



Generating public acceptance on novel technologies



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Project Executive Summary

SCALE (Smart Charging Alignment for Europe) is a three-year Horizon Europe project that aims at preparing EU cities for mass deployment of electric vehicles and the accompanying smart charging infrastructure.

SCALE partners

List of participating cities:

- Oslo (NO)
- Rotterdam & Utrecht (NL)
- Eindhoven (NL)
- Toulouse (FR)
- Greater Munich Area (GER)
- Budapest & Debrecen (HU)
- Gothenburg (SE)

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Executive summary

Key words

Bi-directional charging, social acceptance, narrative flipping

Summary

From a technical point of view, bidirectional charging can be achieved without major difficulties. However, this approach only works if the vehicle owners also participate. In other words, if they allow their vehicle to be charged and discharged without their control. The framework conditions here are, of course, the possibilities offered by apps in smartphones, which can be used to define minimum charging levels or even times when the car must be fully charged again, and according to which automated charging and discharging management must be based. Nevertheless, it is not transparent to the user why which services are called up when and how. And if emotional fears are added to this, such as "I suddenly need the car and it doesn't have a full tank", "I can't use it to drive my child to the hospital", it becomes difficult to integrate one's own car into bidirectional charging.

This situation of an actually sensible technology failing due to resistance from people is well known. Not only with bidirectional charging, but also with many renewable energy projects, project planners experience that people speak out against a technology and put up resistance.

In this paper we will show a communication way that circumvents this issue. It was tested in real.

Table of Contents

DELIVERABLE ADMINISTRATIVE INFORMATION	1
PROJECT EXECUTIVE SUMMARY	2
EXECUTIVE SUMMARY	4
PURPOSE OF THE DELIVERABLE	6
GENERATING PUBLIC ACCEPTANCE ON NOVEL TECHNOLOGIES	7
CONCLUSION	12



Purpose of the deliverable

Attainment of the objectives and explanation of deviations

In the SCALE project, Bayern Innovativ is involved in dissemination and exploitation of Use Case results in Bavaria. Due to the fact that Sono Motors stepped out of the project, there was no more Use Case to be dealt with. For that reason, BI decided to take a look to another aspect of dissemination and expectation: the question on how to generate public acceptance and persuade third parties / institutions on novel technical steps to go. We developed together with culture people a procedure and verified it on the topic of bi-directional charging. This report explains the procedure and results.

Generating public acceptance on novel technologies

1. The project idea

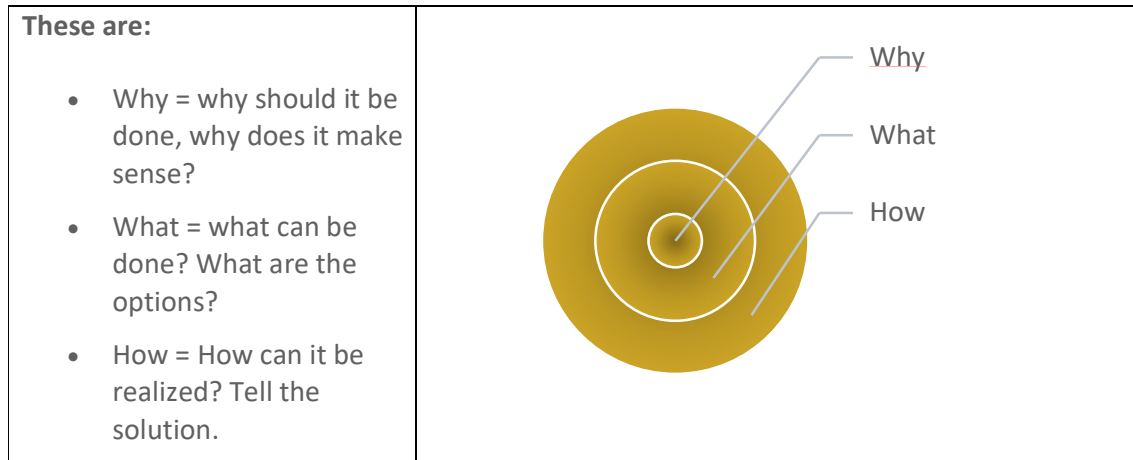
2/3 of people in Germany have very little technical education, which means that they do not necessarily understand the way technicians think and work. They are usually very solution-oriented people. In other words, you identify a problem, look for a solution, then present it and try to implement it. However, this is working less and less. In Bavaria, the majority of citizens are in favor of expanding renewable energies, but not in their own backyard (for example if you want to install a wind turbine). The view is obstructed here, people are afraid of vibrations, stroboscope effect, optical impact and so on. As a technician, you will preferably see the problem that more renewable energy systems need to be built in order to shape the energy transition. The solution offered is: it makes sense to build a wind turbine here, let's do it. However, this is not a persuasive strategy that works with non-technicians.

