AWARD

GOOD PRACTICE OF THE YEAR

Best cases from the 2015 competition

Renewables Grid Initiative

Imprint

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The Renewables Grid Initiative is a unique collaboration of NGOs and TSOs from across Europe. We promote transparent, environmentally sensitive grid development to enable the further steady growth of renewable energy and the energy transition.

For more information, visit our website: **www.renewables-grid.eu**

Foreword by ENTSO-E (European Network of Transmission System Operators for Electricity)

Best practice and sustainability matter. They are highly important to ENTSO-E. Environmental NGOs and Transmission System Operators have to work hand in hand in identifying the best solutions addressing environmental concerns on the one hand, and the need for the grid development on the other. In RGI this is already the case today. Renewables, expected to reach near to half of Europe's power supply by 2030, are the single most important driver for grid development today. We need more grids if we want more renewables. We can't have more renewables if we don't have the grids. This is a simple equation which yet does not work today. Public acceptability is in many cases the obstacle which delays the development of the grid. This is why RGIs' initiative is so important.

ENTSO-E's work on grid development for 2030 (the bi-annual Ten-Year Network Development Plans or TYNDPs) shows a need to double interconnection capacities. The recently completed e-Highway2050 project, looking at grid development needed to support the European Union in reaching a low carbon economy by 2050, finds that additional reinforcement of the grid is needed in all scenarios considered.

All starts with innovative thinking. We will get the future European grid only by constantly improving best practices, by caring for the environment, through a high quality dialogue, and through innovative grid solutions. We also need common deadlines, and efficiency through trust, uniting citizens and transmission system operators in a common objective.

The work carried out by RGI ensures that grid planning and development stay on the cutting edge of innovation and sustainability. RGI's "Good Practice of the Year" award helps ensure that innovative practices in grid development are rewarded and communicated.

Our congratulations go to all the organisations that have participated in this year's award and to the finalists. We look forward to working further with RGI and other stakeholders in addressing the energy transition challenges and to ensure that we are getting there: to a secure, sustainable and affordable European power system.

Peder Andreasen – President

Bente Hagem – Chair of the Board

Introduction

AWARD GOOD PRACTICE OF THE YEAR

Renewables Grid Initiative

MAZARS

This brochure displays the most intriguing submissions of our 2015 “Good Practice of the Year” competition. Our jury of experts reviewed all applications and judged the ones included in this brochure as most commendable and worth being shared with a large audience. It is the purpose of the “Good Practice of the Year” award to give the many good practices in grid development a stage to shine and be acknowledged as well as the opportunity to inspire others to start similar projects and tackle comparable issues.

Grid development is not one single process, but has many facades. For this reason, we introduced different categories. Winners are crowned and good practices are shared in “Technology & Design”, “Environmental Protection” and “Communication & Participation”. Each winning practice is innovative or an improvement to the existing practices in its category. This means that the award is honouring a single exceptional practice, not an entire grid project.

We are very happy about the many great practices submitted and about the diverse group of actors that have decided to participate. This year we are proud to see that practices developed by Avacon, 50Hertz, Germanwatch, NABU, APERe and even two by RTE have been entered into the competition and we are just as proud that many of the organisations, that were already on board for the first award, have decided to share new practices. They include EVN, TenneT and the German Federal Network Agency.

It is similarly great to see that our geographical scope has widened and that our award has now attracted attention in Spain (REE), as well as Norway (Statnett) and Hungary (Mavir) this year.

And of course our winners deserve special attention. This year, the jury has decided to honour a project that focusses on „Pulse heating“ by the Energy Supply of the Cooperative Society in Hjortshoej (Denmark) in the category “Technology & Design”. “It’s a comprehensive approach with benefits at multiple levels – connecting energy across almost all its manifestations”, one of our experts explains their choice. In the “Environmental Protection” category, “Creating Green Corridors” by the LIFE Elia-RTE project has emerged as the winner. Our jury was most impressed by the project searching for “ways of increasing biodiversity rather than just seeking to maintain the status quo”. They also admired that it is “both concrete and applicable on a larger scale”. The jury’s favourite practice from among the “Communication & Participation” practices was EirGrid’s “DS3 Advisory Council”. Our jury members perceived this project as very courageous: “It really meant jumping into cold water, discussing difficult topics and interacting with people who might not necessarily share one’s own views”, one jury member compliments the project.

And last but not least, we wish to thank our incredibly knowledgeable jury for the time they invested in this competition and for the expertise they contributed. Handing out the award annually would also not be possible without the great work of the international audit and advisory company MAZARS. We are very thankful that they donated their services to accompany the evaluation process and support the jury and the RGI team whenever needed.

We hope that you will read on and find these practices as exciting as we do. And maybe you even find the inspiration for a project that will claim the “Good Practice of the Year” trophy next year. We wish you an enjoyable read.

An independent jury of experts

Based on the evaluation criteria and their personal expertise, our independent jury elected a winner in each of our three categories: Communication & Participation, Technology & Design and Environmental Protection. The jury members are experts in their respective fields that include grid development, energy policy and biodiversity:

Gregg D. Ander, Executive Consultant at the Energy Foundation

Gregg D. Ander is an executive consultant for the Energy Foundation, which he formerly worked for as Vice President of Power Strategies. In this role, he oversaw a portfolio of initiatives including energy efficiency, demand response, renewables, gas, coal, smart grid, and financing.

Ivana d'Alessandro, Secretary of the Bern Convention

Ivana d'Alessandro holds a degree in international law and a Master in Human rights; she has been working at the Council of Europe since 2004 and was appointed Secretary of the Bern Convention in 2010. She is also heading the Biodiversity Unit since 2013.

