the German *Länder* with the most jobs in the sector, but the crisis in the photovoltaic sector has undermined the argument that renewable energies will revive the *Land's* industrial base. Additional factors include the fact that wind energy jobs are concentrated in a few locations and remain scarce in mining regions and rural communities, where wind turbine maintenance employs a small workforce.

Moreover, officials can hardly support arguments that energy prices are lower than in states that have invested less than Brandenburg in wind energy. The expensive modernization of the electric grid made necessary by wind farms caused Brandenburg's electric bill to be higher than in some other German states. Grid charges differ, indeed, significantly across Germany. In 2014, the lowest grid charges were in Düsseldorf (4.75 cent €/KwH), the highest in Brandenburg (9.88 cent €/KwH) (RAP 2014). According to the Brandenburg Minister of Economy, Mr Gerber, high electricity costs essentially explain low acceptance rates amongst the population: 'The installation of many wind farms and solar farms in Brandenburg has caused the region to have one of the most elevated electricity costs in Germany. We must renegotiate with the other states about how the costs of reorganizing the network are distributed' (Torsten 2014). The *Land* authorities are indeed requesting that the equalization transfers between *Länder* be re-evaluated.

How can local community participation in wind energy projects be supported in order to increase citizen ownership and ensure more equitable profit-sharing? Brandenburg political leaders have not pursued the same direction as Mecklenburg-West Pomerania, where the regional Parliament (*Landtag*) discussed a proposal in 2015 that would compel developers to offer the population and local governments within a distance of 4.5 kilometres the opportunity of investing 20 per cent of wind farm capital (Weinhold 2015). It is worth noting that this option is conditional on surpassing a number of regulatory obstacles. An additional constraint on adapting such a policy in the ex-GDR is the low level of liquid savings and the financial vulnerability of local communities.

Ultimately, in both Aquitaine and Brandenburg, acceptance is determined significantly by socio-economic factors. Both regions illustrate the complexity of developing and implementing an energy transition without endangering the economic fabric. This difficulty is not purely economic. It also stems from tensions and a lack of cooperation between local, regional, and national administrative levels.

4 Addressing shortcomings of the multi-level governance schemes

Because governance within the EU takes place and involves so many levels of interaction between such a broad array of officials, some researchers have used the term 'multi-level governance' to describe the EU system since the 1990s. Marks (1993: 392, quoted in Hooghe and Marks (2003)) describes it as a 'system of continuous negotiation among nested governments at several territorial tiers—supranational, national, regional and local'. The multi-level governance concept has often been criticized for having no 'separate theoretical approach' (Benz (2000): 141 quoted in Aufenanger (2012)). The advantage of the concept is that it reflects the fact that every level is guided by its own actors, institutions, and proceedings and that they are interconnected vertically and horizontally, as well as territorially and functionally (Grande 2000: 11). The question of renewable energies is adapted to a multi-level approach insofar as the decision-making process is structured around a (constraining) European framework, its

application through laws at the level of the states, and the mobilization of local and regional actors. The previous section of this paper explored the socio-economic factors involved in acceptance, while the section that follows focuses on particular shortcomings in how actions are articulated among actors in each region, as well as between regional and national levels.

4.1 Governance challenges at the regional level

Brandenburg State has planned to allocate 2 per cent of its territory for wind farms by 2030, with a projected production level of 10,500 MW. This rate of development will require the construction of about 130 wind turbines per year (BWE 2014). In the face of rising discontent, and to avoid questioning their targets, since 2003, Brandenburg officials have emphasized the notion of acceptance defined as ‘a process enabling the development of direct dialogue’ (Ministry of Economy and Energy of Brandenburg 2012). A strategy of public consultation is being developed at the regional planning level prior to the installation of wind turbines. The idea, shared by Brandenburg leaders, is that provisions for consultation contained in existing legislation are inadequate. This has prompted the development of various mechanisms for keeping the public informed about energy transition and involving it in the process.

