Towards a new methodology for creating societal acceptance of new energy project

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This paper proposes a methodology for creating societal acceptance of new energy projects based on an analysis of 22 energy projects in Europe. The framework to compile and analyze the cases is based on socio-technical transitions theory and recent sociological research on public participation in science and technology. In particular we analyze (1) the initial vision articulated by the initiator; (2) the project's stakeholders and their expectations; (3) the way expectations are negotiated; (4) the way visions are translated into action; and (5) success of the project in terms of societal acceptance, i.e. the way in which the negotiations resulted in degrees of alignment among the stakeholder expectations and project initiator's vision. We conclude with a proposal for a new six-step methodology for improving societal acceptance of new energy projects. This methodology is currently explored, used and reflected upon in five projects in Europe: a German biomass project, an Italian thermodynamic solar project, an Icelandic hydrogen project, a Dutch CCS project and a Hungarian wind project (www.createacceptance.net).

Keywords:
societal acceptance, new energy projects, social sciences, methodology

INTRODUCTION

Renewable energy and energy efficiency play an important role in Europe in combating climate change, reducing the depletion of fossil fuels and other unsustainable effects of current energy systems. The 2001 White Paper on a community strategy and action plan for renewable sources of energy has set ambitious goals: in 2010 renewable sources should increase to 12% of gross inland consumption - a doubling of the 2005 share (6.38%) [1]. In its recent Energy Efficiency Action Plan the European Commission targeted a 20% energy reduction through energy efficiency improvements by 2020 [2]. More recently also clean coal and in particular carbon capture and sequestration (CCS) have gained attention as an efficient way to mitigate carbon dioxide emissions [3]. These targets and policy plans and their translation into member states' specific regulations and promotional activities have stimulated a wide variety of what we will call 'new energy' projects throughout the European continent.

Public opinion surveys also show widespread support for renewable energy sources and energy efficiency in Europe. For example, in 2006 member states' citizens expressed their willingness to pay more for renewable energy, ranging from 20-40% of all citizens in South and East Europe to 40-50% in North and West Europe [4]. While these figures are encouraging new projects often fail due to a lack of societal acceptance, often emerging locally from citizens or consumers, but also from other stakeholders like NGO's or national political and policy actors. Thus, in recent years, there has been increasing attention to the concept of societal acceptance of renewable energy sources such as the PV Accept, Accept H2 and Accsept.[i] Nevertheless, there is still a lack of sufficient and integrative knowledge on

processes and factors that shape societal acceptance of new energy projects in real, concrete projects. This paper addresses this issue and presents the first results of a European research project on societal acceptance called 'Create Acceptance'.[ii]

The first research question in the paper is '**How does societal acceptance emerge (or does not) in new energy projects and what are the underlying mechanisms?**' We will adhere to a broad definition of societal acceptance. Societal acceptance is not just about the acceptance by the public, and in particular not in concrete projects. In our view it is important to distinguish between the acceptance by different social groups and acceptance on different societal levels.
New energy technologies have to compete with a well established system of energy production in terms of technological and economic efficiency, societal issues like job provision, export benefits from fossil fuels, a widely developed infrastructure for production, distribution and use, etc.
Consequently the successful acceptance of new energy projects often requires a widespread support, both locally and nationally.
We therefore define **societal acceptance as existing when** 1) there is support for the technology among the expert community and national and local policy makers; 2) the general public has an informed and largely positive view of the technology; 3) concrete applications do not meet significant obstacles from local policy-makers, residents, the NGO community or other representatives of social interests; and 4) when the opportunity arises, ordinary people are willing and prepared to adopt the applications in their own contexts and to support them with positive actions.

The second research question is about intervention: '**How** can actors, and in particular managers of new energy projects, pro-actively modulate and **improve societal acceptance of their projects'?**
In contemporary societies plurality of perceptions and interests are a rule rather than an exception and there are always ongoing processes and intentions in multiple directions.
Steering of technology development and implementation can no longer occur in a simplistic top-down way. 'Modulation' of those ongoing processes is possible and can be very productive, but requires understanding of the nature and dynamics of those processes, including the interventionist's own position and role in them.

