

## **RT1: SAFETY AND EARTHING FACING MODERN TECHNOLOGIES**

### **SCOPE**

The increased integration of new technologies such as large PV parks close to high-voltage power systems or a change in neutral point grounding affects all connected or nearby earthing systems. In principle, the necessary proof of the adequacy of the earthing system can be provided either by simulations, tests or a combination of two. While new analysis tools offer more possibilities in predicting and analysing projects they can also give an overconfident appearance of safety/accuracy. In reality, however, the environment in which earthing systems operate can be much more variable and therefore more difficult to model. On the other hand, earthing test methods or earth fault measurements provide real values for earthing impedance or touch voltage. However, testing cannot be used for planned projects, giving only sample information about the existing configuration and requires a certain amount of time and effort. In addition, analytical models are often required to interpret the results of such tests. Another major issue is the testing and simulation of interconnected or global earthing systems with regard to electrical safety.

This round table presents a selection of the problems often encountered in connection with simulation or testing of earthing systems and is intended to initiate discussion on possible solutions.

## **RT2: DYNAMIC NETWORK TARIFFS AND LOCAL FLEXIBILITY MARKETS - MAIN RESULTS OF CIRED WG 2020-2**

### **SCOPE**

Due to the digitalization of the energy system (e.g. smart meter rollout, digital twin) and a wide spectrum of Distributed Energy Resources (DER: distributed renewable generation, demand response, energy storage, electric vehicles, heat pumps, ..), generation becomes more volatile and consumers more flexible in their demand patterns. In consequence consumers or prosumers can be providers of flexibility services to system operators.

This round table will cover experiences from existing implementations of dynamic tariffs and local flexibility markets, discussing the required/ evaluated technologies and roles of different stakeholders involved, as well as challenges (e.g. regulatory) and potential next steps in the development of dynamic network tariffs and local flexibility markets in Europe.

## **RT3: POWER QUALITY AND OTHER CHALLENGES IN DC GRIDS**

### **SCOPE**

DC grids are a strongly emerging technology, especially in transmission networks. However, such grids are increasingly making their appearance in medium- and low-voltage networks. In this round table, several experts in the field not only explain the challenges and bottlenecks in the use of DC grids, but also present their views on power quality-related aspects, both in low- and medium-voltage networks. Next to this also the aspects and challenges with respect to the standardization of DC networks both in the domain of topologies and advisable voltage levels will be discussed.

On top of that the advantages of the use of DC networks, especially related to the use of renewable energy from energy efficiency point of view will be highlighted.

## **RT4: ELECTRIFICATION**

### **SCOPE**

The energy transition is imposing substantial changes on the energy business in general, and on the electricity distribution companies in particular. The electricity distribution networks are a critical enabler for the forthcoming electrification of energy demanding processes throughout society – for example electrification of transport and heating. This will lead to a significant increase in electric energy consumption in years to come. In addition, distribution networks need to handle large and growing influx of local distributed generation resources, disruptively changing the way distribution networks are operated.

DSOs have a huge task ahead making their networks ready to handle massive electrification. This task calls for both increased and flexible utilisation of existing networks, as well as upgrading and expanding the electricity distribution infrastructure.

In this round table prominent executives connected to the DSO business share their views on the challenges facing the DSOs in coming years, how this will impact the business, and possible solutions to tackle this task – sharing their strategic views on the electrification challenge.

## **RT5: TURNING DATA INTO INFORMATION – FUTURE NEEDS IN POWER QUALITY DATA ANALYSIS**

### **SCOPE**

The interest in monitoring Power Quality has significantly increased during the last years. More and more network operators implement monitoring campaigns with several hundreds, sometimes more than thousands of monitors. These monitors generate an immense amount of data, which contains precious information about the behaviour and characteristics of networks, its components and connected installations. Extracting and utilizing this information can help network operators in many different areas, like asset management, component diagnosis or disturbing source identification. Nowadays, this information is still rarely used beyond the comparison of measured levels with existing standards.

