AWARD

GOOD PRACTICE OF THE YEAR **2022**

Foreword

Kadri Simson
EU Commissioner for Energy

The European Union is going through an energy crisis broader than anything we have experienced before. The ripple effects of the Russian aggression against Ukraine require every aspect of our energy system to adapt: our fuel supply, our demand patterns and our energy infrastructure. The three main objectives of our energy policy – sustainability, security of supply, and affordability – remain the same, yet they exist against an ever-shifting geopolitical context. As such, the current energy security crisis has been driving up energy prices to unprecedented levels, and thus hurting our citizens, in particular the most vulnerable households and weakening Europe´s competitiveness.

Europe´s policy response to this turn of events is set out in the REPowerEU Plan. In order to reduce our dependence on fossil fuel imports we are looking for alternative energy suppliers, ways of being more energy efficient, and, above all, the means to enable more homegrown renewable energy across our system. This means that we need to deploy renewable capacity at a pace many times faster than today, and it needs to happen through an integrated and interconnected European infrastructure. Interconnected EU grids are our best guarantee of security of supply, essential for integrating renewable energy sources and withstanding supply interruptions.

Considering the challenges we face and the necessity to act, with REPowerEU, we are proposing to increase our renewables target to 45% by 2030. The main thrust of this increased ambition derives from our proposed Strategy for the solar sector, a plan to accelerate the production of green hydrogen and an action plan to double the production of biomethane by 2030. For this to succeed, we proposed new tools and new approaches, one of which is removing the roadblocks that prevent us from speeding up the deployment of renewables. As such, a key part of the REPowerEU Plan is the legislative proposal to introduce faster and more targeted permitting procedures to get onshore and offshore renewable generation projects off the ground more quickly.

Grids will be needed to reach our ambitious offshore targets and harness the power of wind to break free from Russian fossil fuels on our path to becoming climate neutral. The revised TEN-E Regulation will continue to serve as a guiding vehicle for developing Projects of Common Interest (PCIs) where needed to connect demand and supply across Europe.

Decision-making processes, whether at the selection stage for the PCI label or later on, during the ground routing and construction, have been redesigned to be more inclusive, more transparent and accountable towards the views of those communities affected by the construction.

A decade of experience in implementing the TEN-E policy has shown that cooperation is essential in accelerating the implementation of PCIs. With every lesson learned, promoters of energy projects are reshaping the manner in which they engage with their public. From applying the latest technology and design features to high-voltage transmission lines and cables, to diligently abiding by the highest environmental scrutiny and measures, grid promoters are helping mitigate the perceived intrusiveness and footprint of infrastructure projects. Informing and consulting early on the necessity and aims of each investment has considerably contributed to more legitimate public consultations.

There is no alternative to diversifying away from sources and supplies of energy used as a weapon against the European Union and its citizens. We must team up and improve our tools and approaches with every occasion. This is part of the everyday mission of the Renewable Grid Initiative, which we recognize every year in the form of a 'Good Practice of the Year' award granted to the most exceptional practices in grid implementation. Yet again in 2022, grid promoters have stood up amidst the multi-fold crisis and excelled in the way in which they have taken account of the environment, technology and communities in the design and construction of energy infrastructure projects. Let me offer my congratulations to the winners of this year's 'Good Practice of the Year' award. Thank you for inspiring a new normal in building EU grids!

Kadri Simson

EU Commissioner for Energy

Introduction

AWARD GOOD PRACTICE OF THE YEAR

2022 is a year of multiple, overlapping crises, the energy one worsened by the war in Ukraine, the climate one with extreme weather events occurring more and more often, and the linked biodiversity one affecting an increasing number of species. This forces us to face new challenges and develop new coping mechanisms that tackle multiple issues at the same time. This year's submissions for the Good Practice of the Year award show practices that address our new reality and its simultaneous challenges: the need for new community benefits and participatory approaches in the context of a much-needed sped-up deployment of renewables, and accelerated electrification paired with improved system security. We are delighted to share our expert jury's favourite practices with you in this brochure and to reveal why they chose the following practices as this year's winners.

Communication & Engagement

'Shaping Our Electricity Future' by EirGrid

The jury chose this practice because of its innovative value at high scale, transferability and wide range of stakeholders involved when it comes to public consultation processes and engagement. On the pathway to achieving Ireland's renewable ambitions, the systemic consultations included citizens at a much earlier stage reaching a wider national conversation and a higher level of support among stakeholders. Additionally, EirGrid introduced novel deliberative and co-design mechanisms into the decision-making process. Find out more on page 8.

Environmental Protection

'Bio Transport' by the Spanish National Research Council (CSIC) & Red Eléctrica de España

Bio Transport won its category because it addresses a highly relevant topic, restoration measures near grids, in an innovative, fully transferable, and cost-effective way. The project offers a scientific evaluation of the potential of the grid to enhance biodiversity while partnering up with organisations that possess deep ecological expertise. The first results of the study offer solid evidence that even small changes in vegetation management can benefit ecosystems. Read more on page 16.