For this reason, Bayern Innovativ initiated a project in which an attempt was made to create a group with the help of creative people, i.e. artists from the theater (directors, costume designers) or architects and landscape architects, painters and lawyers, who, together with technicians, develop solutions on how to improve *persuasion* for a technical project. In this specific case, this means: "How can we convince car owners to connect their car to a bidirectional charging station, for example"?

In the experiment carried out at BI, the general topic chosen was the acceptance of renewable energy systems, as this was a broader basis and therefore easier to involve all cultural workers and technicians. A model called the Golden Circle was used in the discussion. The idea is not to come up with a technical solution from the outset and explain how it works and why it makes sense to build it here, but to take the opposite approach. The first thing to do is to define and communicate the purpose of the undertaking. Why does XYZ want to do this? What do people get out of it, what is the driver? In a second step, possible solutions can then be presented. Not just one, but several. What could such solutions look like and then further developed in the discussion with citizens towards the optimal solution. Not only the technical aspects should be considered, but also aesthetic or social aspects, for example. This could be access to a wind turbine or the visual impression that a photovoltaic system makes on the landscape. It can also be that the place and location where a bidirectional charging station is installed, which then narrows cycle or pedestrian paths, for example, causes resentment. All of these mostly negative possibilities must be anticipated and accepted in an initial communication phase in order to then develop solutions together with the affected parties in a discussion phase.

2. Golden Circle

The Golden Circle is based on three simple questions.



The "Why" explains why a product or service is being offered. This is not about describing the company's activities and defining what success you want to achieve with them. Professionals, potential customers and investors must be able to identify the internal drivers that drive the entire company in order to define a fixed target. For example, there is talk of revolutionizing the world of work, driving forward the energy transition, mobility towards e-vehicles or the coupling of electricity distribution and e-mobility, without going into the technical side.

The "What" offers the specific solution (product or service) that represents the optimal solution.

The "How" is about making all the preparations to turn the vision articulated under "Why" into reality. To do this, the company must present a suitable strategy for realizing the vision. Several paths can also be outlined. However, no more than four options should be presented, as otherwise making a decision usually becomes more difficult from a psychological point of view.

3. Key findings from the project

The key findings of this project are as follows:

- Early, intensive and clear communication is essential for the acceptance of innovations
- The approach of the Golden Circle method is a successful approach for carrying out this communication.
- The presentation of positive narratives or the transformation of negative perceptions into positive narratives using haptic elements on site has an important supporting function in communication.

4. Application Example for bi-directional charging

The line of reasoning for bidirectional charging was as follows:

3.1 Golden Circle argument for bidirectional charging:

1. Why? (meaningfulness):

- **Climate protection:** Bidirectional charging supports the integration of renewable energies by balancing out fluctuations in the electricity grid and thus replacing fossil fuel power plants.
- **Energy independence:** It helps to reduce dependence on large centralized power plants by strengthening local energy cycles.
- **Sustainable mobility:** Electric vehicles are not only becoming a means of transportation, but also valuable energy storage devices that support society as a whole in the energy transition.

2. What (goals and measures):

- Introduction of charging infrastructures that enable bidirectional charging.
- Development of standards and technologies for communication between vehicles, charging points and the power grid.
- Promotion through financial incentives such as reduced tariffs or bonuses for users who make their vehicles available for the network.

3. How (implementation):

- Expansion of pilot projects to demonstrate the advantages and technical possibilities of V2G.
- Awareness campaigns to make the concept of bidirectional charging and its benefits understandable to the general public.
- Cooperation between car manufacturers, energy suppliers and politicians to create a legal and technical framework.

