CONFERENCE PROGRAMME

PRE-SESSION MEETINGS LEVEL 0
There will be a pre-session briefing meeting for each main and RIF session for the preparation of the session with the chair and rapporteurs. All those involved will be requested to attend (Chairs, rapporteurs, speakers and technical assistants).

FOR MAIN ORAL SESSIONS LEVEL 0

<table>
<thead>
<tr>
<th>DAY</th>
<th>TIME</th>
<th>SESSION</th>
<th>ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 12 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S1</td>
<td>ROOM N (TUTORIAL 1)</td>
</tr>
<tr>
<td>Monday 12 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S3</td>
<td>ROOM O (TUTORIAL 2)</td>
</tr>
<tr>
<td>Tuesday 13 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S2</td>
<td>PLENARY ROOM 1</td>
</tr>
<tr>
<td>Tuesday 13 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S6</td>
<td>PLENARY ROOM 4</td>
</tr>
<tr>
<td>Wednesday 14 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S4</td>
<td>PLENARY ROOM 1</td>
</tr>
<tr>
<td>Wednesday 14 June</td>
<td>18.00</td>
<td>MAIN ORAL SESSION S6</td>
<td>PLENARY ROOM 4</td>
</tr>
</tbody>
</table>

FOR RIF SESSIONS LEVEL 0

<table>
<thead>
<tr>
<th>DAY</th>
<th>TIME</th>
<th>SESSION</th>
<th>ROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday 13 June</td>
<td>16.00</td>
<td>RIF SESSION S2</td>
<td>PLENARY ROOM 2</td>
</tr>
<tr>
<td>Wednesday 14 June</td>
<td>16.00</td>
<td>RIF SESSION S4</td>
<td>PLENARY ROOM 2</td>
</tr>
<tr>
<td>Wednesday 14 June</td>
<td>16.00</td>
<td>RIF SESSION S5</td>
<td>PLENARY ROOM 3</td>
</tr>
<tr>
<td>Thursday 15 June</td>
<td>16.00</td>
<td>RIF SESSION S1</td>
<td>PLENARY ROOM 2</td>
</tr>
<tr>
<td>Thursday 15 June</td>
<td>16.00</td>
<td>RIF SESSION S3</td>
<td>PLENARY ROOM 3</td>
</tr>
</tbody>
</table>

UPLOAD ROOM LEVEL 0
If you need to update your presentation in Rome, you can go to the Upload Room located on LEVEL 0 inside the conference rooms area, preferably the day before your presentation. There is no possibility of uploading your presentation in the conference rooms.

Upload Room opening hours:

<table>
<thead>
<tr>
<th>DAY</th>
<th>TIME</th>
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</thead>
<tbody>
<tr>
<td>Monday 12 June</td>
<td>15.00 – 18.00</td>
</tr>
<tr>
<td>Tuesday 13 June</td>
<td>08.15 – 18.00</td>
</tr>
<tr>
<td>Wednesday 14 June</td>
<td>08.30 – 18.00</td>
</tr>
<tr>
<td>Thursday 15 June</td>
<td>08.30 – 18.00</td>
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</tbody>
</table>

POSTER SESSIONS LEVEL 1
Poster area – Level 1 (FORUM) next to the Exhibition. Posters should be set up between 08.30 – 09.00 the day of their presentation and removed from 18.00 – 18.30 the very same day. Once set up, posters may be left for free viewing during the whole day. E-posters will give permanent access to the poster files.

POSTER TOURS
Each CIRED Technical Session will organise 8 guided tours (except for Session 2 – only 4 tours). Authors are requested to be present during the poster tour hosting their presentation.

OPENING FORUM 15.00 OPEN TO ALL
Auditorium (access from Level 1)
THE OPENING FORUM OF THIS EDITION OF CIRED WILL HOST KEYNOTE SPEECHES AS WELL AS A PANEL DEBATE ONE POWER DISTRIBUTION SYSTEMS FOSTERING SUSTAINABILITY.

12 JUNE
TUTORIALS 9.30 – 13.45 + lunch until 15.00
ACCESS RESERVED TO HOLDERS OF A REGISTRATION FOR TUTORIAL 1 OR 2.
Level 0 TUTORIAL 1 ROOM N TUTORIAL 2 ROOM O
Tutorials offer the attendees the opportunity to enhance their knowledge in specific areas.

13 – 14 – 15 JUNE
ACCESS RESERVED TO REGISTERED CONFERENCE PARTICIPANTS.

MAIN SESSIONS
Level 0 PLENARY ROOMS 1 & 4
Led by experts, Chairs and Rapporteurs, the main sessions comprise presentations by a limited number of selected authors.

POSTER SESSIONS
The Poster area is located next to the Exhibition on Level 1 (FORUM)
Each author of an accepted paper will be given the possibility to display his/her work during the interactive guided poster tours of the relevant session. These poster sessions are a unique opportunity for an in-depth discussion with presenting authors.

ROUND TABLES
Level 0 PLENARY ROOMS 2 & 3
Round Tables will focus on particularly topical subjects, giving delegates the opportunity to listen to experts and participate in lively discussions.

RIF SESSIONS
Level 0 PLENARY ROOMS 2 & 3
Research and Innovation Forums (RIFs) will highlight interesting research papers for in depth discussion.

PROCEEDINGS (FULL PAPERS)
The proceedings are accessible to conference participants ONLY.
> log in with the e-mail address used during the registration process on www.conftool.org/cired2023
> available also on the CIRED 2023 APP

ACCESS RESERVED TO REGISTERED CONFERENCE PARTICIPANTS.
## PROGRAMME OVERVIEW CIRED 2023

### CONFERENCE ROOMS LEVEL 0 • POSTER AREA LEVEL 1 (FORUM)

<table>
<thead>
<tr>
<th>Monday 12 June</th>
<th>TUTORIALS</th>
<th>OPENING FORUM (OPEN TO ALL)</th>
<th>WELCOME RECEPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00 - 13.45</td>
<td>TUTORIAL 1 (Room N – Level 0) / TUTORIAL 2 (Room O – Level 0)</td>
<td>15.00 – 18.00 Auditorium (access from Level 1)</td>
<td>18.00 – 20.00 Exhibition Floor Level 1 (FORUM)</td>
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<table>
<thead>
<tr>
<th>Monday 13 June</th>
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<tbody>
<tr>
<td>16.00 - 18.00</td>
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<tr>
<td>Gala dinner Villa Miani (on extra booking)</td>
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<table>
<thead>
<tr>
<th>Tuesday 14 June</th>
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<tbody>
<tr>
<td>09.00 - 10.30</td>
</tr>
<tr>
<td>BLOCK 1: Disruptive Innovation, New Usages and Prospective</td>
</tr>
<tr>
<td>BLOCK 1: Strategy &amp; Management 1</td>
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<tr>
<td>BLOCK 1: Strategy &amp; Management 2</td>
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<tr>
<td>BLOCK 1: Operation</td>
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<tr>
<td>BLOCK 2: Equipment Related Power Quality Aspects</td>
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<td>BLOCK 2: DSO</td>
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<tr>
<td>BLOCK 2: Customer</td>
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<tr>
<td>BLOCK 2: Digitalization</td>
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<tr>
<td>BLOCK 3: System Related Power Quality Aspects</td>
</tr>
<tr>
<td>BLOCK 4: Standards, Measurements, Regulations and Advanced Data Analysis</td>
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<tr>
<td>BLOCK 4: New Use Cases</td>
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<tr>
<td>BLOCK 4: Protection, Control &amp; Automation</td>
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<tr>
<td>Session 4: Protection, Control &amp; Automation</td>
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<tr>
<td>Session 5: Planning of Power Distribution Systems</td>
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<tr>
<td>Session 6: Customers, Regulation, DSO Business &amp; Risk Management</td>
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<tr>
<td>Session 7: Cybersecurity</td>
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<tr>
<td>Session 8: Power Quality Challenges Related to E-mobility</td>
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<tr>
<td>Session 9: Capacity management for PV and EV</td>
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<tr>
<td>Session 10: Accelarating the Energy Transition, From Authorisation Through to Commissioning</td>
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<tr>
<td>Session 11: New Role of Smart Metering functionalities</td>
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<tr>
<td>Session 12: Remote Control and Automation Techniques to Improve Continuity of Supply: Performance Requirements and Evaluation</td>
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<tr>
<td>Session 13: Effective Innovation</td>
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<td>Session 14: Planning of Power Distribution Systems</td>
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<td>Session 15: From the Secondary Station to the LV Networks</td>
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<td>Session 16: Lifetime Extension Options for Electrical Equipment</td>
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<td>09.00 - 10.30</td>
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<tr>
<td>BLOCK 1: Automation</td>
</tr>
<tr>
<td>BLOCK 1: Risk Assessment and Asset Management</td>
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<tr>
<td>BLOCK 2: Control &amp; Cyber Security</td>
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<tr>
<td>BLOCK 2: Network Development</td>
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<tr>
<td>BLOCK 3: Communication &amp; Protection</td>
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<tr>
<td>BLOCK 3: Distribution Planning</td>
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<tr>
<td>BLOCK 4: Protection</td>
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<tr>
<td>BLOCK 4: Methods and Tools</td>
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<tr>
<td>Session 4: Protection, Control &amp; Automation</td>
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</table>

### TECHNICAL VISITS

(Technical Visit 1: Departure at 08.30 – Technical Visit 2: Departure at 09.00)
TUTORIAL 1  ■ DATA SHARING & CYBERSECURITY IN SMART GRIDS

AIM OF THE TUTORIAL:
The purpose of the tutorial is to present how do deal with privacy issues in smart distribution grids, regarding both data sharing in big data analytics and the cybersecurity aspects. The first part of this tutorial will be dedicated on how to break the data barrier and promote data sharing. After giving a broad overview of new technologies for data sharing (blockchains, noise-injection techniques, etc.), efforts will be devoted to two aspects, i.e., i) privacy-preserving data analytical methods, and ii) data pricing or valuation approaches. To that end, the relevant statistical methods and data-driven approaches in distribution systems will be introduced, along with recent advances in privacy-preserving settings (e.g., federated learning, differential privacy, etc.) to enable data sharing. In complement, the data trading mechanisms and data value quantification methods in power and energy industries will be summarized and compared.

The second part of the tutorial is focused on the discussion of cybersecurity issues and techniques related to SCADA networks, intrusion detection, and the security of end and legacy devices. The objective is not only to understand the critical risks and technologies used today, but also to foresee innovations that can improve the cybersecurity and resilience of smart distribution networks of the future.

SPEAKERS:
Allyson Bessani (University of Lisbon, Portugal)
Jean-François Toubeau (KULeuven, Belgium)
Yi Wang (University of Hong Kong, Hong Kong)

TUTORIAL 2  ■ RENEWABLE ENERGY COMMUNITIES: WHAT? WHY? HOW?

AIM OF THE TUTORIAL:
This tutorial comprehensively reviews the current state-of-the-art on Renewable Energy Communities. It is motivated by the diversity of points of view, definitions, and hypotheses adopted by academic and industrial professionals, mainly associated with the uncertainties in terms of legislation and regulation, which are still well present. The Tutorial will be presented by a team of speakers from academia, as well as from the public (DSO) and commercial sectors.

SPEAKERS:
François Bordes (WeSmart, Belgium)
Bertrand Cornélusse (ULiège, Belgium)
Zacharie De Grève (UMons, Belgium)
Simone Paoletti (University of Siena, Italy)
David Vangulick (ORES, Belgium)
Papers have been selected for presentation and discussion during the technical sessions (main, poster and RIF Sessions). The conference will be structured around the 6 technical sessions:

**SESSION 1**
Network Components

**SESSION 2**
Power Quality & Electromagnetic Compatibility

**SESSION 3**
Operation

**SESSION 4**
Protection, Control & Automation

**SESSION 5**
Planning of Power Distribution Systems

**SESSION 6**
Customers, Regulation, DSO Business & Risk Management

**SESSION 1** deals with all aspects related to the components used in the electricity distribution networks: cables, overhead lines, primary and secondary substations, transformers, switchgear, protection and monitoring systems, power electronics. It covers topics related to the life cycle of assets from design to end of life management. The session also covers environmental concern including eco-design and life cycle analysis, standardisation, ergonomics and safety. It aims at providing an overview of the state-of-the-art and proposals for future components, including those needed for smart grids, E-mobility, smart cities and microgrids, as well as components for more resilient networks in the context of climate change anticipation. This session is an opportunity for DSOs and manufacturers to share their challenges.

