Create Acceptance

Cultural influences on Renewable Energy Acceptance and Tools for the development of communication strategies to promotE ACCEPTANCE among key actor groups

What is Create Acceptance?

The current understanding of social processes affecting the (non-) acceptance of renewable energy and rational use of energy technologies is limited. Project managers often assume that stakeholders will adopt and adapt to their innovation without resistance. In practice, however, stakeholders such as users, NGO's, neighbours or local public authorities often have different (and possibly conflicting) visions about the innovation and the future world in which the innovation should fit. If these diverging views are neglected, the project might face severe social resistance in the implementation phase. There is a need for empirically based research to understand the complex interactions between stakeholders, the ways these stakeholders block or facilitate the adoption of alternative technologies, and the (institutional) contexts favourable to the acceptance of technological innovation.

Create Acceptance aims at understanding social acceptance of renewable energy and rational use of energy technologies

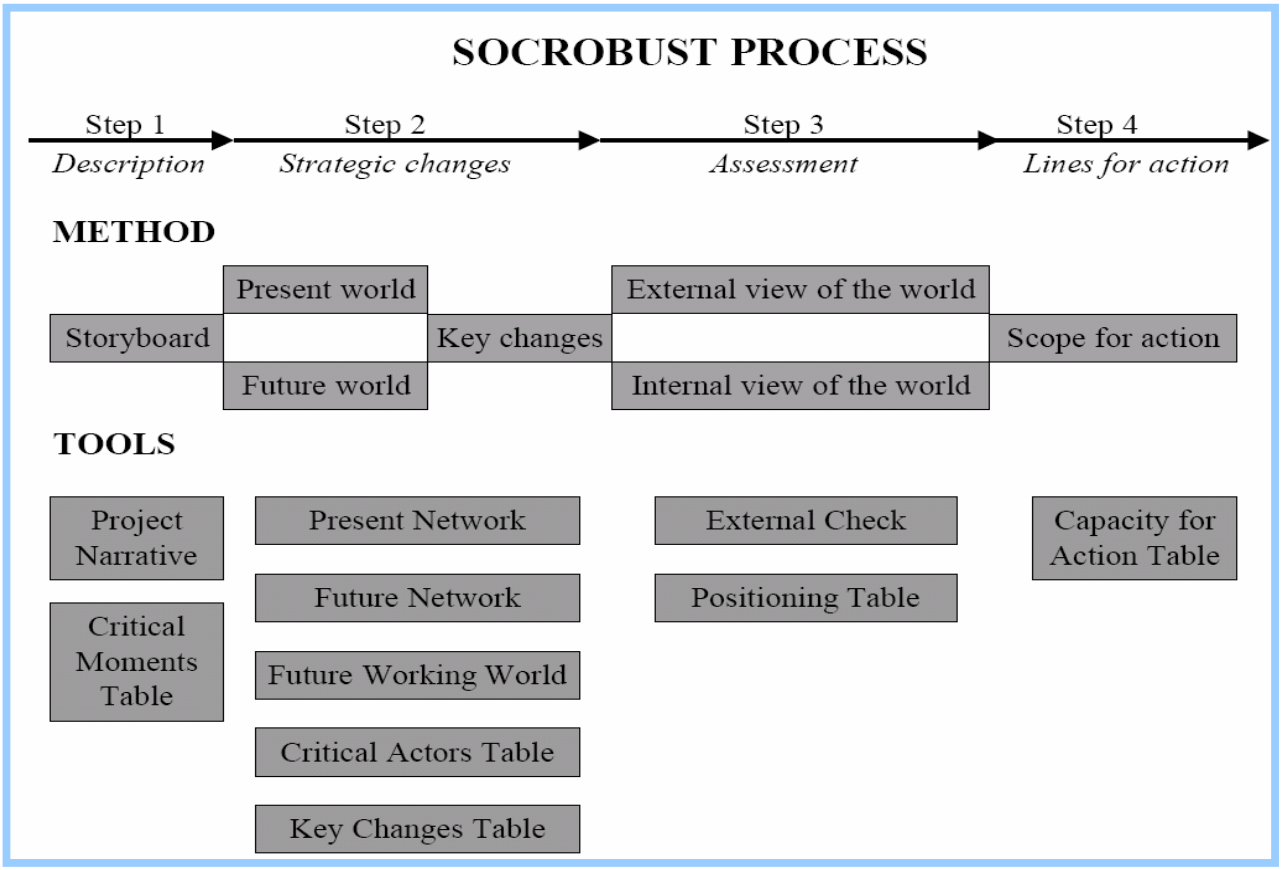
The objective

The objective of Create Acceptance is developing a new multi-stakeholder tool to measure, promote and influence social acceptance. The project Create Acceptance started February 1st 2006 and runs until March 2008. The project aims to improve the social acceptance of renewable energy and rational use of energy technologies. It aims at improving this social acceptance through the development of a tool that not only can measure societal acceptance, but can also be used to promote and improve societal acceptance by creating communication, participation and bridging mechanisms for key stakeholders. It

builds upon a previous developed tool called Socrobust. The new multi-stakeholder tool will become publicly available to energy managers, policy makers, technology developers, intermediary energy service providers, and other possible users **after conclusion** of the project. This will occur by providing the tool and information about the tool on the projects website, including a manual.

The old tool: Socrobust

In 1999 the EC financed a research project to develop a tool platform to measure the social robustness of innovations: Socrobust (Project SOE 1981126 of the TSER Program of the European Commission). Socrobust was a feasibility study, it aimed at providing a technology developer or project manager with information on the assumptions build into a project design. It aimed at enhancing the social robustness by developing a map of the project's future world and compare this map with the current situation (in terms of markets, regulations, technology and science). On the basis of discrepancies between both maps, the technology developer could develop an action plan for increasing the fit between project and future world.