Technological Innovation & System Integration

'SPEED-E' by Redes Energéticas Nacionais (REN) SGPS, S.A.

The jury awarded SPEED-E the prize for technological innovation as it brings a significant contribution to both grid reliability and decarbonisation of the transport sector furthering and accelerating electrification. The practice provides high power for electric vehicle charging stations directly supplied from the transmission grid, making it the world's first solution of this kind and bypassing potential distribution grid constraints. Furthermore, SPEED-E's modular design facilitates scalability while minimising investment risks and creating opportunities for a wide range of end users, such as public transport fleets. Find out more about the approach on page 22.

Honorary Award for Outstanding Achievement

'Agri-PV' by Jack's Solar Garden

For the first time this year, the jury decided to award a fourth project for its overarching achievement at the nexus of renewables' generation, innovation of behaviour and agriculture, also touching upon land-use issues. Jack's Solar Garden is a 4-acre, 1.2 MW-DC solar array integrating improved land management strategies called agrivoltaics – this entails co-locating agricultural activities within the solar array infrastructure. In 2021, it became USA's largest commercial research site for agrivoltaics through its outstanding research partner collaborations. Dive deeper into the project on page 32.

We would like to cordially congratulate the winners and express a sincere thank you to all participants in this year's competition who all enriched our perspectives on good practices. We would further like to acknowledge the valuable contribution of the international auditing and advisory company MAZARS who accompanied the evaluation process for the ninth year in a row and of the European Commission who hosted the award ceremony during the Third PCI Energy Days in Brussels.

Renewables Grid Initiative

mazars

An Independent Jury of Experts

Gregg D. Ander

Managing Director of Gregg D. Ander, LLC; Senior Fellow at Navigant Consulting

In his positions, Gregg provides consultative services on a variety of power and energy sector issues. Previously, he was Vice President of Power Strategies at the Energy Foundation and had a 30-year career at Southern California Edison.

Rachel Asante-Owusu

Programme Manager, IUCN

The focus of her work involves promoting measures to safeguard biodiversity, ecosystem services, natural-resource dependent livelihoods and rights from renewable energy and extractive sector operations. Formerly, Rachel was a research scientist in the field of biotechnology.

Joachim Balke

Head of Unit for Infrastructure and Regional Cooperation in DG Energy

Joachim has been the Head of Unit for Infrastructure and regional cooperation in DG Energy since November 2019. Previously, he held posts in the Commission in the Cabinets of Energy Commissioners Guenther Oettinger and Miguel Arias Cañete, as well as in the units dealing with Renewable Energy and Energy Taxation (DG TAXUD).

Susana Batel

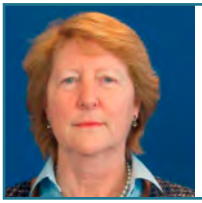
Integrated Researcher, Centre for Social Research & Intervention (Cis) - University Institute of Lisbon (ISCTE)

Susana Batel is an Integrated Researcher at the Centre for Social Research and Intervention (Cis) of the University Institute of Lisbon (ISCTE), Portugal, working on the social studies of energy and the environment. Her research examines people's responses to and engagement with renewable energy generation and infrastructures.

Humberto Delgado Rosa

Director for Natural Capital, DG Environment, European Commission

Previously, Humberto was Director for Mainstreaming Adaptation and Low Carbon Technology in DG Climate Action and served as Secretary of State for the Environment of the Portuguese Government from March 2005 to June 2011.



Marie Donnelly

Chairperson of the Climate Change Advisory Council Ireland

As a Director in DG Energy, Marie was responsible for the development of policies and actions on energy efficiency and renewable energy as well as the coordination of research activities in the field of energy.

Jean-Michel Glachant

Director of the Florence School of Regulation / Robert Schuman Centre for Advanced Studies / European University Institute

Jean-Michel is also the Holder of the Loyola de Palacio Chair in European Energy Policy & Regulation, and vice-president of the International Association for Energy Economics as well as associate researcher at the universities of Cambridge and at the MIT. He worked in the industry and private sector before becoming professor at La Sorbonne.

Michael Hogan

Senior Advisor at The Regulatory Assistance Project

Michael works on electricity decarbonisation policy, particularly matters related to market design. He previously led the power programme at the European Climate Foundation and has 35 years' experience in the electricity industry.

Carl Zichella

Retired Director for Western Transmission at NRDC

Carl was the NRDC's lead western U.S. renewable energy transmission siting expert and served on a nationwide team working on climate and clean energy issues. Carl also served as a director for the Center for Energy Efficiency and Renewable Technology (CEERT).

Communication & Engagement

Shaping Our Electricity Future

AWARD WINNER 2022

by EirGrid

FIND OUT MORE

EirGrid is the Irish Transmission System Operator. Read more here. SONI is the TSO of Northern Ireland.

