Citizens in Transition

Best Practices

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Energy transition societal issues and Best practices

Understanding the citizen societal issues related to Energy transition technologies is the key to avoid the consequences of local oppositions and lasting legal procedures. The term "societal" relates here to the close relationship between Energy transition and the society as a whole, including its deeper structures.

Most of these issues are recurrent from technology to technology, from project to project, or from country to country and can therefore be anticipated. They address the political and legal context, the relationship between the project team and the local population, as well as some issues specific to particular technologies.

Based on bibliographic study, on one binational expert workshop organized in November 2017 in the framework of this project and 10 additional interviews of French and German Energy transition actors, 24 societal issues related to citizen acceptance of Energy transition could be identified and analyzed.

We classified these issues in 5 main consistent categories:

(1) Citizen inclusivity,
(2) Mutual trust,
(3) Communication,
(4) Motivation and incentives,
(5) Specific technology issues.

This newly introduced typology of citizen acceptance issues related to Energy transition technologies may be visualized as an onion model, where each successive category forms an additional layer.

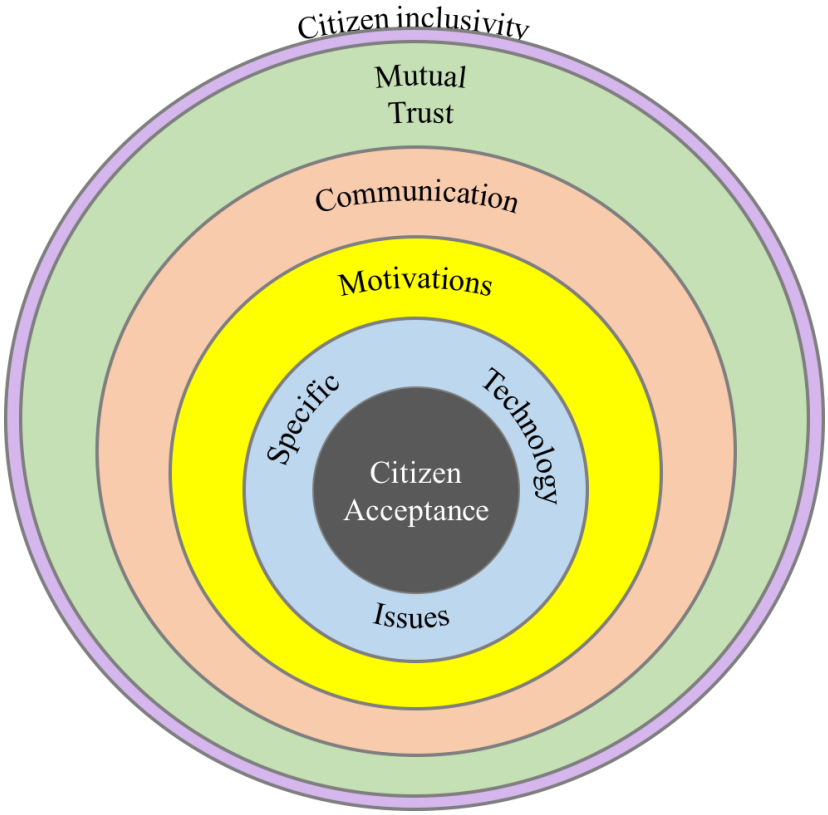

Figure 1: Onion model of citizen acceptance

Each layer represents issues to overcome and required answers, leading closer to the full citizen acceptance at the onion center. The outer onion layer forms the interface between included and excluded citizens (onion's outside) from the Energy transition process. **Citizen Inclusivity** is indeed the societal base of citizen acceptance for the Energy transition. **Mutual Trust** is the next pre-requirement of citizen acceptance, distrust being crippling before an Energy transition project even starts. **Communication and exchanged knowledge** may be built on this base of trust and enables the development of strategies to **motivate citizen** to adopt new technologies. Finally, every technology may present one or more **specific issues** for the society, representing the last barrier to achieve citizen acceptance.

Each of these categories is detailed in societal issue subcategories. These issue categories and subcategories were found significant in both France and Germany, although their frequency and importance may vary locally.

INC – Citizens Inclusivity
INC.1 – Overcoming political and institutional barriers
INC.2 – Overcoming legal and administrative difficulties
INC.3 – Dialogue and listening
INC.4 – Participative decision-making
INC.5 – Enabling citizen initiatives
TRU – Mutual Trust
TRU.1 – Project management and accountability
TRU.2 – Finding local relays
TRU.3 – Social justice
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COM – Communication and Knowledge Exchange
COM.1 – Quality and timeliness of Information
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MOT – Motivation and Incentives
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MOT.4 – Reviving community feeling and local identity
TEC – Technology Specific Issues
TEC.1 – Technology intrusiveness
TEC.2 – Change in neighborhood morphology
TEC.3 – Individual freedom restrictions
TEC.4 – Finding beta users for immature technologies
TEC.5 – Poor local technical skills

Table 1: Citizens in Transition typology of acceptance issues

Some of the listed acceptance issues are interlinked and interdependent. Consequently, the analysis of the issues as well as the listed best practices may overlap some points. Figure 2 shows the main dependencies between the individual issues. For the sake of clarity, these interrelations are not further addressed in the following sections.

Figure 2: Dependencies between the different societal issues

These societal issues are detailed in the following sections. Learnings and best practices for Energy transition project developers, from France and Germany, are presented.

INC – Citizens Inclusivity

Inclusivity encompasses behaviors and policies preventing the exclusion of people based on gender, origins, social class, sexuality, disability, wealth, level of knowledge, access to information, etc. We are obviously not all equal when it comes to Energy transition questions.

Thus, citizen inclusivity can be seen as a societal base of citizen acceptance for the Energy transition, following the deliberative concept of Jürgen Habermas[1]. If citizens feel excluded from this process, or if the rules are not designed for them, they are likely to become indifferent, suspicious or even reluctant to any Energy transition project, spending their time and energy rather against than for it.

INC.1 – Overcoming political and institutional barriers

Energy transition reaches deep into the political dynamics characterizing a given social context (see the Geels & Schot model in part A). Indeed, it affects almost all public policy areas, from energy and environment, economic development policies, agricultural, planning, transport, science and technology, to health policies[2].

However, the long term required for Energy transition planning and citizen appropriation is often in contradiction with the short political schedules imposed by election intervals. National or local institutions may set laws or take local decisions contrary to citizen interest related to Energy transition. The experience shows that even the absence of political support to citizens willing to engage for Energy transition, may be fatal to their efforts: in the brownfield area of *Heppner* in Strasbourg for instance, a group of 150 families motivated to develop an eco-district project were facing the indifference of the municipality, whose planning requirements and project selection process were much more adapted to real estate developers. As a consequence, citizens are unable to engage for the Energy transition, feel to be left aside this global movement, and turn to be reluctant to both political power and the Energy transition implementation like it has been decided.