Column of the coordinator

Innovation in all kind of ways

Together with some colleagues at the Energy research Center of the Netherlands (ECN) I felt it was time to start a radical (social science) innovation of our own. The consortium Create Acceptance with nine European institutes and universities was established. Our aim was to continue early attempts to translate 20 years of Science Technology and Society studies on the interaction between innovations and their future stakeholders into a tool beyond the exploratory method Socrobust.

The consortium in itself is an innovation too. First it consists of social science institutes and universities working together with technological innovators and developers, what is called (but still not yet widely applied) gamma-beta cooperation. Secondly, the majority of scientists working on the project are women, a rarity.

But most importantly, what makes this project a rather radical innovation is that it uses and creates sound theoretical social science knowledge to develop a tool. The tool will be used by practitioners dealing with the implementation of (radically) innovative renewable energy and rational energy use technologies. This aim is rather innovative, since intervention in society by (means of) social scientists is a highly debated (and not yet highly praised) issue in social science research. We will keep you informed about our efforts!

Ruth Mourik
ECN
coordinator@createacceptance.net

Five work packages

Work package 1

Work package 1 takes Socrobust as a starting point. In this work package Socrobust will critically be reviewed to identify which aspects need further improvement and adjustment. This work package builds upon scientific debates on large socio-technical systems, transition management, niche management, system innovations and participatory methods. The work package delivers conclusions on how to further modify the Socrobust tool.

Work package 2

Work package 2 aims to do empirical research to provide a better understanding of how social acceptance is managed in various European regions. Experiences gained from past participation and communication efforts are analysed in detail to deliver a compendium of best practices for managing social acceptance of renewable energy and rational use of energy technologies. The results enable the development of a regional sensitive multi-stakeholder tool in work package 3.

