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Local Responses to Renewable Energy Development

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Abstract and Keywords

This chapter discusses both local opposition and local support to renewable energy developments, with particular attention to wind farms and solar power plants. Actors, arguments, and actions are examined and contrasted. It is argued that opposition to renewables has received far more attention from social scientists, even though the success of this sector in several countries can show that support is frequent and widespread. Regarding opposition, the NIMBY hypothesis is discarded and other more complex and multilayered explanations are discussed, such as place attachment, landscape concerns, procedural and distributive justice, and actual impacts of wind and solar farms. Concerning support to renewable energy developments, justifications such as economic benefits (namely financial incentives and employment generation), landscape rehabilitation, and environmental values are explored.

Keywords: renewable energy, wind farm, solar power, NIMBY, PIMBY, place attachment, landscape, procedural justice, distributive justice, incentives

Introduction

THERE is a wide variation on how local communities respond to reneable energy developments. The following two cases are illustrative.

Case 1

In the late fall of 2015, a small town in North Carolina (United States) made the news all around the world in both conventional and social media. At a town meeting to discuss the construction of a solar farm, residents showed a fierce opposition, sustained on arguments such as that solar panels caused cancer, sucked away the sun from the town, or disrupted photosynthesis. Commentators across the globe made fun of these arguments, denouncing them as irrational and anti-scientific.[1]

However, David Roberts published an insightful piece[2] on the online platform *Vox* showing how this opposition was far from unreasonable and reflected severe economic and social changes, such as the decline of traditional activities (farming), high unemployment, and depopulation, that were eroding the community. Solar farms (three of which were already surrounding the town) were seen as a symbol of these changes. They brought little to no benefit to residents and were seen as impositions from outsiders intent only on extracting profit.

(p. 344)

Case 2

At the beginning of 2016, an unfavorable Environmental Impact Assessment Decision rejected the application for the construction of a wind farm in the Torre de Moncorvo municipality in Portugal. After strong complaints from environmental nongovernmental organizations (ENGOs), national authorities upheld their decision on the negative impacts on protected areas, namely the UNESCO classified wine region of Douro and Natura 2000 areas. The promoter vowed to fight this decision in the courts, and local authorities expressed their indignation. The wind farm would bring a direct revenue of €6 million to local authorities and would pay rent to 400 smallholders. According to a television news report, the mayor stated, “we cannot pour down the river 92 million euros just because there might be something [Bonelli eagles] there.” A local resident complained, “this [decision] only harms the village. We would have development, we would have jobs, we would have roads. It’s the population that will lose. Because of a joke. In my opinion, we don’t see here any bats or birds here. It’s the population that will lose.”[3]

These two cases highlight some of the issues that have made opposition and support for renewable energy development one of the most studied themes in the field of energy and society. The transition to a sustainable energy system, vital for mitigating climate change, demands the replacement of fossil fuel energy with renewable sources, on par with substantial improvements in energy efficiency. However, renewable energy generation requires facilities that, with current technology, take up space, consume resources, transform the landscape, and have some environmental impacts. Their siting is bound to affect communities and thus often gives rise to controversies and disputes.

This chapter discusses the drivers for both opposition and support to local renewable energy developments. Based on the extensive scientific literature published on this issue, as well as the author's own research, it examines the arguments put forward to justify discourses and actions, the local actors that are involved in the controversies, and the results achieved in terms of hindering or promoting renewable energy.

It focuses mainly on wind and solar power, which combined make up 85% of the renewable power capacity in the world in 2015, excluding hydropower (REN21, 2016). It leaves out of the discussion bio-power and geothermal power, since these renewable sources are somewhat less controversial and generate different kinds of impacts. It also excludes hydropower, which has a much longer history, as well as a fairly contested status within energy debates; although it is indisputably a renewable source of energy, its extensive environmental impacts often prevent its classification as sustainable, and it is left out of renewable energy targets in some countries (Frey & Linke, 2002).

The following section of this chapter is devoted to introducing the subject, in particular the apparent mismatch between global support and local opposition to renewables. Next, the most common reasons for opposing wind and solar farms are discussed. The subsequent section explores the reasons that some communities support and even embrace renewable energy developments. A brief conclusion wraps up the discussion.

