Grant Agreement Number: IEE 12/794/SI2.646306

BEST GRID
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BESTGRID best practices background document: Evidence of five guiding principles in Infrastructure projects

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Co-funded by the Intelligent Energy Europe Programme of the European Union

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Content

1. Introduction

Public opposition to infrastructure projects is nothing new. In the US in 19th century the construction of the Erie Canal faced thousand of complaints and lawsuits as a result of negative impacts from the project on local populations. What is new nowadays is that public opinion and engagement is able to stop, delay or modify the design of many infrastructure projects. Under previous forms of organisation of society, infrastructure projects could be executed even despite public protests. For example, Baron Haussmann changed the plan of Paris significantly by construction of new boulevards, which required demolition of existing housing for configuration of large boulevards. However, this infrastructure project would not be possible if Baron Haussmann would not have the power of Napoleon III behind him. Execution of such power is impossible nowadays and is not compatible with the principles of democracy. Nowadays, realisation of infrastructure projects requires public support and acceptance, and it is recognised that public and stakeholder engagement brings positive benefits if it is well organised.

Public acceptance is closely connected with public participation, which is largely understood as democratic principles of inclusiveness and a right of people to participate in decision-making, which can affect their lives (Beierle and Cayford, 2002). Forms of public participation can vary largely, from provision of information through to 'community empowerment' where a community has full decision-making power over resources and the process (International Association of Public Participation, 2004). Public acceptance is also a function of trust, which is closely related to stakeholders' and the public's experiences and perceptions. These are shaped by the details of how a project is planned and designed, and are also by the public's earlier experiences with the relevant institutions' approaches (e.g. whether their local knowledge was taken into account) and the outcomes of previous similar projects (e.g. in terms of experienced impacts on livelihoods and environmental quality). It is a cliché that it takes years to build trust and seconds to destroy it.

Climate change threatens to have huge negative impacts on people and nature. Environmental NGOs increasingly understand the need for power lines to integrate renewables in the effort to reduce greenhouse gas emissions. TSOs increasingly understand the need for environmentally sensitive and socially legitimate development of infrastructure. In addition to the direct and ethical benefits in protecting nature and engaging with affected groups, TSOs understand the need to advance good

practice in these areas for public acceptability reasons - for the specific project in question and also to build trust (and thus public acceptability) for all subsequent development procedures involving the same institutions. BESTGRID will serve these needs, and demonstrate with a solid, scientific evidence base, which measures improve engagement, reduce impacts, improve perceptions, build trust and increase support.

2. Background: five guiding principles

“There is a long body of research into the issue of public support and opposition which in a nutshell suggests the importance of five sets of action in the course of project development:

a. Very early involvement of stakeholders in the deliberative process.

b. Clear and constant linking of the need for new infrastructure to the problems that the specific infrastructure project addresses.

c. Complete transparency concerning all aspects of the project, including costs (to whom), benefits (to whom), design choices, involved actors, and environmental, economic, and health impacts.

d. Concerted attention to minimize any environmental and health impacts.

e. Sharing of the benefits that infrastructure brings to society with those that have to make compromises for the good of society.”

Below these are re-ordered, given abbreviated titles (e.g. ‘need’) and briefly explained.

a. ‘Need’

People who think their interests may be negatively affected by a project will, understandably, seek to question the need for that specific project. The solution is clear and constant linking of the need for new infrastructure to the problems that the specific infrastructure project addresses.

b. Transparency’

Affected groups expect and demand to be able to understand who makes decisions affecting them, on what basis, and to be able to hold decision makers to account. Thus maximum transparency

concerning all aspects of the project is required, including costs (to whom), benefits (to whom), design choices, involved actors, and environmental, economic, and health impacts. This is necessary but insufficient: there must also be clear procedures in place for affected groups to engage, and to make their concerns heard.

c. 'Engagement'

Experiences shows there are strong benefits to public acceptability in very early involvement of stakeholders in the deliberative process. Engagement needs to then continue throughout planning and project phases, with methods suited to different stakeholders, and clarity on how their input will be (and has been) taken into account. All parties concerned (TSOs, Public Authorities, Stakeholders and the broader public) need a certain level of trust and need to be willing to contribute to the process and to collaborate and to take others points of views into account. Transparency as well as information are necessary prerequisites for successful participatory processes. Furthermore, sufficient resources (time, knowledge) are needed with both groups of actors – the ones who participate as well as the ones who offer participation.

d. 'Environment'

Public acceptability is increased where potentially affected groups understand that there will be concerted attention to minimizing any environmental and health impacts. This can be achieved through procedures (which should, in themselves, advance accountability and engagement) to take potential impacts into account and to specify actions to avoid or mitigate those impacts.

e. 'Benefits'

Local public acceptability will be low where affected populations feel they derive no benefit from the new infrastructure, for example where a power line passes overhead but is not needed for local electricity supply nor to support local generation capacity and jobs. This can be addressed by sharing of the benefits that infrastructure brings to society with those that have to make compromises for the good of society.

3. Methodology

The goal of the monitoring framework is to collect evidence on which actions lead to success in addressing issues of public acceptance. The realization of the BestGrid project will allow collection of empirical data from the beginning of the pilot projects. These data can serve for development of recommendations for the policy-making process at the European and national levels on how to deploy further electricity transmission grids and to deal with public opposition. The recommendations can be also apply for replications of lessons learned under the BestGrid project in other EU member countries. Moreover, these recommendations will allow influencing of public discourse processes about deployment of electricity grids in Europe.