- Practice video

EirGrid and SONI used a range of innovative, participatory approaches in their consultation 'Shaping Our Electricity Future'. They asked for views from the public, industry and civil society on their four approaches (generation-led, developer-led, technology-led and demand-led) to achieve Ireland's renewable ambitions.

- Build trust, new relationships, and raise awareness of the need for grid development
- 100 events held including citizen & industry forums, regional workshops and work with the National Youth Assembly.
- Engage 100 citizens over 3 days in a representative 'Citizens Assembly' style Deliberative Dialogue event

About the Practice

EirGrid regards integrated, transparent processes, and independent reporting as a prerequisite for bringing the public on board, which is key for a strong grid. Their comprehensive consultation introduced deliberative and co-design mechanisms into the decision-making process of the development of a plan to prepare the Irish all-island electricity grid to reach 2030 targets.

More than 100 events were held engaging with civil society organisations, communities, local businesses, industry, consumers, agricultural groups and young people, and 572 submissions were received as part of the consultation. Evaluation showed very positive feedback from participants and the media. Learnings have been incorporated into day-to-day grid development project consultation, engagement, and communication as well as strategic development of the company - evidenced by the 10-year engagement roadmap.

Digital Citizen Information Market

by Amprion

FIND OUT MORE

Amprion GmbH is one of the four TSOs in Germany, operating in the Northwest, West, South and South of the country.

- Find out more about their public engagement work here.

Amprion developed a 3D virtual space to present information about grid development projects to stakeholders and the public. Project stakeholders were invited to attend events in the virtual space, where they could read and watch information about grid projects and engage with gird development experts.

- Stakeholders invited to attend livestream events in virtual space
- Side rooms available for in-depth, small group discussions
- Ability to contact grid experts via video calls within the virtual space
- Explorable information points guide stakeholders through gird development process

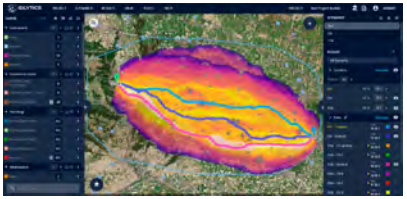
About the Practice

To meet the constraints caused by the Covid-19 pandemic as well as the regulatory requirements to provide early, transparent, comprehensive, and barrier-free information to stakeholders, Amprion developed the “Digital Citizen Information Market”. This interactive, three-dimensional virtual space was used to host events with members of the public, project stakeholders, and grid development experts from Amprion.

Amprion partnered with 3D space developer VRtualX, and design and public affairs firm Raike Schwertner, to create the Digital Citizen Information Market. Events held in the 3D space were well received by participants, who had the opportunity to provide feedback on the design and funcationality of the space.

Pathfinder

by Gilytics



FIND OUT MORE

Gilytics AG helps energy and engineering companies find the best route for powerlines and other linear infrastructure. Read more here.

- Practice video

Pathfinder is a Geographic Information System (GIS) collaborative decision-making platform which automates and optimises the design, planning and routing of linear infrastructure, including sustainable grid development. It aims to increase transparency, communication and stakeholder engagement by quickly computing alternative routes for new powerlines and displaying them with 2D and 3D visualisations.

- Pathfinder helps energy and engineering companies quickly find the best route for powerlines and other linear infrastructure, saving time and money
- Line planning is more efficient and more transparent which may lead to better acceptance of the projects
- Potential to cut planning time by 50% while reducing costs and environmental impact

About the Practice

Pathfinder is an interactive Geographic Information System (GIS) technology platform with specialised algorithms. The identification of corridors and optimal route for a new grid connection line must consider multiple technical, environmental, social and economic constraints at different levels of detail depending also on local regulations. Once the routes are identified, one of the major issues is an effective communication approach with stakeholders – Pathfinder addresses this challenge by providing clear and interactive visualisations of potential routes. Gilytics is working with stakeholders to use this technology for other use cases including heating network design, substation and renewable plants siting, and grid connections to offshore wind farms.

TransMit

by BirdLife International

FIND OUT MORE

Work on TransMit was supported by the Safe Flyways Energy project, funded by the MAVA Foundation and will be disseminated by the Energy Task Force of the Convention on Migratory Species.

Find the tool here.

TransMit is an interactive toolkit which aims to help those involved in planning, installing, and maintaining grid infrastructure to choose the best measures to minimise avian collisions and electrocutions, based on current scientific evidence.

- Offers guidance on mitigation at global scale in an easily digestible, user-friendly, and interactive format
- 'Evidence library' summarises and categorises broad research on methodology, species, location, and efficacy
- Can help grid infrastructure managers to choose the most effective power line mitigation techniques

About the Practice

To combat the risk of bird mortality through electrocution and collision with power lines, measures which improve detectability and decrease risk are key – however guidance is often lengthy, dense, and inaccessible. This lack of overview also makes it difficult for grid operators to compare devices' effectiveness and species-relevance, and therefore to take the most appropriate decision.