[1] J. Habermas (1981), as referred to by P.J. Schweizer (2017) in Partizipation bei der Energiewende und beim Ausbau der Stromnetze: Philosophische Fundierung, in Die Energiewende verstehen – orientieren – gestalten
[2] FP7 European project Milesecure-2050, multidimensional impact of the low carbon European Strategy on Energy Security on Socio-economic dimension up to 2050

Best practices:

A local political support is decisive to enable citizens to be part of the Energy transition. Laws and rules must become more citizen-friendly, integrating occasionally incentives for citizen-driven Energy transition projects.

A citizen inclusive Energy transition policy requires a certain consensus between the different political forces of a municipality, to reduce the impact of political changes on efforts brought to improve Energy transition appropriation by citizens. First steps to adapt the legal framework to the specificities of citizen-driven projects have been taken[3] in France and Germany, but they keep relying on the local political will.

INC.2 – Overcoming legal and administrative difficulties

Even when national and local institutions set legal and financial incentives to encourage citizens to participate to the local Energy transition, these incentives may remain hardly accessible, at least for citizens not supported by professional advisers.

The absence of citizen-adapted commercial and legal frameworks leads to administrative complexity. A citizen cooperative in Beganne - France for instance required 10 years to plan their wind energy project, after having been asked an authorization from the Authority of Financial Market (AMF) which implied a complex cascade structure[4]. The legal framework for such a cooperative in Germany is more adapted to such initiatives[5].

Nevertheless, even with a high technical knowledge and a strong willingness to engage for Energy transition projects, many interested citizens give up: hiring the services of professional lawyers or advisers is most of the time a prerequisite, however the related fixed costs often offset these incentives and the whole project become non-profitable. Even in Germany, participative projects are facing difficulties requiring hard to find professional support[6]

[3] e.g. L. Calandri (2015), Les citoyens dans la gouvernance énergétique : « libre choix », « débat public », in Gouvernance et Innovations dans le système énergétique, De nouveaux défis pour les collectivités territoriales, Paris.
[4] Newspaper Capital, (July, 2014): "L'éolien citoyen anecdotique en France, moteur en Allemagne"
[5] D. Ohlhorst (2017), Akteursvielfalt und Beteiligungsformen im Kontext der Energiewende in Deutschland: das EEG und seine Reform, in Die Energiewende verstehen – orientieren – gestalten
[6] Quoting from Leuphana Universität Lüneburg in the frame of the Transnik project (2017).

Best practices:

The German juridical framework is currently more flexible and straightforward than in France for individual citizens and/or citizen initiatives acting in the Energy transition, according to Andreas Rüdiger from the *IDDRI*. Ideally, legal and administrative frameworks should adapt to the different possible situations, registrations and forms should be low time-consuming, possibly digitized, simplifying for any citizens the access to funds or financial supporting mechanisms related to Energy transition without the systematic support of a professional lawyer to juggle between the different laws and status.

Legal stability is also an essential aspect, which here also differs greatly between France and Germany. It enables citizens to have a long-term vision on rules and laws and commit for the future with complete confidence.

For more complex projects such as citizen-owned windmills or solar photovoltaic installations on public buildings, some private energy companies offer local citizens some adapted "turnkey packages" including commercial and legal support. In Baden-Württemberg, EnBW supported in such a way many citizen initiatives over the last 15 years. Many German cooperative banks[7] play also a significant role, funding citizens Energy transition projects, and bringing them their juridical and financial competencies.

INC.3 – Dialogue and listening

The frequency and quality of dialogues are good hints for the level of inclusivity of an Energy transition project.

In France, public concertation (so-called "*enquête publique*") is mandatory since 1983 (*Loi Bouchardeau*) for projects "likely to affect the environment", as well as to land use planning and urban renewal since 2000 (*Loi SRU*[8]). It consists in informing the population about the features of the new project and gather their observations and feedbacks during a period of at least 30 days. Ideally, public concertation must take place at the earliest phases of the project, reach an audience as wide as possible, and be 100% transparent. The national independent administrative authority *Commission Nationale du Débat Public*

[7] e.g. GLS Bank, Volksbank, Sparkasse.
[8] French Law n° 2000-1208 of December 13th 2000 related to solidarity and urban renewal https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=LEGITEXT000005630252

(*CNDP*) has been created in 1995 to advise project developers and local authorities on public information and dialogue participation and make sure that citizens are well informed and their points of view considered. Thus, it contributes to develop a public concertation culture in France.

In Germany, participation has been strengthened in 2013 by the law for the improvement of public participation and unifying of planning processes (*Gesetz zur Verbesserung der Öffentlichkeitsbeteiligung und Vereinheitlichung von Planfeststellungsverfahren*)[9].

Unfortunately, some project coordinators dread this mandatory process, which often gather fears, worries and contestations, and tend to skimp it.

Best practices:

The mutual exchange of information and knowledge sharing between the project development side and the citizens is essential to improve and legitimate Energy transition projects. Listening and addressing in particular the population fears and worries, even before the mandatory public concertation, shows positive effects on the project opposition reduction. Rational AND irrational worries need to be both answered, no questions or worries should be neglected.

INC.4 – Participative decision-making

Most Energy transition project are planned first and third-party acceptance are requested later, following the "decide-announce-defend" planning process. This "top-down" policy style excludes de facto local citizens and other parties, whose expected role is to provide criticism, not to support the project. As a consequence, non-participatory decision-making processes turn out to be destructive for local acceptance[10]. At the same time, participation is not necessarily sufficient to overcome existing skepticism or opposition[11].

The World Bank also recognized that engaging various actors in participatory decision-making is an important way of reaching a balance between different

[9] Gesetz zur Verbesserung der Öffentlichkeitsbeteiligung und Vereinheitlichung von Planfeststellungsverfahren (PlVereinhG) vom 31. (May, 2013): https://www.bgbl.de/xaver/bgbl/start.xav?start=%2F%2F*%5B%40attr_id%3D%27bgbl113s1388.pdf%27%5D#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl113s1388.pdf%27%5D__1518112739270

[10] Wolsink, M. (2000): Wind power and the NIMBY-myth: institutional capacity and the limited significance of public support. In: Renewable Energy 21-1, 2000/09, p. 49-64.

