

PUBLIC ATTITUDES VS. INSTITUTIONAL FRAMEWORKS IN THE DIFFUSION OF WIND ENERGY: EVIDENCE FROM THE LITERATURE AND FROM AN ITALIAN CASE STUDY.

PASQUA L'ABBATE¹; LUCIO LAURETI²; TOMMASO LUZZATI³.

1,2.UNIVERSITY LUM JEAN MONNET S.S. 100KM 18, 70010 CASAMASSIMA(BA) - ITALY ;

3.DEPARTMENT OF ECONOMICS FACULTY OF ECONOMICS V.RIDOLFI 10,56124 PISA - ITALY .

ABSTRACT

The development of an efficient, safe, and sustainable energy system is a urgent challenge, crucial for humankind, as Georgescu Roegen emphasized already in the 70s (e.g. Georgescu 1976). R&D and diffusion of renewable energies, as for any new technology, are interlinked in a positive feedback loop that requires diffusion to be high enough in order to achieve real progress in R&D. This makes the transition from fossil to renewable energies a difficult task. For instance, solar and wind power in Italy grew less than one might have expected from Italy's favourable geographical position and its high energetic dependency from imported energy sources.

The present paper aims at adding some evidence on the obstacles to the diffusion of wind power. After a brief recall of the development wind power, we focus on the literature about wind power diffusion in six countries (Germany, Netherlands, US, UK, Sweden, Spain) and reports a new one, a case of participatory process failure in Apulia, Italy. The institutional context in Italy is not favourable due to the existence of long procedures for permit, construction and grid connection. Sometimes local authorities, as in the case reported here, due to incompetence and/or the desire to protect vested interests, create serious obstacles to wind power diffusion, also by hiding themselves behind the NIMBY syndrome. In all countries, institutional constraints emerge as very relevant obstacles, much more than NYMBY, and the transition to a more sustainable energy system requires to build up iinstitutional capital – knowledge and relational resources, and the capacity for mobilisation (Wolsink 1999).

Keywords: wind energy; NIMBY ;sustainability.

1. Introduction

A crucial challenge to address the present economic and environmental crises is to develop energy systems which are efficient, safe, sustainable, and with low global and local environmental impacts. The use of renewable sources helps lowering carbon emissions, energy costs and decoupling energy prices from oil ones (GWEC 2011). The EC energy policy adopted in 2007 prescribes to get, by 2020, a reduction of greenhouse gas emissions by 20%, and improvement in energy efficiency of 20%, and an increase in renewable energy share of 20% (EC 2007) (Eurostat 2012). Wind power could give an important contribution to overall sustainability not only due to its very low emissions, but also since it does not produce toxic waste and does not use water. Wind energy has unevenly developed in different countries despite a rather widespread support for it. In some instances concrete plans are being blocked (Nimby forum 2011). The main cause of failure of these projects is attributed to the Nimby (Not in my backyard) syndrome. There are, however, other and more relevant barriers, i.e., institutional factors, democracy deficits in the planning system, and lack of qualified support for developing of wind power. In this paper we will look at seven countries (the United States, Nederland, UK, Germany, Sweden, Spain, and Italy) by comparing six case studies reported in the literature with a new one which is about the failure of a participatory process for the construction of a wind farm in South Italy (Apulia Region).

2. Materials and methods

2.1 Development of wind power

The first windmills were built in 200 BC in Persia. Later on they played an important role in the Netherlands, in Mediterranean regions, and in the 19 century they were built in the US. The interest in wind energy increased during the 1970s oil crisis (Kaldellis 2011). In recent years, wind energy technology has been developed in almost all countries. China has the biggest installed capacity, with 62733 MW followed by the U.S. (46919 MW) and Germany (29060 MW) (see fig.A 1). The situation by continents at year-end 2011 is summarized by figure A.2 (GWEC 2011).