Dr. Maguelonne Dejeant-Pons, Executive Secretary of the European Landscape Convention

Dr. Maguelonne Dejeant-Pons is Executive Secretary of the European Landscape Convention. She has published several books dealing with territorial development, the protection of coastal and marine zones, biological and landscape diversity and the human right to the environment.

Patrick Devine-Wright, Professor of Human Geography at the University of Exeter

Patrick Devine-Wright is an expert on public engagement with low-carbon energy technologies and associated infrastructure such as high voltage power lines. He has participated in, and led, several multi-disciplinary research consortia and advises an EU pilot project on public acceptance of electricity grids.

Marie Donnelly, Director for New and Renewable Sources of Energy, Energy Efficiency and Innovation at DG Energy, European Commission

Within the Directorate General for Energy, Marie Donnelly is responsible for the development of policies and actions on energy efficiency and renewable energy, the coordination of research activities in the field of energy as well as actions supporting the achievement of the 20-20-20 targets.

Baard Eilertsen, Founder of energy utility advisory company Truebase

Baard Eilertsen is the former CEO & President of Wireless Maingate AB. He created the world's largest and most successful Smart Home solution 100Koll for E.ON. In 2015, Baard started Truebase AB, a company advising large utility companies in Europe on strategy.

Jo Leinen, MEP and member of the Party of European Socialists

Jo Leinen has been a Member of the European Parliament since 1999. Before becoming an MEP, Jo Leinen was Minister for the Environment in the State Government of Saarland (Germany) from 1985-1994.

Dr. Gerd Leipold, former CEO of Greenpeace International

Dr. Gerd Leipold led Greenpeace as Executive Director between 2001 and 2009. Today he advises companies on sustainability, works with scientists to improve their stakeholder communication, investigates how to finance a modern electricity grid and supports NGOs in their strategy development.

David Olsen, Board of Governors, California Independent System Operator CAISO

Dave Olsen joined the Board of Governors of CAISO, manager of California's electrical grid, in 2012. Until 2010, he led California's Renewable Energy Transmission Initiative and organized collaborative planning for resource and transmission development.

Catharina Sikow-Magny, Head of Unit B 1 at DG Energy, European Commission

Catharina Sikow-Magny joined the European Commission in 1997. She is the head of unit in charge of "Internal market I: networks and regional initiatives" in the Directorate General of Energy. Before that, she was responsible for the international transport relations team.

"Pulse heating" by the Energy Supply Organisation of the Cooperative Society in Hjortshoej, ESCSH (Energiselskabet ved Andelssamfundet i Hjortshøj)

Short description of the good practice

ESCSH developed a district heating system using both pulse heat and solar panels in order to reduce heat losses in supply pipes and supply low-energy houses in an energy efficient way.

Objectives of the good practice:

- Reduce heat losses in heating supply pipes
- Provide higher supply temperatures to houses
- Evaluate and monitor installation capacity through data measurement

Geographic scope

Denmark (Hjortshøj)

Time Span

2008-2014 (Project planning started in 2007).

ESCSH equipped 20 low-energy houses in the Cooperative Society Hjortshøj near Aarhus with a solar collector and a storage tank. Each house was also connected to the local district heating supply . In regular district heating the heat flow in form of hot water or steam is continuous and a considerable amount of heat gets lost when consumption is low (and due to the slower flow, the water cools before it reaches the consumer).

In order to attenuate the energy loss, a so-called pulse heating was applied to the 20 houses: hot district heating water is sent in pulses. For a 3-4 months summer period no heat is sent via the district system but necessary heat is provided by local solar heating.

The heating pulses are regulated by a timer that is set to four hours a day for the warmer periods, increased to twelve hours a day for colder periods and providing a permanent heat supply for the coldest winter periods. A second regulation stops heat supply to the houses when the tank is warm – based on the thermostats in each house's storage tank. The same heat storage tanks are used to store both solar heating and heat from the district heating in order to ensure heating between the heat pulses. Thanks to the pulse heating technique, total savings amounted to about 50% of heat losses in the local heat supply network. The system also allows heat supply to be scheduled for the hours of the day, where heat is cheapest or most environmental, for instance from a large heat pump driven by wind power.

Additional information

- Energiselskabet ved Andelssamfundet i Hjortshøj is the Energy Supply Organization of the Cooperative Society in Hjortshøj, Denmark. The Cooperative Community of this Ecovillage, about 15 km northwest of Aarhus, is an intentional community started in 1991. The community combines environmental buildings, environmental energy supply, car sharing, and organic farming, with a common goal to live a more environmentally friendly lifestyle.
- The pulse heating project also involved an engineering consultant, Planenergi, and Aarhus Municipality as an associate partner. The project is supported by the Danish District Heating Association.
- For more information (in Danish): http://www.danskfjernvarme.dk/viden-om/f-u-konto/2008-02-praktisk-demonstration-af-pulsva

"The Variable Ratio Distribution Transformer (VRDT)" by Avacon AG

Short description of the good practice

The VRDT offers a simple and cost-efficient alternative to conventional low-voltage grid expansion by helping release the potential of the medium voltage grid. This is done by effectively decoupling the low voltage from the medium voltage making it available separately, without having to build significant new infrastructure.

Objectives of the good practice:

- Develop robust and sustainable solutions for grid modernisation
- Improve voltage quality
- Innovatively develop the most cost-effective integration of renewable energy into the distribution grid

Geographic scope

Germany

Time span

2009-ongoing

With the growth in renewable energy as a distributed energy source it has become clear that new electricity production cannot be integrated into the existing German network in its status quo. Therefore, network expansion is an increasing necessity within Germany. The German low- and medium-voltage level networks, which already accommodate the majority of energy from renewable energy installations, differ in their network structure and need to adapt to handle the changing production-consumption dynamic.