[11] G. Hage, L. Schuster (2018): Daher weht der Wind! in Bausteine der Energiewende

levels of power, creating a platform for actors to communicate on an equitable basis and address problems and set priorities.

Best practices:

The underlying character of planning process must change from confrontation to collaboration. The project developer must first connect with local authorities and create a network of local actors around a project. Stakeholders and local residents must be involved from the very early stage in an "open planning" process (also called participative democracy) with given goals and constraints, but enough flexibility and adaptation possibilities, too.

Consensus must be built, passive supporters must be encouraged to get involved in decision making about Energy transition projects. Getting the adhesion of local residents is much easier based on this consensus, leading to substantial time and budget savings. In the case of wind energy projects, local actors should be able to define certain zones where wind turbines may or may not be sited by letting them propose sites or select from offers. In a successful project conducted in Germany 2002, the local actors additionally chose the planner and the concept itself[12].

INC.5 – Enabling citizen initiatives and cooperatives

The most effective way to include citizens in the Energy transition process is to allow and foster their bottom-up initiatives[13]. As individuals, citizens may invest in Energy transition technologies in their own house, participate to crowdfunding campaigns financing renewable energy projects, or even contribute to sponsoring.

Citizens may also join together under the form of citizen cooperatives (generally a "*Gesellschaft bürgerlichen Rechts*" (GbR) in Germany or a "*Société d'Économie Mixte*" in France) for a stronger impact. Concretely, a dozen to hundreds of citizens can for example invest together in a photovoltaic roof, a wind energy installation or a micro hydro-power installation, and manage these installations and their productions in a participative way. Although the motivations of these

[12] Jobert, A.; Laborgne, P.; Mimler, S. (2007): Local acceptance of wind energy: Factors of success identified in French and German case studies. Energy Policy 35, 2751-2760. doi:10.1016/j.enpol.2006.12.005
[13] The Energy transition to energy democracy (2015), Intelligent Energy Europe Project REScoop 20-20-20 Final report

citizens may be firstly financial, most of them see the opportunity to re-appropriate the Energy transition as community. Beyond the symbolic notion of autonomy, it is a militant gesture to make Energy transition become again a citizen matter, and not only a sector whose management has been delegated to a minority of industrial companies.[14]

Best practices:

In Germany, some governments and local companies strongly support citizens' initiatives for the Energy transitions. Municipalities make roofs of public buildings and infrastructures freely available for solar roof initiatives, companies accompany citizens in the creation of citizens' cooperatives etc.

As a consequence, nearly 50% of renewables are in the hands of citizens and cooperative groups.[15] EnBW, the main energy supplier of Baden-Württemberg at the hand of regional and municipal authorities (see part A), started in 2004 offering municipalities and their inhabitants a "Solar-Bürger-Aktiv" model for citizen participation in photovoltaic and wind energy installations.

This model was a facilitating package which includes prepared administrative forms and contracts, guidelines on project management, how to found a GbR[16], a feasibility study based on local irradiations / wind data and the proposition of an accountant and experienced maintenance operator. The model pattern may be easily adapted to different places.

The GbR "Rutesheim-Solar-Aktiv" in the city Rutesheim, Baden-Württemberg, was created in 2004 thanks to this package. It counts 75 members, all inhabitants of Rutesheim, who have originally invested each a minimum of 1 000 € in two photovoltaic installations of 42 kW mounted on the town hall and public high school[17]. The municipality rents its roofs for free during 20 years; then the ownership of the solar installation will be shifted from the cooperative to the municipality.

[14] Guillaume Christen (2016): "Transitions énergétiques et liens avec la nature. Les coopératives citoyennes d'Alsace sont-elles une alternative au marché de l'énergie ?"
Pensée plurielle 2016/3 (n° 43), p. 139-154. DOI 10.3917/pp.043.0139

[15] Wuppertal Institute for climate, environment and energy (ed.) (2017): Realising long-term transition towards low carbon societies. Impulses from the 8th Annual Meeting of the International Research Network for Low Carbon Societies. Wuppertal Spezial 53. Wuppertal. ISBN: 978-3-946356-03-5
https://epub.wupperinst.org/frontdoor/index/index/docId/6636

[16] The GbR is the simplest company form foreseen in the German law, covering the economic cooperation between individuals even without a written contract. Sources: Industrie und Handelskammer Karlsruhe, Bundesministerum für Wirtschaft und Industrie. (2018)

[17] Blog of the GbR Rutesheim-solar https://rutesheim-solar.jimdo.com/rutesheim-solar-aktiv-i/

Thanks to this gesture of the municipality and the interesting feed-in tariff at that time, the payback-period reached merely 8 years. Additionally to the management of this solar installation, the citizens' cooperative members organize frequently visits and presentations to other citizens, leading to a multiplication of the citizens' participation and acceptance in the regions.

France is not that far yet, but the legislation is changing in order to facilitate the development of local initiatives[18]. The local units of the national environment agency *ADEME* also support innovative experiments on this field[19]

[18] e.g. R. Mainnevret (2015) : Les partenariats en forme de sociétés (SEML, SEMOP, SCIC, SAS). "Quelle pertinence pour les collectivités ? in Gouvernance et Innovations dans le système énergétique, De nouveaux défis pour les collectivités territoriales" Paris.
[19] Source: www.ademe.fr

TRU – Mutual Trust

Mutual trust is the necessary social capital of any Energy transition project and a critical recurring issue, particularly when projects reach an industrial dimension. Without trust, citizens won't be receptive to any argument nor messaged of the project team, whatever the quality of their communication plan, since their credibility is not provided.

Mutual trust is a prerequisite at the beginning of many Energy transition projects. It must be further maintained and cultivated during the project development and exploitation phases.

TRU.1 – Project management and accountability

Project developers are the ambassadors of the Energy transition in new projects. Positive or negative experiences of citizens with these projects will rub off the credibility and acceptance of later similar projects. A high-quality management system with a clear accountability and a reachable person in charge is therefore essential to build up trust-based interpersonal relationships between the project development team, public authorities and the citizens.

This accountability should remain over the whole project life-cycle, from the project planning to the implementation, commissioning, exploitation and maintenance and end-of life phases.

Best practices:

Although Energy transition projects involved many different stakeholders (economic, political, environmental protection, etc.), a project coordinator or another responsible person of the development team should be designated as contact point for the citizens and local public authorities. He/She represents the project team accountability externally, from the project development to the implementation. Finally, the project commissioning and audit may be realized by an external independent expert, possibly involving citizens.

After the implementation, a trustable technical assistance and maintenance should be insured, with close contact with the project developers if possible. In some cases, local energy agencies have been created[20] to support the development and the monitoring of projects.