In response to this need and with the aid of expert consultation, BirdLife International created the TransMit tool. It contains an in-depth analysis of relevant global research, alongside clear illustrations and an easy-to-use decision flowchart, which guides users to the most appropriate mitigation technique.

Power Academy

by Polskie Sieci Elektroenergetyczne (PSE)

FIND OUT MORE

PSE is the Polish TSO that aims to provide electricity transmission services in compliance with the required criteria of the security of the Polish Power System operation. Read more here.

- Practice video

Power Academy is Polskie Sieci Elektroenergetyczne's (PSE) designed educational programme dedicated to primary schools. The main goal of the programme is to familiarise young students with knowledge about electricity, energy production and transmission through play and simple, spectacular experiments.

- Innovative approach – education through interaction (63 schools, 3500 students)
- Designed by PSE in close cooperation with local communities and implemented by a project operator – a company with a large amount of experience in innovative educational projects
- Reached growing public awareness of the activities of PSE and its impact on the development of the country and the regions

About the Practice

The lessons with the school children were conducted by actors playing the roles of two characters: the historical character, Nikola Tesla, and a fictional character, PowerMan. Nikola Tesla involved students in a scientific discussion to help them understand the phenomenon of electricity. PowerMan, on the other hand, conducted various engaging audience experiments in a humorous way.

Even though it initially ran as a pilot project, the practice has been planned as a long-term, cyclic programme from the very beginning. The positive outcomes confirmed PSE's wish to make it a permanent part of the company's DNA as a manifestation of transparent social dialogue and social responsibility to the market, residents, and the environment.

Virtual model of the Rhine-crossing in the EnLAG 14

by Amprion

Amprion developed a virtual model of an underground cable project to allow stakeholders impacted by the project to learn about the building and development process. Users of the virtual model are able to zoom in and out to discover explanatory videos and texts about the project.

- Displays detailed information in an interactive format
- Discoverable videos explain sensitive topics like flooding and nature protection
- Project visualisation displays different aspects of the underground cable in different colours
- Text boxes explain technical aspects of the project to ensure it is understood by stakeholders

About the Practice

To provide transparency to stakeholders impacted by an underground transmission line project crossing the Rhine River, Amprion developed an interactive virtual model of the project with videos and texts explaining the build process to users. The virtual model shows the current planning status of the underground cable project and can be accessed by stakeholders at any time according to their individual interest and needs.

Amprion partnered with communication agency Raike Schwertner, design firm Olli Design, and engineering company Eberhardt, to create the virtual model. The virtual model displays complex information in a digestible format so that stakeholders can navigate the project and understand sensitive issues like flooding and nature conservation.

FIND OUT MORE

Visit the virtual model of the EnLAG 14 project here. Learn more about the project (in German) here.

Amprion GmbH is one of the four TSOs in Germany, operating in the Northwest, West, and South of the country. Find out more about their public engagement work here.

Cooperative Loans

by Coopérnico

FIND OUT MORE

Coopérnico is a renewable energy cooperative in Portugal, primarily installing solar PV on rooftops. Read more here

Coopérnico is a renewable energy cooperative in Portugal whose members invest collectively in solar PV projects, primarily on the roofs of social institutions such as charities, senior residences, and kindergartens. The cooperative manages the normal maintenance of the panels and, at the end of the contract, gives them directly to the institutions – supporting their financial sustainability and promoting renewables uptake.

- Coopérnico is a citizen-led, ethical investment platform supporting local development, self-sufficiency and decentralised energy
- Members have invested almost 1,9 million € in 33 power plants, producing more than 9k MWh of electricity and avoiding 4k CO2Eq emissions

About the Practice

Coopérnico provides expert knowledge and a platform for citizens to invest in renewable energy. Any citizen can join the cooperative and directly support a renewable energy project, regardless of having an appropriate site or the capital to invest in a whole privately-owned system. This approach dilutes the financial risks for citizens (who can invest low amounts) as well as the operational and management responsibilities that come with installing such projects. Coopérnico's objective is to invest savings in an impactful way, socially, environmentally and economically. Their approach channels citizens' will to invest in renewable energies, creates mutually beneficial relationships with non-profit organizations and sustainably invests in local communities.

Environmental Protection

Bio Transport

AWARD WINNER 2022

by the Spanish National Research Council (CSIC) & Red Eléctrica de España

FIND OUT MORE

Doñana Biological Station is a public Research Institute belonging to the Spanish Council for Scientific Research CSIC in the area of Natural Resources.

Read the study here.

The study in question was commissioned and financed by Red Eléctrica de España, the TSO for Spain

Read more here.