Imposing an increase in the minimum distance defined by the usual rule (300 to 500 metres) between wind turbines and housing also represents an option. In response to pressure from Bavaria, the *Bund* granted authority to the states to rule on this issue in 2014, for a period ending on 31 December 2015. The Bavarian government has taken advantage of this opportunity to introduce the 10H rule.⁸ Early in 2015, the Brandenburg government announced that it would not adopt a similar provision. Such a rule would indeed mean a stop to the development of wind turbines on its territory and the abandonment of the initiative to install them on 2 per cent of the region’s area.

The support provided by regional authorities to wind energy nevertheless suffers from the parallel support granted to the mining industry (9,000 direct jobs). The coalition contract considers the shutdown of thermal plants by 2040, but the transition period could last longer in view of the reaction provoked by a federal government decision to impose a ‘climate levy’ on the oldest coal plants. On 27 March 2015, the German Ministry for Economy and Energy proposed to introduce a carbon emissions tax of €18–20 per tonne of CO₂ on old coal power plants in operation for more than 20 years. Such a decision would push out of the market the oldest coal power plants and help to reach the German targets related to greenhouse gas emissions (German Ministry of Economy and Energy 2015b). However, the decision sparked strong reaction from coal miners’ unions from the industry. Three states with significant mining sectors, amongst them Brandenburg, argued that several thousands of jobs might be at risk (Ministry of Economy and Energy of Brandenburg 2015). The proposal was withdrawn in June 2015 (Frese 2015). A new and much less controversial one suggested that lignite power plants with a capacity of 2.7 GW (i.e. 13 per cent of the capacity of German lignite power plants) will be put on ‘temporary standby’. These power plants will only come into operation in emergency situations and, instead of being taxed as planned by the previous proposal, will receive compensation for remaining on standby for four years, and should then be closed (Ifo Institut 2015). This solution could prove

⁸ According to this rule, the distance between a wind turbine and the closest accommodation should be factor 10 of the height of the wind turbine. The *Land* of Bavaria nevertheless authorises derogations to this rule for towns. According to the Federal Institute for Research in Urbanism and Territorial Design (*Bundesinstitut für Bau-, Stadt- und Raumforschung—BBSR*), the decision taken by the Bavarian authorities reduces the available surface for wind energy development to 1.7 per cent of the surface of the *Land* (as against 19 per cent before the measure was adopted). See (Zaspel-Heisters 2014).

costly (its costs are estimated at €0.5–1 billion annually (Bajczuk 2015)) and should cut emissions to 11 million tonnes only by 2020. Thus, to reach the original objective of the government (reduction in carbon emissions of 22 million tonnes) additional investments, in particular in the area of energy efficiency, have been agreed (Ifo Institut 2015).

Previously, following the victory of social democrats in the parliamentary elections in Sweden in 2014, the energy supplier Vattenfall (a company 100 per cent owned by the Swedish state), which holds most of the mining assets in Brandenburg, announced a radical change of strategy. The group decided to prioritize the struggle against climate change, thus abandoning its coal mining holdings, including those in Brandenburg. State officials and the federal Minister of Economy immediately engaged in negotiations with the energy company and the Swedish government to have this decision re-examined (Metzner 2014).

These two examples confirm arguments advanced by the Director of the Chamber of Commerce and Industry of Cottbus, who contends, ‘the regional government has not yet opened the debate regarding a coal free Lusatia’ (Steyer and Matern 2015). The example of Brandenburg illustrates the fact that a successful energy transition requires more than creating a boom in alternative energies. At the same time, at both the economic and social levels, the gradual marginalization of ‘failing’ energies must be prepared.