With the VRDT, Avacon AG has enabled the conversion of a medium voltage bandwidth to a regulat-

ed reference voltage at the low voltage bus bar of the local secondary substation (bus bar = metallic strip that conducts a substantial current of electricity). The technology allows the decoupling of the low voltage from medium voltage. In accordance with current regulations, the complete bandwidth of +/- 10% of the nominal voltage is then available for both medium and low voltage separately.

The VRDT thus helps to release potential for the medium voltage grid that was formerly reserved for the low-voltage.

This means that the VRDT is improving the voltage quality and becoming a cost effective alternative to a conventional grid expansion (laying parallel cables and transformer replacements).

Additional Information:

- Comparisons of different scenarios show that the VRDT is a preferable economic solution if further renewables generation is implemented. Total costs of planned expansion projects with VRDT-use accumulate to 2.3 million €.
- Avacon AG is the European leading implementer of VRDT, with a total of 114 VRDTs in operation.
- Avacon AG is a German power and gas network operator as well as infrastructure service provider. Its activities are concentrated in large parts of Western and central Germany. Avacon provides energy to 16 million people. About 1,700 employees are working for Avacon AG in 15 different locations.
- For more information: www.avacon.de

“Équilibre Pylon design“ by RTE

Short description of the good practice

An innovative pylon design concept developed for the replacement of an existing line - upgrading it into a two circuits 400 kV overhead line. In addition to the new design approach, RTE also chose to involve citizens directly in the process.

Objectives of the good practice:

- Develop an aesthetic design for pylons
- Work on the successful integration of pylons into the landscape
- Improve several technical aspects of the pylon structure
- Create public acceptance regarding the overhead line replacement project

Geographic scope

North of France (Avelin-Gavrelle)

Time Span

2010-2019

Willing to improve the integration of an upgraded overhead line into the surrounding landscape, and thereby to increase its social acceptance, RTE decided to directly involve the 1.7 million people affected by the line by allowing them to choose a concept of power line that would meet local constraints. This initiative enabled local stakeholders to get involved in the grid development of their region. RTE published a tender for the new overhead line concept, for which 80 designers and architects sent proposals. RTE’s technical experts chose three projects from the 80 proposals received, based on the identified local needs and constraints. After being discussed in expert commissions, where citizens

could give input, the Équilibre pylon designed by Hugh Dutton emerged as the winner.

The shape of the Équilibre pylon is a reference to a balanced arrow pointing towards the sky. The pylon's name "Equilibre" is the French word for "Balance", suggesting good integration into nature and stability.

Équilibre is composed of a 70m high white steel pole. The mast, which is made of rolled steel plate, is rather comparable to wind turbines than to usual lattice towers.

The 30 km long 400 kV line, 16km of which will be equipped with the new pylon, should be erected by 2019. Costs are estimated to amount to 1.88 M€/km, i.e. 56.4 M€ for the complete project.

Additional information:

- The triangle configuration of Équilibre's cables helps to reduce the distance between the phases of each circuit and diminish the strength of the magnetic field created by the structure.
- RTE is the French electricity transmission network operator. Its mission includes the operation, maintenance and development of the high and extra high voltage network. RTE also guarantees the smooth operation and security of the grid.
- More information: http://www.rte-ligne-avelingavrelle.com/

“High Voltage VSC“ by Statnett

Short description of the good practice

For the Skagerrak 4 subsea interconnector between Norway and Denmark, Statnett has utilised the voltage source converter (VSC) technology in order to enable the security of the electricity supply while combining wind and hydro energy. Among others, the new technology provides better stability in the AC grid, a lower need for filters, and the possibility to black start a blacked out grid.

Objectives of the good practice:

- Enable an extensive use of intermittent wind power in Denmark
- Provide reserve capacity for balancing power
- Use the new interconnector efficiently by combining technologies
- Raise the level of security of the electricity supply

Geographic scope

Norway and Denmark

Time span

2008-2015

The fourth interconnector between Denmark and Norway, Skagerrak 4, will increase the total capacity between the two countries from 1,000 to 1,700 MW. Combining these two power systems is highly beneficial: the intermittent wind power and relatively slow thermal power plants of Denmark work perfectly together with Norwegian hydro power plants, which are fast and easily controllable. By utilising the new VSC technology, Statnett aimed at adding value to the power system, such as supporting

the grid during failure (voltage control), reducing the risk for commutation failures (stable operations) and making it possible to use the link during a blackout situation (black-start capability).

The multilevel VSC is built up of transistors and diodes in parallel to capacitors. The capacitors can be either connected or bypassed by switching off the transistors. Hence, the VSC can use the capacitors to build up a controlled AC source with small harmonic distortion and a DC voltage on the DC side. Compared to classic HVDC, where the reactive consumption increases with the transmitted power, the new converter can control reactive and active power independently. Capacitor banks for compensation are no longer needed.

Additional information:

- Statnett is the state-owned system operator of the Norwegian energy system. As such, it is engaged in operating 11,000 km of high voltage power lines, 150 power stations as well as in managing connections to Sweden, Finland, Russia, Denmark and the Netherlands. Its main objective encompasses building the next generation grid in order to secure a stable electricity supply.
- The interconnector Skagerrak 4 is owned by Energinet.dk and Statnett, which developed the new technology in cooperation with its contractor ABB.
- More information: www.statnett.no/en/Projects/Skagerrak-4/

“Creating Green Corridors“ by LIFE Elia-RTE

Short description of the good practice

LIFE Elia-RTE is a project that combines electrical safety of grid lines with biodiversity-friendly vegetation management by creating green corridors under high-voltage overhead lines and by relying on a multi-partner approach.