(p. 345) The Renewables Paradox?

Several studies (Afonso & Mendes, 2010; Barry et al., 2008; Bell et al., 2005; Breukers & Wolsink, 2007; Devine-Wright, 2005a; Haggett & Futák-Campbel, 2011; Walker, 1995; Wustenhangen et al., 2007) point to an apparent paradox, in which overwhelming public support for renewable energy at the national level is matched by strong opposition to the siting of energy infrastructures at the local level. International surveys, as well as other published research (Aitken, 2009; Ek, 2005; Wolsink, 2007b), confirm high levels of support for renewable energy. For instance, the latest Eurobarometer survey to address energy and climate issues (European Commission, 2015) shows that 91% of Europeans are in favor of government-set targets to increase the use of renewable energy by 2030. However, some authors have pointed out that public opinion on renewable energy is not homogeneous: there are many "publics," and attitudes vary across social groups, as well as according to the type of renewable energy (with solar being somewhat less contentious than wind) (Ek, 2005; Walker, 1995). Additionally, there is no empirical evidence suggesting a connection between attitudes toward (local) wind farms and attitudes toward renewable energy in general (Ek, 2005; Eltham, Harrison & Allen, 2008; Warren et al., 2005).

This ambivalence is also noticeable in the attitudes and practices of ENGOs, in what Warren et al. (2005) have labeled a "green on green" controversy: "in the case of wind power there are strong 'green' arguments on both sides of the debate. Some

environmentalists advocate wind farms because of their ‘clean energy’ credentials, while others oppose them because of their landscape impacts. Still others are caught awkwardly in the middle, supporting renewable energy in principle but opposing specific wind farm proposals” (Warren et al., 2005, p. 854). This tension within the environmental movement has been confirmed in several other studies (Bell et al., 2005; Breukers & Wolsink, 2007; Cowell, 2010; Delicado et al., 2014; Loring, 2007; Toke, 2005; Toke et al., 2008; Walker, 1995; Wolsink, 2000, 2007a).

Nevertheless, it has yet to be assessed in what measure local opposition plays a role in preventing the development of renewable energy. Given the swift development of renewable energy in some European countries, such as Austria (responsible for 70% of gross electricity consumption), Sweden (63%), Portugal (52%), and Denmark (48%) (EUROSTAT, 2016), but not in others, such as The Netherlands (10%) and the United Kingdom (18%), some authors (Bell et al., 2005; Breukers & Wolsink, 2007; Cowell, 2010; Walker, 1995; Wolsink, 2000, 2007a) attribute varying degrees of success in part to the presence or absence of local support for wind or solar farms. For instance, Van der Horst and Toke (2010) demonstrate that most planning applications for wind farms in the United Kingdom are rejected due to local objections. However, the Portuguese case (Delicado et al., 2014) shows that despite strong opposition to wind farms in the planning stage (through participation in public consultations during Environmental Impact Assessments), this has not prevented a high rate of approval and considerable development of the sector in the country in the past few decades.

(p. 346) Therefore, the connection between local opposition to renewable energy infrastructures and a less successful transition to a sustainable energy system is far from linear. Many other factors are at play, and public policies, as well as economic aspects, may be far more relevant for explaining the development of renewable energy (Bell et al., 2005; Breukers & Wolsink, 2007; Delicado et al., 2014; Jobert et al., 2007; Ringel, 2006; Toke, 2005; Toke et al., 2008; Wolsink, 2000).

Furthermore, few studies address the extent of local opposition or support for energy facilities in each country. The vast majority of literature in this field consists of case studies of localized wind or solar farms, exploring the processes, actors, and justifications that drive social action in these matters. In fact, it can be said that these case studies focus much more frequently on controversies and dissent than on consensus and support for renewable energy infrastructures. This in turn may lead to a somewhat skewed perception that resistance to wind and solar farms is far more widespread than it actually is. There may be a social research bias toward what can be construed as a “social problem,” in need of “fixing” due to the urgency of the climate change threat, thus paying much less attention to success stories. Aitken (2009, p. 53) even points out that “the underlying ‘pro-wind power’ position in this literature could prevent a meaningful engagement with public responses towards wind power developments.”