The analysis of past projects has been an input for developing a process methodology for modulating societal acceptance of new energy projects. Another major input for developing this methodology is the Socrobust tool, developed within a prior project financed by the European Commission.

The remaining part of the paper looks like follows:

1. First of all we introduce **expectations** as an important unit of analysis for investigating and modulating societal acceptance and the relevance of investigating societal acceptance in a variety of new energy projects.
2. We continue with discussing the case studies as well as the **main results of our meta-analysis of the case studies.**
3. The second question will be addressed in the subsequent section, where we will propose **a six-step methodology for intervention.**
4. We end with **summarising conclusions**.

SOCIETAL ACCEPTANCE AS A PROCESS OF NEGOTIATING EXPECTATIONS

a) Many of the innovations considered today in the context of new energy technologies have their origins in **local** experiments such as the grassroots development of wind turbines and biogas plants in Denmark and Germany. While new energy technologies may be attractive for a variety of reasons from a collective perspective such as reduction of greenhouse gasses and reducing the demand for fossil fuels, local projects have to deal with local interests as well. These can vary substantially and include issues like job creation, nature conservation, noise and safety issues, competition for land functions, etc
b) Even when the context of a project is **national** (and subordinately local, such as in the case of solar thermodynamic projects) actors at different levels with a variety of power and resources judge differently the desirability of a new energy project in different situations. As a result the decision making process and its outcome is inherently uncertain and highly political.

A number of scholars increasingly acknowledge the role of **articulating expectations** and **developing visions** in this process
Articulating expectations: Expectations are prospective structures that - when articulated by a project manager for examples - gives others a view on how his or her desirable future looks like and how this future differs from theirs.
Moreover project managers use expectations strategically and rhetorically when they make promises to attract attention and resources from financers. Expectations take the 'outside world' of a project into account, because promises sketch a future world in which the innovation will function.
If the outside world changes (e.g. when new environmental problems dominate the political agenda), this will influence the content of expectations and the resources made available for (local) projects.
Societal acceptance of a (local/national) project has emerged when, through negotiations, participation and power plays, expectations become aligned and translated into a shared vision. Similarly when a project manager is not able to align his or her expectation with the expectations of different stakeholders, societal acceptance did not emerge.

CASE STUDIES: (NON-)ACCEPTANCE OF 22 NEW ENERGY PROJECTS

There are obviously some differences in what societal acceptance can mean for different technologies and applications in different regions, countries and local contexts. Thus, an important task is to identify major differences between technologies, as well as find out whether there are some common features influencing societal acceptance, allowing us to develop a common toolbox for project managers dealing with different kinds of new energy projects. Therefore we decided to include a variety of technologies and regions in our research focus. The technologies in focus include energy efficiency, bioenergy, wind energy, solar energy, hydrogen and CO_2 capture and storage as well as geothermal energy
The projects investigated were located across the European continent as well as Iceland.

We also attempted to include both more and less successful examples of the application of specific technologies to ensure insight in factors of success and failure of modulating

societal acceptance. For example, two of the biomass cases are examples of projects that have been aborted due to local resistance, whereas some of the other cases can be termed ‘success stories’.

The projects have been investigated using a common research framework and extensive case study reports were written. The cases were then compared in a meta-analysis to identify the main challenges in creating acceptance in new energy projects.

The following five challenges were identified as crucial in modulating processes of societal acceptance.

I. The challenge of introducing projects in appropriate contexts

From the meta-analysis the following **general context issues for Societal Acceptance** were derived:

1) **Government policies:** stability and reliability of the national/local policy process; policy culture (consensus, negotiation, confrontation)
2) **Socio-economic factors:** availability of natural resources, energy prices, competition with other technologies and industries;
3) **Cultural factors:** trust in (participatory) institutions; historical experiences with new energy projects in the past, general environmental awareness; traditions related to bottom-up or top-down initiatives;
4) **Geographical factors** such as the local climate and the availability of suitable locations.