[20] e.g. the Agence Locale de la Maîtrise de l'Énergie de l'agglomération mulhousienne created in 1999.

TRU.2 – Finding local relays

Opposition to Energy transition projects may be grounded by the lack of trust in public administrations, external energy suppliers or private developers. Even companies which support the municipalities in the implementation of Energy transition technologies are generally rather seen as advocate or lobbies than neutral experts. The current debates about "fake news" show how all the given information, even when neutral and scientific-based, is put in doubts[21].

In such a case, local personalities, inspiring sympathy and trust like council members, local ecological associations or other local opinion leaders, might serve as relays[22] to the Energy transition Project planning. Municipal actors are given greater confidence than actors from outside the region, as the confidence in *Stadtwerke* comparing to the "Big four" (see part A) shows. Energy transition projects, even when driven externally, must be sufficiently anchored in the territories.

Best practices:

In the early phases of its projects, *Endura Kommunal*, which supports municipalities in the implementation of wind parks in Baden Württemberg, meets the local council. They ask which essential local partners should be first contacted (ecological associations, clubs, citizen representative) in order to create acceptance and to use them as multiplicator. Possibly, these "opinion leaders" are brought to other similar projects already implemented, with the possibly to exchange spontaneously with the local population on-site.

TRU.3 - Social justice

The interaction between Energy transition and social justice and its consequences, such as energy price evolutions, energy poverty or geographical equity are important topics of discussion[23]. Whether it is at country scale (Northern/Southern hemisphere), at regional scale or between social categories, there are imbalances towards climate change: some have

[21] A.Brunnengräber (2018), Klimaskeptiker im Aufwind, Wie aus einem Rand- ein breiteres Gesellschaftsphänomen wird, in Bausteine der Energiewende

[22] e.g. Freiburg Green City, Wege zur Nachhaltigkeit (2007), or the municipal climate Plans (Plan Climat Energie de Territoire) in France

[23] K. Tews (2017), Energiearmut – vom politischen Schlagwort zur handlungsleitenden Definition, in Die Energiewende verstehen – orientieren – gestalten, p. 295

contributed more than others to the phenomenon; some suffer more heavily from the consequences; some citizens hold mainly the drawbacks of the Energy transition, while other market players harvest the benefits.

This sense of injustice is felt by many citizens, for instance in areas where energy suppliers install intrusive renewable energy installation like wind parks, or for citizens who can't afford to insulate their building or change their heating system while energy taxes are rising up. It leads to a dissatisfaction about Energy transition policies and a mistrust of the public authorities and economic system as a whole.

Best practices:

Drawbacks and risks related with Energy transition technologies must be balanced with benefits for the affected municipalities and citizens. In order to increase acceptance for the Energy transition, larger parts of the society need to see themselves as beneficiaries. The expectation towards public authorities to act as keepers of such a social justice is stronger in France, where the welfare-state model is culturally more important (see part A). The question of fair legislations, appropriate tax systems, investment refunding, incentives, however plays a role in Germany too.

In its wind energy project development, *Endura Kommunal* uses rental-pooling for making sure that not only the landowner benefits from the wind energy income but also its direct neighbors also impacted by the new installation. Communes, which benefits from taxes and fees from this new installation may also have this fair redistribution role. Ideally, municipalities choose their project developer according to a catalogue of locally relevant criteria, in particular aiming to realize a maximum of benefits. A good way to achieve local social justice is to give citizen the opportunity to financially participate in and benefit from the new windmills. Therefore, financial participation can be one of the criteria when choosing a project developer.

TRU.4 – Analysis of risks

In order to avoid scaring population and rising local opposition, project developers sometimes hide some inherent risks to new Energy transition technologies, presenting only the shiny side of the medal. However, this

strategy reveals to be counterproductive in a digitalized society of wide internet and (dis-)information access.

Energy transition like all technological and societal disruptions is not a "Zero risk" endeavor: health risks, economical risks, environmental risks, technical risks, data security are part of the equation. An exhaustive and transparent analysis of risks, including a detailed plan to supervise, minimize them and possibly deal with them in case of crisis management is a pre-requirement to a mutual trust between the project development team and the local population. Citizens are more likely to accept risks, if they know and trust (see TRU 1) that they are under control.

Best practices:

Realize an exhaustive analysis of risks for the environment, the citizens and the projects, based on independent scientific studies and a detailed plan to supervise risks, minimize them and possibly deal with them in case of crisis management. For instance, in the case of biogas plant where the spread of putrid odors in the neighborhood is a sizeable risk, innovative real-time odor monitoring enables biogas plant operators to react instantaneously to a leakage, by identifying and repairing it.

Such risk analysis and real-time monitoring can be made publicly available to citizens for the sake of transparency (see COM.2 - Information transparency)

TRU.5 – Dealing with negative experiences

Projects implementing Energy transition technologies may have critical impacts ex post on the local population, due to problems of the technologies themselves, errors in project design, in project operation, or problems in assessing the weight of citizen's expectations with regards to privacy, practicability or comfort. Geothermal power plants experiments led to seismic incidents in South-Western Germany[24] and Switzerland[25], increasing the pre-existing opposition to such projects in the Region. Some wind farms built too close to villages in Northern

[24] Ingo Sass, Ulrich Burbaum (2010): Damage To The Historic Town Of Staufen (Germany) Caused By Geothermal Drillings Through Anhydrite-Bearing Formations
[25] Das Deep-Heat-Mining-Projekt in Basel (2018): " Technischer und erdwissenschaftlicher Hintergrund": http://www.seismo.ethz.ch/static/Basel/www.seismo2009.ethz.ch/basel/indexb941.html?m1=project&m2=background

Germany (project-developers having used municipal competitions to their advantage) setting off growing controversies.

If a successful crisis management is not promptly set up, citizens may feel cheated by the installer or project development team. As a consequence, such negative experiences may spread out very quickly in the rest of the population, locally and on a wider scale through social networks, affecting the credibility of the project responsible as well as the whole Energy transition technology.

Best practices:

To further maintain the trust between the different actors of the running project, and keep a solid credibility basis for the next projects, project responsible must take on responsibility before citizens for possible negative project outcomes. If the error is not repairable, compensation measures for the victims and/or environmental prejudices must be taken (such financial compensation may be worth more compared to the effect of long-term credibility losses). The lessons learnt must then be shared and used by other projects.

COM – Communication and Knowledge Exchange

Even when a societal base and social capital is locally existing, an Energy transition project seeking for local citizen acceptance, cannot afford a communication disaster. The challenge of communication is not as trivial as it may seem, particularly for the historic industry which has worked for decades with limited contact to citizen, developing *au contraire* a culture of secrecy on nuclear and grid safety issues.