This chapter attempts to redress this imbalance, by looking into both the arguments that justify opposition to and support for wind and solar farms. Though it is crucial to understand the barriers that may impede the much-needed growth of renewable energy, it is also important to look into what drives communities to welcome wind and solar farms and even to protest when planning applications are rejected.

Many Reasons to Say No to Renewables

Early studies about wind and solar farms were quick to draw from a tried and tested hypothesis to explain opposition to their construction: the NIMBY “syndrome” (Dear, 1992). The acronym has been used by both policymakers and planners, as well as social researchers, “to describe opponents of new developments who recognise that a facility is needed but are opposed to its siting within their locality” (Burningham, 2000, p. 56). It began to be used to describe protests against the location of waste deposits and other hazardous facilities and has a clear pejorative connotation of “limited and self-interested responses to local environmental change” (Burningham, 2000, p. 60). It is used to withdraw legitimacy from opponents, by labeling them as selfish, irrational, and ignorant.

Although some studies on renewable energy still use this concept (see, for instance, Botetzagias et al., 2013; Fridolfsson & Tangerås, 2013; Groothuis et al., 2008; Ribeiro et al., 2014), many more have a critical stance toward its use. Several authors (Devine-Wright, 2009; Ek, 2005; Van der Horst, 2007; Wolsink 2000, 2007b) looked into evidence from survey data and found little indication that proximity to wind farms had a bearing on attitudes toward them. Warren et al. (2005, p. 866) even found evidence (p. 347) for an “inverse NIMBY” syndrome, whereby those with wind farms in their “backyard” strongly support the technology.

Devine-Wright (2005b) highlights the multidimensionality of public perceptions on renewable energy facilities and draws attention to the role of social identities, social representations, and social networks in generating attitudes. Van der Horst (2007) shows how opponents’ arguments can be reasonable and founded in genuine concerns and impacts. Wolsink (2007a) provides evidence that supporters can also have selfish motives. Ellis et al. (2007) realized that critics of renewable development often share the same environmental and climate mitigation values as supporters. Other authors point out that NIMBY approaches focus exclusively on the public and ignore the role played by institutional actors: “No attention is given in such an account to what developers and technology promoters are doing and saying, and how decision processes are structured and enacted” (Walker et al., 2011, p. 4).

Place Attachment

Devine-Wright (2009) was the first to propose an alternative framework to the NIMBY "syndrome" for understanding opposition to renewable energy that has since gained some traction among scholars in this field. The concept of "place attachment," created by human geographers but increasingly used in environmental psychology and related sciences (Lewicka, 2011), refers to "a positive emotional connection with familiar locations such as the home or neighbourhood" (Devine-Wright, 2009, p. 427) and can be used to explain local opposition "as a form of place-protective action, which arises when new developments disrupt pre-existing emotional attachments and threaten place-related identity processes" (Devine-Wright, 2009, p. 426). It is usually connected to the place of residence, but areas that have symbolic value may also generate feelings of attachment from those who live far away (Carlisle et al., 2014). Devine-Wright (2005b) proposes that it is not physical proximity to the facilities, but rather community perceptions of the turbines and social influence that have a bearing on local attitudes. A case study of a proposed offshore wind farm shows that it threatens the identity of residents: "opposition arises from nature/industry symbolic contradictions: between a place represented in terms of scenic beauty that provides a restorative environment for residents and visitors, and a wind farm that will industrialise the area and 'fence' in the bay" (Devine-Wright & Howes, 2010, p. 271). Other authors have also used the concept of place attachment to explore opposition to wind farms (Delicado et al., 2016; Lombard & Ferreira, 2013; Swofford & Slattery 2010) and solar power plants (Brewer at al. 2015; Carlisle et al., 2014) in different countries.