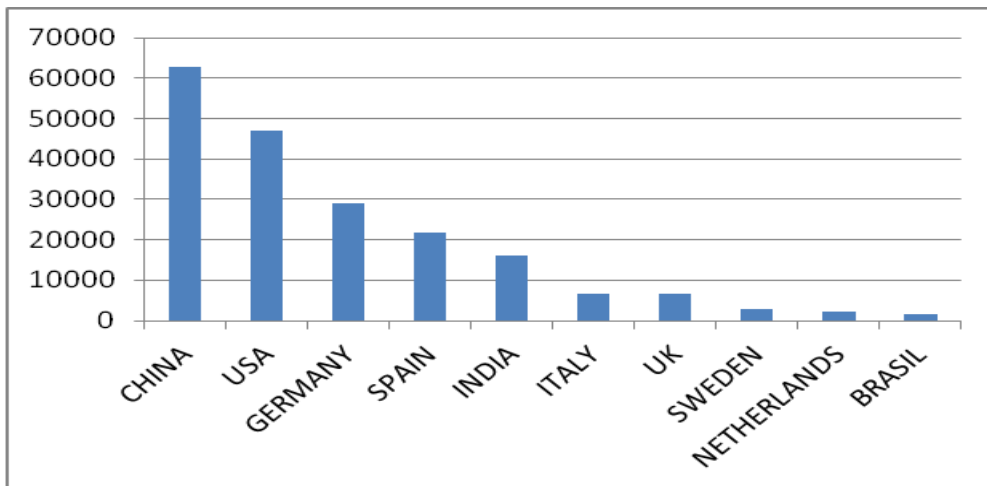


Fig. A 1, Distribution of Wind Power Capacity (MW) in Major Markets (2011)

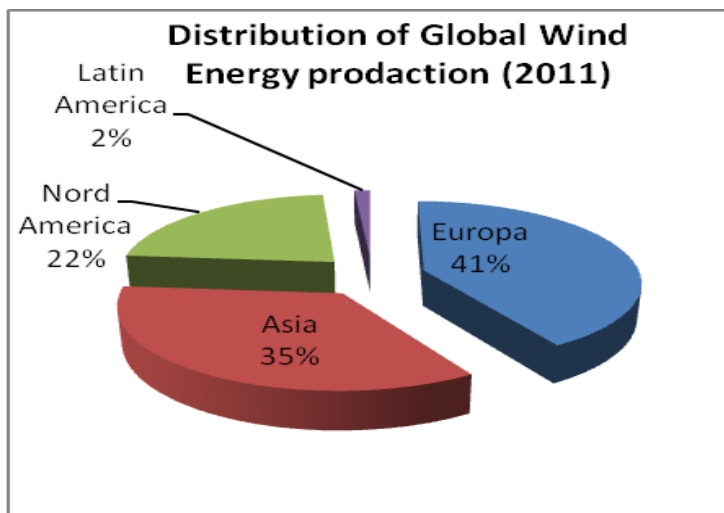


Fig. A 2 Distribution of global Wind Energy production(2011)

2.2 Public attitudes of wind energy, local obstacles

In recent years, major development of wind power has occurred in Germany and Spain. In Germany several laws supported wind power and the involvement of the population, especially by encouraging cooperative investments. The ownership of wind power has led to a higher level of local acceptance (Fabian 2011). In the UK, Netherlands, and Sweden there has been some resistance which can be attributed to institutional factors, in particular to a top down approach, and to the lack of location policy (Wolsink 1999, Christopher 2010). In Sweden and in the Netherlands there has been opposition from environmental groups which stimulated a negative attitude from the population (Patrik 2007, Christophe, 2009). Since one