Researchers analysed if small changes in vegetation management within pylons' bases (shelter rocks, native shrub seedlings) can benefit ecosystems by creating new habitats for certain species. Their findings show positive, transferable and exponential potential of pylons to reconnect ecosystems and support biodiversity, with little management and low costs.

- Scientific evaluation of the potential of the grid to enhance biodiversity
- After 1 year, all biodiversity variables showed significant increase and remained high after 4 study years
- Aside from planting of sapling and irrigation in first four months, no further maintenance or investments were needed

About the Practice

Recognising the potential of grid infrastructure to reconnect ecosystems, the research team at the Doñana Biological Station (CSIC) worked with Spanish TSO, Red Eléctrica de España to run an experiment on two parallel transmission corridors in Andalucía, Spain.

The team measured biodiversity after placing stones as a refuge to small mammals and invertebrates, and planting seedlings of native, beneficial shrubs to the base of the towers. They found that all variables (e.g., number and diversity of small mammals, invertebrates, and birds perching) increased significantly in the first year and remained high. These transferable findings suggest that pylons can help to overcome habitat fragmentation, with relatively low costs and maintenance and that a continental scale connective network is conceivable.

Conserving Threatened Birds in Western Bulgaria

by EGD West

FIND OUT MORE

EGD West builds and manages the electric grid in Western Bulgaria. Visit their bird protection project page here, additionally, there is a Facebook page for the project here.

Bulgarian DSO, EGD West, undertook a myriad of measures to protect threatened birds along their lines. By working with stakeholders and the public, EGD West was able to upgrade their lines, improve public awareness of the relationship between electricity infrastructure and birdlife, and reduce bird mortality along the grid.

- Worked with government ministries to develop national standards for bird-safe power lines
- Cameras installed to monitor White Stork nesting sites along the grid
- Developed and installed bird-safe electric pylon prototypes in selected grid sections
- Created a public drawing competition called “Electric Poles – Home of Wild Birds”

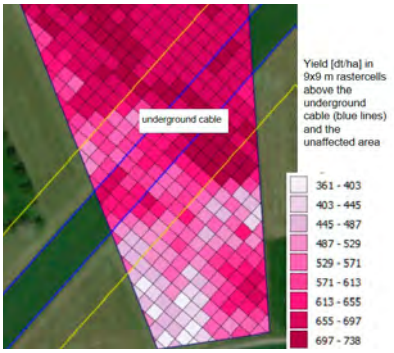
About the Practice

To mitigate the risk of unnatural mortality of threatened birds due to collision with the electric grid, and to preserve the breeding, wintering, and migrating sites of birds such as the White Stork, Electrodistribution Grid West (EGD West) used data and GIS mapping to determine the most effective locations for bird protection measures.

EGD West worked with the Bulgarian Society for the Protection of Birds as well as relevant government ministries to insulate power lines, install bird diversion markers, and safeguard and monitor White Stork nests along the lines. They undertook a public awareness campaign to increase understanding of how the threatened birds can live in harmony with the upgraded, bird-friendly grid.

Biodotti

by Terna S.p.A.



FIND OUT MORE

Terna is the Italian TSO. Read more here.

- Terna's commitment to safeguarding biodiversity

The Biodotti project focuses on improving micro-habitats and enhancing biodiversity at the bases of Terna towers located in agricultural areas between protected "Natura 2000" sites in Italy. The development of natural habitats at the base of 19 power lines will ideally become ecological stepping stones for the movement of wildlife between protected areas.

- Development of natural habitats at the base of 19 Terna towers in Lombardy, Lazio and Sicily
- Helps local wildlife (including pollinators) to find shelter, food, rest and move safely between fragmented habitats in Italy
- One of the main goals is to implement and share guidelines for the scale-up of the Biodotti pilot project according to the principles of landscape ecology and environmental protection

About the Practice

The Biodotti project focuses on using the bases of power line towers as a place for wildlife to find shelter, food and rest between protected areas and on improving the ecological value of the buffer zones. Without any interference with the agricultural activities of the landowners, Terna planted indigenous plants, installed nest boxes for birds, bat boxes, and bug hotels and implemented other measures to protect local wildlife. They will maintain and monitor these areas for at least 3 years. An assessment of the ecological status of the neo-ecosystems used the Incremental Ecological Index (IEI), a synthetic index developed by Terna (included RGI's Good Practice of the Year Award 2021), was completed. Terna hopes to apply the Biodotti approach to all new overhead powerlines which meet the necessary conditions.

Circular Economy for the Wind Industry

by Renewable Parts Ltd.

FIND OUT MORE

Renewable Parts Ltd. is a supply chain and refurbishment specialist in the wind energy industry. Read more here

- Practice video

Renewable Parts (RP) introduces unique circular economy practices into the wind energy industry to improve sustainability of wind energy assets by reducing the emissions of carbon and the amount of waste sent to scrap and landfill. A practice that can and should be utilised across renewable energy and the energy network to ensure green energy is truly sustainable.