Landscape Concerns

Closely connected to place attachment is the value attributed to landscape and the notion that renewable energy developments somehow deplete that value. Countless case (p. 348) studies have demonstrated how landscape concerns (or seascape, in the case of offshore wind farms) and scenic impact are at the forefront of arguments of anti-renewables campaigners (Carlisle et al., 2014; De la Hoz et al., 2013; Delicado et al., 2016; Devine-Wright & Howes, 2010; Jolivet & Heiskanen 2010; Lombard & Ferreira, 2013; Mason & Milbourne 2014; Pasqualetti, 2000, 2001; Warren et al., 2005; Wolsink, 2010; Woods, 2003). As Warren et al. (2005) synthesise, "The landscape impacts of windfarms are exacerbated by the fact that the locations with the highest wind resource are often precisely those exposed upland areas which are valued for their scenic qualities and which are often ecologically sensitive. Opponents not only highlight the scenic impact of the turbines themselves, but also emphasize the visual impacts of the associated construction and upgrades to the electricity transmission grid. Further, they assert that the landscape impacts of windfarms will damage tourism" (Warren et al., 2005, p. 857).

Countries where landscape quality and preservation values are dominant and where landscape protection organizations are particularly active have higher rates of rejection of planned renewable developments (Breukers & Wolsink, 2007; Loring, 2007; Toke,

2005; Toke, Breukers, & Wolsink, 2008; Wolsink, 2007a, 2010). And yet, as shall be seen in the following, landscape can also be an argument in favor of wind and solar farms.

Opponents of wind and solar farms often claim that they spoil pristine natural environments, causing visual intrusion, not just because they are “machines in the garden,” “out of place” technological artifacts, but also because they occupy large spaces, either vertically (wind farms) or horizontally (solar power plants), they require building other infrastructures (power lines, power stations), and they cast shadows (wind turbines) or cause glare (solar panels) (Jolivet & Heiskanen, 2010; Mulvaney, 2013; Rodriguez & Luque, 2010; Rodriguez et al., 2010; Warren et al., 2005). This is particularly acute when landscapes are considered to have an iconic value, such as local landmarks or places of cultural heritage (Afonso & Mendes, 2012; Delicado et al., 2016; Mulvaney, 2013; Rodriguez et al., 2010; Van der Horst, 2007; Wolsink, 2010). Renewable energy developments can also be seen as highly visible symbols of the decline of traditional rural activities, such as agriculture, and the “industrialization” or “mechanization” of rural landscapes (Afonso & Mendes, 2010; Devine-Wright & Howes, 2010; Rodriguez & Luque, 2010; Rodriguez et al., 2010; Woods, 2003). Curiously, several studies point out that it is the “newcomers” (such as second homeowners or retirees who have moved to the countryside), rather than the “natives” of these areas, who invoke these arguments (Anderson, 2013; Van der Horst & Vermeylen 2010). They are often “networked” or “vocal” minorities (Anderson, 2013; Bell et al., 2005; Bell et al., 2013; Carlisle et al., 2014; Ellis et al., 2007; Warren et al., 2005), whose social and economic capital awards them greater power in influencing planning decisions. Van der Horst and Toke (2010, p. 219) show how in more affluent areas in the United Kingdom the approval rate of wind farms is much lower, since “coalitions or special interest groups that are relatively privileged in terms of capital, be it social, human and/or financial, are better equipped to influence and shape the outcomes of the planning process than less organised local publics.”

However, several studies demonstrate that resistance to wind and solar farms is higher during the planning stages and declines after their construction, when the actual **(p. 349)** visual impact is felt (Carlisle et al., 2014; Devine-Wright, 2005a; Pasqualetti, 2001; Van der Horst, 2007; Warren et al., 2005). And in order to overcome landscape concerns, several authors point out how the characteristics of turbines (number, height, color, location) can impact on visual perception (Devine-Wright, 2005a; Jolivet & Heiskanen, 2010; Pasquelatti, 2000; Walker & Cass, 2007; Wustenhangen et al., 2007). Torres Sibile et al. (2009) developed and tested an indicator to assess the magnitude of the objective aesthetic impact on the landscape caused by the installation of wind farms, in order to decrease the likelihood of rejection by populations. Nadai and Labussiére (2013) show how planning procedures based on visualization techniques (“iconographic practices”) can succeed in abating local resistance. Ottinger (2013, p. 225) calls for the co-design between “socially conscious engineers” and local populations of “configuration of turbines compatible with the landscape and locals’ sense of place.”

