Shaping social acceptance of energy projects

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Overview

The urgent need to tackle climate change is leading scientists to design low-carbon solutions and rethink energy systems. Most of the technologies currently used have long services lives, thus calling for long-term assessments. However, the rational approaches on which the models are based intrinsically restrict their propensity to comprehensively cover future challenges.
Most of those who work on them focus on searching for more robust or closer integration of models treating energy, economics, climate and resources, etc. Given that the public's perception of energy transition projects has a strong influence on the effective implementation of long-term scenarios, it is vital to address this question.
The public's perception can be observed mostly when there is (local) opposition to an energy project or policy, thus calling for research on this phenomenon. Although all types of energy are concerned, research on this topic mostly focuses on the attitude toward renewable energy projects. It is quickly apparent that it is not just opposition, but the public's attitudes toward energy projects in general that shape what can be called social acceptance.
In order to correctly integrate this topic into long-term assessments, it is crucial to both understand the concepts behind this term of social acceptance, and identify the various parameters that influence this acceptance of energy projects.

Methods

The aim of this work is to determine whether the existing literature on social acceptance of energy projects could help us to build a model of social acceptance. We analysed more than a hundred articles and combined three main characteristic parameters:

- the objective of the paper (literature review, definition, characterization, measure, etc.),
- the geographical zone focused, and
- the technology or policy studied in the paper.

From this classification, we built a map representing the various technologies and policies studied and the geographical focus of the articles. We also build two tables : one with all the articles studied, and another with only articles which aim is to measure the acceptability.

Results

Concerning the geographical spread of the articles studied, many articles focus on countries in Europe, the Middle East and North America (rich and developed countries). Some articles focus on countries in South America ([1],[2]). The geographical zones that are least represented in the literature are Africa ([3],[4]), Asia, and the former USSR ([5],[6]).
We chose to analyze articles related to the definition, conceptualization and measurement of social acceptance. Most of them present a measure of acceptance regarding a specific technology or project in a specific country. However, it appears that these articles do not always propose a quantitative analysis of social acceptance. When they do, the metholodology studied often differ from one to another.
A model of acceptance which is very often quoted is the model presented by Wüstenhagen *et al.* [7]. The authors structure social acceptance of renewable energy innovation in a three-dimensional approach, namely socio-political acceptance, community acceptance, and market acceptance. This model is major, mainly because it states that citizens are not the only stakeholders involved in shaping social acceptance.

Our analysis of the measure articles put forward some parameters than can impact public’s perception of energy projects.

Socio-political parameters

The parameters that can impact socio-political acceptance are linked to a general context. For example, international agreements such as the Paris Agreement could improve the acceptance of non-fossil energies. Specific events such as the Fukushima-Daishi nuclear disaster [8] can have impacts on specific technologies (nuclear power plants for instance).
For Wüstenhagen et al., "at the general level of socio-political acceptance this also concerns the acceptance by key stakeholders and policy actors of effective policies. Those policies require the institutionalization of frameworks that effectively foster and enhance market and community acceptance, for example the establishment of reliable financial procurement systems that create options for new investors, and spatial planning systems that stimulate collaborative decision making." [7]

Community parameters
As mentioned before, community acceptance is the most studied acceptance. Many parameters are mentioned in the literature and they can be sorted into different categories :

- Individual parameters that concern personal backgrounds of every citizen in the community, such as gender, age, level of education, political ideology or lack of knowledge and preconceived ideas on the project;
- Projects parameters that concern the characteristics of the project, such as the technology chosen, the stakeholders involved, and communication on it;
- Local parameters such as the type of landscape, the history of the region, the power sources that are already in operation, etc.

This list of parameters is not exhaustive and further investigations of the literature might identify new parameters.

Market parameters
The market acceptance of a technology relies on both the will of industrials to diffuse it and that of customers to use it. Regarding the customers, as the socio-political acceptance of renewable energy is very high, they could be keen on subscribing to green power offers. On the other hand, because of a lower community acceptance of local renewable energy projects, citizens could hinder the development of green power and therefore lead to a lack in green kWh.
There might also be a problem regarding intra-firm acceptance.

Conclusions

This analysis of the literature lead us to identify a few parameters that could impact social acceptance of energy projects. However, concerning quantitative results, the methodology used varies from an article to another. The results might not be consistent taken globally, but they can still establish the trend that would be used to establish a first model of the social acceptance of energy projects.

The next steps of our work will be to work on our model for long-term assessments and understand how we can integrate some social acceptance aspects in it.

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