The change of context following the digitalization of information, new market competitors and bottom-up projects is changing the rules of project management on the field of energy. While adapted timing, formats and transparency are prerequisite for a good communication process, it is also essential that the citizens get the global stake of new Energy transition technologies, before adhering to it.

COM.1 – Quality and timeliness of information

Information quality has been conceptualized with different "dimensions" or "metrics" by academics[26] as well as federal administrations[27] : relevance (also called usefulness or utility), accuracy, timeliness, completeness (or exhaustiveness), coherence, accessibility, security (or integrity), format, compatibility, validity (or unbiased).

Citizen acceptance of Energy transition projects implies to reach an ambitious level for most of these information quality dimensions.

Several of these dimensions depends on the information recipient (the citizen) and could therefore be adapted to different audiences and projects: the relevance relates directly to the usefulness from the public perspective. Complete information for one person may be incomplete for another and too much information for a third one, similarly some information may be too accurate when its degree of precision exceeds the public understanding capability or background knowledge. However, while addressing a group of citizens, information accuracy and completeness should be levelled upwards.

[26] Miller H. E., The Multiple dimensions of information quality - Information Systems Management · March 1996.
[27] Information Quality Act - Public Law 106-554, 2001 - US Federal register

Accessibility and timeliness are two complementary keys of information quality. Without it, citizens might feel passed over and become resistant to the further steps in the process due to their fear of the unknown.

Best practices:

The first information must be brought at the very early stage of the project, even (and particularly) if everything is not fixed and acted yet. Project developers must then provide continuously accessible public information on technologies and project development, if possibly in different formats (informational events, open consultation hours, daily press, websites etc.), fostering exchange between locals, relevant actors and developers. Public dialogues must be of course objective (i.e. accurate, unbiased and reliable) and include experts and responsible persons from politics and administration.

The given information should be adequate to the target audiences, without underestimating its technical understanding (further information in COM.3 - Audience-centered communication). Information from neutral actors and organizations considered trustworthy by the population is most effective (see TRU.2)[28].

COM.2 – Information transparency

Transparency is directly related to the completeness and accuracy of information. The citizens' feeling that a part of the information is hidden by the project development team together with public authorities is very recurrent in the Energy transition. This lack of transparency leads almost systematically to a citizen distrust toward the project developers and public authorities.

Among the information whose citizens complain the most to not be given: project costs, benefits and risks, and their distribution to the different involved parties (users, investors, owners).

[28] Bürgerdialog Stromnetz GbR (ed.) (2017): Netzausbau vor Ort. Dialog in den Regionen. Berlin. https://www.buergerdialog-stromnetz.de/assets/Downloads/BDS-Netzausbau-vor-Ort-Dialog-in-den-Regionen.pdf

Best practices:

Not only technological aspects should be communicated to the citizens but also socio-economic impacts in term of employment, municipal economy, etc. Not only the positive facts are to be given but they have to be informed about risks and negative aspects as well. Even if some risks mentioned by the population look irrational or improbable, they must at least be addressed.

Citizens have to know and weight the different project risks, costs and benefits based on transparent data. The contrary would systematically lead to suspicion and distrust.

COM.3 – Audience-centered communication

"There are not only engineers on this Earth."

Conversely, there are also not only retired people ready to participate at 3 pm to a public information meeting. There is often a misunderstanding between the project development team and the local population, because the message and information of the former does not reach the expectations of the latter.

The perception of this message may also differ based on personal, situational and cultural factors. In his Book "Beyond Culture" (1976), Edward T. Hall distinguished between high-context and low-context communication (also called indirect, respectively direct communication), which refers to the degree to which speakers rely on factors other than explicitly speech to convey their message.

Germany has for instance a low-context communication culture, where words hold the full meaning without room for other interpretation, where conflicts are acceptable (and easily solvable), and therefore with a shorter duration of communication. On the other side of the communication scale, France, as most of Latin and Arabic countries, present a high-context communication culture, with a more internalized understanding of what is communicated living more room for interpretations, where situations and relations count as well as words.

Based on these observations, "Audience-centered communication", also called "Target group specific communication", consists in differentiating the

Information message, form, levels and media depending on the different target audiences, while conserving a high overall information quality.

The different target audiences are generally categorized based on their average age, study and profession, and cultural background. In Germany for instance, people tend to have a stronger affinity for technology than in France. Technological or scientific-based arguments will not reach an average French audience as effectively as "Experience knowledge" (how things went in a similar project). Another example: discussing about money is much more common and well-accepted in Germany, than in France, reflecting the differences between direct vs. indirect communication.

It has to be taken also into consideration that long-time residents might be a more interested and involved target audience, because they stronger connect with a place or area. Twenty years are generally required to create new neighborhood feeling. This must be compared with the average local population staying period which reaches four to five years in France.

Best practices:

At the beginning of the project, the target groups need to be identified in order to tailor the message, language usage and citizen expectations in term of communication. In the case of high contextual communication cultures, relationships and backgrounds between the different project actors and the population should be analyzed. Since citizens' expectations and questions are mostly the same for a same target audience from project to project, the communication plan may be prepared and improved in advanced, whether it be a website, arguments for dialogue with opponents etc.

COM.4 – Reweaving the relation between science and society

Although citizens are globally in favors of Energy transition policies (93% in Germany and 91% in France[29]), they have very different levels of interest, awareness and technical knowledge.

[29] Harris Interactive survey conducted for Heinrich Böll Stiftung on 1004 French adult citizens in November 2017 through the quota methodology (age, living area, gender, profession) http://fr.boell.org/sites/default/files/uploads/2017/12/rapport_harris_-_le_rapport_des_francais_a_lenergie_fondation_heinrich_boll_1.pdf

Furthermore, the relation between Science and Society has undoubtedly changed over the last decade: although science and technologies have become increasingly significant and pervasive in all spheres of social life, science have faced a loss of authority[30] in particular in the political spheres, and young people lose interest in scientific studies.

Many citizens don't understand the usefulness of new Energy transition technologies, like smart grid or smart meter. Why should I postpone my electricity consumptions because of my neighbors? Why is Energy transition a global stake? Why is it useful and urgent? As a consequence, a majority of people become indifferent to Energy transition technologies.[31] The current low-tech trend is a kind of answer to technology complexity.

In this context, reweave the relation between Science and Society is essential to raise acceptance and enthusiasm for the Energy transition technologies.