Objectives of the good practice:

- Enhance biodiversity through tangible actions by creating green corridors on 28 sites in Belgium and 7 sites in France
- Positively influence the perception of vegetation management in connection with high-voltage power lines
- Create conditions under which tree growth will be much slower in order to avoid recurrent tree cutting
- Manage the practice in the long term via a win-win multi-partner approach
- Share the experiences throughout Europe

Geographic scope

Belgium (Wallonia) and France (7 sites)

Time span

2011-2017 (First actions on sites in 2012)

The LIFE Elia-RTE team is establishing a new kind of vegetation management underneath grid lines in Belgium and France. They restored forest edges and natural habitats, dug natural ponds, planted conservatory orchards, sowed meadows and created pasturage facilities for local framers. This approach not only turned out to be more biodiversity-friendly by avoiding the traditional clear-cut solutions under grid lines, but also proved to be 1.4 to 3.9

times cheaper on a 30 years scale than conventional forms of vegetation management.

The practice, which involved many stakeholders including TSOs, authorities, forest owners, NGOs and academics, has some impressive results to show. Through its efforts the LIFE Elia-RTE team managed to restore 20 ha of natural habitats and improve the biodiversity network by creating connecting zones between core areas of conservation. By relying on local partnerships they also succeeded in improving acceptance for high-voltage grid lines.

Additional Information

- Life Elia-RTE is a 5-year project that started in September 2011. It is led by a team of seven people coming from the two NGOs Solon asbl and CARAH. The project is estimated to cost 3 M€, and is co-financed by the European Commission (38%), the Walloon region (27%), Elia, the Belgian TSO (22%) and by RTE, the French TSO (13%).
- The project team has been asked by many different organisations to present their approach and their outcomes. Today, Life Elia-RTE is actively communicating with TSOs from seventeen different EU members states about biodiversity.
- More information: www.life-elia.eu/

"Stork Platform Campaign" by EVN

Short description of the good practice

EVN's Stork Platform Campaign is an annual campaign during which artificial nesting platforms are installed on the poles of distribution power lines in order to safeguard white storks nesting on top of the pillars from electrocution.

Objectives of the good practice:

- Safeguard a protected bird species, the white stork, from electrocution by installing insulated nesting platforms
- Conduct field observations and technical inspections of distribution grid lines on EVN's entire territory of operation
- Secure the grid infrastructure in order to increase its reliability

Geographic scope

South-East Bulgaria (42,000 square kilometers)

Time span

2009-2014 (Annually repeated campaign)

Since EVN first started its Stork Platform Campaign, 1651 nesting platforms - ensuring a save distance between the stork nest and the electric parts of the pole - have been installed. The installation periods have been harmonised with the birds migration and breeding periods. These actions have led to diminished bird mortality and – thanks to damage prevention – an increased reliability of the grid. The challenge of protecting the white stork while improving grid security is of growing importance in Bulgaria and in Europe, as studies show that

half of the stork nests are build on electric poles, and that this ratio is increasing. Internal evaluations have shown that at least 61% of EVN's installed platforms are regularly used by birds.

In its campaign EVN is supported by NGOs and established a successful cooperation with organisations such as the Bulgarian Society for Protection of Birds, Green Balkan or Foundation Biodiversity.

The practice is also conducted with great support from citizens and local authorities, who actively send signals when they spot fume or come across storks who have fallen from their nests, as EVN is also involved in storks rescue actions.

Additional Information:

- EVN Bulgaria Elektrorazpredelenie EAD (EVN EP) is an electricity distribution company that operates in South-East Bulgaria and provides electricity for more than 1.5 million customers. Even if mounting artificial nesting platforms is not the core business of EVN EP, it is part of its environmentally responsible policy and therefore an established practice.
- Bulgaria has one of the biggest migration flows of the white stork, a vulnerable bird species protected by the Biodiversity Act in Bulgaria. As old trees disappeared, storks started building their nests on electric power poles. The nests coming in direct contact with the power lines can result in a short circuit and sparking, causing serious harm for both the grid and the birds.

"Birds and electricity transmission lines: mapping of flight paths" by RED ELÉCTRICA DE ESPAÑA (REE)

Short description of the good practice

The Spanish TSO Red Eléctrica is developing a tool integrating data about bird flight paths in Spain in order to adopt minimum impact solutions during the planning and construction of power lines and to prioritise mitigation actions on existing lines.

Objectives of the good practice:

- Improve the compatibility of electricity facilities and infrastructure with birds and reduce the accident rate due to collision with power lines
- Have a positive effect on the state of conservation of endangered bird species, especially those potentially affected by high-voltage power line installations
- Facilitate the adoption of solutions with the least environmental impact in the development of projects, as well as the introduction of preventive and mitigation measures
- Minimise the impacts on natural capital and generate a benefit for society as a whole

Geographic scope

The whole territory of Spain

Time span

Five years (from 2010 onwards)

The purpose of the project is to have a tool based on geographic information systems (GIS), which integrates information on the areas of presence and main flight paths of 45 species of birds listed in the Birds Directive and the Spanish Catalogue of Endangered Species, who are

potentially affected by risk of collision with power lines.

The system integrates information about the areas of presence, routes and flight paths, and also includes geographical and additional environmental information.

The information generated is shared with the regional ministries and departments with competence in biodiversity conservation of the 17 Spanish autonomous communities, as well as with research entities and environmental organisations. In this sense, it is meant to act as a common benchmark framework for the environmental assessment of projects, and favour transparency in the processes of public information and stakeholder consultations in the administrative permitting processes for electrical installations.

Additional Information:

- Red Eléctrica de España (REE) is the sole transmission agent and operator of the Spanish electricity system. REE connects 45 million people with the electricity that they use, aided by a workforce of 1,700 people. It‘s mission is to guarantee the correct functioning of the electricity system at all time.
- More information: www.ree.es/en/sustainability/noteworthy-projects/mapping-bird-flight-paths-project

"Man-made nest programme" by MAVIR

Short description of the good practice

Installation and complete monitoring of man-made nests designed for long-term use at power pylons in order to reduce the mortality rate of the Saker Falcon, a species that was on the brink of extinction.