of the main obstacle to the development of wind farms in the countries analyzed here is the visual impact, the process of choosing the appropriate site for wind power is very relevant. In Sweden, the legal protection against activities with visual/environmental impact is strong and investors are discouraged by the long time required for getting permissions. Local administrations have great decision power, also against national energy planning (Patrik 2007). The lack of discussion/participation in the choice of the sites, and in planning processes more in general, is a common feature of most countries, so that it is not appropriate to speak of "nymby" syndrome, which implicitly requires awareness of the projects. In Spain there has been a good development of wind power, despite the large number of authorities involved and the lack of coordination between them resulting in a long waits for the permits (De Rio 2011). The U.S. population is in favor of the wind power because this technology is supported at the political level. The resistance of local population is born because of the visual impact and loss of value of the land/houses that are located within the area chosen for the construction of the wind farm. Some studies have shown that if people living near wind turbines they get used to them and the level of acceptance increases, that is, the presence of a wind farm is more accepted than the prospect of it. Also the value of land and houses has been seen to lower when the park is under design and construction, but tends to rise when the farm has been built (Klick 2010).

2.3 Italian case study

The observatory nimby forum (Nimby Forum 2011) has observed an increasing opposition to new infrastructures. In southern Italy, Puglia region has invested heavily in renewable energy, especially wind power. However in recent years the number of legal disputes have increased, involving municipalities, the regional government and business investors. The case we report here is about a conflict between the company Wind ERG, the Region of Puglia and the town of Conversano, the site chosen for a wind park. We examined legislation, press releases and newspaper articles, and archives used for officials involved in the process. We also interviewed key actors such as civil servants at the regional and municipal levels, entrepreneurs and investors of the project, political associations, environmental groups and local population.

The project was submitted February 2, 2007 by ECE-ERG CESA WIND SpA. The park was planned in area of Conversano, a small city (25.000 inhabitants) situated in a rural area called "Murge Castellana". The project involved the construction of 28 towers on an area of 10 km², an investment of 88 million Euros with a run of about 2080 hours per year. From a legal standpoint, the production of energy in Italy is a matter of law concurrent State/Region. The Puglia regional government regulates the matter through specific regional laws in which plans

to install wind turbines are approved also by inter-municipal panel of local authorities. In this case a first positive opinion was expressed by the municipality of Conversano, the population was involved in a series of meetings, and local media gave a good coverage of the debate. The environmental groups highlighted several positive issues, the arrangement of the blades out of the corridors migration and spawning, the positive impact on the development of local jobs and the improvement of 'energy sourcing, and the low environmental impact of wind energy. The political opposition strongly opposed the project, mainly for the sake of discrediting the mayor and his council. The council was unable to appropriately defend his choice so that the initial favour of the population converted into disagreement. In 2008 the same municipal council withdrew the authorization. The company appealed to the administrative appeal tribunal. The appeal was rejected in June 2011 since, according to the court, *“interventions and associated works would result in a transformation of the structural, historical, and natural landscape of the area. The site of interest is also a strip of land that fits into the landscape of the Valle d'Itria, characterizing the portion of the Murgia territory of South-East where the architectural elements, trulli, farms, stone walls, must be safeguarded and enhanced.*

3. Results and discussion

Opposition from the local population is often labeled as a Nimby, "not in my backyard", that is, people do not want a plant in their territory but would not object if it is installed elsewhere. The reason for this opposition is the usual free-riding argument. Actually, much local opposition arises from a distribution of advantages and disadvantages that heavily penalize the local population or from authoritarian and non-participatory methods by which the projects are approved (Martin 2009). Local oppositions can be classified according to a broad spectrum of categories, such as those shown in Tab. A 1.