The framework will include the following milestones. First, summary of what we currently know based on the literature review of renewable, non-renewable and transport infrastructure projects and expertise collected by Germanwatch and BirdLife. This will result in the list of actions for each guiding principle. We will discuss the actions, identified under historical cases, and the actions recommended by NGOs, to develop a list of actions to be recommended for pilot projects under the BestGrid project.

Second, during the discussion with TSOs we will identify feedback on the proposed list of actions and identify which actions could be implemented under each concrete pilot project. This will be based on the feedback from TSOs regarding the previous experience with similar actions, available resources and feasibility of the action under concrete pilot project, and existing or probable barriers for implementation of the action. After the discussion we will be able to finalize the framework of guiding principles and actions.

Ideally, this framework will contain one or more action for each guiding principle to be implemented universally through all pilot projects and one or more actions for each guiding principle, which will vary from pilot project to pilot project (Figure 1). This will allow collection of evidence which of the guiding principles and actions really made difference in addressing the issues of public acceptance.

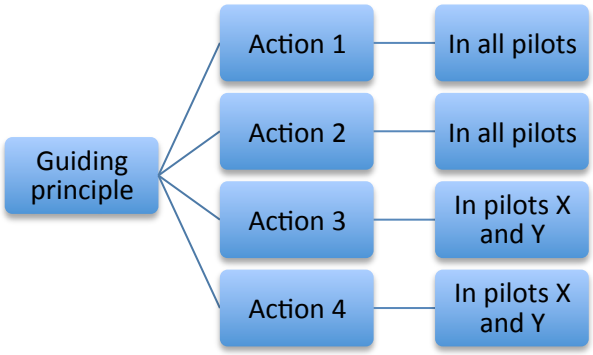

Figure 1: Framework of guiding principles and actions for all four pilot projects

a. During the implementation of the pilot projects we aim to collect evidence about:
b. Which guiding principles and actions were the most important to address the issues of public acceptance?
c. Which were the challenges for implementation of these guiding principles and actions?
d. What was the financial burden for the implementation of guiding principles?
e. How much time did it take?
f. Do the benefits actually exceed the costs of the implementation of actions in the short term, and are there longer term benefits?
g. If actions are implemented all together what would be the difference?

With the implementation of the framework of guiding principles and actions we aim to achieve good and sound outcomes in each pilot project, to clarify costs and benefits of implementation of guiding principles and actions, to identify the most important guiding principles and actions and if they should be implemented all together.

The actions selected for inclusion in the pilot project action plans will need to be specified clearly, and information will be needed on:

a. Brief description of the action, including which guiding principle it addresses
b. Qualitative observations of key differences to standard or good practice for each TSO
c. What is the specific desired outcomes and how it relates to the overarching desired outcomes

d. Time, staff and monetary resources needed for the implementation of the action
e. Information from stakeholders on their perceptions of the action and its outcome
f. Surveys in the context of workshops
g. On-line surveys with participation of stakeholders from affected communities

4. Review of historical cases

This section introduces a set of case studies from infrastructure sectors such as renewable and non-renewable energies as well as transport. The focus of the case studies is on actions which led to success or failure to address issues of public acceptance. Based on historical review, we develop recommendations and additional ideas for consideration of actions in designing pilot project action plans.

4.1. Renewable energy infrastructure case studies

Micro-generation is an interesting example as it requires an advanced form of public acceptance. It requires not only a passive agreement with construction of infrastructure but also an active acceptance by homeowners, whereby individual households become a part of electricity supply infrastructure. However, the passive acceptance of energy generation might change to resistance when it comes to more active form of acceptance in terms of willingness to pay for a higher share of renewable energy, or investing and potentially changing consumer behaviour (Sauter and Watson, 2007).

Another example is ***waste to energy power*** plant. The city of Thessaloniki, Greece, planned to build a Municipal Waste-to-Energy facility at the beginning of the 21st century. However, the project faced severe public opposition from local people. Additionally, application of direct thermal treatment requires heat consumption in a relative short distance for domestic and industrial consumers as well as the existence of adequate infrastructure for distribution of thermal energy and direct heating. The required of additional infrastructure resulted in an increased local community opposition to such investments (Achillas et al., 2011).

The construction of the ***wind park*** in Welshpool, a Welsh village in Powys County, faced severe opposition from its inhabitants. In 2011 protesters came together to challenge renewable energy

developers and the UK National Grid company. The major reasons were, first, perceptions that the Powys county will not benefit directly from power produced by wind turbines. The second was perception that transmission lines and energy installations will destroy the beauty of the county (Williams, 2011). And the county council even called for a moratorium on all new wind-farm applications. This project became a subject of so-called NIMBY effect, when people support development of renewable energies in principle but object it near their homes as they see local detriment and no benefits (Pidgeon, 2012).