II. The challenge of identifying critical issues for different technologies

The issues identified in the following are indicative of the range and variety of issues arising in connection with different technologies.
Moreover societal acceptance is an evolving and changing phenomenon and should require constant monitoring during project development.

	Key problems	Factors of success
Household energy efficiency	High public awareness and participation needed Existing public acceptance high but understanding low Individual investments; high transition and transaction costs	Financial incentives Information campaigns Support through social networks
Bioenergy	Site issues Input logistics: managing economics and social and environmental impacts	Respecting existing (regional) networks Integrating local information into project design Management of local benefits and drawbacks
Wind power	Site issues Land-use intensity Diverging views on landscape preservation	Management of local benefits and drawbacks Involving local residents in the process

Solar energy	Costs Difficulty of developing economies of scale Small-scale applications require significant user involvement Gaps in grid connection rules and procedures Insufficient technical experience in installation firms	Demonstration investments at public institutions Potential to enhance local/personal energy independence Prosperous and fresh image
Hydrogen	Siting of distribution infrastructure Reputation of the operator or initiator Management of risks	Roots in fresh /clean technology Risk tolerance in context Investment relevant to scale
CO_2 capture and storage	Low public awareness and understanding NGO resistance Potential exposure to legislative requirements Immature technology: high investment, low income Perception that large companies are involved in order to improve image Storage and safety issues emerging	High interest of the research community Trust in the project promoter
Geothermal energy	In space heating applications, investment competes with other energy sources and other investments	High public awareness Trust in companies and partners involved Positive impact on local air quality

III.The challenge of interacting with the 'right people' in the 'the right way'

A key task is represented by the identification of the right actors and social networks. 'Right people' refers to partners that bring resources and support the project, but also enable the project to interact with its external environment, and to the stakeholders who are influenced by or can influence the project.
This challenge requires that project managers identify the stakeholders, issues and concerns in the *project*'s context (for example, the extent and types of external effects resulting from the project; the potential user adaptation required; and the potential links of the project to broader policy debates).
Examples of better and worse practices in our 22 cases indicated **some generic issues**: starting early and continuously, the importance of articulating concerns, mutual learning, and the need to ensure clarity of purpose and division of power and responsibilities.

Formal participation processes do not preclude the need for project managers to listen and learn continually. Project managers should not only involve stakeholders, but also involve themselves. Formal structures usually facilitate the process and make it more transparent, empowering and credible, but should be complemented with face-to-face interaction and 'keeping in touch'.

IV. The challenge of reflecting in (on) action

Ideally, the knowledge gained through action and interaction and the observation of the consequences should lead to learning and influence the way the project is managed, designed or communicated. This can be termed reflection in action.
In particular in multi-stakeholder settings, such as in the case of new energy projects, this "reflecting in action" is important as **along the process new stakeholders may become involved (asked or unasked) or existing stakeholders may change their expectations** and views on a project. The iterative processes of checking stakeholders views and comparing it with the project managers' one, separately or within workshop with direct confrontation, can help in identifying internal coherence and conflicts but also changes in the

relevant social networks; external actors, in fact, can become internal, in terms of capacity of influencing the project future development. A typical example is the role of potential competitors when they become closer to the project (attempts of collaboration, i.e. co-development, patent purchase, license contracts or quicker development of technological solutions competing on the same markets).

In the context of managing a new energy project, successful "reflection in action" can be translated into questions specific to different stages of the project. Table 3 presents a summary of the questions that had to address pertaining to the societal acceptance of the projects in different stage of their life cycle, roughly divided into the 'design stage' and 'implementation stage'.

We recommend that if projects desire to create societal acceptance, they will start asking these kinds of questions early on, and continue monitoring their social impacts and stakeholder relations throughout the project, and develop a reflective approach to issues and new information arising in the course of action.

