



Original research article

Stakeholder empowerment through participatory planning practices: The case of electricity transmission lines in France and Norway



Leonhard Späth*, Anna Scolobig

Swiss Federal Institute for Technology Zürich (ETH Zürich), Institute for Environmental Decisions, Climate Policy Group, Universitätstrasse 22, 8092 Zürich, Switzerland

ARTICLE INFO

Article history:

Received 4 March 2016

Received in revised form 3 October 2016

Accepted 6 October 2016

Available online 27 October 2016

Keywords:

Power lines

Acceptance

Empowerment

Participation

ABSTRACT

The importance of grid extension in Europe has risen in the last decade as a result of an aging grid and the energy transition toward a decarbonized electricity sector. While grid extension is claimed as necessary, stakeholder opposition has slowed down this process. To alleviate this tension, increased stakeholder participation is considered as a solution to increase acceptance. The question of stakeholder empowerment is central to participation and it is assumed that higher levels of empowerment improve planning processes. In this paper, we describe, evaluate and compare the planning processes for very high-voltage transmission lines in France and Norway by means of a document analysis. We operationalize the degree of empowerment in three levels: information, consultation and cooperation. The results reveal low stakeholder empowerment that barely rises above the level of *consultation*. The evaluation of recent projects entailing innovations to enhance stakeholder participation reveals a trend of increasing empowerment levels, especially in the early phases of the planning procedure, i.e. the discussion about the needs for new lines and about the needs of the affected stakeholders. The results suggest that current planning regulations can benefit from high levels of stakeholder empowerment, especially in the early phases of the planning process.

© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Grid extension has always been an essential topic for the electricity sector, as electricity consumption increased in the last decades [1]. Today, new challenges related to grid extension are emerging: the goals of the European Union for an almost completely decarbonized electricity sector by 2050 [2] are changing today's patterns of electricity production, consumption and transport [3–5]. While grid extension is needed today, citizens' opposition to new electricity corridors is slowing down planning processes for new power lines and power lines upgrades as well, thus decelerating the energy transition for the European electricity sector [6–9]. The reasons of opposition are manifold and include the intrusive nature of transmission lines in the landscape, the fear of health consequences due to population exposure to electromagnetic fields and the decrease of property values nearby new corridors [6].

Opposition to transmission lines is not new in itself, as documented in several cases from the 1930s in the United States [10]. However, while in the past power lines have been considered as a symbol of progress, today some stakeholders consider them as a threat [6]. Stakeholder participation is seen as a way to smooth planning processes, decrease opposition, diffuse conflicts, and develop the grid by addressing stakeholders' heterogeneous concerns and needs [11,12]. While formal stakeholders' participation is already today included in planning processes for transmission lines, several scholars and organizations claim that it should be carried out in a different and better way [13,7]. Yet, it is assumed that enhanced stakeholder participation is a condition for an increased acceptance of power line projects [6,13–15,7,11,8,16,12]. However, while there are no universal metrics to evaluate stakeholder participation [17], empowerment is a concept that can be used to evaluate qualitatively the levels of participation in a decision-making process [18–20].

In this paper, we evaluate the level of stakeholder empowerment in the planning processes of two European countries: France and Norway. In order to do so, we divide the planning processes in three main phases: need definition, spatial planning and permitting [7]. Based on a documentary analysis, we evaluate for each phase the degree of stakeholder empowerment operational-

* Corresponding author at: Swiss Federal Institute for Technology Zürich (ETH Zürich), Institute for Environmental Decisions, Climate Policy Group, Universitätstrasse 22, CHN J70, CH-8092 Zürich, Switzerland.

E-mail address: leonhard.spaeth@usys.ethz.ch (L. Späth).

ized as information, consultation and cooperation [20]. In order to better understand future trends, we also describe and evaluate recent innovative projects adopting participatory methods for stakeholder engagement. In these projects, the transmission system operators (TSOs) voluntarily improved the planning process and engaged stakeholders by using innovative tools or procedural measures. Finally, we compare and contrast the experiences in the two countries in order to highlight similarities and differences.

2. Evaluating stakeholder empowerment in power line planning processes

Stakeholder engagement in power line planning is a relatively new research topic compared to other fields like environmental conservation [21], water management [22] or sustainable urban development [23]. Since more than one decade, grid development has faced rising public opposition. Stakeholder participation is considered as a way to reduce conflict, foster acceptance and legitimize decisions related to power line projects [6,13–15,7,8,16,12]. Public opposition does not only affect grid extension projects. Wind, solar and biogas energy facilities are also depending on stakeholder acceptance [24–27]. However, while wind turbines, hydroelectric power plants or biogas plants produce energy locally, thus creating an added value to the area, transmission lines do not directly add value to the land they affect. Moreover, the incentives for grid extension are usually linked to additional installed energy production capacity, which also depends on grid availability, causing a chicken-and-egg problem [3]. Nevertheless, stakeholder engagement in the planning process for power lines and other infrastructures related to renewable energy (e.g. wind turbines) is similar due to their impacts on landscape and property value [6].

Today, transmission system operators (TSOs) and regulators carry out planning processes for power lines in a top-down fashion, by providing information or asking stakeholders for feed-back – e.g. on grid positioning – during the different phases of the planning process [7,8]. Many scholars consider these involvements as insufficient and as the root of opposition [6,13,14]. Therefore, it is assumed that enhanced stakeholder participation would ease planning processes for power lines. The premise of this assumption rests on the so-called ‘crisis of representative democracy’: stakeholder participation is seen as a way to revitalize a stiff representative democracy [28] and lack of trust in responsible authorities. Although participation has inherent advantages, it has also limits. This is a highly debated topic in the academic literature. Pellizzoni and Vannini [28] proposed an ‘ascending’ reading of participation-related literature, carried out through optimism in the 1980s, and a ‘descending’ reading of participation literature later in the 2000s, where the optimism faded away for a less optimistic, but more realistic approach.

In the case of power lines, today’s planning processes already engage stakeholders at specific points in time and with specific aims. Economic, social actors and citizens are informed and consulted in the planning process and these interactions are embedded in the current legislative procedures to build the grid [4,7]. Nevertheless, this engagement is not always considered sufficient or appropriate [29,13,7]. More precisely stakeholder engagement is often reduced to one-way information activities that do not serve the purposes of participation such as enhancing the buying in of heterogeneous stakeholders’ perspectives or addressing conflicts in an open democratic debate [13,30,11].

Stakeholders have very different reasons to oppose to power lines. These reasons may be individual, for instance related to health risks due to electro-magnetic fields (EMF), visual disruption or property value loss [6]. However, these can also be of social nature, for instance of disruption of sense of place [24], or of political nature, for instance the influence of the national political context or

the trust stakeholders have in existing institutions [6]. Stakeholders may have a very different perception on the issues at stake depending highly on the context of the project, their needs, interests and values [31]. Nevertheless, most of these stakeholder needs are formally taken into account in current planning processes, which are accurately designed [32,33].

While there is a large body of literature that isolates and explains the public’s reasons for opposition and acceptance of transmission lines (see [6]), the same is not true for stakeholder participation in the planning processes. Stakeholder participation is subject to different interpretations and academics frame it in different ways. Some describe the attributes that define stakeholder participation [21,34–36] and propose outcome evaluation criteria. Other scholars focus on the aims of participation and maintain that participation should reach certain social, democratic or interactional goals [37–40]. The gaps in the literature and research on participatory processes are numerous. So far, little attention has been devoted, for instance to the comparison of methodological approaches used to engage with stakeholders; the methods and tools to co-produce knowledge that is useful and usable to inform decisions; the relationship between process and outcome; the evaluation of the quality of participation [20,40]. In this paper we focus on a research gap that is particularly relevant for stakeholder participation in power line planning processes, i.e. their level of empowerment and its evaluation methods.

Taking stakeholder empowerment as a criterion for classifying stakeholder engagement practices, Arnstein [18] developed a ladder with eight rungs, from (citizen) manipulation to citizen control, divided in three groups: nonparticipation, degrees of tokenism and degrees of citizen power. Although most scholars use the word ‘participation’ as a generic term for stakeholder involvement, Arnstein maintains that the word participation can be used only if stakeholders have a real say, thus power, in the process. Nevertheless, the empowerment levels of stakeholders in a process, although mostly not at the highest rungs as described by Arnstein, can still be evaluated. Therefore, an empowerment scale is appropriated to evaluate the way stakeholders are embedded in a process, in our case power line planning.