The introduction of ***large size wind turbines*** in Greece, installed quickly in few restricted geographical areas, provoked serious reactions from local population led, which in some cases even led to complete cancellation of the wind power projects. Interestingly, the level of acceptance regarding the existing wind parks was relatively high, however, the majority of protests were directed against new installations. In order to study the public perceptions, a public survey was conducted with several representatives to identify the degree of public knowledge about wind energy applications, public awareness about environmental and macroeconomic impacts of wind energy and public attitude regarding new wind parks in view of the NIMBY effect (Kaldellis, 2005).

Two surveys were conducted on the issues of public acceptance among communities of Greater Stavanger, Norway regarding the introduction of ***hydrogen vehicles*** as well as other modes of transportation relying on hydrogen such as public buses and passengers´ ferries. The research showed that even though the public had a positive attitude towards the hydrogen technology, the public acceptance decreased during the three years of the realization of the project (Tarigan and Bayer, 2012).

In the Netherlands, which is a densely populated country, most people accept the need for expanding the transmission grids, but they do not want to have them in their backyard, so call NIMBY effect. The **research work** was conducted jointly by scientists and consultants on the issues of public acceptance for further construction of substations. TenneT, the Transmission System Operator in the Netherlands, wanted to be prepared for the discussion about further construction of substations and started a survey on how to deal with stakeholder needs in relation to substations (Wolsink, 2010).

4.2. Non-renewable energy infrastructure case studies

There are also case studies on public acceptance from non-renewable energy sector like construction large infrastructure projects, particularly ***pipelines***, in the Ecuadorian Amazon. The project to build the Lago Agrio Tank Farm and a 10 km pipelines was faced by severe public opposition. This situation could change due to stakeholder engagement and transparent information process (Benalcazar, 2008).

There are many studies on acceptance issues focused on projects where communities accepted new technologies like ***Carbon Capture and Storage (CCS)***. However, in these studies the term 'acceptance' often means actually no active protest and does not necessarily reflect community approval or support. The characteristics of such communities as well as best-practice public participation processes were studied in science. An example could be the case study of the Australia's Otway Project. Qualitative research methods were used to conduct a human and social capital analysis of the Otway community. An assessment of the project's public participation process was made in light of that analysis. The study found that the community needed capacity-building to enable it to become well-informed about CCS; and to help it develop the negotiation skills necessary to have the proponent address its concerns about the project in a timely manner. The Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC) Otway CCS project in Australia is one of the best know success stories where participation process positively influenced public acceptance (Ashworth et al., 2010). On the surface the community accepted the Otway CCS project, mainly due to such factors as familiarity with gas technology and government legislation and policy regarding the exploration and extraction of resources. Gas wells and pipelines were already situated on the farmers properties. However, sympathy towards CCS technologies appeared to wane after preparation works for the project. Farmers felt being interrupted by repeated soil, water and seismic surveys. They were unprepared for frequency of these interruptions and inconvenience connected with it. The public opposition was driven by existing tensions between different groups of local population, such as farmers and newcomers, who did not really integrate locally. The culture of mistrust and the lack of cooperation with each other was influenced significantly by the previous failed experience to establish a wind farm in the region. The newcomers successfully opposed the project and the farmers lost considerable amount of potential income from the wind -mills to be situated on their grounds. For the project proponent this also created a challenge to identify the community leader who would carry on information and influence the public acceptance patterns. Also the newcomers were tired from the

participatory process for the wind mill, which took place only two years ago and showed the lack of interest to participate in the discussions (Anderson et al., 2010).

4.3. Transport infrastructure case studies

The construction of the Lyon-Turin segment of the European ***high-speed rail*** network was planned to take place in 1990s. However, it faced sever opposition from the side of inhabitants of the Susa Valley in Italy. The public acceptance of risk was influenced by characteristics of hazard, such as influence on environment and public health, and by the communicative approach. These characteristics of hazards were the proposed excavation of two major tunnels and possible spread of dangerous material as well as an increase in noise and electromagnetic pollution due to operations of high-speed train. The protests were so strong that they resulted in a so called “No TAV” movement (No Treno Alta Velocita) and led to demonstration parades, barricades, road and railway line blocks, strikes and scuffles with police (Marincioni and Appiotti, 2009).

In the second half of the twentieth century public acceptance of ***new highways in the US*** was eroded significantly by previous projects. Many of these projects were poorly conceived and insensitively implemented, when infrastructure community ignored its customers. And this lead to a situation when the construction of the highways in the US in the period 1970-1990 was faced by severe public opposition, especially regarding perceived high level of noise. For example, in Kentucky local authorities conducted several public meetings. They were very well attended but the authority underestimated the emotional component. They made only routine presentations at the same time as the opposition showed at this meeting a very well prepared documentation and slides about possible impacts of the highways. The contradiction between presentations given by officials and by opposition was so strong especially regarding its quality that it convinced the public to vote against the highways. At the same time another project of the Youngmann highway received positive reaction from public as the public authorities were much better prepared for communication (Cohn and Harris, 1988).

The construction of ***Wilmington Bypass*** in North Carolina faced public opposition because of perceived impacts from the project on environment but due to a combination of measures to address public concerns it was possible to realize this project (Lane et al., 1998). Two other projects were less successful. The extend of an ***existing runway at the Örebro Airport***, Sweden, and a ***new runway at Manchester Airport***, UK, caused severe public opposition and several years of conflicts as the project developers failed to address the issues of public concerns (Soneryd and Weldon, 2003).