In terms of acceptance, territorial planning also plays an important role. ‘It is easier to accept wind turbines and feel less or no disturbance when people are involved in the planning process. Informing citizens in the hope of convincing them is insufficient. They must also be associated with it at an early stage and have a real influence on the project’ stress Hübner and Pohl (2014) at the end of their empirical study. As far as planning is concerned, Brandenburg can rely on two main documents: the ‘2030 Energy Strategy’ which has little legal constraint, and the land use plan for the entire Berlin-Brandenburg region, ratified in 2009 before being legally declared void and again becoming effective in June 2015.⁹ The plan does not specify the eligible areas for wind farms, however, which are defined by the five Brandenburg planning regions (*Regionale Planungsgemeinschaften*).¹⁰ A planning region has its own legal persona and 5–10 employees. The decision-making organ is an assembly that meets 1–3 times a year in which the *Kreise*¹¹ and towns of more than 10,000 inhabitants are represented. One of the planning region’s responsibilities is the adoption of the plan specifying which zones are eligible for wind energy. To this end, the assembly uses a process of elimination that takes various aspects of *Bund* or regional legislation into account—such as protected zones, noise pollution, army radars, and weather forecast services—that enable the progressive limitation of territories that ban wind energy.

Residual areas constitute zones in which wind turbines can be implanted.¹² These are territories for which the planning region has not noted any legal objection to siting wind turbines. The territories not included in these zones, in the case of Brandenburg, ban wind farms (other states employ a different approach). As a result, the regional plan is not so much a variation of the state strategy as a document that defines which zones are authorized for wind turbines under current legislation. Such a plan requires time (at least three years) and can face disagreement between representatives, leading to postponement and eventual cancellation. Consequently, in

⁹ See <http://gl.berlin-brandenburg.de/> (accessed on 2 July 2015).

¹⁰ Havelland-Fläming, Lausitz-Spreewald, Oderland-Spree, Prignitz-Oberhavel and Uckermark-Barnim.

¹¹ An intermediary level local authority, between the region (the *Land*) and the municipality (*Gemeinde*).

¹² The planning regions deal exclusively with the issue of wind turbines. Solar energy and biomass requiring less space, their planning is left exclusively to towns.

Brandenburg, only two of five planning regions had adopted a plan by July 2015. In the absence of a plan, the regulations of the federal city-planning code according to the 1997 reforms prevail.

Article 35 of the federal urbanism code, modified in 1997, granted a privileged administrative regime to wind farms.¹³ Wind farm construction must be authorized for any non-urban zone if it does not prejudice the general interest and has no harmful consequences for environment, protected sites, radars, etc. In 1998, this provision was amended, with the federal code specifying that an installation can have a negative impact on general interest when a regional or municipal plan for wind turbines on other parts of the same territory has been adopted. Within the framework of a land use plan (*Flächennutzungsplan*), or, in the event of such a plan not existing, of a district plan (*Teilflächennutzungsplan*), a town can therefore specify an area dedicated to wind farms in order to avoid the scattering of installations. In 2002, the Administrative Tribunal nevertheless specified that towns are unable to prevent wind turbines from being installed on their entire territory, because this would violate the principle of the preferred administrative regime given by the federal urbanization code. More generally, a town cannot impose restrictions not justified by legislation, the democratic opposition of a town council being thereby deemed insufficient.¹⁴ Ultimately, developers can sue towns determined to restrict the possibility of installing wind turbines (in Brandenburg, this happened to the town of Beelitz in 2015 (Steglich 2015)). This planning process has a paradoxical effect. On the one hand, it impacts social acceptance negatively insofar as the regional government and local representatives exert only limited influence on the geography of eligible zones. On the other hand, it facilitates wind energy development by placing it under a preferred administrative regime.

Like their counterparts in Brandenburg, regional authorities in Aquitaine are attempting to redefine their relations with regional actors in terms of energy transition. The Aquitaine region has also set more ambitious targets than the national government's ones: the share of renewable energies must double by 2020 to reach 32 per cent, greenhouse gas emissions must be reduced by 30 per cent, and energy efficiency must improve by 30 per cent. Nevertheless, as with Brandenburg, Aquitaine regional authorities are also torn between a desire to develop renewable energies and determination to maintain the industrial workforce (specifically with regard to the forest products industry). They emphasize different ways of managing woodland, considering the fact that the conflict over how such land is used has significantly worsened since two recent storms (Martin in December 1999 and Klaus in January 2009). After the storms, the production potential for maritime pine plummeted from 9.5 million m³/year prior to Martin to 6 million m³/year after Klaus. Industrial demand for wood is between 7 and 8 million m³, however. Finally, it appears that the storms are responsible for increased tensions concerning forest resources. Recurrent violent climatic phenomena, which are arguably caused by global warming (Le Treut 2013), jeopardize forest biomass renewable energy, which has been presented as one mechanism for slowing down global warming. In this context, regional authorities support new methods of forest management as well as exploiting forest biomass without undermining forest products markets.