Work package 3

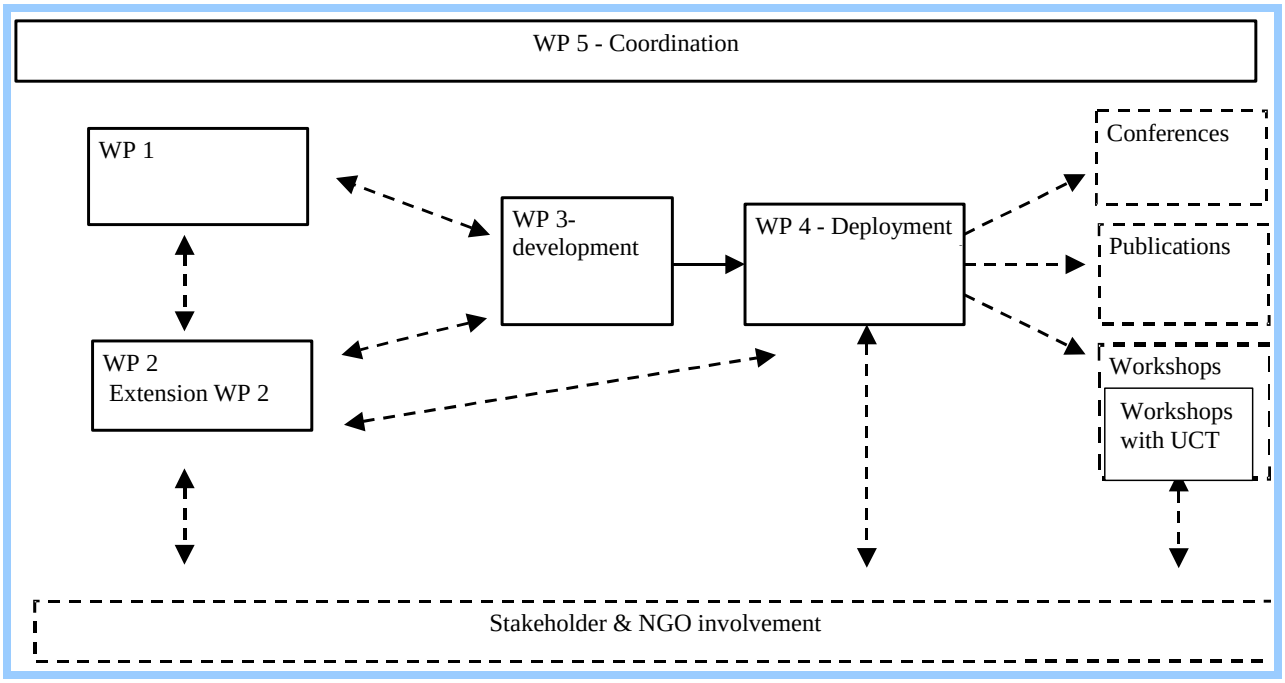
Work package 3 integrates the results from work package 1 and 2. The result of work package 3 will be a new multi-stakeholder tool. The focus is on developed specific methods and instruments. This includes interview protocols, methods for mapping stakeholder expectations, workshop designs and the design of action plans.

Work package 4

In work package 4 the multi-stakeholder tool developed in work package 3 will be validated and deployed in five selected demonstration projects, covering a wide range of renewable energy and rational use of energy technologies as well as various regions in Europe. The demonstration projects are further introduced in the following pages. The project partners organise a multi-stakeholder process for each of these projects, based on the multi-stakeholder tool developed in work package 3. Finally, this work package will evaluate and refine the multi-stakeholders tool after its application in the demonstration projects.

Work package 5

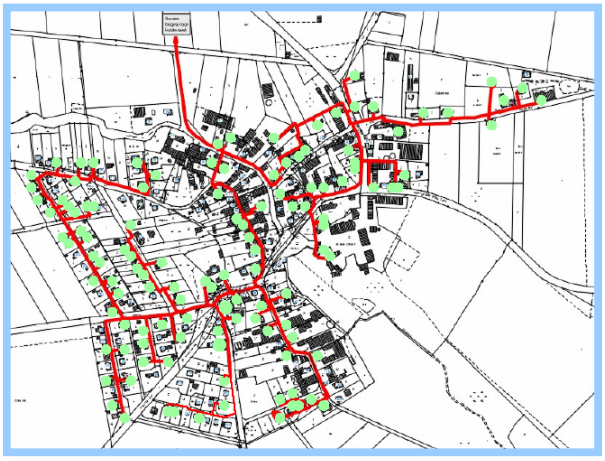
Work package 5 contains the project management and aims at ensuring the adequate achievement of project objectives, on time and within the estimated costs. The project manager ECN also secures adequate levels of communication and promotion of scientific discussion among partners in order to achieve expected levels of scientific and technical outputs.