The expansion of the ***port of Rotterdam*** caused at the beginning public resistance due to perceived environmental impacts. However, after involvement of local stakeholders it became possible to realize the project (Palerm, 2006).

Table 1: Historical cases of infrastructure projects

Name of the case	Year	Journal reference	Successful or not	Guiding principle
Micro-generation	2007	Sauter and Watson	Yes	Need
Waste to energy	2011	Achillas et al.,	No	Need, Environment
Wind energy development in Wales	2011	Cowell et al.,	Yes	Benefit
Wind park in Welshpool	2012	Pidgeon		Benefits
Large wind turbines in Greece	2005	Kaldellis	No	Need
Hydrogen vehicles	2008 2012	Heinz and Erdmann; Tarigan and Bayer	No	Need
Transmission grids	2006	Vajjhala and Fischbeck	Yes	Benefits
Oil pipelines	2008	Benalcazar	Yes	Accountability, Environment, Benefits
Carbon Capture and Storage	2010	Ashworth	Yes	Need, Accountability, Engagement
High-speed rail Lyon-Turin	2009	Marincioni and Appiotti	No	Need, Environment
Wilmington Bypass in North Carolina	1998	Lane et al.	Yes	Environment
Youngmann highway	1988	Cohn	Yes	Environment
Nashville highway	1999	Gifford	Yes	Environment
Runway at Örebro Airport	2003	Soneryd and Weldon	No	Environment
Palm Beach airport	1988	Cohn	No	Environment
Port of Rotterdam	2006	Palerm	Yes	Engagement
Runway at Manchester Airport	2006	Soneryd and Weldon	No	

5. The five guiding principles and their evidence in historical cases

5.1. Need

The information campaign on the Lyon-Turin High Speed Rail was problematic due to two factors. First, all news regarding the project were given in national and not local media. Second, the scientific findings on the impacts from rail project were not communicated to public at all. The perception of benefits from the Lyon-Turin High – Speed Rail was influenced by the mass media source, from where majority of inhabitants received information about the project. The majority of inhabitants received information about the project from local and regional newspapers or from participation at the local public meetings. At the same time their interest in mainstream national or international scientific sources was minimal. Therefore, it showed to be important to give news about the project on local media and not national one. In 2006 the risk analysis report of COWI engineering investigated in details the Lyon-Turin High-Speed Rail project but the inhabitants of the Susa Valley were not aware of the existence of this report. At the same time a good benchmark example can be found on the French side of the high-speed rail project, where the new communicative approach lead to a very smooth public debate on the rail project. The national government from the very beginning established prompt and frank communications with local governments and residents of the territory affected by the railway. The early making of a personal viewpoint on risk showed to be especially important for the process of public-consensus-building.

Besides other factors, such as high installation costs, the attitudes towards micro generation were influenced by the limited knowledge about them, which were connected with perceptions of dread risk. This resulted in a situation when consumers with limited knowledge about technology, took a “wait and see” attitude to investment. The historical review showed that there were two possible information campaign actions to solve this problem. The first one is on the source of information. The local and well-known mediators are more likely to have an impact on behavioural changes. Second, the information shall be continuous and it shall show exactly how technology works.

In the case of waste-to-energy the problems with public acceptance were mainly caused by the absence of clear understanding of gains from such projects to local communities. The major perception was that producing energy from waste does not price-compete with producing energy from fossil fuels (Miranda and Hale, 1997). Waste-to-Energy projects are also a strong subject to dread risk and availability heuristics as scientific evidence show that NIMBY syndrome for these types of projects becomes more intense for countries or areas that either do not have any similar previous experience or waste incineration and any other alternative was unsuccessfully implemented in the past. In the case of the Antonios WtE plant, the area is located to recently closed Tagarades landfill which was operating with significant deficiencies, which climaxed in fire lasting for 16 days. This negative experience caused negative availability heuristics towards the WtE project, even though the general attitude of local people is less critical towards integrated waste management schemes compared to waste landfill. The social concerns regarding WtE plant relate to health effects of incinerators emissions, potential accidents involving “toxic” waste, adverse impacts on quality of life and management of industrial waste. The terms like “dioxins”, “furans”, “toxic waste” created significant social concern. The recommendation on the possible action was to organize a dissemination campaign and to make available to public of all information regarding the ability of regulatory control to detect hazardous conditions, on appropriate emergency action plans, adequate technical expertise, competence of regulators and operators. The information campaign is also important as it seams that the lack of public information was regarded as a major reason for public protests.

In the case of installation of new large wind turbines in Greece, the survey of public opinion found the existence of specific minority which was strongly against wind energy applications, disregarding any financial benefits of these projects. These were mainly farmers and stockbreeders. The survey showed that there resistance was caused to a large extent by the absence of any information regarding the projects and any information campaign to address their concerns. Therefore, the recommendation was to organize a targeted information campaign, especially for farmers and stockbreeders.