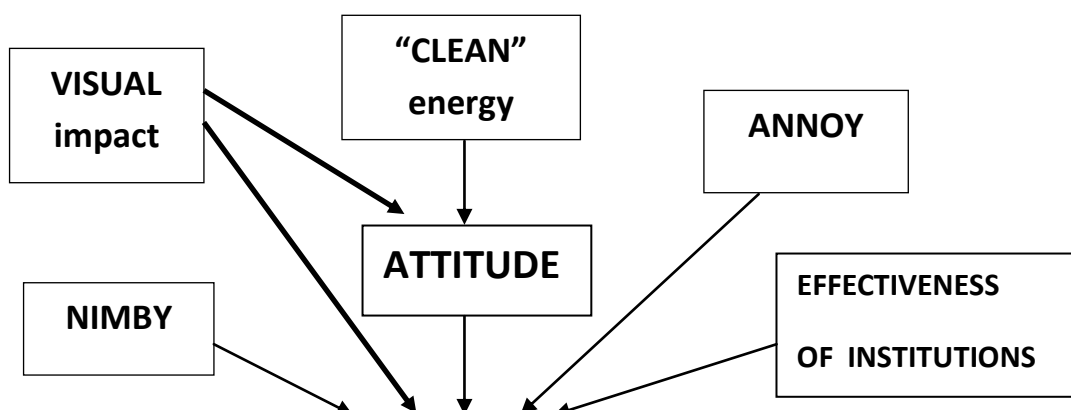
A	Positive attitude towards the project, but opposition to the construction at any point in its neighbour hood	NIMBY Non in my backyard
B	Negative attitude against a given technology	NIABY Non in any Backyard
C	Positive attitude towards the project becomes negative during the decision process	

D Opposition to specific aspects of the projects and request to meet certain conditions

Tab A1, Various forms of local opposition (Wolsink 1989)

Wind farms have a broad social support in the countries analyzed here, around 70%. Specific attitudes toward a given project is very variable (Henley 1998). There are several local actors: institutions, political parties, environmental groups, companies investing in the project. The kind of opposition that will be made depends on the ability of various actors to convey their beliefs about the construction of the project, where institutions have a strong power. In meetings with the stakeholders, the population can easily move opposition from type A and B to C and D. The case study reported here showed a shift from no opposition or NIMBY to C type. This confirms that the development of resistance to wind energy is mainly due to institutional mechanisms (Lake 1993). To avoid deterioration of support from the public, the institutions should make a fair and appropriate steps to raise awareness and involvement and also make an appropriate regional energy planning (Luloff 1998). The involvement of the population should be given from the beginning of the planning phase and continue also once the plant is in operation (Pendel 1999).

Our result is consistent with several studies by Wolsink, (e.g. 1999) who which analyzes public acceptance using a multivariate technique on a set of interviews (see figure A.4). The relationships between positive and negative impacts and the general attitude of the initial population and the local resistance which is formed later are analyzed. Wolsink has revealed that only two major factors determine the general attitude of the initial population, the negative visual impact and the positive impact of getting clean energy. There is no direct relationship with: the impact due to noise, the problems of wildlife (ANNOY), with syndrome Nimby let alone with the effectiveness of institutions. While on the resistance developed by the population at the local level as a result, all impacts have direct relation, it is noted therefore that the only impact that has a double importance is that visual that interacts both in the first phase of attitude in the second of resistance to project (Wolsink 1999). These evaluations emphasize again that the Nimby syndrome has a limited role, and has fundamental importance of visual impact assessment and therefore the choice of sites.



RESISTANCE

Fig A.4 Direct and indirect impact of arguments and motives on resistance to wind turbine projects

The literature survey and our case suggest adding the picture the behavior of the institutions as a key variable able to influence actual attitudes opposition, especially through participatory planning rather than a top-down decision-making approach, information/education of the population, planning skills.