Objectives of the good practice:

- Improve the survival chances of a protected bird species by providing many secure nests and advantageous breeding conditions
- Gain an understanding of the birds characteristics
- Follow the evolution of the bird species' population
- Ensure the continuity of the electricity supply and reduce power interruptions caused by falling bird-made nests
- Raise awareness about MAVIR's birds protection program
- Reach and target both a wider professional and a wider civil audience

Geographic scope

Hungary (Natura 2000 areas)

Time Span Annually improved and repeated program

Facing bird mortality and resulting power interruptions, following the identification of bird population and areas concerned, a man-made nest program was launched and aimed to find a solution in accordance with the physiological properties of birds and the characteristics of transmission network that can improve the survival chances of bird species endangered by the opera-

tion and development of network. In cooperation with national parks and non-governmental organisations a secure and adequate habitat was ensured for the birds of prey, especially to stop the decrease the stock of Saker falcons, considered an endangered species nesting on power pylons. To date, 404 man-made nests have been installed. Actual studies revealed that more than 250 Saker Falcons are nesting in MAVIR pylons, which represent about 75% of the whole species' population in Hungary.

The project was completed by a non-stop online nest monitoring program as well as several events based on communication towards children and adults. In 2014, 1.2 million people from 100 countries were following the lives of the birds thanks to the camera installed in front of one nest.

The bird conservation blog, started by MAVIR in 2014, has a readership of thousands of people at the moment. MAVIR receives three to five requests each month from various institutions for presenting its activities, and feedbacks prove that the public awareness with regard to bird life has greatly expanded.

Additional Information:

- MAVIR is the owner and operator of the transmission network in Hungary. It also operates in the Hungarian part of the Natura 2000 network. Natura 2000 is the centerpiece of the EU nature & biodiversity policy. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats.
- Further information: http://www.mavir.hu/web/mavir/feszekmegfigyeles or https://www.youtube.com/watch?v=m0fz4EilH3M

"New power grids and nature conservation" by the Nature and Biodiversity Conservation Union (NABU)

Short description of the good practice

In order to promote an energy transition that is sensitive to environmental concerns, NABU's new power grids and nature conservation project aimed at intensifying the participation of conservation organisations in grid projects through a variety of engagement and communication activities.

Objectives of the good practice:

- Position NABU as a critical but constructive partner for a successful energy transition ("Energiewende")
- Evaluate and bundle existing knowledge of conservation demands and the environmental impact of grid expansion whilst transferring know-how
- Train volunteering and fully-employed conservationists
- Increase NABU's knowledge for distribution to its subdivisions and members

Geographic scope

Five German federal states

Time span

March 2012 - April 2014

In order to enable grid development that is genuinely nature friendly, authorities, conservationists and the energy industry have to be interconnected and communicate appropriately. NABU holds the belief that delays or lawsuits from conservationists can be avoided by integrating them in the project discussions, creating a collaborative process of joint decision making.

The project revolved around a set of collaborative communication

activities, which included the writing of guidance papers on nature conservation and grids, the hosting of collaborative workshops, the hosting of information seminars and excursions and the publication of factsheets. Active participants came from nature and environmental associations, TSOs, planning authorities, scientists, local politicians, as well as the general public.

The seminars and workshops, each of them accompanied by a field trip, looked to both garner input and educate, receiving very positive feedback from participants. TSOs have recognized the potential to gain from the input of such activities and to effectively implement thorough, prudent and transparent grid project planning.

Additional Information

- Workshops, seminars and publications detailed the topics of bird protection on overhead lines, water and soil conservation when using underground cables, grid connection of offshore windfarms, the fragmentation of landscape and natural habitats, ecological line management and biotope networks as well as grid planning in Northern and Southern Germany.
- Founded in 1899, NABU is one of the oldest and largest environmental associations in Germany. The association encompasses more than 560,000 members and sponsors, who commit themselves to the conservation of threatened habitats, flora and fauna, to climate protection and energy policy. It is the German BirdLife Partner.
- Further information (in German): www.nabu.de/netzausbau

"DS3 Advisory Council" by EirGrid

Short description of the good practice

The DS3 Advisory Council was established to provide a forum to discuss the views and concerns of the DS3 Programme's wide range of stakeholders on issues which impact on the successful implementation of the programme (DS3 = "Delivering a Secure, Sustainable Electricity System").

Objectives of the good practice:

- Discuss, review and ultimately help facilitate the progress of the DS3 project
- Share relevant information related to the implementation of the program and communicate with stakeholders
- Provide a forum to discuss stakeholder views and concerns
- Provide input, advice and assistance to EirGrid on matters related to DS3 and its implementation.

Geographic scope

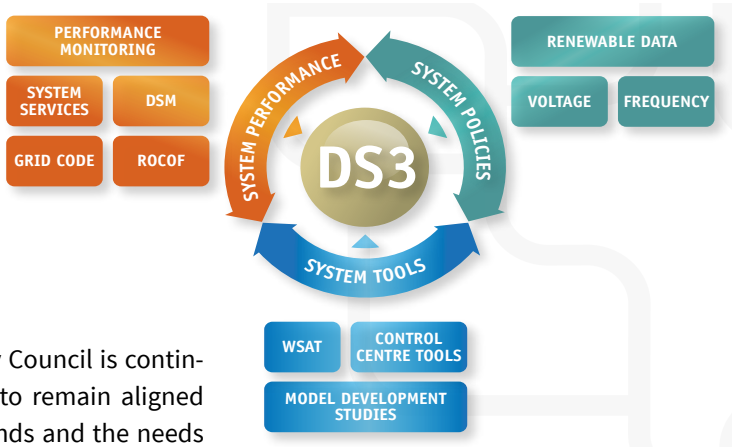
Ireland and Northern Ireland

Time span

2011-2017

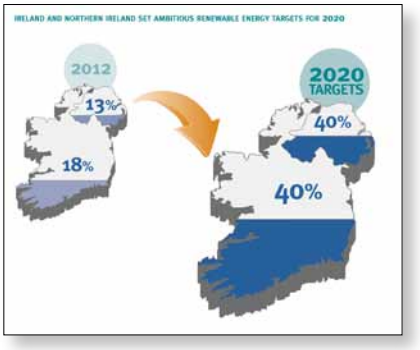
The DS3 Programme is designed to ensure that the power system can be securely operated in the context of meeting Ireland and Northern Ireland's 40% renewable electricity target by 2020. The DS3 Advisory Council is comprised of experts from academia, industry, other system operators, government and research centres across Ireland, Northern Ireland and Europe and North America.