In the case of CCS participatory activities information provision about the projects included such methods as articles in newspapers and the distribution of newsletters to prepare the community for the establishment of a project (Hance et al., 1990). The general-public communication about CCS and the Otway Project at the State and national levels occurred through CO2CRC website, which contained

information materials produced for local community, media releases and media interviews. The information activities also included newsletters, flyers, fact sheets, which were distributed to 1300 community members a month before the community meeting with the project proponent. They were distributed through local community libraries and displayed at municipal offices. The information campaign also included the dissemination of results from a scientific research on inputs from CCS projects. The dissemination of results from this research influenced public perceptions of the Otway CCS project. But it was also a two-way interaction as the research also investigated public perceptions before and after the information campaign, therefore giving the stakeholders a chance to express their concerns. In the case when the community did not have information or knowledge about a project or a technology before means that the community has no reference to points of its own to check against the proponents´ information materials. This, as in the case of the Barendrecht CCS project, resulted in a situation when information came only from one source. The result was the community unrest about the project (Brunsting et al., 2010).

The introduction of hydrogen vehicles in Greater Stavanger, Norway, was supported by extensive information campaign in media. It was extensively discussed and research by public authorities, energy scientists and industries. The discussions in mass media, such as Internet, radio, TV and newspaper, played a crucial role in influencing changes concerning public knowledge, attitudes and acceptance of hydrogen vehicles and related infrastructure. The greater knowledge among local population lowered the level of support for hydrogen energy, and the number of respondents who supported hydrogen vehicles decreased. In fact, gaining more knowledge lead also to a greater opposition as the media were discussing current and potential barriers for technology, infrastructure availability and the current price of fuels. These issues made respondents to be more realistic about the impacts of technology. Other, then information campaign, factors also played a role in the establishment of negative acceptance patterns. The development of hydrogen projects was very slow in Greater Stavanger. Since the project was launched, no additional development of hydrogen refuelling stations in the region took place, this influenced the level of confidence among communities. At the same time other sustainable fuels became more known in the region. The lack of the vision by the project in the long term might also influence negative dynamic. Additionally, expectations concerning support from partners such as auto industries, policymakers and research groups, did not fulfil.

5.2. Transparency

An assessment of the Otway public participation process found that while it implemented the majority of best practice principles in public participation, it lacked an adherence to three: transparency, fairness and capacity (Anderson et al., 2011).

The authors of the meta-study about public acceptance of non-renewable energy sources claim that a comprehensive and transparent stakeholder engagement strategy was developed to facilitate community participation and evaluation of the project. The stakeholders included local, regional and national government; community councils and associations; non-governmental and religious organizations; and individual landowners. Field visits were conducted, technical presentations were provided, formal and informal comments were solicited and workshops were conducted to arrive at a hybrid alternative with micro routing around areas of stakeholder concern. A key strategic decision was to maintain transparency throughout consultation process and flexibility in the final design, despite an atmosphere of continuous conflict stemming from another recently constructed pipeline in region. The affected communities also participated directly in construction monitoring and environmental and social compliance assessment. Due to the high level of community acceptance and proactive environmental approach the pipelines were constructed in 2003 with no public controversy and have been operating to date without incidents and without any complaint about the stakeholder strategy and methodology (Benalcazar and Thurber, 2008).

In the case of Lago Agio project the negotiations with local communities followed a well-known transparency principle that the negotiation process should be first defined by the needs of general public and not by government and local political leaders. The negotiations took place first with local communities and only then local government could provide their opinion. Negotiation with public was especially important regarding identification of routes for pipelines. The project developers identifies thirteen possible routes and during the transparent negotiation process public could express their opinion regarding each of the routes, especially regarding such questions as demographies, infrastructure, environmental sensitivities and urban growth plans. The best three alternatives were selected based on consultations with local public, technical staff from municipalities, representatives from regulatory authorities, some informal groups and local church. Project developers also involved two critical stakeholders from local communities who participated in all meetings with public

authorities. These individuals functioned as witnesses of transparency in negotiation processes (Benalcazar, 2008).

5.3. Engagement

In the case of the Lyon-Turin High-Speed Rail the central government of Italy failed to involve local administrative bodies into the planned stage of the high-speed rail project. The project was included into the Strategic Infrastructure Act, which is managed at the national level. The lack of early involvement of local stakeholders lead to protests against the project, which were also combined with protests against the national government and a wish to defend the territory from the national and the European Union influence and globalization processes. Later on, the protest demonstrations against the project were joined by local and non-local antagonist collectives such as No-Global and Autonomia. As solution the national government withdrew the project from the Strategic Infrastructure Act and moved it under legislation of the ordinary legislative framework for public infrastructures, which provides a greater involvement of local authorities. Secondly, the independent entity called “Lyon-Turin Environmental Observatory” was established with the goal to facilitate dialog among various high-speed rail stakeholders. The stakeholders from national, regional and local government formed this entity. After more than 70 meetings the Observatory developed recommendations for design of new railway tracks and a new transport policy for the territory.

In the case of Otway CCS project participatory activities included workshops with the intention to reach agreement on possible issues of concern, such as traffic management, noise and dust mitigation during construction phases. The major involvement of public took place at the community meetings. The meetings were announced a month in advance by local radio and newspapers. The local community, as well as politicians from the State and federal levels were invited to attend the meetings. The questions and responses from meetings were published in the project newsletters.

Another case study on patters of public acceptance has also its focus on the CCS in Australia and presents the findings of an engagement process using facilitated workshops conducted in two communities in rural Queensland, Australia, where a demonstration project for IGCC with CCS has been announced. The findings demonstrate that workshop participants were concerned about climate change and wanted leadership from government and industry to address the issue. After the workshops, participants reported increased knowledge and more positive attitudes towards CCS, expressing support for the demonstration project to continue in their local area (Ashworth et al., 2010).