**BLOCK 1**

**SESSION 1**
Network Components

**SESSION 2**
Power Quality & Electromagnetic Compatibility

**SESSION 3**
Operation

**SESSION 4**
Protection, Control & Automation

**SESSION 5**
Planning of Power Distribution Systems

**SESSION 6**
Customers, Regulation, DSO Business & Risk Management

**BLOCK 1**

**09.00 – 10.30**

**LEVEL 0 **
PLENARY ROOM 1

**MAIN SESSION 1**

**NETWORK COMPONENTS**

**10763**
Smart Secondary Substation development and demonstration under FLEXIGRID project
JON Aguirre Valparis (1), Alejandro Blasco (1), Miguel Alvarez (1),
Antonio González (2)
1: ORMAZABAL, Spain; 2: EDP REDES ESPAÑA

**10998**
MADELAINE – A Multi-Adaptive and Cost-Effi cient DC Charging System for EV Car Parks
Daniel Stahlieder (1), Stephan Ledinger (1), Florian Mader (2),
Dominik Hartmann (2), Markus Litzibauer (3); Manuel Schmutz (3), Felix Lehuss (1)
1: AIT Austrian Institute of Technology, Austria; 2: WEB Windenergie; 3: ENIO

**11045**
Recent superconducting cable installation in Chicago paves the way for a Resilient Electric Grid (REG) system
Arnaud Allais (1), Nicolas Lallouet (1), Jean-Maxime Saugrain (1),
Beate West (2), Erik Marzahn (2), Frank Fentzas (4), Mike Ross (3)
1: Nexans, France; 2: Nexans, Germany; 3: American Superconductor, USA; 4: COMED, USA

**11050**
Requirements For Large Scale Battery Storages In Low Voltage Grids - Lessons Learned From A Smart Grid Project
Navreet Dultz, Benjamin Petters
Avacon Netz GmbH, Germany

**11469**
Distributed Smart Soft Open Point
Wenlong Ming (1), Jinlei Chen (1), Jianzhong Wu (1), James Yu (2),
Ali Kazerooni (2), Ranit Edgar (2), Alastair Ferguson (3)
1: Cardiff University, United Kingdom; 2: Scottish Power Energy Networks; 3: Polaris Diagnostics & Engineering Ltd

**10784**
Silicon Carbide Enabled Medium Voltage DC Transmission Systems for Rapid Electric Vehicle Charging in the UK
Arkadeep Deb (1), Jose Ortiz-Gonzalez (1), Ruizhu Wu (2),
Saeed Jahdi (3), Wald Issa (4), Oluywola Alatise (1)
1: University of Warwick, United Kingdom; 2: Chongqing Jinkang E-powertrain, China; 3: University of Bristol; 4: Sheffield Hallam University

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## Programme

**TUESDAY 13 JUNE**

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<th>LEVEL 0</th>
<th>PLENARY ROOM 1</th>
<th>MAIN SESSION 1</th>
<th>NETWORK COMPONENTS</th>
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### CONTEXT EVOLUTION DRIVING DEVELOPMENT AND STUDIES ON COMPONENTS

#### BLOCK 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Talk</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10235</td>
<td>Concept Of A Partial Discharge Analysis By Applying Specific Digital Twins</td>
<td>Erhard Aumann (12), Franck Voufo (3), Thomas Hammer (1), Svetlana Gossmann (1), Dirk Westermann (2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Siemen; Germany; 2: Technische Universität Ilmenau; 3: Robert Bosch GmbH, Germany</td>
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<tr>
<td></td>
<td>10447</td>
<td>Innovan Densimeter for GIS Tank, Insensitive to Temperature Variation</td>
<td>Philippe Brun (1), Diego Alberto (1), Raimund Summer (2)</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>1: Schneider Electric, France; 2: Schneider Electric, Germany</td>
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<tr>
<td></td>
<td>10687</td>
<td>On-line Monitoring Condition of On-load Tap Changer of Power Transformers</td>
<td>Mauricio Cuevas (1), Damil Bortotlotti (1), Mohammed Zouiti (2)</td>
</tr>
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<td></td>
<td></td>
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<td>1: EDFT, France; 2: ENERD, France</td>
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<tr>
<td></td>
<td>10699</td>
<td>Diagnostic Techniques Of MV Cable Joints Under Different Environmental Conditions</td>
<td>Giovanni Pirvano (1), Johnny Borghetto (1), Alfredo Contin (2), Andrea Moratti (3), Andrea Pegiani (3), Samuele Forcinti (3)</td>
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<td>1: RSE, Italy; 2: University of Trieste, Italy; 3: Unaret, Italy</td>
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<tr>
<td></td>
<td>11027</td>
<td>Field Experience of On-site Cable Testing of 66 kV Offshore Array Cables</td>
<td>Uwe Kaltenborn (1), Olaf Schacht (1), Christopher Donaghy-Spargo (2), Alex MacPhie (2)</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>1: HIGHVOLT Prüftechnik Dresden GmbH, Germany; 2: JDR Cable System Ltd.</td>
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### BLOCK 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Talk</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.30 – 16.00</td>
<td>10225</td>
<td>Enel’s Circular by Design Approach for Grid Components</td>
<td>Massimo Bartolucci (1), Giuseppe Di Tommaso (1), Fabrizio Gasbarri (1), Lourdes Garcia (2), William Di Tullo (2), Luca Di Rocco (1), Samuele Giovannetti (1), Maria Cristina Papetti (1), Marina Lombardi (1)</td>
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<td></td>
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<td>1: Enel, Italy; 2: Enel, Spain</td>
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<tr>
<td></td>
<td>10596</td>
<td>Sustainable Power Transformers: Enel Grids use of natural ester insulating fluid in large power transformers</td>
<td>Miguel Angel Caballero, Marianna Rizzo, Juan Manuel Rey, Flavio Mauri, Fabrizio Gasbarri, Enrico Valigi, Francesco Amadei Enel Grids</td>
</tr>
<tr>
<td></td>
<td>11223</td>
<td>Fast-tracking Licencing Of Temporary Lines And The Use Of Mobile Maintenance Kits With MV Aerial Bundled Cables</td>
<td>Ruí Bandeirinha, Carlos Manuel Duarte, António Tomás, Jorge Miguel Antunes</td>
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<td></td>
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<td>E-REDES, Portugal</td>
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### BLOCK 4

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<thead>
<tr>
<th>Time</th>
<th>Talk</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.30 – 18.00</td>
<td>10642</td>
<td>Solving the Problem of Wooden Poles Ignition due to Insulator Contamination – In Theory and Practice</td>
<td>Dornagchi Milun, Dinko Marianj, Josip Srdanovic HEP DSO, Croatia</td>
</tr>
<tr>
<td></td>
<td>11056</td>
<td>A Simplified Tool For The Life Cycle Analysis Of A Medium Voltage Switchgear</td>
<td>Teresa Bas (1), Jesus Izcarra (2), Irtigo Aizpuru (3), Jose Ramon Tejedo (1)</td>
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<td>1: Iberdrola Distribucion Electrica; 2: Ornazabal; 3: Ithoe</td>
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<td></td>
<td>11175</td>
<td>Improve Operator Safety and Protect Wildlife in Overhead Distribution Networks</td>
<td>Iban Landeta Zarate (1), Iñaki Apraiz Alvarez (1), Juan Carlos Pérez Quesada (1), Miguel Irizar Moyua (2)</td>
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<td></td>
<td></td>
<td></td>
<td>1: Schneider Electric (MESA PLANT), Spain; 2: Iberdrola, Spain</td>
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</tbody>
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Notes:
- Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur.
- Download the APP to see the last updates.
SESSION 3 deals with operational use of components (Session 1) and systems (Session 4) in public, industrial and private distribution networks in normal operation as well as in any case of disturbance. Session 3 covers all aspects of grid operation including strategies and management topics, challenges and new application, the integration of DER and special applications. Focus is on the use of new technologies like artificial intelligence and the operational challenges to integrate and operate new types of load like electric vehicles and storage.

**BLOCK 1** 09.00 – 10.30

**11035** Digitizing Grid And Vegetation Inspection With Remote Sensing And Artificial Intelligence
Sophie Crommelinck, Katharina Gill, Jürgen Scholz, Mario Gnädig, Bartholomäus Surmann
Netze BW GmbH, Germany

**10983** Data Analytics For Pruning Optimization Around Power Lines
Charles Demay, Pierre Achaichia, Philippe Tuloup
ENEDIS, France

**BLOCK 2** 11.00 – 12.30

**11034** An Automated System for Overhead Line Inspection with Traveling Wave Measurement and Unmanned Aerial Vehicles
Frederik Puhe (1), Maximilian Schmalen (1), Björn Keune (1), Carsten Hermanns (1), Mitja Witteraheim (2), Johannes Bleser (3)
1: Westnetz GmbH, Germany; 2: Beagle Systems GmbH, Germany; 3: Siemens AG, Germany

**11065** A Platform For Real-time Monitoring And Detection Of Conductor Integrity Related Health Hazards In Distribution Networks
Guilherme Freire (1), João Campos (1), Joana Faria (1), Philip Marsh (2)
1: ENEDAJO, Portugal; 2: Powerco, New Zealand

**10599** Feeder Remote Terminal Unit of Distribution Automation System for Detecting Impact and Tilt Change applied to Distribution Equipment
GyuHo Han, Haeyung Jeong, Yeonho Lee, Seongwon Cho
KEPCO KDN, Korea, Republic of (South Korea)

**10359** Detection of Weather Induced Events on Overhead Power Lines
Daniel Mitcan, Bertrand Godard
Ampacimon SA, Belgium

**BLOCK 3** 14.30 – 16.00

**11073** Assessing the Pros and Cons of Different Operating Envelope Implementations Across Australia
Arthur Gonçalves Givisiez, Luis F. Ochoa, Michael Z. Liu, Vincenzo Bassi
The University of Melbourne, Australia

**1232** Determination of Q(P)– And Q(U)-Characteristics By Means Of Time–Series Based Optimal Power Flow Calculations To Optimize Distribution Grid Operation
Manuel Schwenke, Jutta Hanson, Rafael Steppan, Anna Pfendler
Technical University Darmstadt, Germany

**BLOCK 4** 11.00 – 12.30

**11127** High-level Resilience Strategizing Using Data–Driven Inputs
Xavier Weiss (1), Lars Nordström (1), Arne Berlin (2)
1: KTH Royal Institute of Technology, Sweden; 2: Vattenfall Distribution AB

**10986** Advanced Concept of Efficient Use of Transformers Leveraging the Dynamic Thermal Rating Technology
Andréj Souvent (1), Miha Rot (6), Tim Gradnik (5), Andrej Spec (4), Nejc Petrovič (3), Polona Koprivc (2), Andrej Souvent (1), Miha Rot (6), Tim Gradnik (5), Andrej Spec (4), Nejc Petrovič (3), Polona Koprivc (2)
1: Operato d.o.o., Slovenia; 2: SODO d.o.o., Slovenia; 3: Elektro Gorenjska, d.d., Slovenia; 4: ELES, d.o.o., Slovenia; 5: EIMV, Slovenia; 6: Jožef Stefan Institute, Slovenia

**10573** Fitness–check for Power Plants in Distribution Networks for Black Start and Regional Islands
Darko Brankovic (1), Robert Schürhuber (1), Andreas Abart (2), Norbert Rechberger (3)
1: Graz University of Technology, Austria; 2: Netz Oberösterreich; 3: Energie AG Erzeugung GmbH

**11093** Scalable Uncertainty Aware Ancillary Services Procurement Tool For Active Distribution Systems
Muhammad Usman (1), Baara Mohandes (1), Florin Capitanescu (1), Andre Guimaraes Madureira (1), Martin Bolték (2), Zdravko Matić (2), Filip Joel Soares (3), Nuno Fonseca (3), Henrique Teixeira (3), Carlos Mateo (4)

**10471** Performance Analysis of a State Estimator for Low Voltage Unbalanced Grids Using Different Advance Metering Infrastructure Technologies
Mahmud Rashad Ahmed (1), José Manuel Cano (1), Bassam Mohamed (2), Pablo Arboleya (1)
1: University of Oviedo, Spain; 2: Flexgrid, Spain

**11384** Customer Flexibility Operational Strategies for Maximising the Value of Friendly Charging Control
Alfred Einfalt, Albin Frischenschlager, Lukas Schroer, Andreas Schilder, Anton Steinwedelner
Siemens AG OEsterreich, Austria

**10405** Real–time Circulating Currents Calculation In The Distribution Management System
Jan Van de Vyver, Cedric Lahousse, Tine Vandoorn
Fluvius System Operator CV, Belgium

**10992** Scalable Uncertainty Aware Ancillary Services Procurement Tool For Active Distribution Systems
Muhammad Usman (1), Baara Mohandes (1), Florin Capitanescu (1), Andre Guimaraes Madureira (1), Martin Bolték (2), Zdravko Matić (2), Filip Joel Soares (3), Nuno Fonseca (3), Henrique Teixeira (3), Carlos Mateo (4)

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PLENARY ROOM 4
LEVEL 0
14.30 – 16.00

10749
Improved Load and Generation Forecasting for Extended Day–Ahead Estimates in the Nordic Grid
Sweshchha Dahal (1,2), Gunne John Heggli (1), Thomas Øyang (1)
1: University of South Eastern Norway, Norway; 2: Kathmandu University, Nepal

10529
Pilot Application of a Rule–Based TSO–DSO Coordination Concept in Switzerland
Vanessa Schroder (1), Evangelos Vrettos (2), Martina Bossio (3), Michael Auer (1), Raphael Wu (2), Christophe Fritsch (2), Raffaela Tasousi (2), Raffaela La Fauci (1)
1: Elektrizitätswerk der Stadt Zürich, Switzerland; 2: Swissgrid AG, Switzerland; 3: Zürcher Hochschule für angewandte Wissenschaften (IEFE), Switzerland