While in the case of planning processes for power lines, the procedures are often described accurately in the regulation [32,41], it is possible to evaluate the extent to which the stakeholders are empowered in the process. Without going into detail on the intrinsic nature of the power relation between actors involved in the process [42,43], the way stakeholders are formally embedded in the planning process makes it possible to use a relatively simple empowerment scale like the one formulated by Arnstein [18]. For the purpose of this paper, participation and empowerment of stakeholder starts as soon as stakeholders are engaged in the process. Komendantova et al. [15] already used the scale provided by Arnstein [18] to evaluate stakeholder engagement in power line planning. However, in their research, the authors [18] only focused on new participatory practices of some TSOs across Europe and did not focus on the regular planning processes. This leaves a gap that we aim to address in this paper through an evaluation of the empowerment of stakeholder as a result of the formal process carried out for power line planning.

Drawing on the seminal work of Arnstein’s ladder of citizen participation (1969), several scholars developed other scales of stakeholder empowerment. Instead of eight rungs, Lüttringhaus [19] and Rau et al. [20] described a simpler scale with a split between the process owner and the participants where interactions can be classified in four main levels (see Fig. 1): i. *information*: stakeholders only receive information provided by the process owner; ii. *consultation*: stakeholders’ perspectives are elicited by the process owner; iii. *cooperation*: stakeholders’ perspectives are explicitly taken into account and decisions are co-produced with the pro-

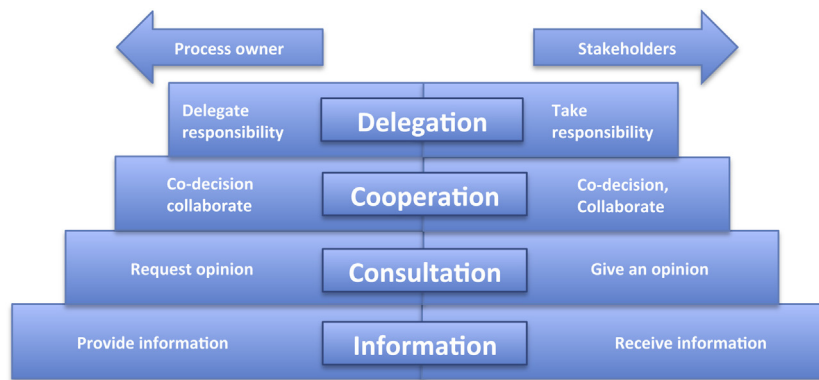


Fig. 1. The four levels of stakeholder empowerment based on Rau et al. [20].

cess owner (power sharing); and iv. *delegation*: stakeholders take over a task and the process owner accepts their decision (power delegation). Originally, Lüttringhaus [19] added an additional level on the stakeholder side as ‘self-reliance’ (Germ.: *Eigenständigkeit*), where citizens have the power to initiate a process. In the case of grid extension, the initiation of the process is usually expert-driven. TSOs identify bottlenecks, future needs [44] and then start a planning process for a line upgrade or a new line [7,45,46]. Therefore, as the process is usually initiated as a response to a technical need assessed by the TSOs, we do not consider the additional level of self-reliance as appropriate for power grids and, in this paper, we rely to the scale described by Rau et al. [20] (see Fig. 1).

3. Methods

The aim of the research was to evaluate, compare and contrast the degree of stakeholder empowerment in power grid planning processes in France and Norway. In order to do so we took a qualitative approach and performed a documentary analysis of planning processes for very-high voltage power lines. For this research, we used two types of data: official documents and TSOs-documents. We used official documents, mainly in form of laws and regulative guidelines provided by state organisms, for instance the Norwegian Water Resources and Energy Directorate (NVE) in Norway or the National Commission of Public Debate (CNDP) in France (see Sections 4.1 and 4.3 for further details). Although no documents can be taken as describing accurately the reality [47], we consider documents tightly related to regulations and their application appropriated to evaluate the way stakeholders are formally involved and thus empowered in the process. Additionally, we use documentation generated by the project owners, in our case the TSOs. We considered the following criteria for assessing the documentary sources: authenticity, credibility, salience, legitimacy, representativeness and meaning [48,49]. More precisely, we paid attention to the subjective judgments and biases in TSOs documents and we took these aspects carefully into account when drawing our conclusions (see [47]).

The first methodological challenge was the cross-country comparison of the power line planning processes. Indeed each country has its own process, entailing different ways to involve stakeholders and to make decisions. In the attempt to compare planning processes in the European Union, Berger [16] proposed six steps as a common denominator: determinations of needs, project preparation, spatial planning, permitting, construction, and operation. However, for the purpose of this research, we reduced the process to three main planning phases, as proposed also by Renewable Grid Initiative in their European Grid Report [7]: need definition phase, spatial planning phase, and permitting phase. We use these three phases as a common denominator to compare the processes.

The second methodological challenge consisted in the definition of stakeholder empowerment levels. Arnstein [18] stated that participation, thus ‘real’ empowerment, only happens at the highest rungs of her ladder, i.e. partnership, delegated power and citizen control, the other levels are only forms of non-participation and tokenism. However, this perspective is questionable, as empowerment may start when a process owner interacts with potentially affected stakeholders [50]. Therefore, we use a notion of gradual empowerment in the sense of increasing stakeholder participation possibilities. We used the first three levels of the participation pyramid provided by Rau et al. [20]: information, consultation and cooperation (see Section 2 and Fig. 1) and we left the highest level of stakeholder participation (i.e. delegation) out because of the nature of power lines. Indeed, planning processes are embedded in existing legal frames where experts play a major role, making delegation not achievable from a project owner perspective.

Aiming to evaluate the empowerment levels of affected stakeholders gives us an appreciation of how participation is carried out for power line planning. However, as the planning procedures may greatly vary across countries [7,8], we focus on two distinct European countries that have very different procedures and stakeholder involvement cultures: Norway and France. More details of the two planning processes are provided in section 4. Here we point out only some of the key differences. While in France the TSO plays the main role as owner of the project [51], in Norway once the application for a project is submitted, the process is taken over by the Norwegian Water Resources and Energy Directorate (NVE) [52]. Additionally, although it is not the direct focus of this research, there are also local differences in the culture of participation, mainly due to the legal frame, the local topology and the different roles of the involved actors in both countries.

Acknowledging the limits of current planning processes from a stakeholder participation perspective, the TSOs, Rte and Statnett, engaged with stakeholders in innovative ways in some recent projects. Therefore, we added also an evaluation of these new projects to better understand what is the trend in stakeholder empowerment for power line planning. Finally, we compared and contrasted the planning procedures in the two countries to highlight general tendencies.

4. Results

4.1. The case of France

In France, the administrative process applicable to power grid projects can be schematically divided into the three main phases: the need definition, the spatial planning, and the permitting (see Fig. 2 and Sections 4.1.1–4.1.3). Each phase is divided in different steps and it involves different categories of stakeholders at differ-

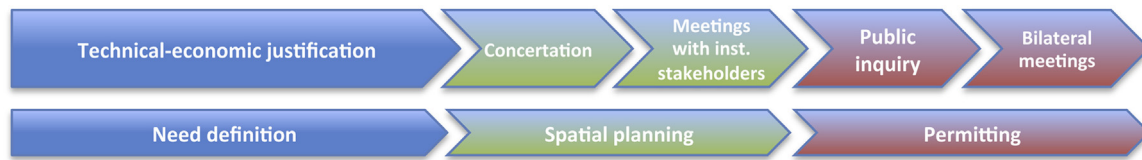


Fig. 2. The administrative planning process for transmission lines in France.

ent scales: State's representatives, regulatory bodies, TSOs, local authorities, NGOs, residents and the general public.