Procedural and Distributive Justice

Non-acceptance of renewable energy developments is also closely connected to perceptions of injustice in terms of participation in the decision-making and of distribution of benefits. Whereas the literature clearly shows that procedural and distributive justice are crucial for successful planning and development of wind and solar farms (Carlisle et al., 2014; Devine-Wright, 2009; Hall et al., 2013; Wustehangen et al., 2007; Zoellner et al., 2008), several case studies reveal that this is still not a generalized practice.

Based on fieldwork in Australia, Gross (2007, p. 2727) ascertains that there is more resistance to wind farms when it is perceived that only part of the community benefits (for instance, in terms of renting out the land) and when the consultation process is seen as nonexistent or biased: “perceptions of fairness do influence how people perceive the legitimacy of the outcome, and that a fairer process will increase acceptance of the outcome.” The author compiles a list of suggestions for increasing legitimacy, which include starting the consultation process early, providing enough impartial information, holding meetings open only to residents and where everyone has a chance to speak, and explaining clearly the impacts on the community. Also in Australia, Anderson (2013) analyzes a case where deficiencies in the public participation process, which was not adequately publicized and did not address community concerns, raised a social network of resistance, with high social capital, that was able to prevent the construction of a wind farm.

Aitken (2009) examines the controversy around a wind farm in Scotland, describing how planning policy devaluates public participation, placing all trust on expert knowledge, even though the technical evidence provided was mostly generalized and did not address local concerns. Opposition campaigners expressed several complaints about the consultation process (access to information, time limitations, absence of a public hearing). A set of case studies in Portugal (Delicado et al., 2014, 2016) also identified severe limitations to public participation in decision-making regarding energy facilities, (p. 350) but a centralized, bureaucratized tradition of administration prevailed over local opposition and planning approval rates were high.

Bringing together this section and the previous one, Mason and Milbourne (2014, p. 106) develop the concept of “landscape justice,” a form of justice that is “attentive to space, time, materiality, affect, scale, participation and value.” Based on a case study of opposition to a wind farm in Wales (UK), the authors show how “a lack of meaningful participation appears to be the root of all injustices felt by anti-windfarm campaigners” (Mason and Milbourne, 2014, p. 110).

However, Jolivet and Heiskanen’s study (2010) of a controversy regarding a proposal for a wind farm in France shows that participation is not a universal panacea for generating acceptance. Although ample opportunities for public consultation were given and the local community embraced the project (more on this case later), surrounding

municipalities were not included in the process and their interests (heritage tourism) collided with the setting up of the wind farm, so they opposed the project and submitted a claim to the courts. Breukers and Wolsink (2007) and Bidwell (2013) also draw attention to participation as a means to explore mitigation options and not necessarily for persuading opponents.

Regarding distributive justice, opposition to renewable energy is based not only on an unfair distribution of benefits (see later discussion), but also on uneven distribution of losses. A common concern of residents near wind and solar farms is the devaluation of their property (Bell et al., 2013; Delicado et al., 2014; Devine-Wright & Howes, 2010; Firestone et al., 2015; Gross, 2007; Gulden, 2012; Krogh, 2011; Warren et al., 2005). Equally, local authorities and business owners often fear the impact of renewable energy developments on tourism, dreading that wind turbines or solar panels will deter tourists and jeopardize the local economy (Aitken, 2009; Delicado et al., 2014; Delicado et al., 2016; Devine-Wright & Howes, 2010; Frantál & Kunc 2011; Fridolfsson & Tangerås, 2013; Hall et al., 2013; Lombad & Ferreira, 2013; Nadai & Labussiere, 2010; Warren et al., 2005; Woods, 2003). Yenneti and Day (2016) examine the case of a solar power plant in India and how it reinforced preexisting inequalities by benefiting the more affluent upper castes and hindering the more vulnerable small farmers and shepherds.