Conflicts over land use and damage caused by storms have nevertheless rekindled debates concerning the opportunity for a different approach to managing forest land. Using short rotation forests of alternative wood species such as black locust and eucalyptus and mobilizing more wood through raising harvest levels are some of the options. However, intensifying the use

¹³ Paragraph 35 of the Urbanism Code. The federal Urbanism Code quotes various projects under this regime. The decision to include the implantation of wind turbines was adopted by the German Parliament in 1996.

¹⁴ The building licence was provided by the *Kreis* authorities.

of forest biomass may imply that current forest rotation periods would decrease, monocultures would be even further promoted, and less wood debris left to decay. This would be at the expense of biological diversity. Furthermore, forests provide an important carbon sink since substantial amounts of carbon are stored in trees and above all in forest litter and soils (FAO 2015). Hence the need for regional authorities to embrace all the dimensions of forest management. As a mayor puts it: ‘an appropriate forest management requires at the same time a good knowledge of the world markets, an intimate knowledge of the socio-cultural specificities of each forest area and an expertise on biodiversity aspects of forest management’.¹⁵ Since responsibilities are fragmented between different institutions, a highly cooperative approach is needed between stakeholders.

In terms of governance, one of the specific aspects of Aquitaine compared to Brandenburg’s federal system is the significant role of national actors at the regional level. Government ministries are represented locally, implementing state-defined programmes, along with various other national agencies (such as ADEME,¹⁶ which supports wood energy projects, and the ONF,¹⁷ which focuses on optimal management of forest resources and preserving biodiversity). In the end, there are numerous local and regional agents, representatives of the national government, and socio-professional forces.¹⁸ In the context of energy transition, supplementary competences have been given to local authorities. The Metropolitan Law of 2014–15¹⁹ has strengthened the role of the region as a coordinator in the field of energy-climate. Although it is now labelled as the ‘leading player’, it does not have hierarchical responsibility over other actors. In the end, the legal changes that have taken place are based on an incremental approach, and the spread of responsibilities between the various institutions involved within a single region as well as their limited resources have not been tackled.

Valio and Paloniemi (2012) mention the absence of discursive strategies emphasizing cooperation between forest owners and other actors as a sign of failure in creating more participatory and pluralistic practices in Finnish forest policy. In Aquitaine, beyond institutional settings, more fluid forms of governance are developing in the region, whether on the scale of a living area, a planted zone, or even, for example,²⁰ between urban areas and neighbouring rural areas. The energy transition thus induces on the one hand (slow) progress in terms of decentralization and on the other, informal cooperation at different levels, thus echoing the distinction established by Hooghe and Marks between the Type I and II of multi-level governance (Hooghe and Marks 2003, quoted in Stead 2014).²¹ However, responsibilities are fragmented between numerous local, regional, and national stakeholders, partly because the national authorities have so far been reluctant to devolve more policy competences to the regional level.

¹⁵ Conversation with the author, June 2015.

¹⁶ Agence de Maîtrise de l’Energie.

¹⁷ Office National des Forêts.

¹⁸ The main cooperative in Aquitaine is Alliance Forêts Bois.

¹⁹ *Loi* No. 2014–58 of 27 January 2014 on the modernisation of public action of territories and on assertion of metropolitan areas. (*Loi n° 2014–58 du 27 janvier 2014 de modernisation de l’action publique territoriale et d’affirmation des métropoles.*)

²⁰ As an example, one can mention the ‘forest exploitation charts’ or the ‘rural poles of excellence’.