A new organizational form of public involvement allowed a successful realization of the project on the extension of the port of Rotterdam. The public participation was mandatory from the start of the project. However, it was not successful as it failed to provide an opportunity for stakeholders to influence the design of the project. Even worse, the consultation meetings between civil society organizations, government and project developers lead only to the escalation of the conflict. One of the solutions for this conflict was to involve a respected ex-politician as a mediator. Another solution was to organize a committee, which had an independent chair and gave to stakeholders an opportunity to discuss all strategic questions. This solution allowed to minimize conflicts and to create environment leading to solutions acceptable for everybody. The third solution was to enable civil society organizations to take responsibility and to help find solutions. Thus, a joint fact-finding took place where civil society organizations and governmental organizations participated. This fact - finding resulted in an advisory study about the possibilities for compensating loss of natural values in affected areas and the definition of adequate compensation measures for affected protected areas.

5.4. Environment

In the case of waste-to-energy projects public opposition was connected to perceptions of dangerous effects on health and environment. The recommendations to address these concerns were to establish day-to-day monitoring of the plant, which shall be backed up by strict enforcement, even including the shut down of the plant for violation of designed standards.

Gifford (1999) argues that for successful implementation of highways projects a survey of public opinion is essential as it is essential to understand what customers´ value and will support. And one of the major public concerns is increased influenced from highway projects on environment and health. These concerns range from air quality to land use, community separation, to erosion of viable markets for public transit. Public awareness about these externalities increased significantly and with this increase their willingness to accept highway projects significantly declined. Another explanation for the decreasing level of public acceptance is dissatisfaction with facilities being tendered for construction. These facilities failed to refine and adapt their design according to the expectations from public.

In the case of the Youngmann highway public authorities conducted prior meetings with public extensive surveys with inhabitants of the affected communities to understand better their needs. Based on these surveys, they identified that the major issue of concern was connected to possible noise from the highway. During the public meetings authorities showed a well-prepared movie about

how the level of noise can be reduced with the help of special barriers. Further on, additional investment was done to construct the barriers.

In the cased of four forty highway in Nashville the interaction process with public was much more lengthy and at the beginning the opposition to the project was much stronger than in the case of the Youngmann highway. The issue of concern was also connected with the possible high level of noise. The department of Tennessee conducted several studies of possible noise impacts and even sent the specialists to conduct large-scale models in the uniquely outfitted laboratory in Japan as a part of feasibility study for absorptive noise barriers. There were several public meetings as well as the meetings with research team in different locations. The format of these meetings was different. The started with 20 minutes presentations, followed by one hour exhibition on design and construction activities, principles of noise, modelling techniques, noise measurements, including before and after audio tapes, photos of representative noise barriers. Afterwards there was a session with questions and answers. The meetings were combined with extensive media coverage and the noise team members were often guests at the local talk shows.

To address public concerns in the case of the Wilmington Bypass the government commissioned a feasibility study including an environmental impact assessment. This study was then presented to public for negotiation and feedback. The study contained four possible routings. After consultation with public the forth alternative was abolished because of its impacts on wetlands, forest lands, cultural resources and low traffic utilization potentials. As a result, two alternatives were considered as feasible and were further evaluated regarding their environmental impacts. However, one of the remaining alternatives caused again public opposition, as the residents in the vicinity of the planned highway felt that they were not sufficiently involved into the decision-making process and the project developers were event accused in some racial disparities. As a response to these accusations a new Wilmington Bypass public involvement process was conducted. It included an informational workshop those objective was to collect information from communities with the help of questionnaires, which contained questions related to neighbourhood, ranking evaluation factors in order of their importance, asking which projects affect the respondent the most and why. The evaluation factors included air quality, community cohesion, noise, visual impacts, water resources and other. To avoid accusations in racial discrimination the datasets from interviews were selected in a way that they contained equal number of respondents from all national and racial groups. The second stage of stakeholders´ involvement

included project development meetings where everybody was welcome to participate. The meetings were designed to encourage residents of local communities to participate in the project development process. Also each community could nominate a person who would act as a liaison between community and project developers and will generate effective feedback between affected community and project team. After the first set of meetings all concerns were reviewed and the adjusted plans were presented at the second row of meetings. During the second row of meetings inhabitants had a chance to discuss the developed mitigation measures to address concerns raised during the first set of meetings. These mitigation measures included design revisions, landscape plans, sidewalk provisions, noise attenuation features.

In the case of the extension of an existing runway at the Örebro Airport the airport company provided an environmental impact study that the extension will not imply any serious impact for environment and humans. However, the local inhabitants mistrusted this assessment as the company failed to involve local stakeholders into the discussion about impacts from the project, nobody asked their opinion and there was no possibility to influence the process. The local people were not regarded as experts and their direct experience was not translated into the language of the expert system. There were stakeholders meeting but general public was not invited and it was difficult to find information about them. The person from the airport company who came to talk to local people used technical terms, which were difficult for understanding. Also, people feared that the calculations made by the company are incorrect as these were mainly theoretical calculations because the real measurements are very expensive and time consuming and there was no alternative method to compare these results. The correct calculation would give to local people also a chance to receive compensation in some form if the exposure of their houses to decibel levels is higher than applicable limits. The local people hired a layer to request from the company a soundproofing for additional 23 houses and an additional costs of 0.5-1 million Euro. The local people also demanded a limitation on the number of flights during the night time.