- As a pioneer of circular economy in the wind industry, RP had to create new processes and procedures and work with customers to introduce new circular economy reverse logistic practices
- Development of unique reused packaging for parts including steel braces for yaw gears and wooden boxes for smaller parts
- RP aims to transfer their expertise to the offshore market as well

About the Practice

The circular economy practice is a supply chain method used in place of a linear economy to produce and supply items to end-users. Its main objective is to create a more sustainable supply chain throughout the industries it is used in by replacing the “buy-new” philosophy with a “reuse-first” one (refurbishing, reusing, remanufacturing), hereby reducing the requirement to create new products (which can sometimes be one of the main causes of emissions), and the number of items sent to landfill. The practice also contributes to building local skills and supporting local economies in a sustainable way, shifting their mentality more and more towards circular economy as a “must”.

Nature+Energy

by Nature +, Trinity College Dublin, Maynooth University

FIND OUT MORE

Nature +, The Trinity Centre for Biodiversity and Sustainable Nature-based solutions is a multidisciplinary team of researchers based in Trinity College Dublin. Read more here.

Nature+Energy develops new ways of accounting for the value of nature on onshore wind farms. Their activities include developing a Natural Capital Accounting methodology, environmental monitoring systems for the measurement of biodiversity on onshore wind farms and supporting measures to build human capacity in natural capital accounting.

- Nature+Energy's Natural Capital Accounting methodology is a tool to integrate nature into decision-making in a structured way for the onshore wind energy sector
- They aim to maximise the positive impacts of wind farms on biodiversity and ecosystem service provision while mitigating negative effects

About the Practice

Nature+Energy is tailoring existing methods in Natural Capital Accounting specifically for use in the wind farm context to provide a standardised methodology on wind farms. They have also designed a new smart environmental monitoring system for onshore wind farms, established the first industry-wide risk register of natural capital assets, developed the first industry-wide prioritisation protocol, and are developing a web-based decision-support tool for optimising natural capital management. Nature+Energy hopes to catalyse the employment of new, innovative tools that revolutionise how we monitor biodiversity at wind farms and increase social acceptance of the wind energy industry in Ireland.

Technological Innovation & System Integration

SPEED-E

AWARD WINNER 2022

Redes Energéticas Nacionais (REN) SGPS, S.A.

SPEED-E provides high power for electric vehicle charging stations directly supplied from the transmission grid. This can help to accelerate the build out of nationwide charging infrastructure in a sustainable way, since it provides a new use for the existing transmission grids.

- World's first EV power supply solution through the very-high voltage (VHV) network for high power charging, superior continuity of service and nationwide coverage
- Flexible scalability through modular architecture, following growing demand requirements
- Overcomes the potential constraints of charging infrastructure from the distribution grid

About the Practice

Conventional EV charging solutions require a multiple step-down transformation of voltage levels: from VHV to HV, from HV to MV, and finally from MV to LV. Portuguese TSO, REN's solution allows a direct transformation from VHV to LV, thus bypassing potential distribution grid constraints, such as higher susceptibility to climate change and need for grid reinforcements. Furthermore, modular design facilitates scalability, allowing an efficient alignment of the infrastructure development with the growth of the fleet electrification, thus minimising investment risk and creating opportunities for a wider range of end users, including public transport fleets, large parking lots, and heavy-duty vehicles.

FIND OUT MORE

Redes Energéticas Nacionais, SGPS. S.A. (REN) is the TSO for Portugal.

Read more here.

Printed Energy

by Kardinia Energy

FIND OUT MORE

Kardinia Energy is a sustainable energy company that is changing the way the world thinks about renewable energy. Read more here.

Project video

Printed Energy is an energy technology using the sun that is low-cost, high performing, durable, extremely flexible, lightweight, and 100% recyclable. It uses organic photovoltaics which are made from semiconducting polymer materials.

- Does not contain any feedstock materials found in traditional PV due to entirely different technology and does not add additional pressure on the existing silicon PV supply chain
- Weighs just 2% of traditional silicon PV panels (300 grams per square meter) – lightweight sheets not limited by the weight-bearing capacity of roof or wall surfaces
- Targets vast markets inaccessible to existing energy provisions and doesn't compete with traditional silicon PV but complements existing energy technologies
- Printed Energy can generate energy in low-light conditions such as walls and does not need to be fixed at a certain position for maximum performance

About the Practice

Kardinia Energy's mission is to revolutionise the way in which energy is generated so that it is flexible, affordable, secure and ecologically sustainable, and becomes the answer to "Energy in a Circular Economy". The philosophy of Printed Energy is entirely focused on cost, it might not have the highest "efficiency" or be the most durable, but it provides incredibly low LCOE (Levelised Cost of Electricity); that includes recycling. This business model is an entirely new way of thinking about energy and their ultimate objective is to provide energy to a world where low-cost and secure energy is accessible to all.