4.1.1. The 'need definition' phase

The need definition phase aims to identify and justify the needs for future grid projects and to collect stakeholders' opinions about them. This is the general purpose of the French TYNDP (Ten-Year Network Development Plan), which describes on the basis of several scenarios the evolution of electricity production, consumption and exchanges at the European level, and how the national power grid will evolve, with regional focuses [45]. This document is published every year on the institutional website of Rte (Réseau de transport d'électricité), the French TSO, so that all interested stakeholders, Rte's customers as well as NGOs and citizens, can comment on it. These comments as well as answers provided by the TSOs are then integrated into the final report to be sent to the regulator before the official publication [53]. For each project, solutions to answer the needs identified in the French TYNDP must be justified by Rte. Therefore, at the beginning of each project, a technical-economic justification is carried out, whose validation is provided either by the Ministry in charge of Energy (for 225–400 kV power lines) or by the regional State's representative (for 63–90 kV power lines and substations) [53]. From an empowerment scale provided by Rau et al. [20], this step ranges in the level of consultation. However, only stakeholders actively interested into the topic of grid expansion consult the published TYNDP and potentially affected stakeholders like citizens or local associations are likely to not provide any feedback to it. Therefore, this first step may be considered at the margin of consultation, as the TSO does not proactively ask all potentially affected stakeholders to take position on their development plans. Besides the general development plans, the TSO provides a technical justification for each project, an exercise that we consider as information to potential stakeholders.

4.1.2. The 'spatial planning' phase

The purpose of the spatial planning phase is to define a study area and to address the environmental and economic aspects, including landscape impacts, of possible corridors in the most suitable area to select the corridor of least impact. This formal step called *concertation* is split in two main phases. The first aims to delimit the study area, which is large enough to include all possible power line alternatives. The second step aims to collect all terri-

torial characteristics related to the study area in order to define a pathway that causes the least impact to the environment of the affected regions [54]. The organization of a public debate for 400 kV lines with a length over 10 km, under the supervision of an independent administrative body, the National Commission for Public Debate (CNDP), was mandatory until 2015. Today, stakeholders like the TSO, parliamentarians, councils at regional and municipal levels, and agreed environment protection associations may voluntarily ask for the involvement of the CNDP [55,41]. At the end of the process, the National Commission for Public Debate produces a report with recommendations on the basis of which Rte must declare whether it is willing to continue the project and, if yes, how it will integrate the CNDP recommendations [54].

Local inhabitants also constitute relevant stakeholders at the spatial planning phase. As the characteristics of the project at this stage are more precisely defined than during the previous phase, this makes it possible to discuss precise points of the project with the affected stakeholders. There is a possibility to involve a neutral third party, named *guarantor*. His or her nomination by the National Commission of Public Debate (CNDP) can be voluntarily asked by the TSO to ensure transparency and fairness during the participatory process [51]. This is also a way to enable the integration of stakeholders' expectations and concerns before the official public inquiry of the permitting phase. During the spatial planning phase, the TSO involves institutional stakeholders like municipalities to gain a better knowledge of local issues related to the development of the line. In this phase, local NGOs and diverse institutions are involved. Because of the integration of different stakeholders' expectations and concerns that is not necessarily binding, we range this step as being at the empowerment level of marginal consultation (see Fig. 3).

4.1.3. The 'permitting' phase

The permitting phase begins with the request for a declaration of public utility (DUP). The purpose of this declaration is to make some future utility easements or propriety transfers legally possible if no amicable agreement is found with landowners [56]. To that end, a two-month consultation is organized with many different stakeholders, for example State services, regional authorities, local representatives and protected area managers. Remarks are made concerning both the demand for the declaration of public utility and the Environmental Impact Assessment, which is mandatory for

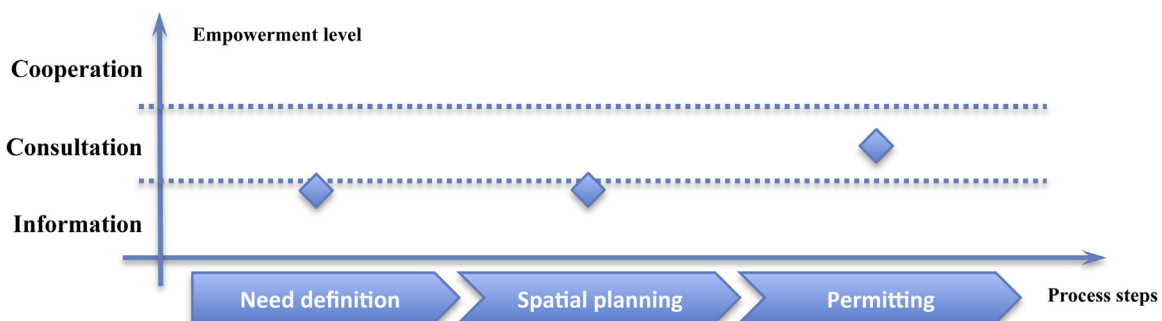


Fig. 3. Levels of stakeholder empowerment in the French planning process for very-high voltage power lines.

new overhead lines over 15 km [54]. Following this consultation, a minimum of one-month public inquiry is opened to all citizens living in the local communities concerned by the projects. The public inquiry is managed by an investigating commissioner who is appointed by the administrative court related to the area of the project [56]. At the end of the process the commissioner proposes a report bringing together the various positions held by participants, adding conclusions and recommendations. Due to the active character of these inquiries, this step may be considered as consultation (see Fig. 3). Finally, the decision of delivering the declaration of public utility is taken in light of the public inquiry by either the Ministry of energy for 225–400 kV projects, or by regional State services for lower voltages [56].

Once the declaration of public utility is delivered, the last details of the project and its precise localization are determined through bilateral meetings with the relevant authorities and any stakeholders (landowners in particular) whose interests may be directly impacted by the project [57]. This process is supervised by the Regional Direction of the Environment, Landplanning and Housing (DREAL) and the Departmental Direction of the Territories (DDT) to ensure that the procedure is carried out according to the law [58]. Specific agreements, for instance on building licenses, exemptions related to protected species, and compensatory measures, in particular in matters of landscape impact, are then discussed. The Project Accompanying Plan, which is financed by Rte to cover a set of environmental measures for the visual integration of the structures into the surrounding landscape, is also discussed at that time [57]. Due to the exchanges and discussion between the TSO and the affected stakeholders, the character of these last meetings can be ranked in a level of cooperation. However, due to the declaration of public utility in terms of means to enforce the application of the project, we consider this step as a level of consultation, as the enforcement means of the declaration of public utility makes a sharing of power between stakeholders and project owner impossible (see Fig. 3).

4.2. Innovative projects in France

The French TSO, Rte, adopted innovative ways to involve stakeholders in three of their projects. We provide below a short description of the innovations and the related empowerment of stakeholders.

In the project *Lonny-Vesle*, an upgrade of a 400 kV power line [59], the innovation consisted mainly in an early landscape ‘diagnosis’, i.e. an integrated analysis which takes into account economic, social and environmental aspects [60–62]. Additionally, the TSO mandated an external company to perform a socio-environmental inquiry through workshops with local stakeholders and citizens affected by the power line path [60]. This approach provided an overview about the effects of the line on the landscape and the possibility to tailor the line to the needs and future plans of local stakeholders. These additional steps in the project are beyond a regular consultation and go in line with cooperation. However, as these steps happened beside the formal process, and not in form of binding-steps added to the traditional project, this cooperation could not be fully considered as such. Therefore, from a whole-project perspective, we considered the empowerment level during these steps as marginal to cooperation. From a time-perspective, most of the additional work involving stakeholders has been carried out early in the process [60,59]. However, the scope of evaluation was already defined by the path of the line to be upgraded. Although the content could also be related to the spatial planning phase, the emphasis in the additional stakeholder engagement has been on needs at a very local scale [60]. Therefore we considered this engagement mainly as part of the need definition phase (see Fig. 4). This step showed that consultation could go far beyond the usual way to involve stakeholders, providing insights that make

possible a more constructive integration of the power line in the territory.

In another project, *Avelin-Gavrelle*, and upgrade of a 225 kV and 400 kV line, the TSO organized five ‘thematic commissions’ during the early steps of the spatial planning phase. These commissions dealt with issues related to power lines like health, agriculture, environment, landscape and energy-economy [63]. In these commissions, independent external experts explained their views and discussed the needs and implications of the power line with representatives of NGOs, socio-economic actors, citizens, and representatives of the state services and of local authorities [29]. Additionally, Rte organized local workshops with citizens affected by the power line to gather local insights on the affected areas at a small scale [64]. We classify this project as genuine consultation because the stakeholders’ perspectives were taken into account explicitly in the further steps of the process (see [65]).