Best practices:

If the background knowledge and interest of the audience on Energy transition technologies is observed as very low, trying absolutely to educate people (in France, the often to be heard "*Faire preuve de pédagogie*") or to change their values is often counterproductive. Instead, actual population values and levels of knowledge can be evaluated and used to design the most effective communication plan, with an emphasis on the meaning of Energy transition as a society project.[32]

COM.5 – Dealing with external opponents

Some organized groups of opponents, often claiming to be ecological associations, come from outside to destabilize new Energy transition projects, in particular wind park projects, high voltage grid expansion, biogas or hydraulic plants. In the name of their perception of the environment, they act at regional level (for instance in the *Black Forest* in Germany) or even at a national level

[30] "Wissenschaftsbarometer 2" from Wissenschaft im Dialog (WiD). Also from the press: Sueddeutsche Zeitung (July, 2016), Die Zeit (April, 2017)
[31] France Energie Eolienne (September, 2016): "Etude IFOP 2016 Sur L'acceptabilité De L'éolien" http://fee.asso.fr/actu/etude-ifop-2016-lacceptabilite-de-leolien/
[32] Bell, D. Gray, T & Haggett, C. (2005): 'Policy, Participation and the 'Social Gap' in Wind farm Siting Decisions' Environmental Politics Vol 14, no.4 p460-477

(in France), even in quasi-inhabited zones like the former East/West German border where a high voltage grid is planned to be installed.

Their strategy consists in systematically suing authorizations of new Energy transition projects, setting a confrontation atmosphere in public concertation meetings, and trying to convince the local population against the project. They use for this purpose argumentations based on the emotional register, which answer directly the worries of citizens.

Municipalities generally do not have an expert to answer objectively the opponents, while companies supporting the municipalities in their new Energy transition project are not seen as neutral but advocate. As a consequence, the local citizens do not know anymore where is the truth and who to trust. The perception ("*Wahrnehmung*" in German, literally the consideration of the truth) by the citizens is key in the communication against external opponents. Rational arguments brought by the project developer isn't generally enough, since perception of technologies depends on emotions, culture and the credibility of the messenger (see TRU.2).

Best practices:

First of all, better act as react! Speak and act first. Being the second to speak is a disadvantageous position, because most of the communication time is used to answer the first speaker's arguments, instead of leading the discussion. Since their arguments are systematically the same, the project developers may analyze them in advance and prepare factual counterarguments.

Furthermore, in order to oppose their emotional and unverified arguments, rational arguments are often useless. The most effective communication in this case is to bring positive experience feedbacks, and to offer the population to visit similar projects. Local relays (see TRU.2) or independent third parties, seen as trustworthy and neutral, may play a mediator role, participating to the debate with the population, bringing an objective view to the different arguments, and eventually giving a neutral verdict.

MOT – Motivation and Incentives

There are many reasons for active and passive resistance against the Energy transition and its technologies. Creating incentives and spreading motivation helps to mobilize the population. On-site studies and surveys show that citizens are much more accepting new Energy transition projects if benefits and risks are shared fairly between them and the project developers. Enabling and emphasizing financial as well as social advantages may form positive attitudes toward the Energy transition. It encourages to reflect the own practices and to consider individual possibilities to contribute.

MOT.1 – Citizens' resistance to change

The reasons for resistance toward Energy transition technologies and change in general are diverse. Besides the fears regarding issues as health risks or data security, the citizens' resistance is also associated with the desire for individual and family autonomy, or the satisfaction with the present state and effort to change.

There are people enjoying change because they like to deal with new things and circumstances and the opportunity to grow personally and professionally. But there are also the ones who dislike change because they rather prefer their set routines. The latter are more likely to be suspicious of change and thus to oppose new projects. For the effective handling of resistant citizens their motives have to be known. Is it a particular technology they oppose or the general change and associated/feared effort?

Best practices:

To analyze citizens' reasons for resistance in detail it is important to communicate with the citizens. The opportunity to express themselves in person as well as anonymously should be given to them. Therefore, possible methods for investigation are, for instance, open discussions, online surveys, meetings with local city offices or citizens' representatives. Results should be gathered without any fix expectations or judging and individual for each region/city/district.

Further it is important to investigate the user's social practices, needs, knowledge level and routines in order to understand their acting and to be able to develop innovative technologies that are accepted by the user and thus, fulfill

their expected environmental effect. A method to generate such insights on consumers are so called "living labs". A user centered approach to develop usable and acceptable products and services is applied. Product and enhancements are collaboratively created and validated in empirical real-life experiments by users and stakeholders.[33]

MOT.2 – Providing financial benefits for the citizens

Sometimes citizens have the feeling to hold mainly the drawbacks of the Energy transition, while few market players harvest the benefits. The citizens' properties may lose value through projects or their own well-being is impaired. Financial compensation for drawbacks as well as a fair distribution of financial benefits of Energy transition projects among the local affected population counteracts this feeling of social injustice (see TRU.3), and simultaneously increases the acceptance.

Best practices:

Different forms of financial benefits or participations are regularly discussed and tested: a lower electricity price, investment possibilities in Energy transition projects, higher saving interest rates or some compensation payments.

According to a survey of the *Fachagentur Windenergie*[34], 90% of the German population find at least one of these incentives well adapted to raise their acceptance towards wind turbines and even 77% among people who have a negative image of wind energy. The most popular incentive would be a lower electricity price for the local population (64%), followed by the investment possibility for citizens and municipalities. Consequently, first, it should be analyzed if the citizens' acceptance/resistance is linked to personal benefits or drawbacks and what kind of self-interests they have. In a next step, a strategy with respective financial incentives should be developed. It is important to make

[33] Baedeker, C. et al. (2014): Transition through sustainable Product and Service Innovations in Sustainable Living Labs: application of user-centred research methodology within four Living Labs in Northern Europe. Paper for presentation at the 5th International Sustainability Transitions (IST) Conference, August 27-29, 2014 Utrecht, The Netherlands

[34] Fachagentur Windenergie an Land e.V. (FA Wind) (ed.) (2016): Umfrage zur Akzeptanz der Windenergie an Land – Herbst 2015. Ergebnisse einer repräsentativen Umfrage zur Akzeptanz der Nutzung und des Ausbaus der Windenergie an Land in Deutschland. Berlin.
https://www.fachagentur-windenergie.de/fileadmin/files/Veroeffentlichungen/FA_Wind_Umfrageergebnisse_Fruehjahr_2016.pdf

sure, that the strategy is feasible and affordable before making promises to the population[35].

In the case of wind parks, for instance, project developers in the Black Forest distribute incomes not only to the parcel owner, but also to its neighbors who might be directly impacted, in function of the distance.