PLENARY ROOM 4
LEVEL 0
16.30 – 18.00

10754
Detecting Power Outages In Low–Voltage Networks From Telecommunications Networks Data
Marleen Bahe (1), Matthias Herlich (1), Peter Dorfinger (1), Josef Leist (2), Christian Wohlesein (2), Markus Radauer (3), Gerald Hörack (3), Walter Schaffer (3)
1: Salzburg Research Forschungsgesellschaft mbH, Austria; 2: Salzburg AG, Austria; 3: Salzburg Netz GmbH, Austria

10672
An Experience Of Detection And Classification Of Quality–Of–Service Problems in MV/LV Distribution Substations Using Artificial Intelligence: Senegal Case Study
Mohamad Al Mansour Kebel, Maodo Sene, Naffissatou Diagne Senèlec, Senegal

LEVEL 0
PLENARY ROOM 4
16.30 – 18.00

10274
Smart Metering And Grid Data Services: French Experience And International Perspectives
Victoria Tan (2), Laurent Karsenti (3), Sébastien Brun (1)
1: Enedias, France; 2: Enedias, France; 3: Enedias, France

10372
Digital Twins Handling: The Real Deployment Stakes!
Laurent Guise (1), Gilles Nativel (2), Guillaume Denis (3), Djibril Djob (6), Eric Suignard (5), Philippe Tailhardes (4), Benoit Jeanson (3), Thierry Coste (5)
1: EnergySemantic.com, France; 2: ENEDIS, France; 3: RTE, France; 4: GIMELEC, France; 5: EDF, France; 6: Schneider–Electric, France

LEVEL 0
PLENARY ROOM 4
11.00 – 12.30

10515
Implications of Forecast Uncertainty on the Optimal Operation of Renewable Energy Communities
Robin Sudhoff (1,2), Sebastian Schreck (1,2), Sebastian Thiern (1). Stefan Niessen (1,2)
1: Siemens AG, Technology, Germany; 2: TU Darmstadt, Technology and Economics of Multimodal Energy Systems, Germany

10900
The Lac–Mégantic Microgrid: A Shared Vision of Energy Transition and the new role for Microgrid Control
Kevin Morrissey (1), Mark Jaggassar (1), David–Olivier Goulet (2), Robert MacDonald (1), Mark Collins (1)
1: Smarter Grid Solutions; 2: Hydro–Québec

SAFEY AND EARTHING FACING MODERN TECHNOLOGIES

Speakers: Bill Carman (Bill Carman Consulting, United Kingdom), Christian Ehler (Avacon Netz GmbH, Germany), Kristof Vliegen (Fluvius, Belgium).

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.
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.
**EFFECTIVE INNOVATION**

**RT6:**

Convener: Peter Söderström (Vattenfall Distribution, Sweden).
Speakers: Luis Cunha (E-Redes, Portugal), Nikos Hatziargyriou (National Technical University of Athens, Greece), Ralf Korntner (Siemens, Germany), Anne-Lise Laurain (EPRI, USA), Luca Lo Schiavo (Arera, Italy).

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

**CYBERSECURITY**

**RT7:**

Convener: Peter Kjær Hansen (Green Power Denmark, Denmark).
Speakers: Luís Cunha (E-Redes, Portugal), Peter Söderström (Vattenfall Distribution, Sweden), Nikos Hatziargyriou (National Technical University of Athens, Greece), Ralf Korntner (Siemens, Germany), Anne-Lise Laurain (EPRI, USA), Luca Lo Schiavo (Arera, Italy).

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 to 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 extend that is at all possible and how it can be done? The panel will also discuss to what extent new regulations (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. It’s only just begun – but how to catch up with a moving target in a hurry?

**DYNAMIC NETWORK TARIFFS AND LOCAL FLEXIBILITY MARKETS**

**MAIN RESULTS OF CIRED WG 2020-2**

**RT2:**

Convener: Ben Gemsjäger (Siemens AG, Germany).
Speakers: Sonja Baumgartner (LEW Verteilnetz GmbH, Germany), Nuran Cihangir Martin (Stedin, Netherlands), Laurence Hunter (National Grid, United Kingdom), Oliver Koch (University of Wuppertal, Germany), Sambeet Mishra (University of South-Eastern Norway, Norway).

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.

**ELECTRIFICATION**

**RT4:**

Convener: Dag Eirik Nordgård (SINTEF, Norway).
Speakers: Sabine Erlinghagen (Siemens Grid Software, Germany), Vincenzo Ranieri (EU DSO Entity, Belgium/Italy), Richard Vidlicka (CEZ, Czech Republic).

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 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.
**PROGRAMME UPDATED ON 26 APRIL 2023. TITLES AND SPEAKERS ARE SUBJECT TO CHANGE AT ANY TIME. CANCELLATION MAY OCCUR. DOWNLOAD THE APP TO SEE THE LAST UPDATES.**

### FORUM LEVEL 1

#### 09.00 – 10.30

**CONTROL 1**

**A1 > A18**

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<th>Session</th>
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<td>A1</td>
<td>An Operational Data-Driven Malfunction Detection Framework for Enhanced Power Distribution System Monitoring – The DeMaDs Approach</td>
<td>David Fellner (1), Thomas I. Strasser (1), Wolfgang Kastner (2), Behnam Feizifar (2), Ibrahim F. Abdulhadi (2) 1: AIT Austrian Institute of Technology, Austria; 2: Technische Universität Wien (TU Wien); 3: University of Strathclyde</td>
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<td>A2</td>
<td>DLR as the Tool for Providing Flexibility Services in the Distribution Network</td>
<td>Adam Babs (1), Tomasz Samotyjik (1), Marcin Tarasiuk (1), Sławomir Noske (2) 1: Institute of Power Engineering, Poland; 2: ENERGA–OPERATOR SA</td>
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<td>A3</td>
<td>Distribution Automation System Field Test in Jakarta MV Network</td>
<td>Angggoro Primadianto, Karina Monica, Riki Waberta, Andi Tobing PLN Indonesia, Indonesia</td>
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<td>A4</td>
<td>A Dynamic Voltage Controller For LV Grids Based On Flexible PV Systems And The Smart Metering Approach</td>
<td>Ali Hamdan, Benoit Vinot, Florent Cadoux Roseau Technologies, France</td>
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<td>A5</td>
<td>Developing Low-Voltage Operational Functionalities</td>
<td>Mikko Haapamäki (1), Mika Loukkalahti (1), Juho Kukkonen (1), Mika Nousiainen (1), Pirjo Heine (1), Matti Lehtonen (2) 1: Helen Electricity Network Ltd, Finland; 2: Aalto University, Finland</td>
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<td>A6</td>
<td>Delivering The Benefits From A Common Disturbance Information Platform To Prevent Unplanned Outages</td>
<td>Paul Morris (1), Mashood Tahir (2), Sid Hoda (2), Samuel Jupe (2) 1: National Grid Electricity Distribution, United Kingdom; 2: Nortech Management Ltd</td>
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<td>A7</td>
<td>Automated Detection of Non-Compliance with DER Interconnection Requirements and the Laboratory Testing of an EDF developed solution</td>
<td>Quentin Morel (1), Jingyuan Wang (1), Charles Brewster (2), Aminul Huque (2) 1: EDF, United States of America; 2: EPR, United States of America</td>
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<td>A8</td>
<td>Economic Model Predictive Control for the Energy Management Problem of a Virtual Power Plant Including Resources at Different Voltage Levels</td>
<td>Luca Santussoesso (1), Simon Carnal (1), Alessandro Di Giorgio (2), Francesco Liberati (2), Andrea Michioni (1), Guillaume Bontron (3), George Kariniotakis (1) 1: MINES Paris PSL, France; 2: Sapienza University of Rome, Italy; 3: Compagnie Nationale du Rhône, France</td>
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### POSTER SESSION 4

#### 09.00 – 10.30

**A1 > A18**

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<td>10126</td>
<td>A10 Automatic System for Evaluation of Lightning Events in Power Grid</td>
<td>Martin Krenicky (1), Martin Svancar (1), Lubomir Kocis (1), Petr Spurny (2), Radek Ovesny (2) 1: EGU – HV Laboratory a.s., Czech Republic; 2: CEPS, a.s., Czech Republic</td>
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<td>10156</td>
<td>A11 From blackouts to flexibility: case study from Burkina Faso</td>
<td>Sebastijan Ursic (1), Luc Richaud (2), Marine Cornelis (3) 1: INEA d.o.o, Slovenia; 2: Odit-e, France; 3: Next Energy Consumer, Italy</td>
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<td>10180</td>
<td>A12 5G-Based Fault location, Isolation, and Service Recovery</td>
<td>Mohand Ouamer Nait Belaid (1,2), Vincent Audebert (1), Boris Deneuville (1), Rami Langar (2) 1: EDF-SA, France; 2: Gustave Eiffel University, France</td>
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<td>10214</td>
<td>A13 A secure Automation Solution to Provide Flexibility at Low-Level Grid – Middleware Services</td>
<td>Razgar Ebrahimi (1), Mohsen Banaei (1), Juan Jacobo Peralta Escalante (2), Manuel Diaz Rodriguez (3), Krzysztof Piotrowski (4), Jaime Chen Gallardo (3), Henrik Madsen (1) 1: Technical University of Denmark; 2: Centro de Estudios de Materiales y Control de Obra, S.A. (CEMOSA); 3: Softcrits; 4: Innovations for High Performance Microelectronics (HPM)</td>
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<td>10284</td>
<td>A14 First Practical Results Of Continuous Grid–Serving Power Control In Low-Voltage Network Via Novel Power Management Concept</td>
<td>Ghayathri Suriyamoorthy (1), Kamil Korotkiewicz (1), Martin Stiegler (1), Peter Kellendonk (2), Wolfgang Zander (3) 1: PSI GridConnect GmbH, Germany; 2: EEBus Initiative e.V., Germany; 3: BET GmbH, Germany</td>
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<tr>
<td>10958</td>
<td>A15 Supervised Learning for Fault Classification Using Hybrid Training Datasets</td>
<td>Archana Ranganathan (1), Simon Tiedemanns (2), Frans Provoost (3) 1: Alliander N.V.; 2: Technische Universität Delft; 3: Qirion B.V.</td>
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<td>10293</td>
<td>A16 AI To Detect Anormal Switching Operations</td>
<td>Georg Achleitner (1), Werner Schöffner (2), Juergen Flesch (2), Wolfgang Huska (1) 1: Austrian Power Grid AG, Austria; 2: ARTEMS, Austria</td>
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<td>11370</td>
<td>A17 Intermittent Earth Fault Detection in Distribution Network based on the voting classification technique</td>
<td>Meysam Pashaei (1), Suzana Pil Ramli (2), Arta Asadi (2), Alireza Razgar Ebrahimy (1), Mohsen Banaei (1), Juan Jacobo Peralta Escalante (2), Manuel Diaz Rodriguez (3), Krzysztof Piotrowski (4), Jaime Chen Gallardo (3), Henrik Madsen (1) 1: Technical University of Denmark; 2: Centro de Estudios de Materiales y Control de Obra, S.A. (CEMOSA); 3: Softcrits; 4: Innovations for High Performance Microelectronics (HPM)</td>
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<tr>
<td>11384</td>
<td>A18 Solving Issues Of The Distribution Network Of Harstad (Norway) In Real Time Using Machine Learning-Based Observability To Place Flexibility Orders</td>
<td>Benoit Grosjean (1), Luc Richaud (1), Nuno Pinho da Silva (2), Ángelo Casalairo (2), Gregor Cerne (3) 1: Odit-e, France; 2: R&amp;D Nester, Portugal; 3: INEA d.o.o, Slovenia</td>
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**LEVEL 1 FORUM**

**09.00 – 10.30**

**NICATION 1**

**COMMUNICATION 2**

**TOUR 2**

**POSTER SESSION 4**

**PROTECTION, CONTROL & AUTOMATION**

**10115**

C15 Data hub based secure integration of DER Assets with Utilities, DSO and Retail

Nirmal Thalayil, Nobin Matthew

Ninti Communication Technologies Pvt Ltd, India

**10204**

C16 Innovative 5G Transmission For Anti-islanding Protection in MV Distributive Network

Etienne Toutain (1), Patrick Coudray (1), Emmanuel Villalta (2), Pierre Renaldo (3), Philippe Dauchy (4), Nicolas Bihannic (5), Philippe Bertazzon (1)

1: EDF, France; 2: ENEDIS, France; 3: Wavestone, France; 4: Nokia, France; 5: Orange, France

**10256**

C17 An Implementation of IEC 61850 for Microgrid Control

Yiming Wu, Firas Daraiseh, Elise Ramqvist, Annika Larsson, Ulrika Morild

Vattenfall AB, Sweden

**10299**

C18 TLC Strategy For Power Distribution Grids

Daniele Rufini, Danilo vencenzo Zollo, Sara Turco, Gianluca Onori, Renzo Valente, Enrico Valigi, Francesco Amadei