The project of the line between France and Spain, *Baixas-Santa Llogaia*, has been documented as an example where opposition grew so high that the TSOs, in this case the French Rte and the Spanish REE (*Red Eléctrica de España*) regrouped in a partnership for the project, required mediation for the project at the European level [66]. Discrepancies appeared between the TSOs and the opposing citizens’ groups on the rationales behind the project, on the layout of the line, and on the environmental implications of the construction, causing delays in the process [13]. This led to an abandonment of the regular process (concertation), and to the organization of specific workshops to detail the technical specificities of the line according to the views of the population. Under a European coordination, stakeholders like local governments, environmental and opposition groups have been involved through workshops [13]. These stakeholder involvements lead to a consensus on a final layout for the power line, which entailed a dedicated eight-kilometer long tunnel for an underground cable under the most sensitive area [13,67]. This is a clear example of cooperation because stakeholders’ perspectives have been explicitly taken into account and decisions have been co-produced with the involved TSOs (see Fig. 4). Moreover, the project showed how an increased degree of stakeholder empowerment led to a compromise solution to build the line.

4.3. The case of Norway

The Norwegian planning procedure for power lines shares the same fundamental phases as the French process: the need definition, the spatial planning, and the permitting. However, the phases can be divided in different steps (see Fig. 5 and Sections 4.3.1–4.3.3). Moreover, a different organization has a critical role: the Norwegian Water Resources and Energy Directorate (NVE), whose role is to ensure a fair use of resources, especially in the interest of the affected communities [68].

4.3.1. The ‘need definition’ phase

The Norwegian development plan follows the aims stated in the European Ten-Year Network Development Plan (TYNDP) [44]. The plan describes trends and scenarios, and projects the evolution of electricity production, consumption and exchanges at the Norwegian-European level [69]. It also describes how the national power grid should evolve, with a regional focus. This document is published every second year, and broadly discussed with politicians and in energy-experts fora. From 2015 there is, in addition, a public hearing on the Norwegian Grid Development Plan [46].

The discussion on the need of the project starts at the early concept evaluation of each project and may recommend several projects for a studied region. Although this first dialog formally takes the form of a consultation, the TSO mainly involves established stakeholders like public authorities and NGOs, but not the wider public, as at this point there is still no clear concept of a

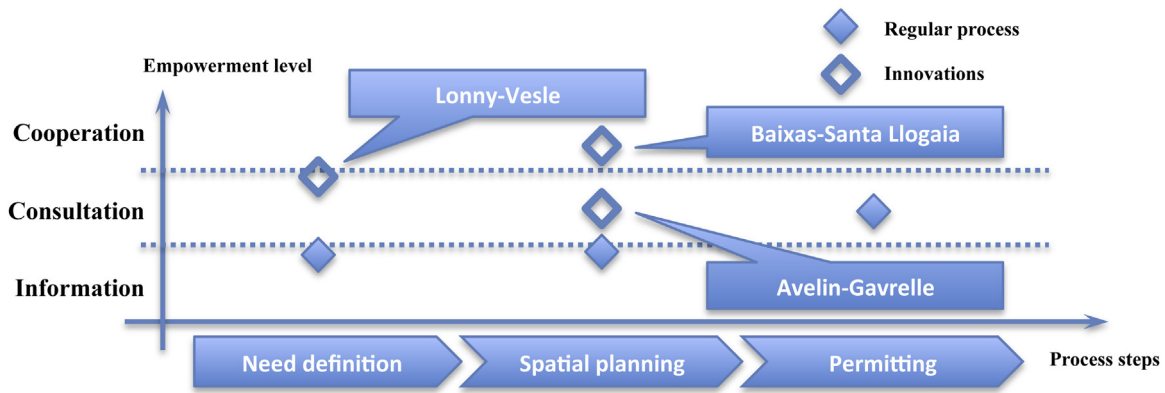


Fig. 4. Additional stakeholder empowerment in French projects through additional innovations compared to the traditional planning process.

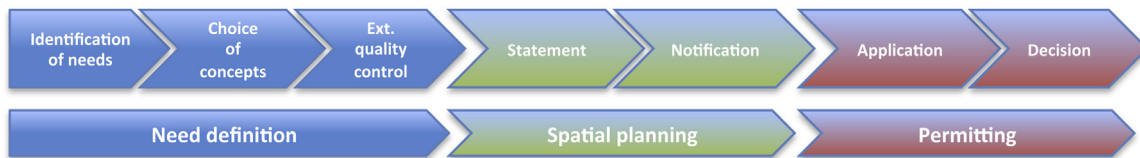


Fig. 5. The administrative planning process for power lines in Norway.

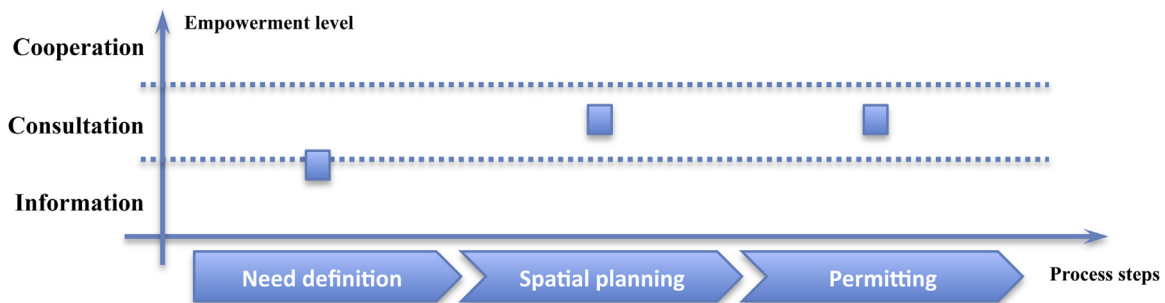


Fig. 6. Levels of stakeholder empowerment in the Norwegian planning process for power lines.

path for the line [7]. For large projects, longer than 20 km and with tensions over 300 kV, the TSO carries out an external audit on the concept evaluation for grid development by external consulting companies before sending the justification report to the Ministry of Oil and Energy [32]. Additionally, discussions about the need rarely end up justifying only one power line, but they are valuable to identify interested stakeholders, their perspectives, alternative solutions and to receive inputs about future needs. This dialog is the first formal discussion between the TSOs, the public authorities and NGOs. During this phase, Statnett presents the need for a new power line, the issues at stake and what needs to be taken into account before the 'spatial planning' phase [70]. Therefore, mainly due to the explorative character of this first stakeholder engagement and the restricted consultation scope for large projects, we categorize it as marginal to consultation (see Fig. 6).

4.3.2. The 'spatial planning' phase

During the spatial planning phase, Statnett sends a notification to the regulator, the Norwegian Water Resources and Energy Directorate (NVE). The organization of the public involvement is then shifted to the regulator who coordinates and organizes the hearings with affected stakeholders [52]. In these hearings, information about the different routes and a proposal for the environmental impact assessment (EIA-program) are provided. The consultation

starts with local authorities, and the public is invited immediately afterward. The TSO and the authorities gather various interests, ideas, and remarks from stakeholders. The notification has usually alternative routes. During the process, some of them can be excluded or others can be added. This part of consultation with the regulator lasts for 8 weeks [52]. After the hearings, NVE gives Statnett a program of an EIA, including which topics shall be included and the alternative routes [71]. The boundaries of the EIA, a result of stakeholder consultation during the hearings, are binding; therefore we can consider this step as a consultation engagement (see Fig. 6). After this period, the dialogue with stakeholders often continues into the next phase, and then bilaterally between the TSO in charge of building the line (Statnett) and the affected stakeholders [71]. Contact and dialogue with the county officials as well as the officials in the municipalities are maintained in order to give Statnett the possibilities to react and take additional local constraints into consideration.

4.3.3. The 'permitting' phase

After the first round of public meetings, Statnett adapts the alternatives and external consultants carry out the Environmental Impact Assessment (EIA) [72]. The EIA and a formal application are sent to the regulator (NVE) who organizes a second round of public hearings. The input of this second round is compiled by

NVE in a binding form for the TSO. At this stage the most accurate route for the power transmission line is usually decided. Indeed, a different alternative route will require an additional EIA, which may delay the entire process. In this phase there is a constant dialogue with the landowners and other stakeholders to get into the details of the planning. This process also results in (usually minor) changes. Moreover the process includes a gathering of comments by the county, municipality officials, landowners and NGOs through hearings. These officials provide feedback on the EIA and formulate demands for additional information, for instance about biodiversity loss [72]. From an empowerment perspective, the permitting phase fulfills the conditions of a consultation through the binding results of the public hearings (see Fig. 6).