Table 3. Questions that help projects to increase the likelihood of creating societal acceptance

Questions to be answered at the design stage	**Questions to be answered during implementation**
How does the project interact with the local/national context • what kinds of external effects does it involve; does it require user adaptation? • in which ways might it benefit or harm the local context (physical, economic, social or symbolic) and how equitably are the benefits and risks distributed? • what synergies or competition may the project involve with other ongoing developments? • how does it relate to historical experiences and existing competences of those present in the local context? **Who are potential partners and stakeholders of the project on the local, national and international level**: • whose resources could be important for the project: who might be important 'bridges', 'champions' or 'multipliers'? • who might the project influence and who might exert an influence in it? • how does the project relate to stakeholders' interests and concerns? **How will stakeholders be involved and their concerns addressed**: • how will stakeholders be informed	**How are communications managed on an ongoing basis:** • how does the project keep 'in touch' with its stakeholders (formal and informal channels)? • do new stakeholders emerge as the project evolves? • how can stakeholders monitor the progress of the project and the unfolding of its impacts **How is competence developed during the project?** • in what ways can stakeholders interact with the project as it unfolds? • what competences are needed for making use of local resources and how do such competences develop? • is there evidence of mutual learning and adaptation? **How does the project deal with issues that arise during the project:** • issues of representation and division of responsibilities and powers? • resolving potential conflicts among different stakeholders' interests?

about the project and how will its vision be communicated? • how will information about stakeholder's concerns be collected? • how early can stakeholders be involved in the project and what aspects of the project design could they influence? • how will different stakeholders interests be represented? • how will stakeholder involvement be integrated in the time frame of the project?	• dividing attention between stakeholder management and other aspects of project management (technical, operation, market, financial, etc.) **When and how should the project 'take stock' and reflect on achievements and remaining problems:** • evaluation and milestones? • opportunities for modifying the project according to lessons learned?

V. The challenge of combining process success with outcome success

Ideally, projects should be successful both in terms of outcomes and in terms of processes, and the case studies in this project showed that this is possible.

Successful in terms of outcome refers to the project manager's perspective and is related to the content of the project including technical, operational, market and financial issues.

Success in terms of process refers to the way the project interacts with its stakeholders.

These outcomes are of course interrelated. Successful processes are likely to contribute to successful outcomes – and unsuccessful processes to unsuccessful outcomes – even though the relationship between outcome and process is not straightforward or deterministic. Table 4 outlines some of these issues on a continuum of more process-related vs. more outcome-related tasks, while recognizing that the issues are not totally independent of one another (for example, managing the labour force, local contractors or investor relations obviously depends on the ways in which the process is managed and different stakeholders' expectations are aligned). Project managers thus face the challenge of dividing their attention among these different management tasks and balancing between the potentially conflicting demands of different stakeholders, including stakeholders at different levels (local, national and international)..

Table 4. Examples of management activities that are important for successful processes and successful outcomes

Process-related ←	→ **Outcome-related**
• Developing good relations with the local community • Articulating and understanding the project's and its different stakeholders visions and expectations • Flexibility, adaptability and continuity in managing change • Involving project partners that enable continual channels for interaction and reflection at appropriate stage • Maintaining ongoing dialogue with stakeholders	• Technical and infrastructure issues (e.g., selecting the most viable technologies, gaining access to grid connections) • Operational issues (e.g., gaining and managing the labour force and contractors, managing the logistics of fuel supplies) • Market issues (e.g., competition with other technologies, energy sources and industries; access to international markets) • Financial issues (gaining and maintaining investor confidence, dealing with policy support instruments

that influence the viability of the project)