This round table discusses the needs and opportunities of advanced analysis of large Power Quality monitoring data from the viewpoint of different stakeholders, namely distribution and transmission system operators, monitor manufacturers, consultants and academics. This way it aims to identify promising ideas and approaches to what is effectively needed in order to support DSOs and TSOs in the efficient operation of future electricity networks.

## **RT6: EFFECTIVE INNOVATION**

### **SCOPE**

DSOs are in the middle of the energy transition towards a sustainable and reliable energy system. The transition is a significant challenge for the DSO's and is further challenged through the security situation in the world and the ever increasing speed of society change. Current solutions are in many cases not sufficient to meet the challenges so innovative solutions is required.

DSO innovation can be conducted in many different ways and involves tools, methods, equipment, business models and know-how, all in the end within the

framework of the regulation. This round-table will show and discuss different ways of conducting innovation in the DSO business, the experiences and best practices.

#### **RT7: CYBERSECURITY**

##### **SCOPE**

Cyber security will be an ongoing task for the DSOs worldwide in the future. Though, pandemics like the COVID19, extreme weather and other major incidents may challenge the DSO business, the cyber threat might be the biggest single threat for the DSOs. Just before Christmas 2022 the EU Commission and the EU Parliament agreed on the updated Directive for Network and Information Security (NIS2) and the Directive for Critical Entities Resilience (CER). These two directives will together with the coming EU Cyber Resilience Act (CRA) and the EU Network Code for Cyber Security (NCCS) be four important pillars which the DSOs in the EU must comply to.

In this Round Table on Cyber Security the panel will discuss the importance of DSOs being cyber secure – and to what extent that is at all possible and how it can be done? The panel will also discuss to what extent new regulation (like the NIS2 and the NCCS) will result in higher level of security of supply– or will it only introduce more paper, procedures and policies? But how can procedures and policies be transformed to real security of supply? And what about new products and services, which will be integrated in the already existing long line up of legacy systems? And finally: The need for co-operation, information sharing and trust among stakeholders though we are monopolies and/or competitors. Its only just begun – but how to catch up with a moving target in a hurry?

#### **RT8: APPLICATIONS OF FLEXIBILITY IN PLANNING AND OPERATION**

##### **SCOPE**

Power system flexibility is the ability to adapt to dynamic and changing conditions, for example, balancing supply and demand by the hour or minute, or deploying new generation and transmission resources over a period of years. DSOs have to face the ability to manage changes, and to be able to improve the resilience characteristics of the grids, including planning and adequate operation.

#### **RT9: MAXIMIZING HOSTING CAPACITY: INNOVATIVE APPROACHES TO CAPACITY MANAGEMENT FOR EV AND PV IN DISTRIBUTION SYSTEMS**

##### **SCOPE**

As more electric vehicles (EVs) and photovoltaic (PV) systems are integrated into distribution systems, managing their capacity becomes critical for grid operation and planning. Hosting capacity assessment is a crucial tool for achieving this goal, as it enables utilities to determine the maximum amount of renewable energy that can be integrated into their networks without compromising performance. Starting from a recent EU document on the capacity of distribution networks, this panel session will explore innovative approaches to capacity management for EV and PV in distribution systems, with a focus on hosting capacity assessment.

The panelists, drawn from industry, academia, and government agencies, will share their insights and experiences on best practices and emerging technologies for managing capacity in the context of an evolving energy landscape.

## **RT10: DIGITAL PRIMARY SUBSTATION**

### **SCOPE**

Digitalisation is the key enabling factor for decarbonizing the electrical energy generation and key for interoperability of decentralized energy generation and integration of volatile renewable energy sources. Digitalisation is also required to manage the exchange of the information on all levels of the electrical network, distribution and transmission.

The Scope of the round table is to give an overview of state-of-the-art and development direction of primary substations on a high level and to identify the requirements, challenges, opportunities, benefits, and restrictions for primary substations, depending on the degree of digitalisation.