For small projects (smaller than 300 kV and 20 km), NVE makes the final decision, unless an appeal is made. Once the regulator gives its approval to the selected route, they send an information letter including the assessment paper of the project, which is the basis of their decision. This letter is sent to the stakeholders who contributed or were involved (NGOs, citizens' groups, etc.), the landowners, and the local and regional authorities [73]. Stakeholders are given the possibility to object the decision within three weeks. We consider this sub-step as marginal to consultation, because the input from stakeholders can only be in form of an objection. If there is an objection to the decision, NVE takes it into consideration and either changes the decision in accordance with the objection, or overrules the objection. If overruled, the original decision is maintained and NVE forwards the conclusions and recommendations to a higher level, i.e. the Ministry of Oil and Energy, which evaluates and makes a final decision, which cannot be objected anymore [74]. For larger projects (new lines, or larger than 300 kV and 20 km), the final decision is made by the Ministry of Oil and Energy (OED) based on NVE's recommendations. The stakeholders are informed about the decision made by the Ministry of Oil and Energy, but the stakeholders cannot object to it [74]. The variation of the process between big and small projects is the result of the a document named *White Paper*, which was introduced in 2012 as a result of the 'Hardanger line', whose development was heavily undermined by stakeholder opposition [32]. More precisely stakeholders raised opposition because they wanted subsea cables instead of over-head lines and due to a perceived ambiguity on the need for the power line [75,7].

Finally, the negotiations with the landowners about compensation for land loss related to the new line or corridor begin after the application hearing. The compensation only covers the economic losses [76]. Common interests with landowners and municipalities may be included, often resulting in the provision of local benefits (e.g. new roads) [72]. The TSO collaborates in parallel with the affected municipalities, NGOs and landowners. Collaboration is project-specific and the wider public is not involved anymore.

4.4. Innovative projects in Norway

As a result of facing opposition, the Norwegian TSO Statnett enhanced its planning processes with additional hearings. In addition to the mandatory public hearings related to the notification and the application of power lines projects, Statnett organized meetings with stakeholders, among them potentially affected residents and landlords, earlier in the planning process. For instance, in the project *Bamble-Rød*, a new 420 kV line, the TSO organized meetings with the population before the official hearings organized by the regulator. These hearings made possible to discuss issues like the reason for grid extension and the project, possible cabling solutions, its price and its impact on the landscape, and finally develop additional path alternatives, taking into account stakeholder input in a very early phase [77], therefore, we considered this as a consultation. Additionally, as a result of the meetings, a new process to remove power lines with lower voltage begun (132 kV and 66 kV). These additional meetings gave more possibility to affected stakeholders to exchange on projects affecting them, providing inputs to the TSO, helping to select technical alternatives, and to reduce tensions between the TSO and the stakeholders. The same procedure has been applied to the general upgrade of the existing power line network around Oslo [7]. The project *Nettplan Stor-Oslo* covers the complete upgrade of the electricity grid around the capital, where most lines have been built between the 1950s and the 1980s, and will not be able to satisfy the city's future consumption patterns until 2050 [78]. In the early meetings organized by the TSO, stakeholders could provide direct input, especially consisting of requirements regarding the visibility of the line, to be then considered in the framing of later stages of the planning process [7,78]. Therefore, we consider this involvement as a form of consultation. Although the planning phases of the project *Stor-Oslo* are not finished yet, collecting stakeholder views early in the process is gaining momentum in Norway. Streamlining the process in this way may therefore reduce the risk of time-costly appeals at the end of planning procedures.

4.5. Cross-country comparison

The planning processes for transmission lines differ between France and Norway in several points. The most salient one is the involvement of stakeholders, mainly in form of hearings. Statnett in Norway does not have control on the stakeholder hearings in the formal process as it is carried out entirely by the Norwegian Water Resources and Energy Directorate (NVE) [32]. In France, Rte plays a crucial role in the involvement of stakeholders and although large projects are monitored by the National Commission for Public Debate (CNDP) [55,54], Rte is the key actor in charge of stakeholder involvement.

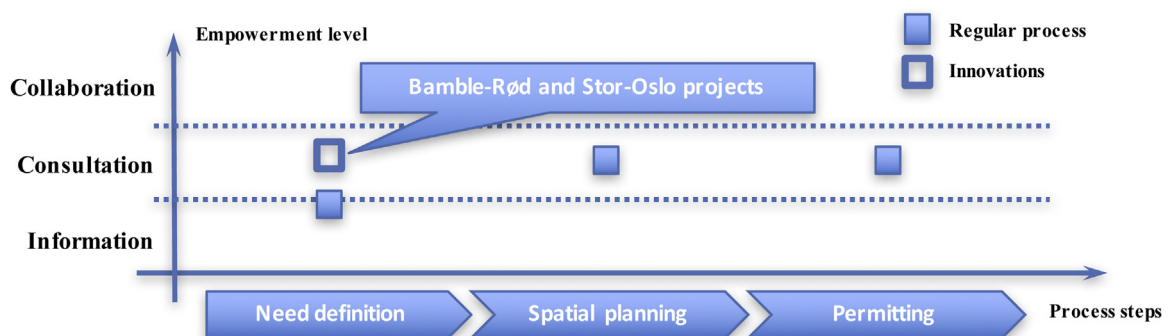


Fig. 7. Additional stakeholder empowerment in Norwegian projects through additional innovations compared to the traditional planning process.

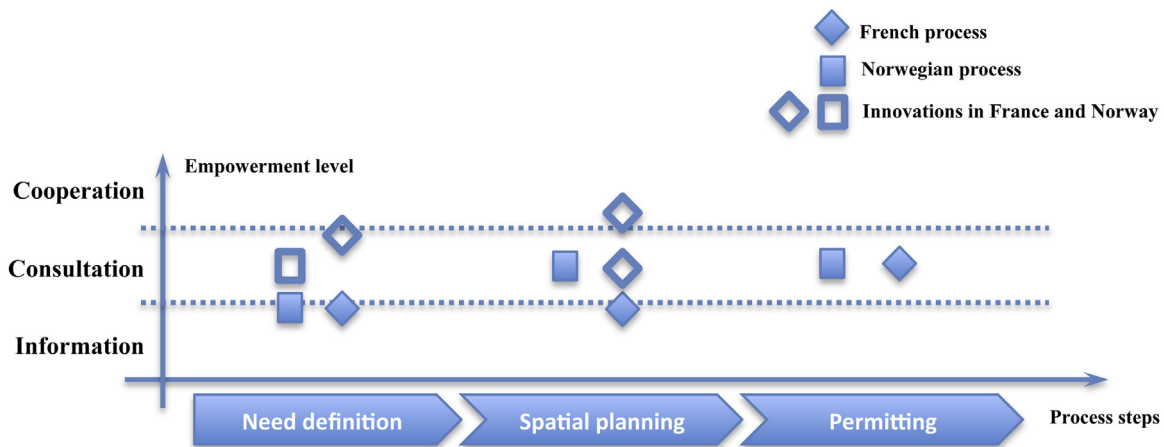


Fig. 8. Comparison of the empowerment levels of the planning procedures in France and Norway and their innovations in newer projects.

The evaluation of regular planning processes in both France and Norway revealed similarities in the involvement of stakeholders between the two countries. First, in both countries there is a common trend of adopting higher levels of stakeholder empowerment in the need definition phase additionally to the formal requirements of the planning regulations, as shown by the innovative projects (see Fig. 8). However, the two countries have different ways to empower stakeholders in the early phase of the project, mainly using citizens' workshops in France and additional stakeholder hearings in Norway. Second, both countries show higher levels of stakeholder empowerment in the spatial planning phase (see Fig. 8). Third, both countries did not increase stakeholder empowerment in the permitting phase.