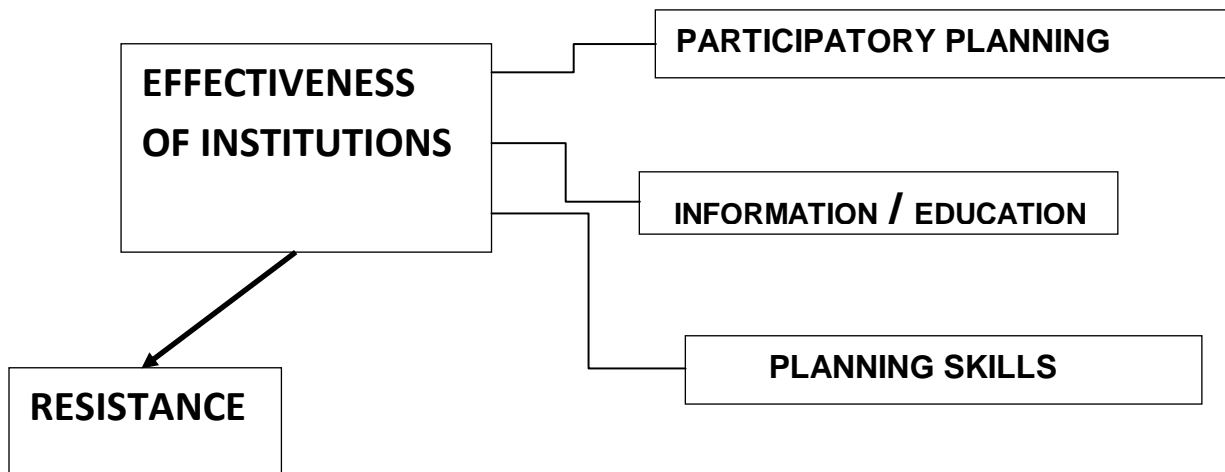


Fig. A 5, extrapolation scheme in Figure 4 A, addition of new variables significant.

4 . Conclusions

From an environmental point of view, wind energy is a good option. From an economic point of view it must be noted that in recent years the global crisis has led many countries to raise tariffs for renewable energies to create barriers to trade, thus jeopardizing the ability of the wind industry to develop, and dramatically reduce the level of international technology transfer (GWEC 2010). In our opinion, the main obstacle to its development, however, is given by inadequacies of the institutions, particularly the lack of collaborative planning which implies that project cannot be easily changed if the public consultation occurs at the end of the planning phase (Thayer 1988). The resistance of the population emerges when there is no or little knowledge of wind energy. Financial participation of the citizens in the projects increases the level of acceptance (Fabian 2011). In Italy the main obstacles to wind power are the political exploitation of projects for electoral purposes, the absence/low quality of information, the conflicts between the various levels of governments, a lack of planning skills. To sum up an institutional capital (Hearley 1998),

consisting of knowledge resources, relational resources and mobilization capacity, is needed for the development and diffusion of wind energy.

References

- Agterbosch S., Vermeulen W., Glasbergen P., 2004, Implementation of wind energy in the Netherlands: the importance of the social-institutional setting, *Energy Policy* ,32:2049–66.
- Bergmann A., Hanley N., Wright R., 2006, Valuing the attributes of renewable energy investments, *Energy Policy* ,34(9):1004–14.
- Christopher R. Jones, Richard E., 2009, Identifying predictors of attitudes towards local onshore wind development with reference to an English case study, 37, 4604-4614.
- Christopher R. J., Richard E., 2010, Understanding “local opposition to wind development in the UK: How big is a backyard?”, *Energy Policy* 38, 3106-3117.
- Council of the European Union. Presidency Conclusions of the Brussels European Council, in 7224/07; 2007. Del Rio P., Burguillo M., 2008, Assessing the impact of renewable energy deployment on local sustainability: towards a theoretical framework. *Renewable and Sustainable Energy Reviews* ,12(5):1325–44.
- Energy information administration, international energy statistics. Available at, <http://www.eia.doe.gov/>. 2010 (accessed February 2012).
- European Commission, Strategic energy technologies information system, Production cost of electricity 2020 projection, Available at: <http://setis.ec.europa.eu/> (accessed December 2011).
- European Commission. Special Euro barometer, energy technologies: Knowledge, Perception, measures. Available at, http://ec.europa.eu/public_opinion/index_en.htm. 2007 (accessed December 2011).
- Eurostat, energy statistics-infrastructure. Available at, <http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/database>. (accessed February 2012).
- EWEA, Wind in power, 2009 European Statistics, February 2010.
- Fabian D. M., Onno K., 2011, Local acceptance of renewable Energy – A cas study from southeast Germany, *Energy Policy*, 39, 3252-3260.
- Georgescu-Roegen N., 1976, *Energy and economics Myths: Institutional and Analytical Economic Essays*, Pergamon Press, New York . Global
- Wind Energy Council. Global wind energy outlook-2010. Available at, <http://www.gwec.net/>. 2010 (accessed February 2012). Global Wind
- Energy Council, Global Wind Statistics 2011, 07 February 2012. Healey P., 1998,
- Building institutional capacity through collaborative approaches to urban planning, *Environment and Planning A* ,30:1531±46. Heiskanen E,
- Hodson M, Mourik R, Raven R, Feenstra C, Torrent A., 2008, Factors influencing the societal acceptance of new energy technologies: meta-analysis of recent European projects. Create Acceptance Project. Petten, The Netherlands:ECN; www.createacceptance.net. Kaldellis J. K. , D.