In the case of the new runway for the Manchester Airport the company provided an environmental impact study with details on the possible loss of wildlife and countryside. The Secretaries of State for Transport and the Environment approved the application after a nine-month public inquiry. As in the case with Örebro Airport, the airport company failed to involve stakeholders. Indeed, the local stakeholders were invited to meetings and they could express their opinion but then their arguments

were not taken into consideration as their were regarded as less important than scientific and professional arguments. This inability to take into account contextual local knowledge forced local stakeholders to employ legal and scientific experts to frame their arguments. This case shows that public participation was regarded only as a one-way information transfer, from experts to public. If a greater emphasis would be placed on the two-way communication, it would result in better information about possible impacts from the project.

In the case of Palm Beach airport public authority undertook a special feasibility study where the major component was the public involvement phase. The study was conducted by a team of specialists from four different organizations. The team established a large number of citizen´s committees those major aim was to ensure that all interested stakeholders could provide inputs into the development of the abatement analysis scenario. Most of these committees met monthly and representatives of mass media were also present at these meetings. Additionally, the team established a 24-hours telephone line for the case of complaints about aircraft operations. One public meeting took place in the middle of the realization of the project. The meeting lasted for seven hours and did not include any formal presentations but included several information stations. One of the stations included slides presentations about the feasibility study, which was planned throughout the overall meeting. Citizens were able to give comments by speaking directly to stenographer. As results of feasibility study an additional noise staff member was hired, a permanent noise monitoring system was installed and night-time restrictions on noisy aircraft operations were introduced. All these measures improved public perceptions of the airport project and reduced the organized opposition.

In the case of Lago Agrio project the community was engaged into the dialogue with project developers on identification of the best and less intrusive pipeline route as well as on identification and application of environmental standards for pipeline construction and operation. The discussion on environmental impacts included stakeholders from civil society, community leaders, environmental groups, local authorities and the church.

Perceptions of environmental and health impacts from the Lyon-Turin High-Speed Rail were influenced by the dread hazards of uranium mining and asbestos insulation necessary for construction of two railway tunnels in Susa Valley. These two hazards were perceived as a high risk, as the more dreaded and unknown is a hazard, the higher it is perceived as a risk and the greater is the public demand for corrective actions to reduce the threat (Slovic, 1985). Availability heuristics was another

cognitive bias, which influenced public perceptions regarding the project. The problems of atmospheric pollution, along with natural and industrial contamination of water and soil are not new in the Susa valley and the rail project refocused immediately public attention to the old and new environmental issues. The valley was already exposed to all undesirable fallout of large industrial concentrations from Turin. Additionally, the Susa Valley is vulnerable and experienced several natural hazards like floods and landslides and inhabitants perceived that the rail project will increase vulnerability of the valley to these hazards. The correction of the dread risk and availability heuristics lays in the principle of “trust in communicator” (Slovic, 2000). If the trust in sources of communication of risk is high, then even little or poorly substantiated information will come into view as convincing. Hence, early dialog with local stakeholders, especially with local newspapers, was crucial to diffuse understanding of risks from the project based on scientific evidence.

5.5. Benefits

In the case of TenneT and construction of new substations, the interviews with local stakeholders such as asset owners and local authorities showed that acceptance of substations in terms of landscape integration will increase if alternatives are available, especially if some of these alternatives offer added value (through public functions) or are better suited to the surrounding area. The research found out that If TenneT can show the various stakeholders that several alternatives have been investigated and can convince them that TenneT really wants to act as a "good neighbour", it will be able to reduce the initial resistance. Therefore, one of the recommendations would be to introduce feasible alternatives for various landscape types, including urban areas. These alternatives should also provide additional benefits to local communities. As an answer to this recommendation a catalogue or sketchbook describing concepts and practical examples of how to integrate the electrical installation into its environment.

In the case of the wind park in Welshpool the project developers failed to share benefits with local communities, such as to offer communities material local benefits in return for hosting facilities or through various community-driven renewable-project co-ownerships, and as result the project did not take place. Offering co-ownership could be an efficient way to improve public perceptions of the project. For example, in Scotland on the Isle of Gigha a wind-energy project is now owned and operated by community. This ownership structure had positive effects on public acceptance from the side of local population.

In the case of Lago Agio project developers and local government, including local mayor, city council and some representatives of civil society, negotiated a large compensation project for local community with development and social orientation. This involved construction of a public market building following the design requirements from municipality. The selected version of public market came out of possible alternatives discussed with local stakeholders. Additionally, project developers agreed to provide all non-skilled and some skilled job opportunities to local communities and to optimize utilization of local services such as transportation, catering and others.