Enel Grids, Italy

**10352**

C19 The Potential of Emerging Communications Technologies in Distribution Grid Management

Seppo Borenius (1), Petka Kolkolait (1), Matti Lehtonen (1), Raimo Kantola (1), Heli Kokkonen-Tarkkanen (2), Jørgen Costa-Requenza (1)

1: Aalto University, School of Electrical Engineering, Finland; 2: VTT Technical Research Centre of Finland

**10643**

C20 Use of Low-Cost RF Mesh WAN Based Feeder Pillar Monitoring System

V T Narayanan, Vikas Koul, Nisha Dubal, Souryna Sidhamwar, Sutti Kachhwaha, Prasad Khadpe

Tata Power, India

**10725**

C21 5G Edge for Power System Applications

Heli Hokama (2), Julia Beatriz Conceição (2), Ulisses Netto (3), Seppo Borenius (1), José António Gonçalves (2)

1: VTT Technical Research Centre of Finland, Finland; 2: ABB, Finland; 3: Aalto University, Finland

**10760**

C22 E-REDES’ IEC61850 Specification for PAS Interoperability

João Ricardo (1), Hugo Melo (2), Miguel Castanheira Marques (2), Celso Filipe Silva (2), André Pereira (2), José João Cardoso (2), Elisa Abrantes (2), Luis Pires (2), José António Gonçalves (2)

1: EDP Labelec, Portugal; 2: E-REDES, Portugal

**10816**

C23 Primary Substation Protection and Control System: Future Architecture Proposal

Hugo Melo, José Goncalves, Filipe Vale, Luís Pires

E-REDES, Portugal

**10999**

C24 A 5G Communication-Based Wide Area Protection Concept for Enabling Resilient and Reliable Loss of Mains Protection

Ontrei Raipala (1), Anna Kulmala (1), Petri Hovila (1), Boris-Emanuel Yazadzhian (2), Rui Dantas (2), Colin Scoble (2)

1: ABB, Finland; 2: UK Power Networks, UK

**LEVEL 1 FORUM**

**11042**

C25 Validation Of MPLS-TP For Tele–Protection / Current Differential Protection Services Via Proof Of Concept

Davy Haegdeorens (1), Mohd Mokhiss Abdul Wahib (2), Gurdial Singh Nacarat Singh (3), Mohd Nasim Zakaria (3), Muzaffar Hanif Zaman (4), Ahmad Farid Mohd Perdaus (3), Rahmah Uzir (3)

1: OTN Systems, Belgium; 2: Tele–Flow Corporation Sdn Bhd, Malaysia; 3: Tenaga Nasional Berhad, Malaysia; 4: TNB Researcher Sdn Bhd, Malaysia

**11124**

C26 Building a Realistic Sampler to Emulate Communication Delays in PLC-Operated Low Voltage Networks

Mahmoud Rashid Ahmed, José Manuel Cano, Pablo Arboleya

University of Oviedo, Spain

**11207**

C27 Four Problems for Digital Substations I wish to be solved

Fred Steinhauser

OMICRON electronics, Austria

**11373**

C28 Concept And Implementation Of A Grid Simulation Framework Utilizing Containerized IEC 61850 Compatible IED

Shuo Chen (1,2), Jerome Morris (3), Zhiyu Li (2), Gerd Heilscher (1)

1: Ulm University of Applied Sciences, Germany; 2: Ulm University, Germany; 3: Netze BW GmbH, Germany

**11389**

C29 Low Voltage as the final frontier for Broadband over Power Line

Ingo Berganza, Alberto Sendin, Raquel Ayala, Sebastian Gomez

Iberdrola, Spain

**11506**

C30 Real Time Digital Simulation and IEC 61850 Standard: Interoperability Test Between OPAL-RT and Typhoon HIL Simulators

Adriano Morais (1), Jhonthan Cassol (1), Ângelo Felipe Sartori (1), Daniel Bernardon (1), Diomar Lima (1), Wagner Hokama (2), Julia Beatriz Conceição (2), Ulisses Netto (3)

1: Universidade Federal de Santa Maria, Brazil; 2: CPFL Energia; 3: Federal University of Technology – Parana – Brazil

**LEVEL 1 FORUM**

**10481**


David Kriesel, Simon Schramm, Gert Mehlmann, Matthias Luther

Friedrich–Alexander Universität Erlangen–Nürnberg, Institute of Electrical Energy Systems, Germany

**10602**

A20 A Real-Time Optimal Operation Strategy for Active and Reactive Power Sources in Smart Distribution Systems

Akbar Beyat (1), Amir Bagheri (2), Saeed Behzadi (2)

1: Zanjan Electric Distribution Company Zanjan, Iran; 2: Department of Electrical Engineering, University of Zanjan, Zanjan, Iran
FORUM LEVEL 1

11.00 – 12.30

NICATION 2
COMMUNICATION 2
TOUR 3

+ M1 > M6
A19 > B10

PANELS

10736
A21 Converter–Driven Stability In A Distribution Grid With High Penetration Of Inverter–Based Generation
Phuong Huynh Minh (1), Ashrpreet Singh (1), Vincent Debusschere (1), Noureddine Hadjaïd (1,3), Marie–Cécile Alvarez–Hérault (1), Xavier Legrand (2), Benoît Bouzigon (2)
1: University Grenoble Alpes, CNRS, Grenoble INP, G2ELab; 2: Enerdis; 3: Nanyang Technological University

10815
A22 Selfhealing – FLISR in Underground and Overhead Real the First Performance Results
José Gonçalves, Rita Ramilo Cadete, João Carvalho, Rui Parreira, João Nunes Carreira, Carlos Fortunato, Paulo Ribeiro, Sérgio Lopes, João Rosa, Ricardo Nunes, João Bastão, Miguel Grossinho
E–REDES, Portugal

10955
M6 A Study on the Fault Current Limiting and Interrupting Operation Technology of MVDC Systems Using a Protective Equipment
Hanyang University, Korea, Republic of (South Korea)

11144
M5 A24 PMU–Based State Estimation and Fault Analysis in Active Distribution Grids: A Case Study for Kythnos Island, Greece
Themistoklis Xygkis, Orestis Darmis, Georgios Karvelis, Aris Dimeas, George Korres, Nikos Hatzigiayriou
National Technical University of Athens, Greece

11189
M4 Equivalent DC Impedance of a Three-phase Impedance through an Inverter
Quentin Delhaye, Marc Bekemans, Emmanuel De Jaeger
UC Louvain, Belgium

11218
M3 Semi–Distributed Automatic Scheme for Self–Healing Implementation in Distribution System
Candra Agus Dwi Wahyudi, Karina Monica, Luthfi Arsyaadani
PT PLN (Persero), Indonesia

11248
M2 Implementation Of An Advanced Remote Engineering Platform
Indrek Künnapuu (1), Rene Voog (2), Armeen Hamdon (3)
1: Elektrilevi OÜ; 2: Enefit Connect OÜ; 3: SUBNET Solutions Inc.

11306
M1 An Edge–Fog Computing Approach For Advanced Distribution Management Systems For The Low–Voltage Network
Matias Ariel Kippke, Leo Marcelo Villalba, Pablo Arboleya Arboleya
Universidad de Oviedo – Laboratory for Electrical Energy Management Unified Research (LEMUR), Spain

11318
B1 Control Architecture and Algorithms for Isolated Microgrids
Cosimo Iurlaro (2), Lucio Barbato (1), Gianpatrizio Bianco (1), Sergio Bruno (2), Gianni Ceneri (1), Massimo La Scala (2), Luigi Mascolo (2), Marco Menga (1), Chiara Micillo (3), Francesco Renna (1), Gianluca Sapienza (1)
1: Gridspertise Srl, Italy; 2: Politecnico di Bari, Italy; 3: e–distribuzione SpA, Italy

TUESDAY 13 JUNE

POSTER SESSION 4
PROTECTION, CONTROL & AUTOMATION

11401
B2 Demonstration of a Concept for the Data Management and Monitoring of Larger Scale DER Utilizing a Time–series Database
Zhiyu Lu (12), Shuo Chen (12), Gerd Heilscher (1)
1: Ulm University of Applied Sciences, Germany; 2: Ulm University/Germany

10429
B3 Distributed Ledger Technology for Monitoring Operations Carried out on the Embedded Generation Units
David Vanquilck (1,2), Saul Escalona (2), Dannien Ernst (2)
1: ORES, Belgium; 2: ULIEGE

10446
B4 A Cyber–Physical Digital Twin Approach to Replicating Realistic Multi–Stage Cyberattacks on Smart Grids
Omer Sen (1), Nathalie Bleser (2), Martin Henze (3), Andreas Ulbig (2)
1: Fraunhofer FIT, Germany; 2: IAEW at RWTH Aachen, Germany; 3: Fraunhofer FKE, Germany

10612
B5 Is the Cybersecurity Standard IEC62443 Applicable to Distribution Substations?
Juha Rintala (1), Mika Loukkalaihti (2), Shyam Musunuri (3), Joose Haapaniemi (4), Christoph Hampel (3,4)
1: Siemens Osakeyhtiö; 2: Helen Sähköverkko Oy; 3: Siemens AG; 4: Helen Oy

10777
B6 Secure and Resilient IoT and Cloud–Based Infrastructure for Electric Vehicles Recharge Systems
Elisa Albanese, Roberto Terruggia
Ricerca sul Sistema Energetico – RSE S.p.A., Italy

10808
B7 Root/Chain of Trust in Complex Energy Distribution Systems
Ingeteam Power Technology, Spain

11181
B8 Operational Considerations for Substation Security
Abhilash Appukuttan, Andrew Darby, Abraham Varghese GE, United Kingdom

11197
B9 Interoperability Raises Two Challenges: Cybersecurity & Maintenance
Mathieu Salles, Hervé Bigeard
Schneider Electric, France

11474
B10 Performance Evaluations For The Configuration Of IEC 62351 Cybersecurity Profiles In Energy Telecontrol Scenarios
Mauro G. Todeschini, Giovanna Dondossola
RSE S.p.A., Italy

11786
B11 Performance Evaluations For The Configuration Of IEC 62351 Cybersecurity Profiles in Energy Telecontrol Scenarios
Mauro G. Todeschini, Giovanna Dondossola
RSE S.p.A., Italy

10178
C31 Detection and Location of Single Phase Faults in New 10(20) kV Distribution Networks
Seila Grudonjic Ferhatbegovic (1), Zijad Bajramovic (1,2)
1: PE Elektroprivreda BiH, Bosnia and Herzegovina; 2: Faculty of Electrical Engineering, University of Sarajevo

10210
C32 A Study on Automatic Fault Isolation of Closed Loop System in Power Distribution Systems
Chung min Lee, Sang hyun Park, Hak Yeol Park, Soon gu Kang, Un jung Jeong
E–REDES, Portugal