The focus is on the use cases enabled by the digitalisation such as extended monitoring, improved asset management, supervision and control capabilities, automation and protection, improved engineering process.

## **RT11: ACCELERATING THE ENERGY TRANSITION, FROM AUTHORISATION THROUGH TO COMMISSIONING**

### **SCOPE**

Energy transition involves a significant change in the way in which energy is produced, transmitted, distributed, and consumed. Final energy uses will shift to electricity consumption at a faster pace than in the last decades; public infrastructures will be built not only to distribute electricity, but also to deliver EV charging services; hard-to-abate industrial sectors will open to innovative electric technologies. Public funds will be directed to steer that path. In this context, it is important that the evolution of the electric system can proceed in an organized way, so that no part of the system is left behind but at the same time no one is waiting for the others. In such complex projects, permitting and execution are crucial: efficient, careful, coordinated processes can propel the ambitious plans that are needed to enable energy transition, while bureaucracy and disorder can seriously affect, and even frustrate, them. The panel deals with positive examples of projects and initiatives whose development has been supported by effective authorization processes and commissioning.

## **RT12: REMOTE CONTROL AND AUTOMATION TECHNIQUES TO IMPROVE CONTINUITY OF SUPPLY: PERFORMANCE REQUIREMENTS AND EVALUATION**

### **SCOPE**

Remote control and automation techniques are becoming more and more strategic to operate the distribution system and manage faults and their reliability is key to improve the continuity of supply. The aim of the RT is to illustrate the available solutions and the challenges for DSO, manufacturer and TLC operators in the next future and to launch the CIRED WG on the same topic.

## **RT13: NEW ROLE OF SMART METERING FUNCTIONALITIES**

### **SCOPE**

European decarbonisation goals are massive drivers for power system planning, control, and operation changes. In addition, technical developments in data analytics and information technologies enable new use cases. Pushed by the goals of the

European Union in the field of electricity metering, “smart meter” have been and will be further rolled out all over Europe. While the main application of these meters - provided by the meter manufacturing and IT companies- lies in the automation of electricity metering processes themselves, the comprehensive smart meter rollout offers possibilities for the distribution system operators (DSOs). The extensive collection of data especially calls for using them to optimize the processes in planning, control and operation of distribution grids.

In the round table the state of the art and perspectives offered by smart meters to improve distribution grid operators’ processes, are going to be presented and discussed with representatives from distribution system operators, smart metering industry as well as research.

The discussion will very much reflect the outcomes of the CIRED working group report on “the future role of smart metering in planning, control and operation” available here: <http://www.cired.net/cired-working-groups/smart-metering-wg-2018-5>

#### **RT14: SMART NETWORKS: FROM THE SECONDARY STATION TO THE LV NETWORKS**

##### **SCOPE**

Secondary Substations (SS) and LV Networks play an increasingly important and smart role in the distribution network in the energy transition context. Together with smart metering infrastructure, intelligent integration of distributed energy resources and optimisation of energy flows on the LV grid, they are the first layer to provide solutions to improve the flexibility of the global distribution system.

Will Dynamic voltage regulation, energy storage management, new-generation IoT-based monitoring, HEMS and DER vertical integration in the global distribution system and, more generally, local intelligence for control and management of MV and LV networks be an integral part of the future secondary substation and LV network?

This round table will promote a “think-tank” about the concept of the future Secondary Substation and LV Network, bringing to the discussion vision and the most advanced experiences.

#### **RT15: DIGITAL SOLUTIONS FOR MAINTENANCE**

##### **SCOPE**

Digital solutions becoming more and more important to organise daily work. In the field of maintenance solutions do not only cover the workforce management but also allows to evaluate the condition and the importance of each electrical equipment. At the end this will lead to a systematic maintenance strategy. Round table 15 will discuss the benefits and also highlights the challenges to implement digital solutions form manufacturer and utility side.