Another example is a small town called Mastershausen, Germany. Here the municipality invested in renewable energy technologies. The revenue is used to fund the construction of a fast internet connection, playgrounds and a library. In addition, the local Energy transition is further promoted by subsidies for house insulation and public transport[36].

MOT.3 – Creating symbolic rewards

In the case that people are not (only) interested in financial benefits, compensations and incentives through symbolic rewards may be an effective way to strengthen their acceptance[37] of Energy transition projects and their willingness to invest in such. A symbolic reward emphasizes the appreciation and acknowledgement for the citizens' contribution. Furthermore, symbolic rewards are good publicity and are likely to attract attention. As a result, for instance, the recognition and reputation of a municipality increases and attracts tourists. The attraction itself can also be seen as a symbolic reward.

Because of its success in renewable energy, Wildpoldsried, a village in southern Germany, receives about 100 visiting groups each year from countries all over the world. The mayor of Fukushima, Japan, has visited twice[38].

<u>Best practices:</u>
Symbolic rewards might be given for various accomplishments in diverse ways: For example, prizes could be passed to municipalities for the development of effective and fair marketing strategies, a certain amount of installed capacity

[35] Bell, D. Gray, T & Haggett, C. (2005): 'Policy, Participation and the 'Social Gap' in Wind farm Siting Decisions' Environmental Politics Vol 14, no.4 p460-477
[36] Energy transition, The Global Energiewende (January, 2018): " We are the Energiewende: German villages go 100% renewable"
https://energytransition.org/2018/01/we-are-the-energiewende-german-villages-go-100-renewable/
[37] K. Tews (2017), Energiearmut – vom politischen Schlagwort zur handlungsleitenden Definition, in Die Energiewende verstehen – orientieren – gestalten, p. 295
[38] Energy transition, The Global Energiewende (August, 2013):"With Citizen Buy-in, German Village Generates 5X Renewable Energy It Needs"
https://energytransition.org/2013/08/german-village-generates-5x-renewable-energy-it-needs/

from renewables or even the energetic independency, or for participating in pilot projects.

Another possibility to give a symbolic reward is to publicize the achievements on a large scale or to name the municipality in a travel guide. Thereby, they gain recognition as a good role model and tourists are attracted. The organization of thematic events and the installation of symbolic sights or landmarks are further ideas to show appreciation. For example, the exterior of the Splittelau district heating plant in Vienna was once designed by Hundertwasser. But symbolic rewards cannot only be passed to municipalities. Other actors, such as individual citizens, businesses or city districts can also be awarded for their contribution and achievements.

MOT.4 – Reviving community feeling and local identity

Working for a common goal strengthens communities and neighborhood networks. In this perspective, Energy transition projects initiated and developed by communities are great opportunities to develop such community feelings.

At the end of the days, inhabitants may be proud to have achieved at their scale a more environment-friendly world. Such experiences link them together as long as the photovoltaic installation produces solar energy for them, as long as a biomass-based heating district network connect their houses together with a low-carbon heat. Sharing economy applied to Energy transition (e.g. electric cars, biogas plant) may also strengthen these community feelings.

Best practices:

In the Bavarian village of Larrieden, a small group founded a community renewables initiative, originally to struggle against the village desertification. They decided to develop a biogas unit, two district heating networks, and a giant modern wind turbine along with several solar roofs. Suddenly, everyone had a reason to get together regularly, share ideas, talk about costs, and figure out laws and permitting procedures. Thereby, not only the community's economy was saved but also the people got to know each other and the community feeling was strengthened.[39]

[39] Energy transition, The Global Energiewende (November, 2017):" We overlook how renewables can bring people together"
https://energytransition.org/2017/11/we-overlook-how-renewables-can-bring-people-together/

TEC – Technology Specific Issues

The implementation of new Energy transition technologies brings societal issues specific to the different technologies. Some tend to shrink the citizen private spheres with their material and immaterial intrusiveness. Innovative and promising, some may still not be mature, with unknown long-term system performance for instance. As a consequence, citizen societal acceptance of Energy transition may vary depending on the technology features and specific impacts.

TEC.1 – Technology intrusiveness

Several innovative Energy transition technologies deeply interfere with the citizen private sphere. They may be intrusive in different ways: physical obstructiveness, invasion of privacy, and security risk. A survey conducted among a group of senior citizens showed that technology intrusiveness represented 19% of the total technology judgments, but accounted for almost half of the negative judgements in general[40].

Smart home technologies, including smart meters, collect through a bench of sensors daily energy loads and room environmental parameters. These private household-related data may reveal many things about citizens' private life habits. Home automation systems and smart grid technologies control additional devices (e.g. shading, lighting) and energy consumptions, based on algorithms implemented in processors inside their private homes, or in network operator systems.

The psychoanalyst Jacques Lacan has created the neologism "extimate technologies" to designate such new technologies which are both intimate and external[41]. Even if these technologies give valuable services like real-time feedback about energy consumptions, citizens may feel more like targets, rather than agents of their energy use. Rather than being in control, they may become increasingly dependent on these new technologies[42].

<u>Best practices:</u>

[40] Melenhorst, A.-S., Fisk, A., Mynatt, E., Rogers, W. (2004) - Potential Intrusiveness of Aware Home Technology: Perceptions of Older Adults. September 2004, Human Factors and Ergonomics Society Annual Meeting Proceedings 48(2)

[41] Lacan, J. (2006) Le Séminaire de Jacques Lacan XVI : D'un Autre à l'autre. Paris: Editions du Seuil

[42] H. Zwart (2015) 'Extimate' Technologies: Empowerment, Intrusiveness, Surveillance. The fate of the human subject in the age of intimate technologies and Big Data. In: Emerging Technologies and Human Rights (proceedings). Strasbourg: Council of Europe, p. 40-45.

"Extimate technologies" are not limited to the Energy transition. Smartphones for instance are a very invasive technology, able to track us and collect very sensible data on our private life. However, most of smartphone users do not complain about this intrusiveness, assessing that the technology benefits are bigger than the mentioned disadvantages.

To strengthen the acceptance of intrusive technologies as smart meters, benefits for users must be put forward, balancing the disadvantages (intrusion in private sphere). Moreover, trust has to be built up by transparency, asking for instance which private data users want to share with their operators, and rewarding them for this data disclosure.

TEC.2 - Change of neighborhood morphology

Some Energy transition technologies may have an important visual impact on the landscape and the neighborhood landscape: Wind turbines impose their moving silhouettes in the skyline. Photovoltaic panels alter the perception of built exposed surfaces such as roofs and façades, with different materials, surface textures, and colors. Certain persons even perceive "biogas plants as an UFO family having landed in the countryside landscape"[43].