PANELS

C31 > D14
TOUR 4
PROTECTION 1
11.00 – 12.30

LEVEL 1 FORUM

PANELS

11401

11474

11786

10178

10210
<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Fault Location for Multi-Terminal Lines</td>
<td>Zaphiro Technologies, Switzerland</td>
<td>Mayank Nagendran, Lorenzo Zanni, Paolo Romano, Marco Pignati</td>
</tr>
<tr>
<td>D2</td>
<td>Phase-to-Earth Faults Causing Inaccuracy of Distance Protection in Low Impedance Earthen Power Systems</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
<td>Rainer Luxenburger (1), Gregor Policht (2), Michael Albert (1)</td>
</tr>
<tr>
<td>D3</td>
<td>High Impedance Fault Detection for MV Distribution Networks</td>
<td>E-REDES, Portugal</td>
<td>Andre Neves, Ines Almeida, Hugo Melo, Miguel Louro, E-REDES, Portugal</td>
</tr>
<tr>
<td>D4</td>
<td>Pilot Test of the Method Vdp for an Earth Fault Localization</td>
<td>ZIV, Spain</td>
<td>Cezary Dzienis (1), Joerg Blumschein (2), Jens Hauschild (3), Cezary Dzienis (1), Joerg Blumschein (2), Jens Hauschild (3)</td>
</tr>
<tr>
<td>D5</td>
<td>Optimising the Safety, Reliability and Efficiency of rural distribution networks</td>
<td>Brno University of Technology, Czech Republic; ELVAC a.s.; EG.D, a.s.</td>
<td>Dominique Croteau (1), Quentin Laboureur (1), Dominique Croteau (1), Quentin Laboureur (1)</td>
</tr>
<tr>
<td>D6</td>
<td>Differential Voltage Grid Protection</td>
<td>CPFL, Brazil</td>
<td>Mauro Sergio Silveira, Alexandre Vieira de Oliveira, Eliana Roratto de Andrade, Helton de Oliveira Vilbior, Odair José Schirmer, Leonardo do Nascimento Pereira</td>
</tr>
<tr>
<td>D7</td>
<td>Novel Touch Voltage-Based Earth-Fault Current Protection For Ensuring Dependability And Electrical Safety In Modern Compensated MV-Distribution Networks</td>
<td>ABB Oy; Finland; ALVA Sähköverkkko Oy, Finland; Elenia Verkko Oy, Finland, 4: Finnland</td>
<td>Ari Wahiroos (1), Janne Altonen (1), Sakari Kauppinen (2), Hanna-Mari Aalto (3), Risto Pitkanen (4)</td>
</tr>
<tr>
<td>D8</td>
<td>The Impact of Neutral Treatment and Earth Fault Protection on Resilience and Reliability of High Voltage Grid</td>
<td>Holmgren Institute Stockholm; 2: Swedish Neutral Company</td>
<td>Klaus Winter (1), Johan Hollander (2), Viacheslav Levashov (2)</td>
</tr>
<tr>
<td>D9</td>
<td>Improved Method for Earth Fault Location in MV Distribution Networks with Compensated Neutral Grounding</td>
<td>50Hertz Transmission</td>
<td>Elie Salhab (1, 2), Marc Petit (2), Trung Dung Le (2), Dominique Croteau (1), Quentin Laboureur (1)</td>
</tr>
<tr>
<td>D10</td>
<td>Evaluation and Influences of Harmonic Earth Fault Currents</td>
<td>Tampere University, Finland</td>
<td>Ari Nikander, Perti Pakonen, Bruno Ceresoli (3), Lucio Barbato (1), Gianpatrizio Bianco (1)</td>
</tr>
<tr>
<td>D11</td>
<td>Requirements For Generating Plants To Be Connected In Parallel With Distribution Networks – Focus On EN 50549 Series</td>
<td>ALVA Sähköverkko Oy, Finland; 2: Finnsverkko Oy, Finland; 3: Elenia Verkko Oy, Finland</td>
<td>Alberto Cerretti (1), Christian Noce (2), Herve Rochereau (3), Thoma Schapp (4)</td>
</tr>
<tr>
<td>D12</td>
<td>A Validation of IED for Networked Distribution System</td>
<td>KEPL, Korea, Republic of (South Korea)</td>
<td>Ju-Yong Kim</td>
</tr>
<tr>
<td>D13</td>
<td>Protection System Analysis in Microgrids with DSO Static Generation</td>
<td>Gridserve Ltd, UK; 2: e-distribuzione SpA, Italy; 3: CESI SpA, Italy</td>
<td>Bruno Ceresoli (3), Lucio Barbato (1), Gianpatrizio Bianco (1), Gianni Ceneri (1), Ettore De Berardinis (3), Luigi Moscati (1), Chiara Micillo (2)</td>
</tr>
<tr>
<td>D14</td>
<td>Estimation Of TOVs Due To Single Phase To Earth Fault By Means Validated Model By Comparison With Measurements From Real Fault Tests</td>
<td>ENEL, Italy; Grispertise, Italy</td>
<td>Luigi D’Orazio (1), Alberto Cerretti (1), Gianluca Sapienza (2), Stefano Riva (2), Pietro Paulon (2)</td>
</tr>
<tr>
<td>D15</td>
<td>A Robust Fault Location Method for MV Distribution Feeder</td>
<td>University of Paris-Saclay, CentraleSupelec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 91192, Gif-sur-Yvette, France. Sorbonne Université, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 75252, Paris, France</td>
<td>Alexandre Bach, Trung Dung Le, Marc Petit</td>
</tr>
<tr>
<td>D17</td>
<td>Field Validation of a Novel Fault Location Solution Using Synchronized Phasor Measurements in Active Distribution Networks</td>
<td>Gridspertise Srl, Italy; E-distribuzione SpA, Italy; CESI SpA, Italy</td>
<td>Chiara Micillo (2), Gianni Ceneri (1), Ettore De Berardinis (3), Luigi Mascolo (1), Bruno Ceresoli (3), Joerg Blumschein (2), Jens Hauschild (3), Chiara Micillo (2), Gianni Ceneri (1), Ettore De Berardinis (3), Luigi Mascolo (1), Bruno Ceresoli (3), Joerg Blumschein (2), Jens Hauschild (3)</td>
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<tr>
<td>D18</td>
<td>Fault Location for Multi-Terminal Lines</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
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<td>D19</td>
<td>Phase-to-Earth Faults Causing Inaccuracy of Distance Protection in Low Impedance Earthen Power Systems</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
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<tr>
<td>D20</td>
<td>High Impedance Fault Detection for MV Distribution Networks</td>
<td>E-REDES, Portugal</td>
<td>Andre Neves, Ines Almeida, Hugo Melo, Miguel Louro, E-REDES, Portugal</td>
</tr>
<tr>
<td>D21</td>
<td>Evaluation and Influences of Harmonic Earth Fault Currents</td>
<td>Tampere University, Finland</td>
<td>Ari Nikander, Perti Pakonen, Bruno Ceresoli (3), Lucio Barbato (1), Gianpatrizio Bianco (1)</td>
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<td>D22</td>
<td>Requirements For Generating Plants To Be Connected In Parallel With Distribution Networks – Focus On EN 50549 Series</td>
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<td>D23</td>
<td>A Validation of IED for Networked Distribution System</td>
<td>KEPL, Korea, Republic of (South Korea)</td>
<td>Ju-Yong Kim</td>
</tr>
<tr>
<td>D24</td>
<td>Protection System Analysis in Microgrids with DSO Static Generation</td>
<td>Gridserve Ltd, UK; 2: e-distribuzione SpA, Italy; 3: CESI SpA, Italy</td>
<td>Bruno Ceresoli (3), Lucio Barbato (1), Gianpatrizio Bianco (1), Gianni Ceneri (1), Ettore De Berardinis (3), Luigi Moscati (1), Chiara Micillo (2)</td>
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<td>D25</td>
<td>Estimation Of TOVs Due To Single Phase To Earth Fault By Means Validated Model By Comparison With Measurements From Real Fault Tests</td>
<td>ENEL, Italy; Grispertise, Italy</td>
<td>Luigi D’Orazio (1), Alberto Cerretti (1), Gianluca Sapienza (2), Stefano Riva (2), Pietro Paulon (2)</td>
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<td>University of Paris-Saclay, CentraleSupelec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 91192, Gif-sur-Yvette, France. Sorbonne Université, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, 75252, Paris, France</td>
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<td>Field Validation of a Novel Fault Location Solution Using Synchronized Phasor Measurements in Active Distribution Networks</td>
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<td>D29</td>
<td>Phase-to-Earth Faults Causing Inaccuracy of Distance Protection in Low Impedance Earthen Power Systems</td>
<td>University of Applied Sciences, Germany; Siemens AG; 50Hertz Transmission</td>
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<tr>
<td>D30</td>
<td>High Impedance Fault Detection for MV Distribution Networks</td>
<td>E-REDES, Portugal</td>
<td>Andre Neves, Ines Almeida, Hugo Melo, Miguel Louro, E-REDES, Portugal</td>
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<td>A Validation of IED for Networked Distribution System</td>
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<td>Ju-Yong Kim</td>
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<tr>
<td>D34</td>
<td>Protection System Analysis in Microgrids with DSO Static Generation</td>
<td>Gridserve Ltd, UK; 2: e-distribuzione SpA, Italy; 3: CESI SpA, Italy</td>
<td>Bruno Ceresoli (3), Lucio Barbato (1), Gianpatrizio Bianco (1), Gianni Ceneri (1), Ettore De Berardinis (3), Luigi Moscati (1), Chiara Micillo (2)</td>
</tr>
</tbody>
</table>
FORUM LEVEL 1
14.30 – 16.00
AUTOMATION 1
TOUR 5
GUIDED TOURS 5 & 6

10116 B11 Standard IEC 61850 based real-time DER interface for The Netherlands
René Troost (1), Sjors van der Heijden (1), Rik Fontein (2), Alain Stuiwenvolt (2), Davood Mohammadi Sooran (4), Bas Mulder (4), Joris van Leeuwen (5), Rob van Oost (3), Nuno Pereira (6), Elvira Sánchez Ortiz (6), Bart Puijima (3)

10276 B12 Success deployment of 6 digital substations in Vietnam 2020-21 – Return of experience
Van Ngo Ha (2), Tuan Thanh Bui (3), Hung Hoang (4), Dang-Thoang Vo (4), Chin-Fei Chov (5), Chee Pinn Teoh (1)

10314 B13 An Efficient Hybrid Control and Protection Strategy for Frequency Regulation of Low-inertia Power System
Ahmed Elmelegi (1), Loai Nasrat (2), Mohkhar Ayal (3), Emad A. Mohamed (2)
1: Upper Egypt Electricity Distribution Company, Egypt; 2: Aswan University, Faculty of Engineering, Egypt; 3: San Sebastian University, Chile

10473 B14 Practical Review And Advancements In Testing Multi-vendor Digital Substations
Rick Loenders (1), Thomas Lisiecki (2), Iskander Yesil (2), Dirk Van Hertem (1)
1: KULeuven; 2: Tractebel, Belgium

10690 B15 Frequency Droop Characteristic for Grid Forming Battery Inverters – Operation in Islanded Grids with the InFeed of Distributed Generation Systems
Tobias Lechner (1), Sebastian Seifried (1), Johanna Timmermann (2), Claudia Bernecker-Castro (2), Georg Kerber (3), Kathrin Schaarachmidt (4), Steffen Hermann (5), Michael Finkel (1), Rolf Witzmann (2)
1: Augsburg University of Applied Sciences, Germany; 2: Technical University of Munich, Germany; 3: Munich University of Applied Sciences, Germany; 4: LEW Verteilnetz GmbH, Germany; 5: AVS Aggregatbau GmbH, Germany

11018 B16 Alternative Low-Frequency Demand Disconnection (LFDD) Solutions for UK Distribution Network Operator Implementation
Abdullah Emhemed (1), Nathan Bryson (2), Ryan Huxtable (3)
1: WSP UK Limited, United Kingdom; 2: WSP UK Limited, United Kingdom; 3: National Grid; 4: National Grid ESO

11033 B17 Decentralized Management of Distributed Energy Resources for Frequency Support – Finnish Pilot
Matti Aro (1), Jerome Ferrari (2), Mikael Opas (1), Raphael Care (2)
1: VTT Technical Research Centre of Finland, Finland; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France
Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.

FORUM
LEVEL 1
10156  B27 Voltage Regulations Solutions for Low Voltage Distribution Network with Large Pvs Integration: Performance Analysis with a Real Swiss Case
Boling Guo (1), Ludovic Pignat (2), Julien Pouget (1), Nicolas Jordan (1), Didier Blatter (1), Guido Köppel (3)
1: HES-SO, 1950, Sion, Valais, Switzerland; 2: OIken, 1950, Sion, Valais, Switzerland; 3: Enbag group, 9390, Brig, Valais, Switzerland

10166  B28 Analysis of Control Algorithms on Different Low-Voltage Grid Clusters
Veronika Barta (1), Sonja Baumgartner (2), Armin Dulsch (1), Stephanie Uhrig (1), Rolf Witzmann (3)
1: HT University of Applied Sciences Munich, Germany; 2: LEW Verteilnetz GmbH; 3: TUM Technical University of Munich

10189  B29 Detection of Neutral Loss in Distribution Networks Using Smart Meters Records
Tania Vázquez
E-REDÉS (EDP networks Spain), Spain

830 Optimized Provision of Local Ancillary Services With Sensitivity Factors Using Prosumer Flexibility
Carsten Wegkamp, Matthias Hadlak, Henrik Wagner, Julius Kohlhöpfe, Bernd Engel
Elnia, Technische Universität Braunschweig, Germany

10238  B31 Evaluating State Estimation Performance On Distribution Circuits With High PV Penetration
Jens Schoene, Muhammad Humayan
EnerNex, United States of America

D15 Experimental Validation of a Novel Stator Interturn Fault Detection Method in Induction Motor
Simi Valan, Arinjay Gupta, Ranjeet Kumar
ABB, India

D16 A Comparison Between Different Inertia Estimation Algorithms in Smart Grids Applications
Davide Gotti (1), Paolo Ledesma Larrea (1), Hortensia Amaris Duarte (1), Samuele Grillo (2)
1: Universidad Carlos III de Madrid, Spain; 2: Politecnico di Milano, Italy

D17 Implementation and Test of Frequency Estimation Methods for RoCoF-based Load Switching in Islanded Grids
Sebastian Seifried (1), Simon Fischer (1), Dominik J. Storch (1), Tobias Lechner (1), Michael Finkel (1), Rolf Witzmann (2)
1: University of Applied Sciences Augsburg; 2: Technical University of Munich

D18 Distribution Network Fault Prediction Utilising Protection Relay Disturbance Recordings and Machine Learning
Ebrahim Balouji (1), Karl Bäckström (1), Viktor Olsson (1), Petri Hovila (2), Henry X. Niveri (2), Anna Kulmala (2), Ari Salo (3)
1: EnerNex; 2: ABB; 3: Vaasan Sähköverkko

D19 Hardware-In-The-Loop Investigation Of Distance Protection Algorithm In Grids With Dominant Decentralized Generation Units
Manuel Gallier, Philipp Hackl, Robert Schürhuber
University of Technology Graz, Austria

D20 A New Adaptive Auto Reclosure Approach With Secondary Arc Detection
Angelika Vogel, Yilmaz Yelgin
Siemens AG, Germany