At the Council meetings EirGrid present on their latest analysis, potential approaches to challenges and high level progress of DS3. This is



supplemented by corresponding industry presentations on matters relevant to DS3. These presentations are essential to both EirGrid and the industry in keeping up to date with progress in the DS3 Programme and any other industry movements of note that may have an impact on the programme's success. This education and communication plays a key role in facilitating the evolution of the wider electricity industry and implementing changes to the way the power system is operated that will ultimately benefit the end consumer.

The DS3 Advisory Council is continuously adapting to remain aligned with industry trends and the needs of the programme. For that reason the DS3 Programme Office has added new members from niche areas of the industry in order to enhance the Council's broad depth of knowledge. Separately, the Council evaluates its role and identifies key challenges via an annual review and anonymised risk workshop. The Advisory Council convenes every four months and has met thirteen times since the first meeting in October 2011.



Additional Information:

- EirGrid plc is a leading Irish energy business, dedicated to the provision of transmission and market services for the benefit of electricity consumers. EirGrid is committed to delivering high quality services to all customers, including generators, suppliers and consumers, across the high voltage electricity system and via the efficient operation of the wholesale power market. It puts in place the grid infrastructure needed to support competition in energy, to promote economic growth, to facilitate more renewable energy, and to provide essential services.
- Further information: http://www.eirgridgroup.com/

“EnergizAIR” by APERe

Short description of the good practice

EnergizAIR is an international initiative aimed at providing easy-to-understand indicators that represent the current capacity for renewable energy production across Europe.

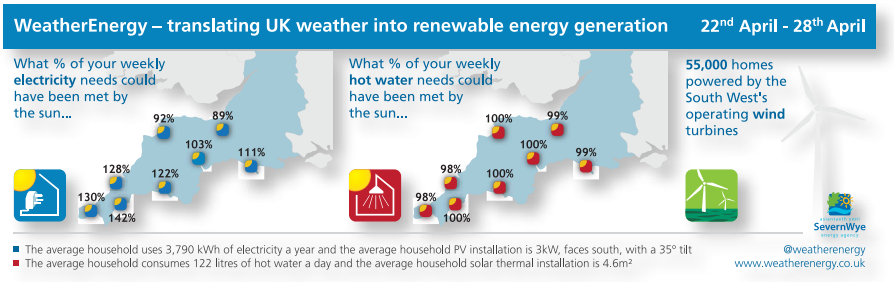
Objectives of the good practice:

- Emphasise the energy generation possibilities created by everyday weather conditions
- Enhance people’s understanding of the capabilities and capacities of renewable energy production possibilities
- Add qualitative energy information to the regular weather forecast to encourage people to utilise home-grown energy
- Promote usage of home-grown energy as an element of grid management and a potential tool to relieve grid constraints

Geographic scope Europe

Time span 2013 – 2105

The EnergizAIR project was set up in order to take information regarding renewable energy production from the engineering world and place it with consumers. By combining sets of country-specific data, such as energy consumption and renewable energy production data, EnergizAIR is able to create a set of indicators that demonstrate what percentage of the average households energy needs could be met renewably. These are represented graphically through “solar PV”, “solar thermal” and “wind” icons, with a percentage of how much energy/hot water could be provided by renewable sources.



The project currently covers 10 countries and employs an easy to replicate "franchise" model for expansion to other countries. Three web papers, three newspapers, eight radio and eight TV channels from across Europe have reached six million citizens with EnergizAIR's tool to date. The tool is also currently embedded as a widget on more than 200 websites. In addition, APERe has worked to train 80 weather team members to understand and explain the indicators to their audience, becoming ambassadors for the project.

By understanding what percentage of their energy needs could be coming from renewable energy sources in real time, the project has increased trust in the renewable energy sector and aims to significantly increase investment into renewable energy technologies across Europe.

Additional Information:

- A survey among 400 recipients of the indicators showed that EnergizAIR increased trust in renewables in more than 50% of the cases. Additionally, 45% felt encouraged to invest in renewable energy solutions.
- The Association for the promotion of renewable energy (APERe) is an independent Belgian organisation aiming to encourage the development and use of renewable energy sources within the context of a rational energy use. As a permanent education provider, APERe heads educational projects and field activities as well as constituting a network for academics and associations within Belgium.
- Further information: www.energizair.eu

"The future of energy - turning young people into aware citizens" by 50Hertz

Short description of the good practice

In cooperation with its nature conservation partners, 50Hertz is implementing a range of both fun and informative communication activities that specifically target young adolescents and the communities in which they live.

Objectives of the good practice:

- Convey the challenges of the energy transition and of grid development to young people
- Establish a strong network within the affected region and be perceived as a trustworthy partner that initiates constructive dialogue
- Maximise the impact of the compensation and mitigation measures by jointly developing and carrying out ideas with the local communities

Geographic scope Germany

Time span 2013 – ongoing

The project is inspired by a lack of awareness often seen amongst young people regarding the challenges that come with Germany's energy transition and related grid development projects, which in turn compound a broader lack of acceptance amongst the community. The set of communication activities seeks to address this lack by initiating a number of joint solution-finding activities, which look to increase knowledge of the environment and issues surrounding grid development.