Environmental and Health Impacts

Finally, opposition to wind and solar farms is also motivated by very tangible concerns about their impact on the environment and even on human health. Although renewable energies present far fewer risks than other sources, such as fossil fuels and nuclear energy, their effects over wildlife and human life are not negligible. Noise and vibration cause discomfort and can even lead to health problems in local residents (Firestone et al., 2015; Hall et al., 2013; Horner et al., 2012; Knopper & Olson, 2011; Krogh, 2011; McMurtry 2011; Philips, 2011). High-voltage power lines that are needed to connect renewable energy facilities to the grid carry their own risks, which are far from settled in (p. 351) the scientific community (Cotton & Devine-Wright, 2011; Linder, 1995). Water contamination can also be an issue (Aitken, 2009; Delicado et al., 2014).

Wind turbines are known to cause excess bird and bat mortality, which is particularly problematic in protected areas and habitats of at-risk species (Delicado et al., 2014;; Ellis et al., 2007; Lombard & Ferreira, 2013; Nadai & Labussiere, 2010; Sovacool, 2009; Sprague, 2011; Warren et al., 2005; Wolsink, 2010). The same can be said for solar farms, in the case of birds and reptiles (Mulvaney, 2013; Turney & Fthenakis 2011). Also, environmentalists argue that these facilities also disturb wildlife by opening routes into previously safeguarded natural spaces and cutting migration paths of wolves and other mammals (Delicado et al., 2014). Residents and ENGOs also express concerns with waste disposal of technological equipment once it reaches its end of life (Delicado et al., 2016; Mulvaney, 2013).

And Quite a Few Reasons to Say Yes to Renewables

Though the literature is almost unanimous in devaluing NIMBY explanations for the opposition to renewable energy developments, the same cannot be said for its mirror syndrome, PIMBY (“please in my backyard”). Though references to it are far scarcer, some authors point out that some communities do welcome with open arms the opportunity to have wind and solar farms in their vicinity (Jobert et al., 2007; Stigka et al., 2014). Though the literature is far less extensive regarding support to renewable energy developments, two main drivers can be identified: economic rewards and landscape and environmental values.

Economic Rewards

By far the most common motivation for accepting renewables in the literature has to do with the income that wind and solar farms can bring to communities, which is particularly important in a context of crisis in rural areas. First, owners of the land where they are sited benefit from renting or selling their properties (Bell et al., 2013; Brunt & Spooner, 1998; Jobert et al., 2007; Warren et al., 2005). Wind turbines are compatible with agricultural practices such as animal husbandry, so farmers can keep their traditional activities and add an additional source of income (Anderson, 2013; Hall et al., 2013; Lombard & Ferreira, 2013). In the Portuguese case (Afonso & Mendes 2012; Delicado et al., 2016), traditional land-ownership practices are marked by the predominance of smallholdings, which means that usually several families benefit from having wind turbines. In some cases, renewable energy developments are sited in vacant land that is collectively owned (*baldios*) or is the property of the parish, which means that (p. 352) the income is managed by local authorities, in favor (hopefully) of the community. In several countries, renewable energy promotors are required by law to pay a percentage of the revenue to local authorities, which leads to mayors becoming strong supporters of wind and solar farms (Delicado et al., 2016; Fridolfsson & Tangerå, 2013; Pasqualetti, 2001; Walker et al., 2014).

However, going back to opposition to renewable energy development, this added income for some can also be a source of tension, when it is perceived as being not equitably distributed within the community (Delicado et al, 2016; Gross, 2007; Walker et al., 2014). Financial incentives can also be seen as a “bribe” to the community to accept something that is undesirable (Bell et al., 2005; Mason & Millbourne, 2014; Walker et al., 2014). Several studies found that communities often have an expectation of a reduction in electricity bills for putting up with a wind or solar farm in their vicinity and that expectation is usually not met, causing grievances (Delicado et al., 2016; Walker et al., 2014;Warren et al., 2005).

Community ownership of wind and solar farms is also considered as having a positive impact on acceptance (Bell et al., 2005; Breukers & Wolsink, 2007; Ek & Persson, 2014; Loring, 2007; Toke et al., 2008; Walker, 1995; Warren et al., 2005; Wolsink, 2007a, 2010; Wustenhagen et al., 2007). Local communities benefit directly, either from the electricity that is generated or from its income by selling power to the national grid. They can also be involved in the management, as well as having a say in the location and characteristics of the facility (highlighting again the importance of participation).