D21 Advancing the Capabilities of OpenDSS: A Directional Overcurrent Relay Feature for Modelling Modern Microprocessor Network Protector Operation Modes
Celso Rocha (1), Andres Ovalle (1), Aadityaa Padmanabhan (1), Sean McGuinness (2)
1: Electric Power Research Institute (EPRI), United States of America; 2: EPRI Europe DAC, Ireland

D22 EPRI Distribution Protection Analysis Toolkit
Andres Ovalle (1), Sean McGuinness (2), Aadityaa Padmanabhan (1), Celso Rocha (1), John Bannon (3), Mychal Kistler (3), Arun Doodnauth (3)
1: Electric Power Research Institute, United States of America; 2: EPRI Europe DAC, Ireland; 3: PPL Electric Utilities, United States of America

Vijay Shah, Yogesh Bharnare, Arpita Leua, Harshit Surati
ABB Ltd, India

D24 Open Phase Fault Analysis in MV Distribution Grids with Resonant Grounding
Tomáš Škumát, Martin Horák
Západoslovenská distribučná, a. s., Slovak Republic

D25 A Study on the Protection Scheme for LVDC Distribution System in Commercial Buildings
Ducksu Lee, Jonghyun Lee, Seongyong Lee, Jihong Kim
HYUNDAI ELECTRIC & ENERGY SYSTEMS CO., LTD, Korea, Republic of (South Korea)

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Patrick Favre-Perrod (1), Marco Barri (5), Michael Schueller (2), Nicolas Steiger (2), Walter Sattinger (3), Bruno Wartmann (4)
1: HES-SO, Switzerland; 2: OST, Switzerland; 3: Swissgrid, Switzerland; 4: ezw, Switzerland; 5: BKW, Switzerland

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1: HES-SO, 1950, Sion, Valais, Switzerland; 2: OIken, 1950, Sion, Valais, Switzerland; 3: Enbag group, 9390, Brig, Valais, Switzerland

D28 Analysis of Control Algorithms on Different Low-Voltage Grid Clusters
Veronika Barta (1), Sonja Baumgartner (2), Armin Dulsch (1), Stephanie Uhrig (1), Rolf Witzmann (3)
1: HT University of Applied Sciences Munich, Germany; 2: LEW Verteilnetz GmbH; 3: TUM Technical University of Munich

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Tania Vázquez
E-REDÉS (EDP networks Spain), Spain

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Carsten Wegkamp, Matthias Hadlak, Henrik Wagner, Julius Kohlhöpfe, Bernd Engel
Elnia, Technische Universität Braunschweig, Germany

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Jens Schoene, Muhammad Humayan
EnerNex, United States of America

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Simi Valan, Arinjay Gupta, Ranjeet Kumar
ABB, India

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1: Universidad Carlos III de Madrid, Spain; 2: Politecnico di Milano, Italy

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1: University of Applied Sciences Augsburg; 2: Technical University of Munich

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1: EnerNex; 2: ABB; 3: Vaasan Sähköverkko
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1: Graz University of Technology, Austria; 2: Austrian Power Grid, Austria

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Michael Albert, Rainer Luxenburger
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Michael Albert
OMICRON electronics Deutschland GmbH, Germany

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1: TU Dresden, Germany; 2: SIBA GmbH

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1: ABB, Finland; 2: Energy Queensland, Australia; 3: Omicron, Austria

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Daniel Lafferty, Jennifer Mackenzie, Cristina Fundulea, Catherine Edwards, Bojana Djukic, Diyar Kadar
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Michel Minoux (1), Dominique Croteau (2), Andrea Laguerre (2), Riadh Zorgati (2)
1: Paris-Sorbonne University; 2: EDF Lab Paris Saclay, France

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1: ENERGA–OPERATOR SA, Poland; 2: Institute of Power Engineering Poland

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Chin Kim Lo (1), Shong Ching Calvin Ku (2), Azlan Abdul Rahim (1)
1: TNB Research Sdn. Bhd., Malaysia; 2: Tenaga Nasional Berhad, Malaysia

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Naoyuki Takahashi, Kentaro Fukushima, Hiroyuki Hatta
Central Research Institute of Electric Power Industry, Japan

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Sami Repo (1), Antti Supponen (1), Kalle Ruuth (1), Kenneth Rosenberg (2), Michael Møller (3)
1: Tampere University, Finland; 2: Green power Denmark; 3: Riso National Laboratory, Denmark

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Eberhard Waffenschmidt, Markus de Koster, Christian Hotz, Miroslaw Matuszewicz (1)
1: Technical University of Delft, Netherlands; 2: Institute of Power Engineering Poland

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1: University of Wuppertal, Germany; 2: PSI Grid Connect GmbH, Germany
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1: Siemens AG, Germany; 2: UK Power Networks; 3: Friedrich–Alexander University

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Paweł Klys (1), Suheil Patel (2)
1: Hitachi Energy Poland; 2: Hitachi Energy India

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Deepak Deepak (1), Matthias Buchner (1), Krzysztof Rudion (1), Christoph John (2), Hans Abele (2)
1: University of Stuttgart, Germany; 2: Transnet BW, Germany

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SP Energy Networks, United Kingdom

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1: Universidade Federal de Santa Maria, Brazil; 2: Grupo Equatorial Energia / CEEE-D

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Andrea Vermigili, Giulia Serafini, Gabriele Lisacale, Alessio Montone
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1: Augsburg University of Applied Sciences, Germany; 2: LEW Verteilnetz GmbH

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1: University of Cyprus, Cyprus; 2: University of Manchester, UK; 3: E–REDES, Portugal; 4: INESC TEC, Portugal

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1: Engie Impact, Belgium; 2: World Bank, USA

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1: Fundação Getulio Vargas; 2: Grupo CPFL Energia

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<td>Investment Planning For Electrification Of Transport In An Industrial Port</td>
<td>Farrukh Farhan (1), Dunks, Clara (2), Dypvrik, Per Olav (3), Nygård, Heidi S. (4)</td>
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<td>F49</td>
<td>Optimised Approach to Grid Development under Consideration of Digital Solutions</td>
<td>Daniel Schacht (1), Christoph Schönhofer (1), Patrick Niewerth (1), Rainer Basmann (2)</td>
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<td>F50</td>
<td>Sizing Of A Power Electronics–Based Voltage Regulating Device To Support The Integration Of Photovoltaics And Electric Vehicles In LV Grids</td>
<td>Sabine Vieira Reinert Frello (1), Victor Lavaud (1), Romain Trimbur (1), David Frey (1), Marie–Cecile Alvarez–Herault (1), Yvon Besanger (1), Nourdeine Hadjsaid (1), Michel Cordonnier (2), Guillaume Langlet (2), Leonard Bacaud (2)</td>
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<td>F51</td>
<td>Increasing Network Intelligence: Implementing Distributed Local Automation to Reduce Power Interruptions in Distribution Networks</td>
<td>Aslan Rassouli (1), Christine Korsell (2), Yiming Wu (3), Anders Johnson (2)</td>
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<td>F52</td>
<td>Grid Futurability – Network Development Strategy</td>
<td>Anna Lisa Frau, Agostino Galati, Marta De Vita, Gabriele Licasale</td>
<td>Enel Grids, Italy</td>
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<tr>
<td>F53</td>
<td>Investment Planning For Electrification Of Transport In An Industrial Port</td>
<td>Farrukh Farhan (1), Dunks, Clara (2), Dypvrik, Per Olav (3), Nygård, Heidi S. (4)</td>
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10545
I11 Planning Principles for Hybrid AC/DC Underlay Grids in the Medium-Voltage Level
Maxim Müllender (1), Julian Saat (1), Lasse Emem (2), Andreas Ulbig (1)
1: IAEW at RWTH Aachen University, Germany; 2: RWTH Aachen University, Germany

11051
I16 Planning Methods For DC Lateral Electrification In Rural Africa
Lucas Richard (12), Marie-Cécile Alvarez-Herault (1), David Frey (1), Bertrand Raison (1), Nicolas Saincy (2)
1: G2Elab, France; 2: Nanoe, France

10574
I19 MVDC Distribution System Application Scenarios and Economic Analysis
Hongjoo Kim, Jintae Cho, Youngpyo Cho, Hosung Ryu, Jiyoung Kee, Juyong Kim
1: EELab/Lemcko, Ghent University, Belgium; 2: EELab, Ghent University, Belgium; 3: Corelab MiRDF, Flanders Make

11426
I21 DC Interface For Industrial And Residential Applications
Mikel Opas, Marius Baranauskas, Kalle Rauma
1: VTT Technical Research Centre of Finland, Finland

10398
I14 ENeuron Project – Facilitating The Energy Transition In A Military Campus By Optimizing A Local Energy Community
Carlos Cardoso (1), Rafael Rodrigues (1), Francisco Gomes (2), João Pacheco (2), Gisela Mendes (3), Raquel Figueiredo (4), Diogo Cabral (4,5)
1: EDP Labelec, Portugal; 2: Marinha - Portuguese Navy, Portugal; 3: EDP NEW R&D, Portugal; 4: Smart Energy Lab, Portugal; 5: Högskolan I Gävle, Sweden

12050
I22 Experience In The Implementation Of Isolated Electrical Energy Generation Systems From Renewable Energy Sources - Solar Villages
Miguel Quispe Reyes, Daniel Alejando Nieto López, Martin Lomas, Rodrigo Cés Gomez
1: EJE SA, Argentine Republic

10440
I15 Main–Grid Versus Renewable MicroGrid Energy Supply A Case Study of Isolated Rural Areas in the Sultanate of Oman
Ahmed Ibrahim Abri (1), Dr. Dharmasa P P (2)
1: Mazingon Electricity Company, Oman; 2: National University of Singapore
**Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.**

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10454 **FORUM LEVEL 1**

10144 **FORUM LEVEL 1**

10192 **FORUM LEVEL 1**

10251 **FORUM LEVEL 1**

10292 **FORUM LEVEL 1**

10297 **FORUM LEVEL 1**

10762 **FORUM LEVEL 1**

**POSTER SESSION 5**

**PLANNING OF POWER DISTRIBUTION SYSTEMS**

**LEVEL 1 FORUM**

**POSTER SESSION 5**

**PLANNING OF POWER DISTRIBUTION SYSTEMS**

**LEVEL 1 FORUM**

**GUIDED TOURS 3 & 4**

11.00 – 12.30

**FORUM LEVEL 1**

10272  F22 Flexibility as a Cost-effective Solution Applied to MV Lines Investment Deferral: Guidelines to Study and Pinpoint Opportunities

Julien Lucas, Jerome Moiziaard

Enedis, France

10454  F23 Flexibility Inside: How To Seamlessly Embed Flexibility In DSO Activity

Hubert Dupin, Pémela Catinque Martins

Enedis, France


Yassine Naimi, Valentin Chesnet, Xavier Le Pivert

CEA, France

10192  F26 Partitioning of Distribution System into Resilient Clustered Microgrids Using Complex Network Approach

Divyanshi Dwivedi (1,2), Pradeep Kumar Yemula (2), Mayukha Pal (1,3)

ABB Ability Innovation Center, Asea Brown Boveri Company, Hyderabad 500084, India; 2: Department of Electrical Engineering, Indian Institute of Technology Hyderabad, Kandi, Sangareddy, Telangana 502285, India; 3: Corresponding Author

10251  G1 Mitigating and Preventing Electricity Distribution Congestion and Constraints Through Energy System Integration: an Integrated Energy System Analysis at DSO level

Arjan van Voorden, Arjen Jongepier, Sangareddy, Telangana 502285, India; 3: Corresponding Author

10292  G2 Technical Benefit Assessment for Network Automation Plans

Marta De Vita, Anna Lisa Frau, Agostino Galati, Carlos Alcaine Baquedano, Lilà Consiglio

Enel Grids, Italy

10297  G3 Nested Energy Management System to Improve the Resilience of Remote Interconnected Microgrids.

Fundiswa Mtethwa, Chandima Gomes, David Dorrell

University of the Witwatersrand, South Africa

10762  G4 Assessing The Impact Of Uncertainties Impact On The Techno-economic Performance Of Microgrids

Elsy El Sayegh (1,2), Benoît Jacquet (1), Julien Bruschi (1), Sarah Nasr (1), Nabil Sadou (2), Pierre Haessig (2), Hervé Guéguen (2)

1: EDF R&D, France; 2: CentraleSupélec, IETR, France

**TOUR 3 DISTRIBUTION PLANNING 2**

11.00 – 12.30

**LEVEL 1 FORUM**

10766  G5 Distribution Network Spare Capacity Unlocking Strategy (scus) to Integrate Heterogeneous Flexibilities

Jianwei Li, Shuang Cheng, Melissa Mitchell, Furong Li

University of Bath, United Kingdom

10845  G6 Probabilistic Impact Analysis Of Residential Batteries Providing FCR And aFRR On Low Voltage Grid

Lionel Delchambre (1), Tom Carron (2), Patrick Hendrick (1), Hamada Almasalama (3), Pierre Henneaux (1), Abdramane Barthily (3)