- 50Hertz jointly developed a nature trail with students of a local school that was situated close to the proposed route of a

power line. The realisation of the trail included the installation of nesting aids for bats and birds, the creation of new habitats for lizards and the construction of a beehive.

- This project is complemented by the rehabilitation of an orchard, where 200 trees have been incorporated into an upgraded learning environment that schools can visit and learn about orchard environments and fruit pressing.
- In cooperation with UfU, the Independent Institute for Environmental Issues, 50Hertz created the so-called “Mitmachausstellung” (participatory exhibition), which aims to raise awareness for the energy transition by integrating theoretical knowledge and practical hands-on experience in a playful way. To this day, more than 3000 school children and more than 800 adults participated in this new format.

The approach involved local stakeholders such as municipalities, authorities, schools, teachers, pupils and parents, NGOs, and others. All activities are designed to be repeatable and have a long-term impact.

Additional Information:

- 50Hertz is responsible for the operation, maintenance, planning, and expansion of the 380/220 kilovolt transmission grid throughout the northern and eastern part of Germany. Already today more than 42% of consumption in the 50Hertz grid area is covered by renewable energy sources, making it the world-wide leader in this respect.
- www.50hertz.com/netzausbau and www.mundraub.org/50hertz and www.ufu.de/de/projekte/energie-gemeinsam-wenden.html

“Animated videos for grid expansion” by Bundesnetzagentur (German Federal Network Agency)

Short description of the good practice

The Bundesnetzagentur created animated online videos in order to present to the public highly accessible, comprehensive and reliable information about the five steps involved in the complex legislative procedure for grid expansion in Germany.

Objectives of the good practice:

- Communicate the idea that the energy transition (Energiewende) concerns everybody and highlight participation possibilities in the planning process
- Provide the public with accurate, reliable and comprehensive information about the formal procedure of grid expansion planning, therefore increasing transparency of the procedure
- Visualize the different steps of grid planning for a broader audience
- Reach a younger audience by using the internet/social media

Geographic scope

Germany

Time Span

Planning: 2013; Production: January 2014 - June 2015

The Bundesnetzagentur commissioned five three-minute long animated videos to explain the five steps of the grid expansion planning procedure in Germany. The videos are available on YouTube and shown at conferences, public dialogues and events.

Every video has an individual setting (representing an everyday situation) to create personal associations, making people feel like they are becoming a part of the

process of the Energiewende. The project aims at reaching younger generations, who are not explicitly involved in the public participation of the grid expansion process, by broadening the range of media used for communication. The videos also emphasize the link between the integration of renewables and the need for grid expansion.

To date, three videos have been published, with high hits compared to other videos from governmental authorities. Positive responses provoked ideas for additional, even shorter videos concerning other aspects of grid expansion, such as underground cables or AC/DC technology. The spectrum of themes and videos will be developed further. YouTube hits, YouTube comments and tweets are used to evaluate the general acceptance and influence of the project.

Additional Information:

- The legislative procedure of grid expansion in Germany described in the videos starts with the TSOs drafting a scenario framework, describing likely developments in the German energy landscape. Next, a network development plan is constructed and its impact on the environment assessed. Third, the Federal Requirements Plan is presented to the legislative body. Afterwards, the federal sectoral planning and in a last step the route planning procedure take place.
- For further information: http://www.youtube.com/user/Netzausbau

"Joint public power line planning" by TenneT & KWI

Short description of the good practice

TenneT, in partnership with KWI (Institute for Advanced Study in the Humanities, Essen), implemented a set of actions that sought to re-design the standard participation processes. This was done in order to enhance "early" public participation in grid expansion projects, to listen and to improve levels of acceptance among local stakeholders.

Objectives of the good practice:

- Identify new route corridors jointly with citizens, by enabling citizens to develop their own routes at the beginning of the planning process
- Assure maximum transparency in the process by improving the comprehensibility and accountability of the planning process
- Develop the best route alternatives for the official regional planning procedure including knowledge on local singularities

Geographic scope

Germany (Bavaria)

Time span 2014 – 2016

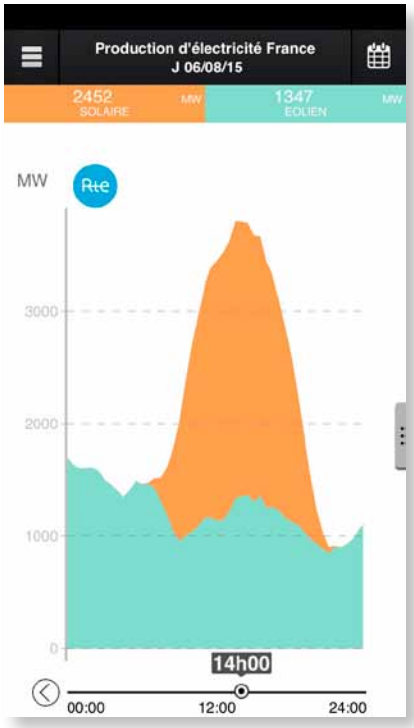
In the past, participation processes did not offer citizens and stakeholders a chance to influence the routing of new lines. With accompanying research and co-financing from the Demoenergy project (a German government funded project), TenneT and KWI jointly developed and implemented a new set of participation concepts that sought to overcome this. These were developed with the assistance of both external consultants and facilitators, and introduced new formats for public events, workshops and continuous planning groups.