Of course, not all these technologies are installed in "sensitive places". Very few complains about solar panels installed on flat roofs in industrial area, or on roofs which are non-visible for pedestrians and wind parks in the Northern German countryside provoked relatively few objections. However, they undoubtedly changed the neighborhood morphology for the local population. Since aesthetics and perception are subjective, even if 75% of French inhabitants living at proximity of wind turbines have still a good image of them[44], some other citizens may find them too intrusive in their landscape.

Best practices:

Some approaches and tools exist to help authorities preserving the quality of pre-existing urban areas while promoting renewable energies. This is the case of Leso-QSV[45], developed by Swiss researchers from *Ecole Polytechnique*

[43] Extracted from discussion held during Citizens in Transition round table
[44] France Energie Eolienne (September, 2016): "Etude IFOP 2016 Sur L'acceptabilité De L'éolien" http://fee.asso.fr/actu/etude-ifop-2016-lacceptabilite-de-leolien/
[45] Munari-Probst, M. C., Roecker, C. (2015) - Solar Energy promotion and urban context protection : Leso - QSV (Quality Site Visibility) method. Conference PLEA 2015.

Fédérale de Lausanne, which is based on a combined assessment of the architectural integration of solar panels, site sensibility and panel visibility, in order to evaluate the visual impact of solar energy use technologies in urban morphologies.

Many citizens are also proud to have visible Energy transition technologies in their neighborhood, like the former president of the local Rhein-Hunsrück District, Bertram Fleck, who answered a question on wind turbine aesthetics:

"An ugly view? That is a question of value. Some people like looking at wind turbines, because they represent the Energiewende."

Some Energy transition technologies may even become landmarks of the landscape, like some wind parks which have become a promenade for the local population[46], or semi-buried seasonal thermal storage which have been arranged in sightseeing platform.

TEC.3 - Individual freedom restriction

The implementation of some Energy transition technologies may be related to obligations and freedom restriction[47], due to the technology itself, or the way it is deployed.

Because of the current battery capacities, electric car owners are currently forced to stop every 300 km to reload in a sparse network of charging stations, depending on the regions. Smart grid peak shaving technology is based on a delegation of the user energy load control to the network operator. Although this service leads to energy savings, it is not possible anymore to consume what we want when we want. Technology choices become life-style choices.

Some public policies related to Energy transition technology deployments also force citizens to change their old car against a new efficient one in German "Umweltzone", connect their new building to the renewable district heating network in some new urban development (to make it profitable for the

[46] France Energie Eolienne (September, 2016): "Etude IFOP 2016 Sur L'acceptabilité De L'éolien" http://fee.asso.fr/actu/etude-ifop-2016-lacceptabilite-de-leolien/

[47] A. Kibbe, O. Arnold, F.G. Kaiser (2017), Energiewende, nicht ohne selbstgewählten Wohlstandverzicht, Definition, in Die Energiewende verstehen – orientieren – gestalten, p. 331

operators), install the *Linky* smart meter in their home for all French residents etc.

Even if most citizens understand that it is for the common good, few of them feel that the Energy transition rhyme actually with a series of freedom restrictions.

Best practices:

Mandatory deployment of energy transition technologies at local/national scale has the benefit to accelerate tremendously the energy transition, but on the other hand meet a lower local citizen acceptance. In this optic, comparing both French and German smart meter deployment strategies is very telling (see Part B.2). However, *Linky* smart meter contracts leave the freedom to the user to select which of their home appliances may be remotely controlled during peak shaving, and get advantageous tariff contacts for that. Citizens are more inclined to abandon their plentiful life-style if they see direct benefits for them and their community.

TEC.4 – Finding beta users for immature technologies

Energy transition has become an urgency to face climate change and resources scarcity. Public policies set financial incentives for new promising technologies in order to accelerate the emergence of these technologies on the market. However, beta users and early adopters are not easy to find, although they receive generally benefits from testing these not-yet-mature technologies.

Users are generally more reticent in using smart meter or smart home appliances than other fancier technologies (smartphones, vocal assistants etc.), although they are as much intrusive. They are also very marked by the few negative experiences during demonstration phase of these new Energy transition technologies.

Best practices:

In the project *SusLabNWE*, the involvement of households was key to analyze experiences with sustainable product-service-innovations as smart feedback devices (e.g. smart meters). The approach included a combination of financial incentives for participation and a communication strategy (press release, direct contact person in project team, flexible event timing rather after working hours

etc.). Thus, the project succeeded not only in finding a reasonable number of users but also on keeping them, with a dropout rate of 0 %.

TEC.5 – Poor local technical skills.

The Energy transition involves a process of technology transfer, which may be unevenly distributed geographically. There is in some places an inadequate availability of trained installers for the new technological equipment, and a poor quality of locally available technology supplies. Even once the Energy transition technologies are implemented, an absence, discontinuity or poor accessibility of technical assistance and maintenance services represent important issues for local populations.

In such a case, the new transition technologies create dependencies for users with respect to "foreign" experts, manufacturers and technicians, as well as materials and tools which must be imported from outside the locality[48]. As a consequence, citizens may feel abandoned from the Energy transition process, left with an alien technology they can't properly use.

Best practices:

Energy transition is a slow global process. It requires a technology and competence transfer over all territories which requires time and professionals. In France, 330,000 new workers would be required between 2013 and 2030 and 825,000 until 2050[49]. Huge training programs, coordinated at national and local level (e.g. *Pôle Fibre Energivie* in the region *Grand Est*), are needed to prepare these workers to new required competences.

Network of professionals must be built over the whole territory to share experiences and provide a local solution. Several French local authorities have started to organize training clusters (*Pôle de compétences*), but often face a certain reluctance from established professionals, who need to be supported in their efforts to reduce fears and risks when their investment is not immediately clear and certain. An entire new generation needs to be prepared to these new Energy transition jobs.

[48] Project "Pathways for carbon transitions (PACT)" (November, 2014): Report D4.1 "Driving socio-economic forces and actors, acceptability, heritage, policies"
[49] Ademe (2013) - Évaluation macroéconomique des évolutions énergétiques 2030-2050

There are great hopes for French education, but there is still a long way to go in order to turn the corner. For example, one of the only ministries not represented at CNEFOP (*Conseil National de l'Enseignement, de la Formation et de l'Orientation Professionnelle*) is the Ministry for Ecological and Solidary Transition. Germany drives the change through its education: in 2014, there were already 385 renewable energy-related programs at German universities and colleges, and 824 "solar (secondary) schools".