#### **RT16: LIFETIME EXTENSION OPTIONS FOR ELECTRICAL EQUIPMENT – MAIN RESULTS OF CIRED WG 2020-1**

##### **SCOPE**

Electrical equipment is a considerable economic asset for DSOs. Many network equipment in distribution networks have long intrinsic lifespans, most of which exceed 40 years. However, some equipment components age faster than others or become obsolete due to changes in the technologies. Environmental or safety requirements may also appear and pose problems of equipment compliance. The development of

smart grids to achieve energy transition objectives can also lead to functional requirements that some legacy generation electrical energy distribution assets do not meet.

Faced with the constraints mentioned above, solutions for extending the life of equipment and/or modifying/upgrading critical parts and/or implementing monitoring can prove effective in many cases, compared to a complete renewal of equipment. In addition, today's technologies such as IoT, big data and AI offer new possibilities to optimize the lifespan of equipment.

A CIRED working group (WG 2020-1) has been devoted to this subject, the main results of which will be presented during the round table. Beyond that, the round table will be an opportunity to discuss experiences and prospects for extending the life of network equipment.

## **RT17: STORAGE TECHNOLOGIES AS AN OPPORTUNITY FOR DISTRIBUTION SYSTEMS SCOPE**

Energy storage can be both an opportunity and a threat for distribution system operators (DSOs). On the one hand, energy storage technologies can help DSOs manage peak demand, integrate renewable energy sources, and improve system efficiency. This can result in cost savings, and increased system resilience.

On the other hand, energy storage can also present challenges for DSOs. If not managed properly, the addition of energy storage to the grid can cause voltage fluctuations, overload transformers, and disrupt the balance between supply and demand.

To address these challenges, DSOs must develop new strategies for managing energy storage on their grids. This may include implementing new technologies to monitor and control energy storage systems, developing new policies and regulations to support their integration, and collaborating with stakeholders to ensure a coordinated and efficient transition to a more decentralized and distributed energy system.

In this session, we will lightly explore the existing technology, the current status of the regulatory framework and debate the technical and business use cases that are being considered by the DSO's around the world when deploying ESS. This roundtable will also provide valuable insights about some existing projects with ESS at the distribution grid level and further explore the challenges when planning, deploying and operating these types of assets.

## **RT18: GREEN NETWORK SOLUTIONS SCOPE**

Considering climate change as one of the most important challenges to mankind, the reduction of CO<sub>2</sub> emission along the complete electricity value chain is of major importance. In the last years green network components and products with alternative gaseous insulation and polymer-based solid and liquid insulation materials were introduced to the field. Here the roundtable will challenge the penetration of the installed based, limitations, restrictions and alternative ways to make CO<sub>2</sub> reduction a commercial success.

As CIRED stands for a holistic view, the roundtable will also discuss eco-design perspectives and life cycle analyses (LCA) including the impact of grid installations to

wildlife and fauna. Here the ecological impact of design, engineering, production, installation and commissioning, operation and dismantling and recycling of products and components of distribution networks will be in the focus. An operational aspect of increasingly importance is minimizing impact to wildlife and flora as well as to guarantee biodiversity. We are urged to find opportunities for optimised technical solutions meeting divergent targets of economy, ecology and regulations.

## **RT19: ENERGY COMMUNITIES: TECHNICAL AND REGULATORY CHALLENGES**

### **SCOPE**

Energy communities are one of the key elements of the energy transition since the end-users, who own and operate distributed energy resources, become active players of the energy systems. The European commission sees energy communities as a way to increase energy efficiency, reduce electricity bills and help providing flexibility services to the whole system. Nevertheless, technical and regulatory barriers remain and need to be resolved to ensure the successful development of these energy communities. Issues related to the optimal operation of ECs versus the optimal operation of the global system as well as the appropriate market design will be addressed in this roundtable. Experts coming from industry and academia will share their vision and return of experiences of real projects in some European countries.