It is difficult to provide an explanation for these trends. We may hypothesize that this is due to an increased TSO awareness that taking into account stakeholders' perspectives in the early stages of the planning process can avoid later bottlenecks and conflicts. This mechanism is also known as the 'Participation Paradox': over time the interests of stakeholders grow, while the possibility to influence the project decreases [79]. Additionally, recent research showed that stakeholders and citizens are indeed willing to participate in planning processes [80,81].

5. Discussion

In this paper, we describe, evaluate and compare the planning processes for very high-voltage transmission lines in France and Norway by means of a document analysis. Grounding on previous research, we operationalize the degree of empowerment in three levels: information, consultation and cooperation. Our analysis of traditional electricity grid planning procedures shows lower levels of stakeholder empowerment in the early phase of the planning process (need definition) than in the final one (permitting to build the new line). This emerges as a common trend in both countries under study, France and Norway (see Figs. 3 and 6). Also the results about innovative projects reveal a common trend, but it goes in the opposite direction: innovative projects show higher levels of stakeholder empowerment in the need definition and spatial planning than in the permitting phase (see Fig. 8). These results open up several questions: why could we not observe very high levels of empowerment (e.g. cooperation) in the traditional processes? Why could we not observe innovations in terms of enhanced stakeholder engagement in the permitting phase? Why is there a tendency to increase empowerment in the early phases?

In principle citizens could be highly empowered in order to cooperate with equal powers on power lines issues [20]. However, as decisions about power line planning are usually started

at the national or European level, it is unclear how to really empower citizens and how to conciliate their local interests with the national ones. We may hypothesize that the lack of enhanced levels of empowerment in the last critical phase, the permitting phase, reflects the difficulties in effectively addressing the conflicts between the national strategic decisions and local protests. At the same time our results show that, in their innovative projects, the TSOs tend to increase dialogue, engage with stakeholders and address disagreement as early as possible in the procedure. Therefore, they adopt a 'precautionary approach' to anticipate local protests.

The specific characteristics of power lines are another aspect affecting the conciliation between local and national interests. Due to their linear structure, power lines have disadvantages compared to other infrastructures like wind turbines. In the case of wind energy, affected communities can directly benefit from the additional energy production in their area, stimulating in some cases grassroots' initiatives to build wind turbines [82]. In the case of power lines, the question of the added value at the local level remains open because the line usually goes through the land and the affected community does not directly benefit from it. Therefore, it is unclear how a bottom-up approach could actually reduce local protest in planning processes for power lines. However, what a bottom-up approach can do is to open-up critical issues and make conflicts visible since the very early stages of the decision making process. While traditional top-down approaches show their limits in matter of acceptance for power lines [13,7,8], some authors argue that stakeholder engagement should be tailored to the process with the right level of empowerment for each phase of the planning process [39,40]. Our results clearly go in the same direction, showing that there is no 'one solution' for the level of stakeholder empowerment that fits for all the phases of the planning process (see Figs. 4 and 7).

Another result that deserves further discussion is that France and Norway use different ways to empower stakeholders in the early phases of the project, mainly using citizens' workshops for the former and additional stakeholder hearings for the latter. Considering the large amount of methods available (see a non-exhaustive list in [16], each project owner, TSO or regulator can implement participation methods adapted to the purpose of the stakeholder engagement according to the needs, resources and local participation cultures. This reinforces the considerations of Krütli et al. [39] and Stauffacher et al. [40] that participation and its corresponding stakeholder empowerment should be tailored to the project. Nevertheless, what empowerment is effective at what point in time remains unanswered. Higher levels of empowerment are not synonym of better outcomes and lack of conflict. Also, the deci-

sion about the level of empowerment is dependent on a number of social, political, cultural and institutional factors. Although the newer projects described in this paper provide some hints of possible paths to explore, further research is needed on this issue.

Another key difference between France and Norway is the role of the TSOs. In Norway, the formal engagement with stakeholders is carried out by the Norwegian Water Resources and Energy Directorate (NVE), thus out of the direct control of the TSO Statnett. In France, RTE organizes the formal stakeholder participation, often with a monitoring of the National Commission for Public Debate (CNDP). Although RTE emphasizes its role as a servant of the legislator and its political vision on the future of the energy and electricity system [45], this creates a potential bias in the process, where RTE can be perceived as conducting the participatory process to legitimize a decision that has been already made. Nevertheless, a process owner, in this case RTE, can still allow independence of the process by defining how the end-conclusions of the participatory process will influence decision-making [34]. On a different register, Statnett clearly states its stake in the future energy landscape claiming as guiding vision that the “future is electric” [46]. Therefore, co-organizing the planning process while being also an interested stakeholder does not preclude a fair amount of independence, as long as interested stakeholders do not exclusively carry out the process. Therefore, if in the future TSOs need to play a greater role advocating the development of electricity transmission lines against other forms of energy sources or distribution, a participatory process owned by a neutrally perceived instance like it is the case in Norway with NVE seems more appropriate. This has substantial implications for the existing legal frameworks for power line planning. As TSOs act more like private companies defending financial and technical interests, a too deep implication as process owner may compromise the neutrality of the process and this would increase criticism from stakeholders. Therefore, our results suggest that a separation between the process owner and the TSO may have beneficial effects on the process.

Finally, although further empowerment of stakeholders and citizens may be considered as a way to revitalize a stiff representative democracy [28,13,38,35], the question of the limits of stakeholder empowerment remains open. On the one hand, from a political perspective, a power line project might be perceived by some stakeholders to be a form of tyranny of an expanding system where stakeholders are social outcasts (see [83]). On the other hand, power line planning might be considered as the result of a democratic process and of energy politics aiming at expanding the electricity transmission infrastructure. If these two conflicting instances are not addressed, stakeholders who feel neglected will continue to protect themselves and their assets through legal appeals, thus delaying the processes or even causing their failure (see [13,8,84,85]). Increased empowerment of stakeholders is therefore a way to give a voice to stakeholders in order to avoid decision deadlocks, blockades and legal conflicts. Avoiding these delays is crucial to speed up the grid development that is necessary for an energy transition toward a decarbonized European electricity sector.

Acknowledgments

The work in this paper has been supported by the European Commission in the frame of the 7th Framework Programme. The results presented in this paper have been generated through the INSPIRE-Grid project (Grant agreement no: 608472, <http://www.inspire-grid.eu/>). We thank all the members of the INSPIRE-Grid project, especially Anthony Patt from ETH Zurich, Vivien Molinengo from RTE, Irene Meldal and Bente Rudberg from Statnett and Solveig Willgoths from NVE for their valuable insights, comments and input. We also thank three anonymous reviewers for their careful read-

ing of our manuscript and their many insightful comments and suggestions. This paper is based on research carried out at ETH Zurich, within the INSPIRE-Grid work package 3 *State of the art and critical review*. The authors declare no conflict of interest. This paper reflects the authors' views and not necessarily those of the European Commission. Neither the European Commission nor any member of the INSPIRE-Grid Consortium is liable for any use of the information in this paper.