²¹ Hooghe and Marks distinguish between two basic types of multi-level governance, labelled Type I and Type II. Type I governance is designed around territorial communities, while Type II is designed around specific tasks or policy issues.

4.2 The challenges of multi-level governance: is the national government the leading actor?

The forest products sector of the economy in France is in second place in terms of external deficit, despite the fact that France's forested territory is the third largest in Europe (Caullet 2013). This illustrates the difficulties faced by public actors as they attempt to structure a diversified, fragmented forest products market. From preparation to post-project phases, the sector suffers from a lack of structure, and supply is limited by problems related to mobilizing resources. The divergence of interests between the various wood products actors, in particular between silviculture professionals and wood industry professionals, impede consensus about the most effective approaches to forest policy. These problems with respect to French forestry also prevail in Aquitaine, where 92 per cent of woodlands are privately owned (AGRESTE Aquitaine 2012).

In addition, the use of resources is constrained by tax policies that encourage long-term woodland ownership through transmission from one generation to the next but that do not encourage active forest management. The basis of this policy goes back to the post-war period, when the government sought to avoid over-exploitation of forest resources at a time when reconstruction generated strong demand for forest products (Caullet 2013). This tax policy currently contributes to weak market fluidity and uneven supply, to the subdivision of forestland through inheritance—France currently has 3.5 million forest owners—and to passive forest management. In short, one of the principal constraints on the development of the wood-based energy market is not the availability of raw materials as it is the tax framework, which, in its current form, does not encourage owners to manage their property actively. However, these two features of the wood market are essentially the national government's responsibility, hence the crucial role of national policies for the success of the regional-level energy transition.

More surprisingly, the national framework is also a key factor in the case of Germany. The legal framework favours wind farms in terms of territorial planning, and when added to the generous feed-in tariffs planned by the EEG,²² partly explains the flow of investors to Brandenburg. The regulations defined by the *Bund* in terms of purchasing feed-in tariffs and planning rights have contributed significantly to overall increases in wind energy at the regional level. Although there are few cooperatives in Brandenburg, a number of initiatives show that the energy transition has led some local authorities to implement innovative policies. The energy autonomy plan developed in the village of Feldheim, the citizen fund in Brandenburg an der Havel, and the wind farms in Schlalach-Mühlenfließ and Frehne that entail neighbour partners, offer several examples of this promising trend (Becker et al. 2012). These experiences have confirmed that citizen ownership of wind energy production capacities dramatically improves community acceptance (Yildiz et al. 2015). The proliferation of local initiatives owes a great deal to a positive financial and legal framework, however.

A new European framework for renewable energies assistance was developed in 2014 to gradually reduce this support from the member states (European Commission 2014). As a result, Germany reformed its energy transition law. The overall objectives and priorities of the energy transition have not been called into question,²³ but the new support scheme has reflected the

²² *Loi de transition énergétique* (Energy transition law).

²³ By 2025, at least 40 per cent of the electricity consumed in the country will have to come from renewable sources (55 per cent in 2035) against 25 per cent now. By 2035, 55 to 60 per cent of electricity consumption will have to be obtained from renewable energies, and in 2050, 80 per cent given that in the short term (2020) 18 per cent of the global consumption of energy will have to be obtained from renewables

government's willingness to submit increasingly renewable energies to market-based rules. Financial support is gradually reduced, and the principle of competitive bidding for contracts has been enacted. This should promote the development of organizations that have both expertise and sufficient financial capacities, although the German government has guaranteed that tenders will be 'organized to enable a variety of actors to participate, cooperatives as well as major companies, small citizen initiatives and municipal companies' (German Ministry of Economy and Energy 2014). Some politicians have nevertheless noticed that their municipal projects would no longer be possible under the new law.²⁴ For the villages tempted by energy autonomy, the reform has changed the economic model on which they could depend until now, if only because, as for most other consumers, they will have to pay the EEG tax. The new regulations already appear to be impacting cooperatives in Germany. In 2014, one cooperative in three did not plan further investments, while this was the case for only 8 per cent the previous year (DGRV 2014). The pace with which cooperatives are formed has slowed by 60 per cent between 2013 and 2014, although the number of cooperatives in other sectors has continued to increase (DGRV 2014). It has become clear that in both Aquitaine and Brandenburg, the energy transition cannot be engineered only at regional level but requires enhanced coordination amongst and between the various levels of governance.