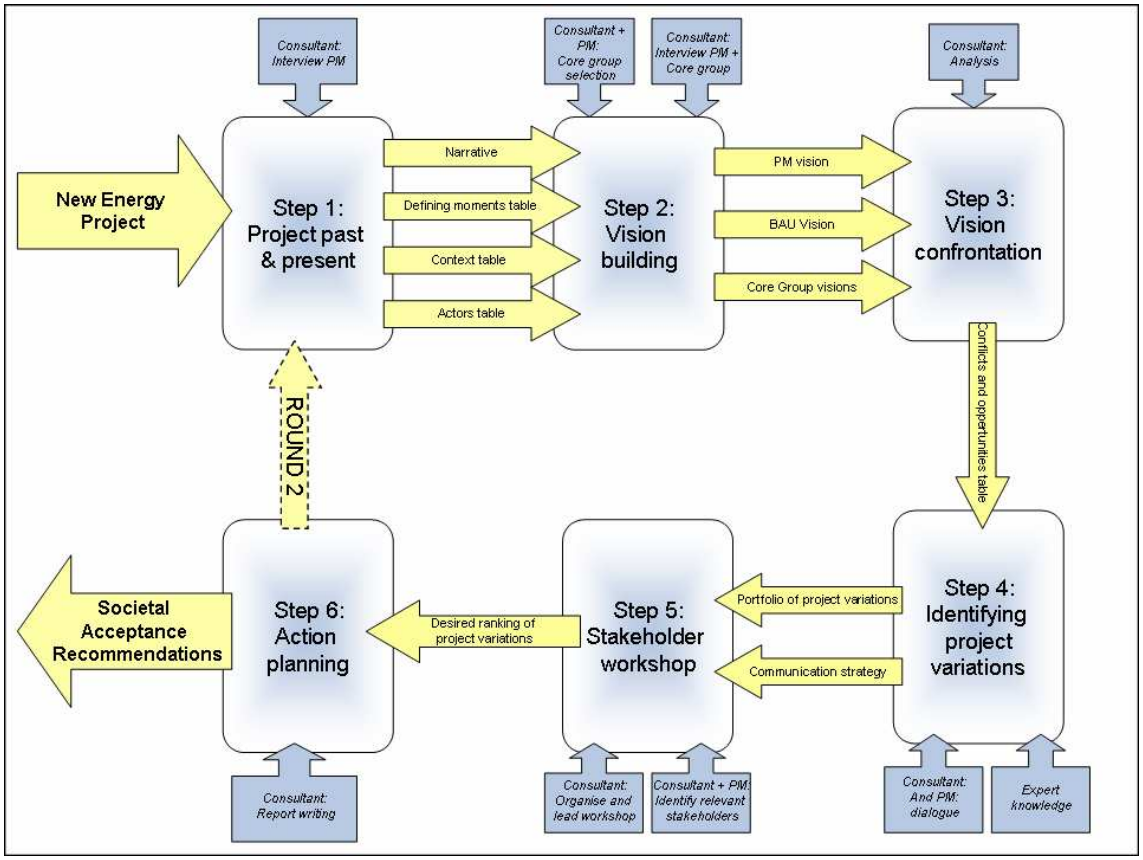
3. A six-step methodology for intervention.

The CA methodology aims at assisting project managers in modulating the societal acceptance of a project.
In the Create Acceptance project we take a six-step approach for this purpose.

1) Project past & present
2) Vision building
3) Vision confrontation
4) Identifying project variations
5) Stakeholder workshop
6) Action planning

We make a distinction between ‘the project manager’ and ‘the consultant’. The first one refers to the individual or a team that is the responsible agent for managing the project. The consultant refers to an individual that is an outsider to the project and performs the necessary steps of the Create Acceptance process in interaction with the project manager. Note that not all steps have been developed fully yet and in particular step 4-6 will be further developed the coming months

Figure 1 visualises the process as six steps with inputs and outputs



Step 1. Project past and present

The aim of the first step is to enable project managers to reflect on the history of their project, identify important moments that have shaped the project into its current form, make explicit the relationship between the project and its context and identify key actors the project needs to engage with in future developments.

Four tools have been developed to serve this purpose.
The first tool is 'the narrative'. The aim of the tool is to make the history and present status of the project explicit. The narrative is used as a basic reference that ensures that both the Create Acceptance consultant and managers, and any other actor involved in the interaction, are in consensus on main details of the project. The form in which it is presented is that of a chronological story-like text.
The 'important moments table' is the second tool in Step 1. The aim of the important moments table is to extract moments from past project development and make important attributes of these moments explicit. This table thus enables a more strategic reading of the project narrative and provides insight into the level of 'path dependence of the project'.
The 'context table' is the third tool in Step 1. The aim of this tool is to have project managers reflect upon the context within which their project is to be deployed, and thus identify the level of sensitivity the project manager has in regards to the influence of context. A distinction is made between opportunities and barriers that emerge from the present context of a project.
The 'actors table' is the final tool. The aim is to help project managers identify key actors and stakeholders of the project. By systematically addressing the issues presented in the table, project managers can become aware of the actors and stakeholders related to their

project, and also be alerted to their concerns, resources, social networks and potential sources of influence on the project.
By recording actor information that the project manager knows and identifying information that the project manager does not know, the social networks surrounding the project are made more visible and also to some extent more manageable. Project managers are thus better equipped to identify latent opportunities and threats in the operating environment.