Five demonstration projects

Germany: Jühnde lives on Bio-energy

The central idea of this model is a complete shift of energy sources for an entire village - away from conventional sources to the renewable and CO_2 neutral biomass. One such community is the bio-energy village in Jühnde, located in the southern part of Lower Saxony, Germany. It is the first of its kind in Germany, and aims to completely replace its fossil energy use for heating and electricity through bioenergy. The know-how attained in Jühnde is to be transferred to other suited neighbouring villages in an upcoming process to be started in autumn 2006.



The energy system in the Jühnde model is operated by a local cooperative company. Beforehand, all inhabitants were invited to participate in the planning process. Working groups dealt with concrete visions about the energy future of their community. The common decision-making and problem-solving in the process of reorientation and conversion to renewable energy sources generated a new sense of orientation and connectedness within the community. So this participatory business case guarantees a high compatibility with local needs and networks of actors, while local competence can be established. One of the formulated aims of the Jühnde model is to support the local cultural heritage, and to strengthen the community life and identity.

Furthermore, a new market for farmers focusing on biomass as a renewable energy source is generated in addition to the traditional demand for crops. Selling bioenergy crops and wood as biomass creates a new income base for local farmers, and leads to higher employment levels in this sector. Economic prosperity can thus be secured in the long-term, given the steady rise in fossil-fuel costs. Also, the overall effect on the region's and country's balance of trade is positive, as payments for oil and natural gas imports are reduced.

The energy production process itself works as follows: Under anaerobic conditions micro-organisms engage in enzymatic digestion of liquid manure and silaged plant material to create biogas in a central facility. The combustion of biogas in a combined heat and power generator (CHP) then generates enough electricity for the entire village, and the co-generated heat is mainly used to heat homes and other living space, replacing the conventional fossil fuels. A smaller portion of the generated heat is required as process energy for the digestion plant. The amount of heat generated cannot cover the high demand during winter months in Germany. During this period, an additional heating plant fuelled with regional wood chips is required.

Italy: Solar on Sicily

Perfect wind and solar conditions make the town of Priolo Gargallo (200.000 inhabitants), a town on the east coast of Sicily (Italy), a unique location for applying innovative sustainable technologies. One major innovation is a local solar power plant. The plant generates steam from solar radiation, which is then fed into the steam cycle of a gas-fired combined cycle power station next to it. The system combines several innovations that overcome the existing problems of solar power systems.

Nobel Prize winning physicist Carlo Rubbia, president of the alternative energy agency ENEA, has opened the pilot of the Archimedes solar power plant in 2004. The prototype on industrial scale, which will supply energy to the town of Priolo Gargallo and save 6.337 tons of CO_2 emissions each year. The project is realised in collaboration with the Italian electricity supplier Enel by a joint venture and is supported by some private banks.

The solar plant consists of a solar field of 40 acres, a storage system and a steam generator. In the modular solar field the solar energy is collected in 54 linear parabolic collectors, with a 5 MW power. The movable collectors are arranged in parallel rows that each form a single string. The number of strings determines the thermal energy and thus the power of the plant. ENEA introduced a new fluid heat carrier (mixture of sodium and potassium) in order to increase the operating temperature and the possibility of storing heat. Another innovation of ENEA is the design of a new type of concentrator based on thinner mirrors that saves construction and installation costs.

The use of large scale heat storage is another innovation in the Archimedes project. Due to two storage tanks operating at different

temperatures, the plant provides heat to the steam generator at a constant rate 24 hours a day, regardless of variations in solar energy availability. The steam generator consists of 'tube and shell' heat exchangers in which heat is transferred to water to produce superheated steam for use in a conventional thermoelectric plant.

The Archimedes project is the first of its kind in the world. Apart from disseminating new technologies, ENEA also wants to stimulate the creation of a self-sustained market. The sunlight, especially in the south of Italy, can make the country rely mainly on solar power. More general, solar power plants will increasingly play a key role in the energy development of Italy towards diversifying energy sources and reducing greenhouse gas emissions.

Hungary: Wind farm with local commitment

In Western Hungary, close to the Austrian border, the first turbine of a wind farm is operational and provides the public lighting costs of the village of Vep (3000 inhabitants). The project company has a two step extension plan: first to install three more turbines of altogether 4.8 MW (second phase), and then 16 turbines of 32 MW (third phase).