1: ULB, Belgium; 2: Sibelga, Belgium; 3: VITO, Belgium

10929  G7 Modeling PV Facility Side – Impacts and Recommendations

Jouni Peppananen, Devin Van Zandt

Electric Power Research Institute, United States of America

10943  G8 Understanding the Effects of EV Management and TOU Tariffs on Customers and Distribution Networks

Jing Zhu, William J. Nacmanson, Luis P. Ochoa

The University of Melbourne, Australia

10959  G9 Future Of Thermal Plants On Microgrids With High Renewable Share

Matthieu Chiiodetti (1), Thibaut Lafont (1), Hugo Gevret (1), Clément Huet (2), Pierre Mocellin (2)

1: EDF R&D, France; 2: EDF SEI, France

10106  G10 Operation And Planning Services For Active Distribution Networks – A BD4OPEM Project Use Case: Spanish Pilot

Alejandro Hernández-Matheus, Antonio Emmanuel Saldana González, Rafaela Ribeiro, Mónica Aragüés-Penalba, Eduard Bullich-Massagué

CITEA – UPC, Spain

10130  G11 Distribution Planning Tool using Flexible Strategies: Case Study in Spanish Pilot

Antonio Saldana-González (1), Mónica Aragüés-Penalba (1), Andres Sumper (1), Ramón Gallart-Fernández (2), Lluís Cànoves-Navarro (2)

1: Universidad Politécnica de Cataluña, Spain; 2: Estabanel Distribució, Spain

10134  G12 The impact of Reinforcement Learning-based Energy Management on a microgrid physical structure

Taherni Swibki (1), Ines Ben salem (1), Yousef Kriam (2), Lilia El Amraoui (1), Dhaker Abbes (2)

1: Smart Electricity & ICT, SEICT, LR18ES44, National Engineering School of Carthage (ENICarthage), University of Carthage, TUNISIA; 2: Univ. Lille, Arts et Metiers Institute of Technology, School of Carthage (ENICarthage), University of Carthage, TUNISIA; 2: Univ. Lille, Arts et Metiers Institute of Technology, School of Carthage (ENICarthage), University of Carthage, TUNISIA

10166  G13 Methods and Future Scenarios for Strategic Grid Development of Full Low and Medium Voltage DSO Supply Areas

Helfried Brunner (1), Clemens Korner (1), Thomas Wieland (1), Andreas Sumper (1), Vincent Cosperec (2)

1: AIT Austrian Institute of Technology; 2: EDF R&D, France

10180  G14 Distributed Generation: Next Generation of Thermal Plants On Microgrids With High Renewable Share

El Amraoui (1), Taheni Swibki (1), Ines Ben Saalem (1)

1: Smart Electricity & ICT, SEICT, LR18ES44, National Engineering School of Carthage (ENICarthage), University of Carthage, TUNISIA; 2: Univ. Lille, Arts et Metiers Institute of Technology, School of Carthage (ENICarthage), University of Carthage, TUNISIA; 2: Univ. Lille, Arts et Metiers Institute of Technology, School of Carthage (ENICarthage), University of Carthage, TUNISIA
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<td>Caterina Martins (1), Maria Inês Marques (1), Ricardo Bessa (2), Ferinno Moaidi (2), Simon Camal (2)</td>
<td>EDP NEW, Portugal; INESC TEC, Portugal; MINES Paris – PSL University, France</td>
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<td>G16</td>
<td>Integrated Method for Distribution Grid Expansion Planning Considering Operational Strategies of Residential Technologies</td>
<td>Luis Böttcher (1), Klemens Schumann (1,2), Arthur Pereira Novaes (1), Andreas Ulbig (1,2)</td>
<td>IAEW at RWTH Aachen University, Germany; Fraunhofer Center Digital Energy</td>
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<td>G17</td>
<td>Distribution System Planning with models of flexibility markets</td>
<td>Gianni Celli (1), Marco Galici, Fabrizio Pilo</td>
<td>University of Cagliari, Italy</td>
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<td>G18</td>
<td>Effects Of Demand Side Management Programs in Modern Distribution Planning – Challenges and Opportunities</td>
<td>Davide Monegato, Alison O’Connell, Jason Taylor</td>
<td>EPRI, United States of America</td>
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<td>I24</td>
<td>A 2030 Snapshot of Public Smart EV Charging Stations</td>
<td>Alastair Oldfield (1), Calum Watkins (2), Robert MacDonald (2), John Orr (1)</td>
<td>SP Energy Networks, United Kingdom; Smarter Grid Solutions, United Kingdom</td>
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<td>I25</td>
<td>How Can Flexibility Support Power Grid Resilience Through The Next Level Of Flexibility And Alternative Grid Developments</td>
<td>Santiago Gallego Amores (1,2), Emil Hillberg (3), Antonio Iliceto (2), Ewa Matczynska (4), Albana Ilo (5)</td>
<td>I–DE, Redes Electricas Inteligentes (Iberdrola), Spain; ETIP SNET; INESC TEC, Portugal; MINES Paris – PSL University, France</td>
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<td>I26</td>
<td>Domestic Demand Shift Trial for Local Network Management and Distributed Generation Curtailment Avoidance</td>
<td>Kailash Singh (1), Russell Bryans (1), Malcolm Bebbington (1), Guy Shapland (1), Gerard Boyd (1), Wendy Mantle (1), Kieron Stopforth (2), Simona Burchill (2)</td>
<td>Scottish Power Energy Networks, United Kingdom; Octopus Energy, United Kingdom</td>
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<td>I27</td>
<td>Innovative Digital Solutions That Enable Local Energy Communities to Provide Flexibility Services to the DSO: the Avacon Approach</td>
<td>Ilaria Losa (1), Benjamin Georg Petters (2), Navreet Dult (2)</td>
<td>RSE, Italy; AVACON, Germany</td>
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Programme updated on 30 Apr 2023. Titles and speakers are subject to change at any time. Cancellation/cancellation occur. Download the .pdf to view the latest updates.
FORUM
LEVEL 1
14.30 – 16.00
PLANNING 4
TOUR 5
NETWORK DEVELOPMENT 3 & DISTRIBUTION PLANNING 3
11.00 – 12.30
LEVEL 1
FORUM
10315
J1 Correlation Analysis on the Application Potential of Voltage Regulating Distribution Transformers in Medium- and Low-Voltage Grids
Patrick Wintzek (1), Markus Zdralevik (1), Julia Wack (2), Franco Pizzuto (2)
1: University of Wuppertal, Germany; 2: Maschinenfabrik Reinhausen GmbH, Germany

10874
J2 System Integration For Enhanced Network Planning And Operation With A Focus On Customer Interaction
Walter Schaffer, Christoph Groß, David Grubinger, Gerald Hörack, Sandra Renner
Salzburg Netz GmbH, Austria

J3 Integration Of Flexibility Solutions In The Multi-year Planning Of Distribution Grids With Large Amounts Of Renewable Energy Sources: Development Of A Decision-support Tool For The DSO
Amine El makhroubi (1), Hélène Baraffe (1), Juliette Morin (1), Mathieu Rainot (2), Juliette Chatel (2)
1: EDF R&D, France; 2: Enedis, France

J4 Restructured Active Distribution Network Planning Considering Agents’ Investment Budget Uncertainty
Milad Kabirifar (2), Mahmud Fotuhi-Firuzabad (2), Moein Moeini-Aghtaie (2), Niloofer Pourghaderi (2), Matti Lehtonen (1)
1: Aalto University, Finland; 2: Sharif University of Technology

G19 Representing Topology Uncertainty For Distribution Grid Expansion Planning
Domenico Tomassi (1), Paul Stursberg (1), Michael Metzger (1), Florian Steinke (2)
1: Siemens AG, Germany; 2: TU Darmstadt, Germany

G20 SENS – Tool for Planning and Operation of Smart Distribution Networks
Tomislav Antić, Alen Hrga, Tomislav Capuder
University of Zagreb Faculty of Electrical Engineering and Computing, Croatia

G21 Assessment Of The Impact Of Future Electrification Scenario On An Urban Distribution Network
Giacomo Viganò (1), Chiara Michelangeli (1), Marco Rossi (1), Diana Moneta (1), Daniele Clerici (1), Andrea Morotti (2), Diana Moneta (1), Daniele Clerici (1), Andrea Morotti (2), Caterina Pasetti (2), Alessandro Bossi (3)
1: EDF R&D, France; 2: Enedis, France; 3: Sharif University of Technology

G22 Decision Support Tool For The Development Of Power Distribution Networks Based On AI Planning
Sandra Castellanos (2), Maris-Cecile Alvarez-Herault (1), Philippe Lalanda (1)
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, 38000 Grenoble, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG, 38000 Grenoble, France

G23 Techno–Economical Approach on Establishing Zero Down Time Area To Promote Premium Reliability in Super Priority Tourism Destination
Revi Aldrian, Daniel Tampubolon, Margi Setiyono, I Wayan Harimbawa, Fauzi Arubusman
PT PLN (Persero), Indonesia

G24 New Approach into Material Supply Chain to Boost Industrial Capability
Silvia Mannucci, Andrea Balena, Andrea Campi, Matteo Carraro, Francesco Amadei, Claudio Liberatori
Enel Grids, Italy

G25 Increasing the Renewables’ Hosting Capacity by Topology Optimization of Neighbouring Medium Voltage Grids
Achraf Kharrat (1), Marcel Böhringer (1), Jutta Hanson (1), Lars Weispffenning (2), Athanasios Krontiris (2), Ingo Jeromin (2), David Petermann (3), Nicole Buchau (3)
1: Technical University of Darmstadt, Germany; 2: Darmstadt University of Applied Sciences, Germany; 3: e-netz Südhessen AG

G26 Integration of Environmental and Economical Impacts of Electricity Consumption in an Energy Community Based on Coalition Game.
Adrien Bossu (1), Benoit Durillon (1), Arnaud Davigny (1), Hervé Barre (2), Sabine Kazmierczak (2), Benoit Robyns (1), Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France

H1 A Novel DSO Approach In Proactively Upgrading The LV Distribution Network For Electrification Of Heat And Transport
Padraig Coughlan, Francisco Romo, Tara Ni Reachtagain, Dan Catanase, Jack Herrig, Clem Power
ESB, Ireland

Gregorio Higuera, Behzad Kazemtabrizi
Durham University, United Kingdom

H3 Polygonal Optimisation Of Topologies For L V Network Planning For Future Distribution Networks
Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France

H4 Distribution Planning Model Requirements for Smart Community Integration
Mark McGranaghan (1), Treisa Ravi Sahaya (2), Jouni Peppanen (3)
1: EPRI Europe, Ireland; 2: University College Dublin, Ireland; 3: EPRI, USA

H5 Digitized Complex Project Management
Mario Fernandez (2), Valentina Loreto (1), Andrea Campi, Matteo Carraro, Francesco Amadei (1)
1: ENEL GRIDS, Italy; 2: ENEL GRIDS, Spain

H6 Distributed Energy Exchange System
Matthew Dixon (1), James Mason (1), Nasser Elimelech (1), Mark McGranaghan (2), Treisa Peppanen (3)
1: EPRI Europe, Ireland; 2: University College Dublin, Ireland; 3: EPRI, USA

H7 Integration of Environmental and Economical Impacts of Electricity Consumption in an Energy Community Based on Coalition Game.
Adrien Bossu (1), Benoit Durillon (1), Arnaud Davigny (1), Hervé Barre (2), Sabine Kazmierczak (2), Benoit Robyns (1), Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France

H8 Network Reconfiguration Under a Stochastic Optimisation Framework for Day-Ahead Operation Planning for Future Distribution Networks
Gregorio Higuera, Behzad Kazemtabrizi
Durham University, United Kingdom

H9 Polygonal Optimisation Of Topologies For L V Network Planning For Future Distribution Networks
Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France

H10 Integration of Environmental and Economical Impacts of Electricity Consumption in an Energy Community Based on Coalition Game.
Adrien Bossu (1), Benoit Durillon (1), Arnaud Davigny (1), Hervé Barre (2), Sabine Kazmierczak (2), Benoit Robyns (1), Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France

H11 Polygonal Optimisation Of Topologies For L V Network Planning For Future Distribution Networks
Fateh Belaid (3), Christophe Saudemont (1)
1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia, Lille, France; 2: Lille Catholic Institute (ICL); FGES, Faculty of Business, Economics, and Sciences, Lille, France; 3: Faculty of Management, Economics & Sciences, Lille Catholic University, France
H6 A Surrogate Model of Distribution Networks to support Transmission Network Planning
Matteo Rossini, Marco Rossi, Dario Siface
Ricerca sul Sistema Energetico – RSE SpA, Italy

H7 SILVERSMITH – An Investigation Into Low Voltage Network Management
Thomas Stone (1), Sebastian Lindmark (1), Laurence Hunter (2)
1: EA Technology, United Kingdom; 2: National Grid, United Kingdom

H8 A Study of Mid to Long-term Distribution Planning Based on PV Installation Forecasting
Jintao Cho (1), Hongjoo Kim (1), Hosung Ryu (1), Jiwon Lee (1), Juhyong Kim (1), Yongju Son (2), Sungyun Choi (2)
1: KEPCO, Korea, Republic of (South Korea); 2: Korea University, Korea, Republic of (South Korea)