References

- [1] Eurostat, Electricity and Heat Statistics, 2015 (retrieved 19.02.16) http://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_and_heat_statistics.
- [2] European Commission (EC), Energy Roadmap 2050, 2011, COM(2011) 885 final.
- [3] A. Battaglini, N. Komendantova, P. Brtnik, A. Patt, Perception of barriers for expansion of electricity grids in the European Union, *Energy Policy* 47 (2012) 254–259.
- [4] European Commission (EC), Regulation of the European Parliament and of the Council on Guidelines for Trans-European Energy Infrastructure and Repealing, 2011 (Decision No 1364/2006/EC).
- [5] A. Patt, N. Komendantova, A. Battaglini, J. Lilliestam, Regional integration to support full renewable power deployment for Europe by 2050, *Environ. Polit.* 20 (2011) 727–742.
- [6] N.L. Cain, H.T. Nelson, What drives opposition to high-voltage transmission lines? *Land Use Policy* 33 (2013) 204–213.
- [7] RGI (Renewables Grid Initiative), Beyond Public Opposition: Lessons Learned Across Europe, RGI, Germany, 2012.
- [8] Roland Berger, Permitting Procedures for Energy Infrastructure Projects in the EU: Evaluation and Legal Recommendations – FINAL REPORT, 2011 (Tender No. ENER/B1/452-2010).
- [9] T.S. Schmidt, Low-carbon investment risks and de-risking, *Nat. Clim. Change* 4 (2014) 237–239.
- [10] J.E. Fogerty, Oral history and environmental controversy: the Minnesota powerline project, *Oral Hist. Rev.* 13 (1985) 77–91.
- [11] RGI (Renewables Grid Initiative), European Grid Declaration on Transparency and Public Participation, 2012, 05.12.12.
- [12] K. Rottmann, Recommendations on transparency and public participation in the context of electricity transmission lines, in: Position Paper, Germanwatch e.V., Bonn, Germany, 2013.
- [13] A.R. Ciupuliga, E. Cuppen, The role of dialogue in fostering acceptance of transmission lines: the case of a France–Spain interconnection project, *Energy Policy* 60 (2013) 224–233.
- [14] M. Cotton, P. Devine-Wright, NIMBYism and community consultation in electricity transmission network planning, in: P. Devine-Wright (Ed.), *Renewable Energy and the Public: From NIMBY to Participation*, Earthscan, London, UK, 2011.
- [15] N. Komendantova, M. Vociante, A. Battaglini, Can the BestGrid process improve stakeholder involvement in electricity transmission projects? *Energies* 8 (2015) 9407–9433.
- [16] Roland Berger, Study Regarding Grid Infrastructure Development: European Strategy for Raising Public Acceptance, European Commission, 2014 (Tender No. ENER/B1/2013/371).
- [17] G. Rowe, L.J. Frewer, Evaluating public-participation exercises: a research agenda, *Sci. Technol. Hum. Values* 29 (2004) 512–556.
- [18] S.R. Arnstein, A ladder of citizen participation, *J. Am. Inst. Plan.* 35 (1969) 216–224.
- [19] M. Lüttringhaus, Voraussetzungen für Aktivierung und Partizipation, in: M. Lüttringhaus, H. Richers (Eds.), *Handbuch Aktivierende Befragung: Konzepte, Erfahrungstipps für die Praxis*, Stiftung Mitarbeit, 2003.
- [20] I. Rau, P. Schweizer-Ries, J. Hildebrand, Participation. The silver bullet for the acceptance of renewable energies? in: S. Kabisch, A. Kunath, P. Schweizer-Ries, A. Steinführer (Eds.), *Vulnerability, Risks and Complexity: Impacts of Global Change on Human Habits*, Hogrefe, Göttingen, 2012, pp. 171–191.
- [21] M.S. Reed, Stakeholder participation for environmental management: a literature review *Biol. Conserv.* 141 (2008) 2417–2431.
- [22] G. Carr, G. Blöschl, P. Loucks, Evaluating participation in water resource management: a review, *Water Resour. Res.* 48 (2012) W11401.
- [23] T. von Wirth, U. Wissen Hayek, A. Kunze, N. Neuenschwander, M. Stauffacher, R.W. Scholz, Identifying urban transformation dynamics: functional use of scenario techniques to integrate knowledge from science and practice, *Technol. Forecast. Soc. Change* 89 (2013) 115–130.
- [24] P. Devine-Wright, Y. Howes, Disruption to place attachment and the protection of restorative environments: a wind energy case study, *J. Environ. Psychol.* 30 (2010) 271–280.
- [25] M. Wolsink, Planning of renewables schemes: deliberative and fair decision-making on landscape issues instead of reproachful accusations of non-cooperation, *Energy Policy* 35 (2007) 2692–2704.
- [26] R. Wüstenhagen, M. Wolsink, M.J. Bürer, Social acceptance of renewable energy innovation: an introduction to the concept, *Energy Policy* 35 (2007) 2683–2691.