6. Recommendations: the five guiding principles and sets of actions in historical cases

6.1 'Need'

The historical cases showed that the following actions contributed to public acceptance based on the principle of information sharing and explaining the needs to new infrastructure:

a. Information published in local media, such as media campaign including local or international media source, dependently on preferences from stakeholders
b. Transformation of scientific knowledge and its adaptation to public needs, publication of results from scientific research
c. Engagement of local and well-known mediators to report about the project to overcome perceptions connected with dread risk or negative past experience
d. Clear communication of goals and gains of the project
e. Dissemination campaign about the work of regulators and government to control possible risks
f. Special targeted campaign for separate groups of stakeholders
g. One-way information campaign, including regular newsletters about the project, flyers and factsheets
h. Information campaigns in Internet and new social media

i. Two-way information communication where community and project team learn about concerns from each other, including questions and answers sessions, community meetings, interactive websites, feedback questionnaires

6.2 'Transparency'

The guiding principle of accountability and transparency means to ensure that community is aware of all practices and risks connected with the project and also to ensure that the major stakeholders and public understand the process of implementation of the project and their role in the public participation process. The historical cases showed that the following actions contributed to public acceptance based on the principle of transparency:

a. Principle of talking to general public first and then to local government and politicians
b. Nomination of a representative from community who would watch all negotiations and meetings
c. Participation of community in monitoring of construction
d. Participation of community in environmental and social compliance assessment
e. Publishing of results from meetings in national and local media
f. Transparency throughout consultation process and flexibility in final design

6.3 'Engagement'

One limitation of the stakeholder involvement process is that stakeholders involved into decision-making might be self-selected and can have strong personal interests or be biased for particular solutions. To overcome this limitation there are different actions for public involvement. The historical cases showed that public acceptance issues can be addressed successfully through the following actions for public involvement:

a. Involvement of local administrative bodies into planning process as equal partners to the national bodies
b. Establishment of an independent entity to facilitate dialogue with stakeholders at local, national and regional levels such as project task forces to meet with opposition leaders in privacy and to work out compromise solutions

c. Organization of a committee with an independent chair and opportunity for all parties to discuss strategic decisions such as citizen´s committees to access and utilize knowledge of citizen´s on the project and to answer concerns
d. Workshops to reach agreement on possible issues of concern
e. Community meetings such as public meetings with participation of high level officials
f. Consultation meetings such as three-parts meetings with presentations about the project, information stations and questions-answers sessions, including audio /video/slide presentations played continuously at the information station
g. Information stations with possibility of one-to-one discussion with project team members
h. Organization of votes on certain issues and the willingness of involved partners to give serious attention to the results of the votes
i. Joint fact – finding studies with involvement of local community, project developers and government
j. Opinion surveys on opinion and needs of affected citizen give a sense of personal involvement into the project
k. Dedicated telephone numbers, which are largely advertised and give an opportunity for complaints. However, it is important that all inquiries are answered properly by return call or in writing
l. Involvement of respected ex-politician as a mediator

As the stakeholders´ involvement or public participation in and acceptance of routing decisions for electric transmission lines has delayed and prevented the construction of numerous lines in recent decades, there are scientific works developing recommendations how to address it. One is a new method of public participation called structured public involvement (SPI). The method was developed previously for routing other public infrastructure, but can be adapted to routing electric transmission lines. SPI elicits and quantifies community values then routes the line according to these values and best engineering design practices. The process is done before any potential routes are ever considered by the transmission company and routing professionals, effectively allowing the public, in collaboration with experts, to determine the line route. This reduces the chances of line routing failure by simplifying the project and greatly accelerating the complex problem of comparing alternate line routes, and it facilitates public acceptance of a final route (Jewell et al., 2009).

6.4 ‘Environment’

One of the explanations for the decline in public consensus regarding energy and transport infrastructure is an increasing public concern about social and environmental impacts. The principle of environment protection stems, among others, from the EU commitment to conserving biodiversity, which is based on such legal frameworks as Natura 2000, providing habitats for endangered species, Birds Directive and the Habitats Directive. The need of public participation as a tool to ensure environmental protection is also recognized by the international policies (UN 1992; EC 2000), which underline the value of local knowledge in the environmental decision-making.

a. Joint fact-finding study with NGOs, governmental organizations and project developers on impacts on environment and human health
b. Chaired committee to bring stakeholders from business, civil society and government to discuss possible impacts on environment and human health and to find acceptable to all solutions
c. Establishment of day-to-day monitoring of the project
d. Public surveys on perceptions of environmental risks
e. Movies about measures to control environmental risks
f. Feasibility studies with environmental impact assessment including feedback from local people as well as from experts
g. Ranking of environmental risks based on perceptions from local stakeholders about important of this risk and its possibility to happen
h. Public meetings and workshops to discuss environmental risks

6.5. ‘Benefits’

The principle of sharing the benefits from new infrastructure is often connected with social learning. It means that when infrastructure starts to contribute to social and economic well-being, stakeholders learn to recognize and to realize the benefits from this new infrastructure. The social learning often requires from stakeholders to adapt to the new situation in order to be able to profit from new infrastructure. Thus, the evolution of social acceptance based on sharing benefits from new infrastructure can be also understood as a learning process.

a. To offer local stakeholders to choose from several alternatives for various landscape types, including urban areas or to integrate measures to improve landscape
b. Material benefits for local communities in exchange for hosting facilities

c. Co-ownership by local communities of projects and installations
d. Large compensation projects with social and development orientation
e. Employment of local people for all non-skilled and as much as possible skilled jobs
f. Optimized utilization of local services

7. Literature

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