FARCROSS Modular Power Flow Control Solution

by FARCROSS Project Consortium

FIND OUT MORE

Visit the FARCROSS project website here. Check out the video on the Modular Power Flow Control (MPFC) solution here. For a more in-depth look, explore the MPFC factsheet here.

The 31-member FARCROSS Project Consortium has begun installing a Modular Power Flow Control (MPFC) solution between Greece and Bulgaria to unlock cross-border capacity on congested lines between the countries without building new overhead lines. The continued expansion of project should increase the utilisation of the electricity network and unlock spare capacity.

- Able to accurately assess the success of the installation over a one-year period using well-defined KPIs, which allows the performance in different network conditions to be seen
- The modular, re-deployable SmartVale power control system can be easily moved to a new location and expanded in scale

About the Practice

To address the challenge of improving cross-border electricity interconnections in order to boost the EU's security of supply and enable the integration of large amounts of renewable energy generation, the FARCROSS Project Consortium has created a large-scale demonstration aiming to develop and deploy a novel Modular Power Flow Control (MPFC) solution.

This MPFC solution was built in collaboration with SmartWires and aims to increase cross-border network capacity in the South-Eastern-European (SEE) region, aiming to deploy the technology at an optimal location on the network to reduce congestion and unlock more capacity on the existing network – without needing to build additional power lines.

Out-of-Step Protection to Detect Power Swings

by Power System Protection Centre of the Netherlands

A new approach to grid management by using synchrophasor technology that can detect a power swing from a sudden energy unbalance, known as an out-of-step condition, in the grid. The technology provides voltage and phasor measurements in real time, allowing for swift action to prevent a system outage.

- Uses an algorithm and synchrophasors to identify severe disturbances which can potentially result in blackouts
- Has been tested successfully in the Icelandic grid
- Provides a fast, reliable, and low-cost solution for grid stability, especially when working towards a high amount of renewable energy

About the Practice

This practice uses synchrophasors to enhance grid security and provide timely detection of severe power swings. The practice overcomes the drawbacks of other solutions by differentiating between stable and unstable power swings, quickly detecting fast and slow swings, requiring low processing power, and removing the need for time-consuming studies with its versatile adaptability. It provides a cheaper solution that does not require other special devices and is based on a software application that can run in every control room. The practice addresses the urgent need to provide smart solutions for future power systems with high level of renewable energy.

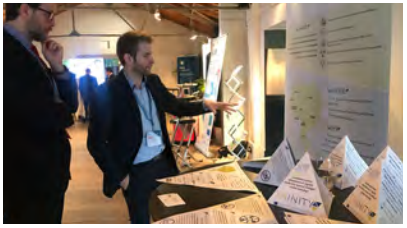
FIND OUT MORE

The Power System Protection Centre of the Netherlands operates within TU Delft and is a centre for advanced research, education and knowledge transfer in large scale power system protection. Read more here.

Publications on the practice can be found here and here.

TRINITY

by ETRA I + D



FIND OUT MORE

The project is coordinated by ETRA I+D, a large business group dedicated to service society in technological areas. Read more here.

Project website

TRINITY is a project that enhances cooperation and coordination among the Transmission System Operators of South-Eastern Europe (SEE) in order to support the integration of the electricity markets in the region, whilst promoting higher penetration of clean energies.

- TRINITY has defined 3 pilot scenarios in 8 SEE countries to maximise the benefits brought by the cross-border collaboration and to address the market integration, TSOs coordination and RES promotion
- The project solutions are being designed to be repeatable and transferable as it will be shown in the TRINITY Replication Handbook
- Project will increase 14,95 TWh of RES production, reduce 10,58 MT-CO2eq and allow a price decrease of 7€ per MWh consumed during the first five years after the project end

About the Practice

Electricity consumption in SEE is up to twice as high as in other parts of EU, causing a higher burden on SEE households with high electricity costs. The project aims to enhance cross border trading and balancing energy exchange to allow higher electricity market integration and increase the share of RES in SEE. Thus, TRINITY will reduce SEE's electricity prices and carbon footprint. In this context, it also investigates the improvement of system operation security and reinforces coordination, interaction and communication among the key energy actors of the region, encompassing regulatory and governance aspects. TRINITY is also cooperating with other Horizon 2020 projects via the BRIDGE initiative created by the EC to create durable synergies and sustainable impacts.

New planning practices with an EE1 focus

by Red Eléctrica, a Redeia company

This practice reflects the energy efficiency first (EE1) principle in a system-wide approach, applying it to all the steps of the transmission network planning. Robust results are obtained using powerful tools enabling the selection of the best alternative with the lowest environmental and economic impact.