The basis of this new concept was to host participation processes in two areas posing particular planning challenges along a line in need of upgrade and expansion between Redwitz and Schwandorf. These participation processes included a set of three public events in each city, accompanied by the established TenneT info-mart format, which allows for informal exchange. A central feature of the participation processes were “Route Assessment Teams”, who held in-depth discussions regarding routing options. These routing teams were made up of a mixture of randomly selected citizens, NGO groups, municipal and forestry agencies as well as representatives from TenneT. These meetings helped TenneT understand the sensitivities and preferences around routing options and provided citizens and other stakeholders accountable planning info and interaction with TenneT.

Additional Information

- The conventional format of info-marts as a forum for one-on-one interviews between interested citizens and the project team has been used by TenneT on several high-voltage power line projects and was integrated into the public participation processes. The participatory processes described here included info-marts, but went beyond this already established format.
- KWI will evaluate the whole participatory process between July 2015 and March 2016.
- For further information: www.tennet.eu/de/netz-und-projekte/onshore-projekte/ostbayernring.html and www.demoenergie.de/

“Application éCO2mix” by RTE



Short description of the good practice

An online application designed in order to assure the accessibility and transparency of real-time energy related data for every possible user.

Objectives of the good practice:

- Provide highly comprehensive real-time data, that can be understood by every possible user
- Provide highly qualitative and detailed data
- Assure a higher transparency of the energy sector through accessible information
- Communicate in favour of a better comprehension of the energy transition and the integration of renewable energy in France

Geographic scope

France

Time span

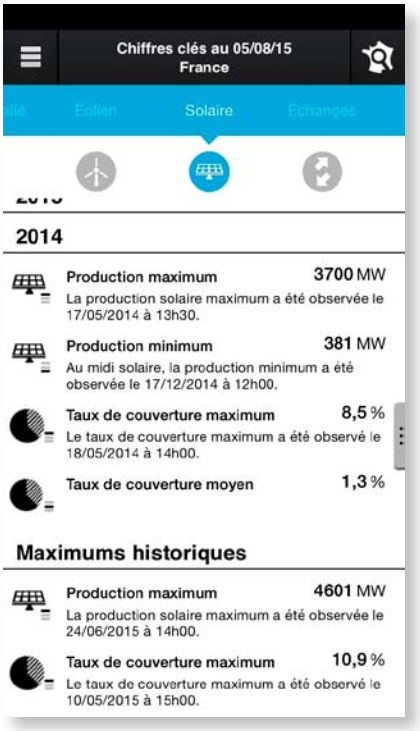
Developed for the first time in 2010, implemented until 2015

éCO2mix is a public online application that has been designed by RTE as a transparent tool to visualize the characteristics of the electric power system in France in real-time. The idea is to popularise information about the operation of the electric power system and to enable a better understanding of the energy transition and the integration of renewable energy. The application allows the user to track the changes in power consumption and production in France, with the possibility of focusing on a specific region and a particular production mode (hydropower, nuclear, gas, wind, etc.). The application also shows

the related emission of CO2. Power exchange data, spot prices, monthly analyses as well as other data (max. consumption, coverage rate of consumption per wind and sun generation) are available as well. This application is free and available on the web or through a mobile app for smartphones or tablets (Android and IOS), which can be downloaded by way of a QR code.

Created in 2010, éCO2mix has been improved and upgraded every year with a wider range of functionalities. The application is evaluated by RTE through several indicators, such as the number of users (2.5 million consultations of the application and website every year) and the amount of data uploaded (14 million files uploaded every year). The availability of the application reaches nearly 100%, and the users are rewarding the application with very good marks (almost 5/5).

The application is not only used by RTE itself but also by media representatives, politicians and other stakeholders as a reliable source of information.



Additional information:

- The evolution and constant development of the application is based on the needs expressed by RTE employees and other stakeholders in order to improve the service delivered to the public.
- RTE is the French electricity transmission network operator. Its mission includes the operation, maintenance and development of the high and extra high voltage network.
- For more information: http://www.rte-france.com/fr/eco2mix/eco2mix

“Transparent transmission grid planning” by Germanwatch e.V.

Short description of the good practice

The German climate and environment organization Germanwatch closely followed the implementation of a new legislation on transmission grid planning and participated actively in expert discussions on the methodology for transmission grid planning and a stable political framework to support the next steps for an increase of renewable energy in Germany.

Objectives of the good practice:

- Ensure that power grid planning is based on ambitious climate and energy targets
- Contribute to a transparent and participative planning and permitting procedure of new power lines and high environmental standards
- Advocate the consideration of arguments, concerns and interests of local stakeholders in power grid planning procedures
- Assure that environmental standards set in the "European Grid Declaration on Electricity Network Development and Nature Conservation" are applied thoroughly in German and European grid development projects

Geographic scope

Focus on Germany (partly also European level)

Time span 2012 – 2015

In 2011, the German government introduced a new procedure for transmission grid planning, which provides extended possibilities for public participation. Based on a scenario framework on future power generation and consumption, a ten-year grid development plan is

annually drafted by German TSOs and approved by the central permitting and regulatory agency. The NGO Germanwatch made substantial efforts in contributing to this planning procedure by numerous means, including the participation in expert workshops, the development of position papers and the publication of a handbook for local stakeholders who would like to participate in the planning processes of new power lines. To come up with recommendations for grid operators and policymakers, Germanwatch has been in continuous interaction with other stakeholders on European, national and local level.

Together with other German NGOs, Germanwatch was extraordinarily vocal in supporting those power lines that they consider necessary for the transformation of the electricity system. One outstanding example for this effort is a press release in support of north-south transmission lines in Germany published in collaboration with NABU, WWF and DUH.

Additional information:

- Germanwatch e.V. is an independent development and environmental organisation. Their mission statement focuses on the active promotion of North-South equity and the preservation of livelihoods through observation, analysis and action. Therefore, Germanwatch e.V. focuses on the energy and climate politics and economics of the North with their worldwide consequences.
- For more information: germanwatch.org/de/stichwort/nep (German)