During forums in the village on the proposed wind farm, the project was largely supported due to dedicated involvement both with respect to local participation and ownership plans. The project company will transfer 20% of ownership of the turbines free of charge to the municipality, and 40 % will be sold to residents at preferential prices. The municipality has plans to transfer part of the profit on the 20% municipal share into the social support system of the village which has a high unemployment rate. The company form is a so-called public benefit company. Some of the owners and the management have strong local commitment. Besides that, the mayor of Vep is the president of the supervisory board.

A large part of the already installed development was financed from EU support, the rest from bank credit and some own capital and similar is the financing strategy for the second and third phase, also involving grants and Austrian support. The company has a special priority option contract with a major wind turbine manufacturer, therefore the turbines could be quickly delivered despite the for over a year reserved capacities of the supplier.

However, the Hungarian Energy Office, on the suggestion of the system operator, put a 330 MW cap on

total wind capacities in the spring of 2006 (for an unspecified time). The argument justifies it on the basis of imbalances and security problems that intermittent energy can cause to the electricity system as it stands now. The quota has been allocated among applicants for wind power plant energy licences. There were applications for over 1500 MW, thus questions and conflicts of allocating scarce resources arose.

Although technical conditions were already settled with the distribution network operator, the project company has not yet received the wind quota for the proposed extension, Therefore it is uncertain that the turbines will be erected in the coming 2-3 years. However, the project company continues its coordination, designing and permit acquiring work. The quota is not set for ever, and bringing together the several views can accelerate the quota revision, which, due to lobby forces, technical and regulatory developments, may be probable.

Iceland: Hydrogen in transportation

Approximately 70% of the total energy use in Iceland is produced locally with renewable resources. Heat for industrial plants, households and services is provided mainly by geothermal district heating systems or local hot springs. Electricity is generated either by hydro- or geothermal power. The Icelandic government aims to reduce the use of fossil fuels in transportation in order to come to a 100% renewable energy supply. INE (Icelandic New Energy) has developed a roadmap with three major milestones in order to introduce hydrogen into the transportation and fishing sector.

The first milestone was finalised in August 2005, the ECTOS project. This hydrogen fuel cell bus demonstration was the forerunner of the larger CUTE project that demonstrated hydrogen technologies in 10 other European cities. With financial support of the European Commission and some international partners, the first pre-commercial electrolytic hydrogen station in the world that makes compressed hydrogen from water and electricity was opened in April 2003. A few months later three pre-commercial fuel cell busses were shipped from Germany and were used within the public transportation service in Reykjavik. The public reaction to the project was very positive.

The demonstration project with the hydrogen fuel cell busses stopped as planned in August 2005, but later continued under Hy-Fleet CUTE. ECTOS was organised to become a learning experience that can facilitate the use of hydrogen as a fuel on a large scale within Icelandic conditions. Furthermore the outcomes of ECTOS were used to indicate drivers and barriers within the implementation of a future hydrogen economy and further political decision making in Iceland, but also in other countries.

The second step in the hydrogen roadmap - to introduce hydrogen into the transportation and fishing sector - consists of a demonstration project with hydrogen passenger vehicles and light applications. In September 2006 the government allocated financial support for the import of approximately 30 hydrogen personal cars from three continents. This project also includes a fuel cell module to be integrated into a whale watching vessel. The implementation will begin in 2007.

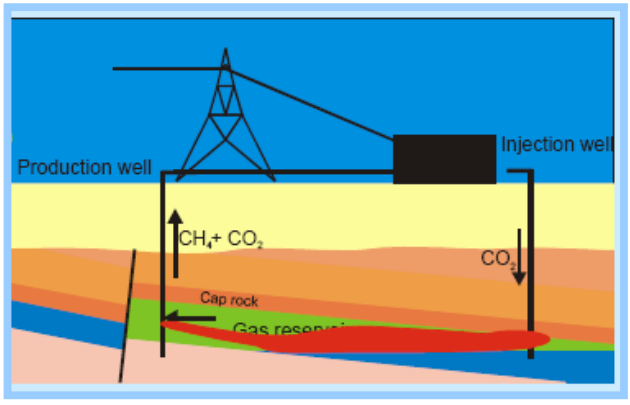
The Netherlands: Zero Emission Power Plant

In Drachten, a town in the North of the Netherlands, a project is being developed to build the first Zero Emission Power Plant (ZEPP) in the world that is able to produce enough emission-free electricity for a small town of hundred thousand households (68 MW). The climate neutral power plant has a go/no-go decision point in 2007 and should be operational in 2009. To realise the project two relatively new technologies are combined.