Second, renewable energy developments can have a positive impact on local employment (Carlisle et al., 2014; Delicado et al., 2016; del Rio and Burgillo 2009; Devine-Wright & Howes, 2010; Hall et al., 2013; Hillebrand et al., 2006; Moreno & Lopez, 2008; Sastresa et al., 2010; Walker et al., 2014). Although solar and wind farms require few permanent personnel for running and maintenance, in communities heavily affected by unemployment even that can make a difference. Also, during the construction stage more manpower (often less qualified) is needed and temporary jobs are created, which also generate revenue for local businesses (accommodation, meals). Furthermore, renewable energies can create additional jobs in connected industries (building or assemblage of solar panels and wind turbines, maintenance, electronics, and components). In parallel, some authors argue that renewable energy developments can have a positive impact on tourism, attracting more visitors, also benefiting the local economy (Delicado et al., 2016; Frantál & Kunc 2011; Frantál & Urbanková, 2017; Lilley et al., 2010).

Local support for renewable energy developments can even spur active protest against planning decisions that reject wind and solar farms. Afonso and Mendes (2010, 2012) examined the case of a proposed wind farm in a natural park in the northeastern tip of Portugal, in one of the poorest areas of the countryside that has been losing population at an accelerated rate. In 2007 the park's development plan required a public debate in which the issues of wind energy were discussed. Whereas park authorities straightforwardly rejected the possibility of including wind farms within the admissible uses of the natural park, the local authorities and population strongly supported this option. They envisioned the future wind farm as a solution for retaining population, (p. 353) generating economic benefits, and bringing innovation and development. The community objected to the official decision and showed their displeasure through small acts of resistance (such as preventing park officials from accessing some areas of the park). They argued that there were already dozens of wind turbines in the Spanish side, just a few feet away from the park border, so the visual and environmental impact was already there. This conflict echoed the distinct visions of the natural park between local residents and park administration already identified by Figueiredo (2008).

Landscape and Environmental Values

Despite the dominance of landscape preservation as an argument against renewable energy, wind and solar farms can also be perceived as an improvement in existing landscapes. This is particularly the case of landscapes perceived as already industrialized

(often suffering the effects of deindustrialisation), such as mining areas, or those transformed by human intervention, such as planted forests. Communities see the arrival of renewables as symbols of progress and development or as an opportunity for mitigating industrial stigma by acquiring “green credentials” (Cowell, 2010; Delicado et al., 2016; Firestone et al., 2015; Jobert et al., 2007; Jolivet & Heiskanen 2010; Selman, 2010; Van der Horst, 2007; Warren et al., 2005; Wustenhagen et al., 2007; Zoellner et al., 2008).

Some case studies illustrate this more specifically. Krauss (2010) focused his study on two coastal regions of northern Germany, where landscapes had already been transformed by technology over the centuries (such as the construction of dikes). Familiarity with these technological transformations of nature led communities to actively embrace the wind turbines, as shown in the creation of community-owned wind farms. Furthermore, the land parallel to the dike lines was designated by the land-use plan as a building area for wind turbines. Rodriguez et al. (2010) show how solar farms in the south of Spain can contribute to landscape recovery in spoiled areas, already marked by extensive greenhouses, mining or industrial infrastructures, urban peripheries, or marshlands, or that are close to roads and railways. Jolivet and Heiskanen (2010) address the case of a wind farm in France supported by the local community because it fit the local industrial genealogy and was to be included in a touristic route of a scientific nature, which included deactivated mines.

Renewable energy can even contribute to the generation of a new local identity. Such is the case of a solar farm in the south of Portugal (Delicado et al., 2016): the village where it is situated adopted the brand “Land of the Sun,” which appeared in commercial and official logos, a walking tourist route (that included the solar power plant), and even local folk songs.[4] There are cases where wind farms have become local tourist attractions, with walking paths and picnic areas, where families go to see the snow in the mountains in winter or to take wedding pictures (Delicado et al., 2016).