- Detailed data collection is key to complete an analysis which enables an identification of system needs and ulterior project definition
- Solutions include options focusing on maximising the use of the existing grid by means of new tools and technologies
- This practice has led to a grid plan with more than 70% of the proposals directed to the improvement of the existing grid use

About the Practice

The practice only considers alternatives that optimise the use of the existing network. If these alternatives are insufficient to meet the identified needs, alternatives that consider new infrastructures are evaluated; with new corridors only as last option. A cost-benefit analysis (CBA) is performed using a detailed model of the system, including joint market and network simulations, using optimisation tools, and considering all the possible hourly situations within a representative year to ensure the robustness of the results. The alternatives include recent innovations such as automatic generation downloading for renewables, Dynamic Line Rating (DLR), and batteries working as integrated network components.

FIND OUT MORE

Red Eléctrica de España is the sole transmission agent and operator (TSO) of the national electricity system in Spain. Read more here.

Project website

TIGON

by 15-Partner Project Consortium

FIND OUT MORE

TIGON is an EU-funded project under the HORIZON 2020 framework implemented by consortium of 15 partners and coordinated by Fundación CIRCE.

Project website

DC grids have become attractive in recent years due to the high proliferation of renewable energy sources together with the increase in DC loads. The TIGON project demonstrates hybrid microgrid innovations with the aim of enhancing the reliability and resilience of decentralised renewables-based power systems.

- Sets out a path to the hybrid AC/DC grid transition
- Develops new generation of broadband semiconductor-based power electronic devices, such as the introduction of solid-state transformers (SST) module to provide an interconnection between MV AC and DC distribution grids
- Increases share of RES in the power network and resilience to faults and cyberattacks

About the Practice

DC grids can help energy efficiency and control of power quality. They can also better cater for renewables and energy storage. However, the lack of DC microgrids hinders these objectives and they need to be enhanced for future smart grids and turned into commercially viable technology.

TIGON proposes a four-level approach for improving reliability, resilience, performance and cost-efficiency of hybrid grids. This involves pioneering power electronic solutions and software systems and tools focused on the efficient monitoring, control and management of DC grids. Two hybrid microgrids are being designed and set up in France and Spain and two ‘use cases’ (a public metro network in Sofia, Bulgaria and a residential district in Finland) will demonstrate solutions.

NordGrid Programme

by Nordic Energy Research

FIND OUT MORE

Learn more about the NordGrid Programme here. See the first project funded by NordGrid, REDISET, here.

The platform for cooperative energy research across the Nordics, Nordic Energy Research, worked with TSOs in the region to define research and development needs and launch an open call for funding proposals to achieve the needs of the TSOs. By working together at the Nordic level, research costs are lower, and the impacts of innovation are broader in scope.

- Funded the REDISET project to develop system designs and resilience criteria for different types of critical events in collaboration with involved need owners
- Allows for direct interaction between the need-owners, the research communities, and the technology providers

About the Practice

To build power systems capable of handling a much larger proportion of unregulated and volatile production, the risk of cyber-attacks, more HVDC-links, increased loads, higher infrastructure costs, and public resistance to new infrastructure, Nordic Energy Research has begun an open call for funding proposals with very specific eligibility requirements.

Nordic Energy Research works with Nordic TSOs to define their research and development needs. These needs are then translated into open calls for funding proposals, the winners of which will have a direct impact on TSO operations. So far, one project has been funded as part of the NordGrid Programme, with the aim to annualise the call for proposals.

Honorary Award for Outstanding Achievement

Agri-PV

AWARD WINNER 2022

by Jack's Solar Garden

Jack's Solar Garden is a 4-acre, 1.2 MW-DC solar array integrating improved land management strategies called agrivoltaics – this entails co-locating agricultural activities within the solar array infrastructure. It became the country's largest commercial research site for agrivoltaics in the USA in 2021 through research partner collaborations.

- Researchers and universities use the land under the solar panels for free to study the microclimates the solar panels create and how vegetation grows within their solar array
- The solar array consists of 3,276 solar panels on a single-axis tracking system elevated to heights where panels are flat at 6ft and 8ft high to support research objectives and the ability of farm labour to work under them
- Developed an "Artist on the Farm" program to support local artists in the community who help showcase their work and 2% of the solar array's electricity is donated to low-income households

About the Practice

Jack's Solar Garden created a non-profit called the Colorado Agrivoltaic Learning Center to teach students, community members, and policymakers about how land beneath solar arrays is still functional and shouldn't be disregarded, denuded, and degraded.

Jack's Solar Garden aims to be a model for the potential of agrivoltaics and inspire more research into the practice and promote a broader acceptance of solar on farmland given better land stewardship practices within solar arrays.

FIND OUT MORE

Jack's Solar Garden is a family-owned social enterprise in Colorado doing more with the family farm for the betterment of the local community, agrivoltaics. Read more here.

Project video

RGI is a unique collaboration of NGOs and TSOs from across Europe engaging in an 'energy transition ecosystem-of-actors'. We promote fair, transparent, sustainable grid development to enable the growth of renewables to achieve full decarbonisation in line with the Paris Agreement.

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

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