Step 2. Vision building

The second step assists the project manager to make explicit his or her expectation and develop a PM vision on the project.
The stakeholder core group is selected by the consultant and the PM through a variety of selection criteria and input from step 1; this selected group of stakeholders react on the PM vision and possible develop their own (if possible through a first workshop).
A third vision is build by the Create Acceptance consultant on PM indication and represents a Business As Usual situation, i.e. how the "world" should be if the project were not realised.
Visions are constructed by interviewing the project manager and the selected group of stakeholders.
Three tools are used to construct the vision. The 'sociogram' gives a visual representation of the social network involved in the future. The 'synthesis writing' is a 1 page that describes this future in a story-like form. And the 'vision title' summarises in a newspaper title style the essence of the vision.

Step 3. Vision confrontation

The different visions developed in step 2 are compared in step 3 by the Create Acceptance consultant to identify possible conflicts between the visions or opportunities and overlaps. For that purpose a table is used in which the visions of the PM and the stakeholders are deconstructed in terms of several dimensions, including 'infrastructure', 'economy', 'social', 'environment' and 'regulation'. For each dimension possible conflicts and opportunities are identified. For example in the case of a bioenergy project there may be a conflict emerging from competition for biomass resources or local emissions and the minimum level of health and safety issues.

Step 4. Identifying project variations

In step 4 the Create Acceptance the project manager and the consultant enter into a dialogue to discuss possibilities for changing the project in order to address the conflicts identified in step 3, or exploit opportunities and can also reflect on the more distance context and new entrants. This step has a connection with the important moments table from step 1. Some developments in the past are very difficult to undo or can only be undone with an unacceptable amount of (financial) losses.
Step 4 is about identifying project variations, but also about identifying strategies to communicate with stakeholders that are important in relation to the conflicts and opportunities identified. In some cases external knowledge such as quantitative scenario building or risk analysis may be required, e.g. when there is uncertainty about future environmental impacts of a project.

Step 5: Stakeholder workshop

The project variations are then communicated and discussed with a larger number of stakeholders in step 5. These stakeholders are selected by the consultant and project manager on the basis of a variety of selection criteria and input from Step 1. The workshop has the form of an interactive workshop in which stakeholders can react to the project variations.

Step 6: Action planning

The last step in the Create Acceptance process is action planning. The Create Acceptance consultant produces the final report and translates the results from the previous steps into recommendations for modulating societal acceptance and identifying activities that are necessary to anticipate possible future opportunities or conflicts. One of the recommendations can also be to repeat the six steps within a certain time to keep up with ongoing processes in the project and its context and continuously monitor changes.

SUMMARISING CONCLUSION

In this paper we have discussed the intermediary results of the Create Acceptance project and in particular the results from a case study analysis of 22 new energy projects. In a meta-analysis we have identified five challenges that are important to deal with when developing new energy projects. On the basis of this analysis we are currently working on developing a six-step methodology for creating societal acceptance in new and ongoing energy projects. This methodology is applied in five ongoing projects: a carbon capture and storage project in the Netherlands, a hydrogen project in Iceland, a biomass project in Germany, a wind project in Hungary and a thermodynamic solar project in Italy. The first results of this process are positive and project managers have positive expectations about the remaining steps. One major issue that needs improvement is related to simplifying the methodology as much as possible without loosing the nuance and in-depth analysis that are necessary for a complex issue as societal acceptance of renewable energy projects. A second major issue is to develop a typology of projects in order to identify which specific tools and steps are necessary for which kind of projects.

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