Residents that support renewable energy developments also base their stance in environmental values, such as contributing to fight climate change, to expand clean energy, (p. 354) and to safeguard the planet for future generations (Bidwell, 2013; Delicado et al., 2016; ; Ellis et al., 2007; Firestone et al., 2015; Van der Horst, 2007; Van der Horst & Vermillyen, 2010; Wolsink, 2010; Woods, 2003).

Conclusion

Support or opposition of local communities to renewable energy development is strongly contextual. Among the many drivers that influence how communities react to solar and wind farms, we can highlight the following:

- *The economic fabric of localities*: thriving rural communities may be less inclined to accept renewable energy than those that suffer from unemployment and decline of traditional activities and see renewable energy as a new source of revenue that might halt population hemorrhaging.
- *Social capital*: areas that attract affluent second homeowners or retirees are more prone to the generation of opposition movements, which usually have more resources and influence over planning decisions.
- *The characteristics of the renewable energy facilities*: type of energy generated, number and size of turbines or panels, impacts on the landscape and wildlife. The more conspicuous facilities usually generate more opposition.
- *Ownership of the facilities*: Wind and solar farms that are owned by the community or by local promoters tend to attract less resistance. As Wolsink (2000) suggests, opposition to wind farms usually focus on the people (outsiders) who want to build them, rather than on the turbines themselves.
- *Planning traditions and procedures*: transparency, access to information, and involvement of communities in decision-making are crucial for reducing resistance to renewable energy, but not all local or regional authorities enforce these measures.
- *Cultural conceptions of nature*: idyllic representations of rural environments as unspoiled nature usually come into collision with plans for introducing "artificial" artifacts such as turbines or solar panels, whereas acknowledgment that most landscapes have already been transformed by humans (through afforestation, agriculture, or construction) or visions of the rural landscape as a productive space facilitate acceptance (Devine-Wright & Howes, 2010; Woods, 2003). These conceptions, of course, vary according to the kind of landscape where the facilities are sited (more industrial or more rural), but they are also socially constructed and dependent on cultural values and collective emotional attachments.

Thus, simple explanations, like the NIMBY syndrome, or one-size-fits all solutions do little to foster energy transitions. Understanding what is at stake in particular locations is crucial, and that can only be done through participatory engagements between promotors, authorities, and stakeholders.

(p. 355) Both positions often coexist in the same communities. Communities are made up of different kinds of people, from long-time residents to newcomers, from landowners to local authorities, from members of environmental conservation groups to business owners. Different kinds of people have different interests, concerns, and values. Power relations within the community often have a bearing on the planning decisions. Social and economic capital, on one hand, and political authority, on the other, can tip the scales in favor or against renewable energy infrastructures.

The chapter has aimed to demonstrate that we need to pay more attention to success stories, not just to controversies. Even though in some countries the least contentious

locations for renewable energies are already taken and disputes are set to rise, the swift development of renewables in the past decade offers some hope for finding solutions to nurture acceptance. Improved technology, a more equitable distribution of benefits, and increased dialogue with citizens can be the key to a more sustainable future.

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Notes:

(1.) See, for instance, Todd Miller’s piece, “Woodland, N.C. saves earth from dreaded sun sucking solar cells,” *Huffington Post*, December 29, 2015, http://www.huffingtonpost.com/todd-r-miller/woodland-nc-saves-earth-f_b_8869968.html

(2.) David Roberts, “The North Carolina town that’s scared of solar panels, revisited,” *Vox*, December 18, 2015, http://www.vox.com/2015/12/18/10519644/north-carolina-solar-town

(3.) Sílvia Brandão, “Autarquias contra chumbo de parque eólico de Moncorvo,” *RTP*, February 2, 2016, http://www.rtp.pt/noticias/economia/autarquias-contra-chumbo-de-parque-eolico-de-moncorvo_v893101

(4.) “So many hours, so many days/So much sun, a vastness/To renew the energies/So many hours, so many days/It’s the best solution/Amareleja you are talked about/In heat you have no equal/Beautiful blessed land/Amareleja you are talked about/For the power plant is born.” Lyrics to a local folk song about the solar power plant.

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