- [27] J. Zoellner, P. Schweizer-Ries, C. Wemheuer, Public acceptance of renewable energies: results from case studies in Germany, *J. Energy Policy* 36 (2008) 4136–4141.
- [28] L. Pellizzoni, L. Vannini, Une idée sur le déclin? Evaluer la nouvelle critique de la délibération publique, *Participations* 2 (2013) 87–118.
- [29] M. Bastard, V. Molinengo, D. Landier, Dealing with stakeholders' expectations: a need for innovative approaches, in: 2014 CIGRE Canada Conference – CIGRE-423, Toronto, Ontario, September 22–24, 2014, 2014.
- [30] M. Cotton, P. Devine-Wright, Putting pylons into place: a UK case study of public perspectives on the impacts of high voltage overhead transmission lines, *J. Environ. Plan. Manag.* 56 (2013) 1225–1245.
- [31] S. Batel, P. Devine-Wright, A critical and empirical analysis of the national-local 'gap' in public responses to large-scale energy infrastructures, *J. Environ. Plan. Manag.* 58 (2015) 1076–1095.
- [32] OED (Norwegian Ministry of Petroleum and Energy), Vi bygger Norge-nettmeldingen lagt frem, 2012 (Press communication Nr. 018/12).
- [33] Legifrance, Code de l'environnement (retrieved 18.06.16), 2016 <https://www.legifrance.gouv.fr/affichCode.do?jessionid=14FC0BD7A550A26451CD21315EFD3291.tpdila14v.1?cidTexte=LEGITEXTE000006074220&dateTexte=20160204>.
- [34] G. Rowe, L.J. Frewer, Public participation methods: a framework for evaluation, *Sci. Technol. Hum. Values* 25 (2000) 3–29.
- [35] G. Smith, *Democratic Innovations: Designing Institutions for Citizen Participation*, Cambridge University Press, Cambridge, UK, 2009.
- [36] T. Webler, S. Tuler, Fairness and competence in citizen participation: theoretical reflections from a case study, *Adm. Soc.* 32 (2000) 566–595.
- [37] T.C. Beierle, Using sodal goals to evaluate public participation, *Policy Stud. Rev.* 16 (1999) 75–103.
- [38] D.J. Fiorino, Citizen participation and environmental risk: a survey of institutional mechanisms, *Sci. Technol. Hum. Values* 15 (1990) 226–243.
- [39] P. Krütli, M. Stauffacher, T. Flüeler, R.W. Scholz, Functional-dynamic public participation in technological decision-making: site selection processes of nuclear waste repositories, *J. Risk Res.* 13 (2010) 861–875.
- [40] M. Stauffacher, T. Flüeler, P. Krütli, R.W. Scholz, Analytic and dynamic approach to collaboration: a transdisciplinary case study on sustainable landscape development in a swiss prealpine region, *Syst. Pract. Action Res.* 21 (2008) 409–422.
- [41] Legifrance, Code de l'environnement – Article L121-9, 2015 (retrieved 04.03.16) <https://www.legifrance.gouv.fr/affichCodeArticle.do?jessionid=CF83DB923D04675DB378B0C73007A061.tpdila14v.1?cidTexte=LEGITEXTE000006074220&idArticle=LEGIARTI000031068965&dateTexte=20160204&categorieLien=id#LEGIARTI000031068965%29>.
- [42] F. Avelino, J. Rotmans, Power in transition: an interdisciplinary framework to study power in relation to structural change, *Eur. J. Soc. Theor.* 12 (2009) 543–569.
- [43] S. Lukes, *Power: A Radical View*, Macmillan, London, 1974.
- [44] ENTSO-E, 10-Year Network Development Plan 2014, European Network of Transmission System Operators for Electricity, 2014.
- [45] RTE (Réseau de transport d'électricité), Schéma décennal de développement du réseau: Edition 2015, RTE, Réseau de transport d'électricité, 2015.
- [46] Statnett, Nettviklingsplan 2015, Statnett, SF, Oslo, 2015.
- [47] A. Bryman, *Social Research Methods*, Oxford University Press, Oxford, UK, 2009.
- [48] J. Scott, *A Matter of Record: Documentary Sources in Social Research*, Polity Press, Cambridge, UK, 1990.
- [49] D.W. Cash, W.C. Clark, F. Alcock, N.M. Dickson, N. Eckley, D.H. Guston, J. Jäger, R.B. Mitchell, Knowledge systems for sustainable development, *Proc. Natl. Acad. Sci. U. S. A.* 100 (2003) 8086–8091.
- [50] G. Rowe, L.J. Frewer, A typology of public engagement mechanisms, *Sci. Technol. Hum. Values* 30 (2005) 251–290.
- [51] CNDP (Commission nationale du débat public), Extrait de: Le cahier de méthodologie, CNDP, 2013, in: Partie « La concertation recommandée par la CNDP », 2013, pp. 54–58.
- [52] NVE (Norwegian Water Resources and Energy Directorate, Trinn 2 – Melding og høring, 2015 (retrieved 18.02.16) <https://www.nve.no/energiforsyning-og-konsesjon/nett/konsesjonsbehandling-av-nettanlegg/saksgang-c/trinn-2-melding-og-hoering/>.
- [53] RTE (Réseau de transport d'électricité), Répondre aux critères d'intérêt général: la justification technico-économique, 2015 (retrieved 19.02.16) <http://www.rte-france.com/fr/article/repondre-aux-criteres-d-interet-general-la-justification-technico-economique?profil=41>.
- [54] RTE (Réseau de transport d'électricité), Rencontre entre territoire et projet: la concertation, 2015 (retrieved 19.02.16) <http://www.rte-france.com/fr/article/rencontre-entre-territoire-et-projet-la-concertation?profil=41>.
- [55] CNDP (Commission nationale du débat public), A quoi ça sert? Permettre à tous de participer à l'élaboration des grands projets. <https://www.debatpublic.fr/a-quoi-ca-sert>, (n.d.) (retrieved 19.02.16).
- [56] RTE (Réseau de transport d'électricité), Reconnaissance de l'intérêt général: la déclaration d'utilité publique, 2015 (retrieved 19.02.16) <http://www.rte-france.com/fr/article/reconnaissance-de-l-interet-general-la-declaration-d-utilite-publique?profil=41>.
- [57] RTE (Réseau de transport d'électricité), Dialoguer avec les propriétaires sur les servitudes et le transfert de propriété, 2015 (retrieved 19.02.16) <http://www.rte-france.com/fr/article/dialoguer-avec-les-proprietaires-sur-les-servitudes-et-le-transfert-de-proprieete>.
- [58] RTE (Réseau de transport d'électricité), Permettre la réalisation de l'ouvrage, le projet détaillé, 2015 (retrieved 19.02.16) <http://www.rte-france.com/fr/article/permmettre-la-realisation-de-l-ouvrage-le-projet-detaille>.
- [59] RTE (Réseau de transport d'électricité), Reconstruction de la ligne de grand transport d'électricité entre Charleville-Mézières et Reims, 2011.
- [60] Aménités, Diagnostics écologique et paysager, enquête socio-environnementale et conférence citoyenne pour une prospective territoriale entre Charleville-Mézières et Reims, 2011 (Montreuil).
- [61] IATEUR (Institut d'Aménagement du Territoire d'Urbanisme et d'Environnement de l'Université de Reims), Etude Socio-économique axe Reims/Charleville-Mézières, in: Partie 1: La situation actuelle des territoires, Université de Reims Champagne-Ardenne, 2011.
- [62] IATEUR (Institut d'Aménagement du Territoire d'Urbanisme et d'Environnement de l'Université de Reims), Etude Socio-économique axe Reims/Charleville-Mézières, in: Partie 2: Les perspectives d'évolution des territoires à l'horizon 2020–2030, Université de Reims Champagne-Ardenne, 2011.
- [63] RTE (Réseau de transport d'électricité), Concertation sur le projet de constriction de la ligne à 400 000 Volts entre Avelin et Gavrelle, 2011.
- [64] RTE (Réseau de transport d'électricité), Les principes guidant RTE pour la concertation, 2012 (retrieved 19.02.16) <http://www.rte-ligne-avelingavrelle.com/la-concertation/regles-jeu/>.
- [65] RTE (Réseau de transport d'électricité), Concertation sur le projet de reconstruction de la ligne à 400 000 volts entre Avelin et Gavrelle, Atelier de proximité de Moncheau 16 avril 2015: Compte-rendu, RTE, Réseau de transport d'électricité, 2015.
- [66] Inelfe (France-Spain Electric Connection), Cooperation Agreement on the Electrical Interconnection Between the Government of the French Republic and the Government of the Kingdom of Spain, 2008.
- [67] Inelfe (France-Spain Electric Connection), Electrical Interconnection Through the Catalan Pyrenees, 2011.
- [68] OED (Norwegian Ministry of Petroleum and Energy), FACTS 2013: Energy and Water Resources in Norway, 2013.
- [69] Statnett, Nettviklingsplan 2013: Nasjonal plan for neste generasjon kraftnett, Statnett, SF, Oslo, 2013.
- [70] Statnett, Kommunikasjonsveileder for prosjektenes tidligste faser – analyser og konseptvalg, Statnett, Oslo, Norway, 2014.
- [71] NVE (Norwegian Water Resources and Energy Directorate, Trinn 3 – Utredningsprogram, 2015 (retrieved 18.02.16) <https://www.nve.no/energiforsyning-og-konsesjon/nett/konsesjonsbehandling-av-nettanlegg/saksgang-c/trinn-3-utredningsprogram/>.
- [72] Statnett, Planprosessen, 2014 (retrieved 18.02.16) <http://www.statnett.no/Samfunnsoppdrag/Miljo/Arealbruk/Planprosessen/>.
- [73] NVE (Norwegian Water Resources and Energy Directorate, Trinn 4 – Søknad og høring, 2015 (retrieved 18.02.16) <https://www.nve.no/energiforsyning-og-konsesjon/nett/konsesjonsbehandling-av-nettanlegg/saksgang-c/trinn-4-soeknad-og-hoering/>.
- [74] NVE (Norwegian Water Resources and Energy Directorate, Trinn 6 – Behandling i OED og vedtak, 2015 (retrieved 18.02.16) <https://www.nve.no/energiforsyning-og-konsesjon/nett/konsesjonsbehandling-av-nettanlegg/saksgang-c/trinn-6-behandling-i-oed-og-vedtak/>.
- [75] OED (Norwegian Ministry of Petroleum and Energy, Statnett SF – 420 kV kraftledning Sima kraftverk i Eidfjord kommune til Samnanger transformatorstasjon i Samnanger konmiune i Hordaland – klage, 2010 (Ref 08/02049-69).
- [76] NVE (Norwegian Water Resources and Energy Directorate, Ekspropriasjon rinn, 2015 (retrieved 18.02.16) <https://www.nve.no/energiforsyning-og-konsesjon/nett/ekspropriasjon/>.
- [77] Statnett, 420 kV-ledning Bamble – Rod: Melding med forslag til utredningsprogram, Statnett, SF, Oslo, 2009.
- [78] Statnett, Konseptvalgutredning for ny sentralnettløsning i Oslo og Akershus, Statnett, SF, Oslo, 2013.
- [79] R. Albrecht, G. Grüttner, T. Lenk, O. Lück, O. Rottmann, Optionen moderner bei Infrastrukturprojekten Ableitungen für eine verbesserte Beteiligung auf Basis von Erfahrungen und Einstellungen von Bürgern, Kommunen und Unternehmen, Kompetenzzentrum Öffentliche Wirtschaft, Infrastruktur und Daseinsvorsorge e.V., Universität Leipzig, 2013.
- [80] P. Schweizer-Ries, I. Rau, J. Zoellner, Partizipations- und Akzeptanzforschung zu Energienachhaltigkeit FVEE Themen: Transformationsforschung für ein nachhaltiges Energiesystem, vol. 2011, Beiträge zur FVEE-Jahrestagung, 2011, pp. 138–144.
- [81] J. Zoellner, I. Rau, P. Schweizer-Ries, Beteiligungsprozesse und Entwicklungschancen für Kommunen und Regionen, *Ökologisches Wirtschaften* 3 (2011) 25–27.
- [82] G. Seyfang, S. Hielscher, T. Hargreaves, M. Martiskainen, A. Smith, A grassroots sustainable energy niche? Reflections on community energy in the UK, *Environ. Innov. Soc. Trans.* 3 (2014) 21–44.
- [83] J.S. Mill, in: D. Bromwich, G. Kateb, D. Binghamton (Eds.), *On Liberty*, Yale University Press, New Haven, 2003.
- [84] RTE (Réseau de transport d'électricité), RTE prend acte de l'annulation de la DUP de la ligne Boutre-Broc Carros par le Conseil d'Etat, 2006 (Communiqué de presse).
- [85] RTE (Réseau de transport d'électricité), Retour d'expérience du projet Boutre Broc Carros, 2008.