Zafirakis, 2011, The wind Energy devolution: A short review of a long history, *Renewable Energy*, 36 1887-1901.

Khan J.,2003, Wind power planning in three Swedish municipalities. *J Environ Plan Manag* ,46(4):563–81.

Klick H., Smith E., 2010, Public understanding of and support for wind power in the United States, *Renewable Energy*, 35, 1585-15.

Lake RW.,1993, Rethinking NIMBY, *J. of the American Planning Association* ,59(1):87±93.

Luloff AE, Albrecht SL, Bourke S.,1998, NIMBY and the hazardous and toxic waste siting dilemma: the need for concept clarification. *Society and Natural Resources* ,11(1):81±9.

Martin S.L., 2009, *Wind Farms and Nimbys : generating conflict , reducing litigation*, Hofstra University, New York .

Morthorst PE.,1999, Capacity development and profitability of wind turbines, *Energy Policy* 1999;27:779–87.

Morthorst PE.,2009, *Wind energy the facts Part III The economics of wind power*. Risø DTU National Laboratory, Technical University of Denmark.

Nimby Forum , National observatory, ARIS , report 2011.

Pablo del Rio, 2011, Analysing future trends of renewable electricity in the EU in a low-carbon context, *renewable and Sustainable Energy reviews*, 15,2520-2533.

Soderholm P., Ek K., Pettersson M., 2007, Wind power development in Sweden: Global policies and local obstacles, *Renewable & sustainable energy reviews*, 11, 365-400.

Passqualetti MJ, Gipe P, Richter W.,2002, *Wind power in view. Energy landscapes in a crowded world* California, London: Academic Press.

Pendall R.,1999, Opposition to housing: NIMBY and beyond. *Urban Affairs Review* ,35(1):112±36.

Rawls J. A theory of justice. Cambridge: Harvard University Press; 1971.

Reiche D., Bechberger M., 2004, Policy differences in the promotion of renewable energies in the EU member states. *Energy Policy* ,32:843–9.

Sussane Agterbosch, Ree M. Meertens, Walter J.V. Vermeulen, 2009, The relative importance of social and institutional conditions in the planning of wind power projects, *renewable and Sustainable Energy reviews*, 13, 393-405.

Thayer RL, Hansen H.,1988, Wind on the land: renewable energy and pastoral scenery vie for dominance in the siting of wind energy developments. *Landscape Architecture* ,78(2):69±73.

Wolsink M., 1999, Wind power and the NIMBY-myth: institutional capacity and the limited significance of public support, *Renewable Energy*, 21 49-64

Wolsink M. Attitudes and expectancies about wind turbines and wind farms. *Wind Engineering*,1989;13(4):196±206.