The ZEPP will be equipped with an innovative gas generator in which the combustion takes place with pure oxygen. To avoid extremely high temperatures, water is injected in the flame. The exhaust of the generator consists of pure CO_2 and water vapour. After condensation, the water is re-used for injection and pure CO_2 remains. This CO_2 is stored in an existing gas field. All consequently the plant produces electricity without substantial emission of any kind. This will result in a CO_2 reduction of one megaton in six years.

The ZEPP will use a gas field which is no longer used but still contains a considerable amount of natural gas. The injection of CO_2 leads to an increased pressure and eases the extraction of the remaining gas of the field (Enhanced Gas Recovery), which will be used in the power plant. Additional the residual heat of the plant will be used for heating nearby buildings. In the Netherlands, several gas fields are suitable for ZEPP technology. And after the plant in Drachten will be operational, possibly others will follow. This project will be the first project in the Netherlands with inland underground storage of CO_2.

The ZEPP in Drachten is initiated by the Dutch company SEQ Nederland B.V. Financial support is given by by ONS energy, an electricity distribution company, local governments and by Energy Valley, a public-private foundation with local, national and European members, which stimulates the economy of the North of the Netherlands through the financing of energy activities.



The consortium

The Energy research Centre of the Netherlands (ECN) is a leading institute in the Netherlands for energy and environmental research and policy advice.

Icelandic New Energy Ltd (INE) is an innovation company with the main purpose of working on innovative projects that can/will lead the way to transform the conventional (fossil fuel) society to a hydrogen society.

The National Consumer Research Centre (NCRC) is a Finnish state research institute for applied consumer research that produces and disseminates research that can be used to enhance the well being of consumers and households and strengthen their influence in decision-making.

The University of Salford, Research Centre for Sustainable Urban and Regional Futures (SURF), Manchester, UK is a research centre that undertakes interdisciplinary research on sustainable urban and regional futures to improve understanding of how fundamental economic, social, environmental and technological changes interact to affect urban and regional futures, to promote interdisciplinary analysis of the sustainability of these changes.

The Spanish Ecoinstitut Barcelona has a large experience in participation processes and since 1999 has applied social participative methodologies to foster social acceptance of big urban transformation projects.

CERIS - Instituto di recerca sull'impresa e lo sviluppo is one of the Italian CNR Institutes, dealing with analysis and research activities on applied economy and firms.

The Hungarian Environmental Economics Centre (MAKK) is the successor of the influential environmental economics research and consulting work of the Budapest Office of the Harvard Institute for International Development. MAKK aims to create and disseminate knowledge that supports public officials and business entities in recognising and optimally incorporating the value of natural resources and environmental services into their decision-making.

The Polish Institute of Renewable Energetic Ltd (IEO) is an independent research and consultancy company, established in 2001 and owned by experts. It aims at development of projects connected with renewable energy promotion and implementation in Poland.

The French University of Social Science, Research Centre in Management (CRG/IAE), situated in Toulouse, is a centre whose research topics cover three major themes being markets, globalisation and innovation studies.

The Oeko Institute (Institute for Applied Ecology) is one of the leading environmental research organisations in Germany and the Energy & Climate Group is working on problems of energy planning (systems analysis, scenario design), renewable and energy-efficiency technologies, utility regulation and implementation of sustainable energy strategies in liberalised markets and national and international climate policy.

The Energy Research Centre is a multi-disciplinary energy research centre, housed in the Faculty of Engineering and the Built Environment at the University of Cape Town. The current focus areas are Energy, Poverty and Development, Energy Efficiency, Energy Modeling and Energy Environment and Climate Change.