3.2 Narrative reversal for bidirectional charging:

- **Counterargument:** "Bidirectional charging puts a strain on the car's battery."
 - **Narrative reversal:** "Modern batteries are designed to cope with many charging cycles. Bidirectional charging can even extend battery life, as intelligent control technologies can always keep the battery in optimum condition."
- **Counter-argument:** "The network is already stable enough. Why do we need this?"
 - **Reversing the narrative:** "Due to the increase in renewable energies, we need more flexibility in the grid. Bidirectional charging makes electric vehicles important building blocks for a sustainable and secure energy system."
- **Counter-argument:** "That sounds complicated and is of no use to me."
 - **Narrative reversal:** "As a user, you benefit directly: you can sell electricity from your battery, save on grid charges or even receive remuneration for your participation in the energy market."
- **Counter-argument:** "Not everyone has the opportunity to use it."
 - **Narrative reversal:** "Bidirectional charging is being introduced gradually and is becoming increasingly accessible. The technology is forward-looking and promotes a social transformation towards greater energy autonomy."
- **Counter-argument:** "The technology is too expensive."
 - **Narrative reversal:** "The costs fall continuously with increasing penetration. In addition, the added value generated, such as participation in energy markets, can amortize the investment."
- **Counter-argument:** "Bidirectional charging could lead to data security problems."
 - **Narrative reversal:** "The development of bidirectional charging goes hand in hand with state-of-the-art security standards. Encryption technologies and continuous updates protect your data better than ever before. You also become part of a transparent, future-proof energy system."
- **Counterargument:** "The management of loading times is far too complicated."
 - **Narrative reversal:** "Intelligent control systems do the work for you. The technology is designed to make the use of bidirectional charging user-friendly and automated, so you don't have to worry about it."
- **Counter-argument:** "What happens if I feed electricity back into the grid and then my battery is empty?"
 - **Narrative reversal:** "The system always gives you priority. The intelligent charging infrastructure ensures that your vehicle never falls below a minimum charge level set by you so that you remain mobile at all times."
- **Counter-argument:** "That only helps the energy companies, but not me as a user."
 - **Narrative reversal:** "With bidirectional charging, you yourself become part of the energy market. You can benefit from remuneration for grid support and actively reduce your own electricity bill."
- **Counter-argument:** "The technology is not yet advanced enough."
 - **Narrative reversal:** "Bidirectional charging is already being successfully tested in pilot projects and the technology is constantly being developed further. Those

who get on board now are among the pioneers of a future technology and benefit from the very first hour."

- **Counter-argument: "If many cars feed into the grid, it will certainly be overloaded."**
 - **Narrative reversal:** "Exactly the opposite is the case: bidirectional charging stabilizes the grid by acting as a buffer. The energy from many vehicles balances out peak loads and ensures a more reliable power supply."
- **Counter-argument: "I don't want to use my car as a power source, that's not its main purpose."**
 - **Narrative reversal:** "With bidirectional charging, your vehicle gets an additional benefit that brings you financial advantages and strengthens your energy independence - without any disadvantages for your mobility."
- **Counter-argument: "This is only a temporary solution, in the long term we need other storage solutions."**
 - **Narrative reversal:** "Bidirectional charging perfectly complements other storage solutions. It makes efficient use of existing batteries and is already helping to drive forward the energy transition while we work on further innovations."
- **Counter-argument: "I have no influence on when my car releases energy."**
 - **Narrative reversal:** "You retain full control. You can determine at what times and up to what state of charge your car feeds energy back into the grid. Everything runs according to your conditions."
- **Counter-argument: "What if I need electricity myself in the event of a power cut?"**
 - **Narrative reversal:** "Bidirectional charging can also help in precisely such cases: Your car becomes an emergency power generator that can supply your home. This makes you less dependent on disruptions to the grid."

3.3 Additional benefit:

Bidirectional charging offers advantages that are emotionally and rationally appealing. It's not just about the energy transition, but also about individual benefits for users:

- **Emotional level:** Being part of the solution that solves our energy problems and contributes to climate stabilization.
- **Rational level:** Financial benefits through revenue and lower electricity costs as well as more effective use of renewable energies.

Conclusion

The project generated and demonstrated a procedure for the raising of acceptance for new technologies in public beyond just technical arguments by usage of the Golden Circle Model.