5 Conclusion

By focusing on two regions, this paper has attempted to call attention to factors that both inhibit and contribute to the implementation of the EU clean energy transition policy at the subnational level in a federal state (Germany), and in a unitary one (France). The study invites the generalization of some common assertions and the interrogation of others, despite the narrowness of the two cases studied here. It confirms that the infra-government actors in Europe are the driving force behind energy transition, it highlights how some have made European and national priorities their own, and that rural areas play a key role in energy transition. Factors proposed by other studies to explain support for or hostility to wind farm projects from local actors can be observed in Brandenburg. The competition with the coal sector, the official rationale of the energy transition—doubts regarding the latter are nurtured by the ambivalent attitude of the Brandenburg *Land* concerning the future of coal mining—and certain attitudes inherited from the communist era and reunification are additional factors that must be considered. The case of Brandenburg also confirms the decisive importance of the spatial planning process.

These case studies nevertheless call for nuanced interpretation concerning certain arguments that have been advanced at international and national levels. For example, the largest cultivated forest in France is in Aquitaine but, despite this abundance, the region continues to suffer from powerful tensions implied by an increased competition over forest resources. The acceptance of renewable energies and strong citizen involvement in the production of renewable energies are two major characteristics of the *Energiewende* at the German level. However, none of them is reflected in the case of Brandenburg, one of the most successful regions in Germany in terms of wind policy. In this specific case, favourable natural and economic conditions added to the very attractive feed-in tariffs agreed at the national level are far more important than acceptance and citizen involvement. Brandenburg can rely on a low population density and on numerous flat and windy areas favourable to wind machines. The adverse economic conditions in rural communities (in comparison with other German *Länder*) have also made it very attractive for

²⁴ Interview with Annalena Baerbock (Green MP in the Bundestag) (Fröhlich 2014).

investors and developers. The legal framework, namely the national regulations on spatial planning have proved to be crucial too. The vocal support provided by regional authorities and the reluctance to regulate some key issues (such as the distance between wind farms and built neighbourhoods that has been addressed by the State of Bavaria) have been instrumental. However, the case study of Brandenburg demonstrates that low acceptance and low citizen involvement (at least in comparison with other German *Länder* that have seen far more grass-roots initiatives) do not necessarily hamper clean energy transitions.

‘Do institutions matter for regional development?’ asks Rodriguez-Pose (2013). Institutional arrangements above all are needed across administrative boundaries at the vertical as well as at the horizontal level. We would argue that it is not the institutional system itself that matters, whether unitary or federal, as much as the ability of the various stakeholders to share common visions and to act collectively. Further, the multi-level approach is justified by the fact that the number of actors involved in energy has grown with the implementation of the 3 x 20 package (see the Introduction). Although decentralized energy production imposes new responsibilities on local actors, the national government is in no way marginalized and remains crucial, particularly in terms of tax policy (for forest lands), spatial planning, and defining of the feed-in tariffs.

These two cases also suggest the need to analyse the implications of growing territorialization of the energy transition for regional actors. Leading this transition calls for reinforced administrative capacities that can develop forest resource by possessing both knowledge of local factors and of the global market (in the case of Aquitaine), or even the ability to build a balanced dialogue with private actors in the wind energy sector (in the case of Brandenburg) in a context of increasingly complex energy laws. More broadly, both of the cases studied here confirm that regional strategies for facing climate change should be coordinated within a vision of territorial development to minimize conflicts over land and resource use (in the case of Aquitaine) or to prepare the conversion of regions negatively affected by the transition (in the case of Brandenburg).

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