H9 Large-Scale Grid Investment Strategy In Low-Voltage Networks
Jur Erbrink, Peter van Oirschouw, Johan Kroeze, Bart Plijms, Lars Hoe fnagel, Atze Peters
Alliander, The Netherlands

H10 Study of Low-voltage Distribution Grid Connection Dimensioning Principles Considering Distributed Generation in Finland
Jouni Haapaniemi (1), Otto Räisänen (1), Antti Supponen (2), Juhana Hakkanen (1), Julius Vilppö (1), Jukka Lassila (1), Sami Repo (2)
1: Lappeenranta-Lahtil University of Technology LUT, Finland; 2: Tampere University, Finland

Jintao Cho (1), Hongjoo Kim (1), Hosung Ryu (1), Jiwon Lee (1), Juhyong Kim (1), Yongju Son (2), Sungyun Choi (2)
1: KEPCO, Korea, Republic of (South Korea); 2: Korea University, Korea, Republic of (South Korea)

H12 Predicting Local Effects of Energy Transition Through Development of a Network Observation Tool
Julien Vandenbure, Thomas Wenhkel, Simon Gerard
RESA, Belgium

H13 Enel Grid+: the Advanced Platform for Network Analysis and Planning
Gabriele Licasale (1), Raffaele Scarantino (1), Francesco Viapiana (1), Andrea Vermigl (1), Massimiliano Alloni (2), Pierluigi Bianchi (2), Giulia Ravarino (1)
1: Enel Grids; 2: Enel Grids, Italy

H14 Efficiency Comparison of Programmed SAID in Investments in the Distribution System
Taric Saldhana, Diogo Boff, Ingrid Kirsch, Rodrigo Figueiredo, Paulo Pereira, Lucas Chiara
UNISINOS, Brazil
**FORUM LEVEL 1**

**14.30 – 16.00**

**PLANNING 5**

**TOUR 6 DISTRIBUTION PLANNING 5**

14.30 – 16.00

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| 10961      | J12 Selection of Representative Urban Low-Voltage Grids for Electric Vehicle Integration Studies | Simon Niederle (1), Simon Kreutmayr (2), Christoph J. Steinhardt (3), Christian Gutzmann (3), Rolf Witzmann (1), Michael Finkel (2)  
1: Technical University of Munich, Germany; 2: Augsburg University of Applied Science, Germany; 3: SWM Infrastruktur GmbH & Co. KG, Germany |
| 11005      | J13 Challenges and Needs for High Power Combined Charging of Ferries and Electric Vehicles – A Norwegian Scenario Case Study | Erlin Bachmann Mehammer (1), Venkatachalam Lakshmanan (1), Jonatan Ralf Axel Klemets (1), Andrej Gjortsen (2), Bendik Nybakk Torsæter (1)  
1: SINTEF Energy Research, Norway; 2: Mellom AS, Norway |
| 11082      | J14 A Planning Toolkit to Evaluate Shore-side Infrastructure Requirements for Electrified Water-based Transportation | Lewis Hunter, Stuart Galloway  
University of Strathclyde, Glasgow, Scotland |
| 11165      | J16 Integration of a Multi-megawatt Charging Station in the Medium Voltage Network | Barbara Herndler (1), Roman Schwabl (1), Clemens Körner (1), Tobias Riedlinger (2), Thomas Wieland (3), Dr. Stephan Brandl (4), Maxiilamin Ortner (5)  
Norwegian University of Life Sciences, Norway |
| 11266      | J18 Load Demand and Grid Integration of Electric Ferries: A Case Study in the Three Major Italian Lakes | Massimo Ceraolo (2), Giovanni Lutzemberger (2), Giuseppe Mauri (1), Paolo Mazzucchelli (3), Sara Salamone (1)  
1: RSE S.p.A., Italy; 2: University of Pisa; 3: Gestione Rete Amatoriali Innovativa (Laghi) Amatoriali Innovativa (Laghi) |
| 11428      | J19 Smart Charging of Electric Vehicles Based on Scheduling Theory | Heidi S. Nygård, Ingrid Maria March, Olvar Bergland  
NMBU, Norway |
| 11445      | J20 Coordinated Deployment Of Electric Taxi Minibuses To Enhance Solar Photovoltaic Hosting Capacity Of Residential Networks | Lewis Waswa, Justice Munyaradzi Chihota, Bernard Bekker  
Stellenbosch University |

**POSTER SESSION 5**

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1: Universidade Federal de Santa Maria, Brazil; 2: Universidade Regional Integrada do Alto Uruguai e das Missões – URI campus Santo Ângelo, Brazil |
| 10379      | J22 Efficient Integration of Electric Vehicles Through Optimal Charging and Reactive Power Support | Damir Jakus, Josip Vasilj, Bosko Poljak, Danijel Jolevski  
University of Split – FESB, Croatia |
| 10449      | J23 MWOA for Optimal Integration of Hybrid Renewable Resources into the Distribution Systems for Techno-Economic Benefits | Ahmed Sami (1), Elsaaed Otman (2), Mohammed Elbakh (3)  
1: Ministry of Electricity and Renewable Energy, Egypt; 2: Faculty of Engineering – Al Azhar University; 3: Faculty of Engineering at Shoubra – Benha University |
| 10721      | J24 The Use of Distributed Energy Resources to Mitigate the Negative Imbalance Between Bulk Purchase Versus Distribution Tariffs in South Africa | Aiden Kyle Rhode, Bernard Bekker, Christo Nicholls  
Stellenbosch University, South Africa |
| 11025      | J25 A New Optimization Method Brings Distribution Grids Performance To The Next Level Thanks To Digital Transformation | Thi Thu Ha Pham, Jerome Brun, Julien Mecreant, Nicolas Choulet  
Schneider Electric, France |

**GUIDED TOURS 7 & 8**

16.30 – 18.00

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amperias GmbH, Germany |
| 10295      | H8 Voltage Demand Relationship Modelling for Future Energy Scenarios | Mark Collins (1), Mark Rafferty (1), Colin Mackenzie (1), Kiran Bailey (2), Maurice Lynch (2), Darren Moran (2)  
1: Smarter Grid Solutions, United Kingdom; 2: Electricity North West Ltd, United Kingdom |
| 10327      | H9 Use Of Linky Smart Meter Data To Enhance The Diversity Factor Assessment In Real Networks | Guilherme Ramos Mills (1), Marie-Cécile Alvarez-Herault (2), Raphael Caire (2), Christophe Gay (1), Bruno Gourguechon (1)  
1: Enedis, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France |
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<td>Anna Pfender, Patrick Riess, Soharn Choudhury, Rafael Steppan, Aaron Hebing, Jutta Hanson</td>
<td>Technical University of Darmstadt, Department of Electrical Engineering and Information Technology, Institute of Electrical Power Supply with Integration of Renewable Energy, Germany</td>
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<td>Emir Nukić, Jelena Ponocko</td>
<td>The University of Manchester, United Kingdom</td>
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<td>H22 Comprehensive Building Clustering as an Abstraction Method for Planning of Power Distribution Systems</td>
<td>Paul Maximilian Röhrig (12), Nils Körber (12), Andreas Ulbig (12)</td>
<td>1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT Aachen</td>
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<td>Mina Skok (1), Lahorko Wagner (2), Mario Maricевич (1)</td>
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<td>Joana Teixeira (1), Inês Ferrão (1), Sérgio Gonçalves (1), Anderson Soares (1), Nuno Lourenço (2), António Rua (2)</td>
<td>1: E-REDES, Portugal; 2: Banco de Portugal, Portugal</td>
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<td>Ana Ta Turk (1), George Sideratos (2), Kamini Shahare (3), Aysegül Kahraman (1), Alexandros Paspatis (2), Guangya Yang (1), Arghya Mitra (3), Dianpan Hu (2), Panos Kotsampopoulos (2)</td>
<td>1: Technical University of Denmark, Denmark; 2: National Technical University of Athens; 3: Visvesvaraya National Institute of Technology</td>
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<td>Marc Cariguelo, Joaquim Meléndez</td>
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<td>Ville Tikka, Otto Räsänen, Jouni Haapaniemi, Gonçalo Mendes, Jukka Lasllisa, Samuli Honkapuro</td>
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<td>1: AIT Austrian Institute of Technology, Austria; 2: Technische Universität Wien (TU Wien), Austria</td>
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<td>Kristoffer Fürst, Peiyuan Chen, Irene Yu-Hua Gu</td>
<td>Chalmers University of Technology</td>
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<td>Gary Howorth (1), Ivaan Kockar (1), Paul Tuohy (1), Graeme Fleet (1), John Bingham (2)</td>
<td>1: University of Strathclyde, United Kingdom; 2: Engineering Technology Centre Ltd (ETC), United Kingdom</td>
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<td>Quasi-Dynamic Line Rating Spatial and Temporal Analysis for Network Planning</td>
<td>Stella Hadjivakalou (1), Sergio Daniel Montana Salas (2), Andrea Michiardi (2)</td>
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<td>1: National University of Singapore (NUS); 2: MINES Paris - PSL</td>
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<td>Evaluation Of Dynamic Active Distribution Network Equivalents With Grid Forming Converters In The Context Of System Stability Studies</td>
<td>Jakob Ungerland (1), Wolfgang Biener (1), Hendrik Lens (2)</td>
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<td>1: Fraunhofer Institute for Solar Energy Systems; 2: University of Stuttgart</td>
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<td>Bridging The Gap From Geographical To Electrical Modeling</td>
<td>Sébastien Vallet, Benoît Vinot, Florent Cadoux</td>
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<td>Experiences With Ampacity Rating Calculations For Wind Farm Export Cable</td>
<td>Henrik Strand (1), Espen Eberg (1), Nina Marie Thomsen (1), Kristian Thinn Solheim (1), Kim Ove Akslund (2)</td>
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<td>Determining the Accuracy of Average Fault Rates in Assessing the Risks of Individual Circuits</td>
<td>Felix Peterken, Paul Morris</td>
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<td>Low-Voltage Topology Identification from Incomplete Smart Meters Data : Spain Experiment</td>
<td>Rémi Côme (1), Clémentine Benoit (1), Carlos Gaitan Poyatos (2), Francisco Javier Leiva Rojo (2)</td>
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<td>Phase Identification using Smart Meter Data</td>
<td>Andrew Urquhart (1), Iro Psarra (2), Alex Gardner (2), Jenny Woodruff (3), Nadim Al-Hariri (2), Murray Thomson (1)</td>
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<td>Case–Based Probabilistic Load–Flow Calculation Considering The Correlative Interdependence Of Loads</td>
<td>Tim Pfueiler, Jutta Hanson</td>
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<td>Technical University of Darmstadt</td>
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<td>Voltage Congestion Monitoring Through Machine Learning</td>
<td>Rémy Cifonelliwerck (12), Wouter Parys (1), Jan Desmet (2), Thierry Coosemans (1)</td>
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<td>1: EVERE, Vrije Universiteit Brussel, Belgium; 2: EELAB/Lemcko, Universiteit Gent, Belgium</td>
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<td>Graph Computing Techniques for Power Flow Resolution Considering Real Distribution Networks</td>
<td>Francesca Soldan, Enea Blonda, Carlo Tornelli</td>
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<td>Power Grid Model: a High–Performance Distribution Grid Calculation Library</td>
<td>Yu Xiang, Peter Salesmin, Bram Stoeller, Nitish Bharame, Werner van Westering Allander N.V., The Netherlands</td>
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<td>Multiconductor Approach To Study Power Flows In Asymmetric And Unbalanced Electric Distribution Networks</td>
<td>Massimiliano Coppo (1), Roberto Turri (1), Alberto Cerretti (2), Massimo Bolognesi (2), Rosalba Russo (3), Giovanni Franzone (2)</td>
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<td>1: Università Padova; 2: Enel grids srl; 3: e-distribuzione spa</td>
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<td>Hosting Capacity Using Real Time–Series for PV, EV, Load and Background Voltage</td>
<td>Tais Tavares de Oliveira (1), Nicholas Etherden (1,2)</td>
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<td>1: Luleå University of Technology, Sweden; 2: Vattenfall R&amp;D, Sweden</td>
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<td>Non-technical Losses Identification in Distribution Grids: A Hybrid Approach</td>
<td>Marc Jene–Vinuesa, Monica Aragüés–Péralba, Andreas Sumper</td>
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<td>Novel Approach on Monitoring Technical and Non–technical Losses in Distribution Networks</td>
<td>Vahid Mottaghi (1), Maria Rashki Ghaleno (2), Mohammad Hekmat (2), Fatemeh Darabi Farimani (2), Navid Yektay (2)</td>
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<td>1: Esafhan Electricity Power Distribution Company (EEDPC); 2: Sunflower Industrial Research Company (SIRCO)</td>
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<td>Data–driven Techniques to Improve the Reliability of Low Voltage Electricity Networks Through Dynamical Evaluation of Non–technical Losses</td>
<td>Marc Girona–Badia (1), Gerard Mor (1), Gerard Laguna (1), Jordi Cipriano (1), Alvaro Luna (2)</td>
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<td>1: Centre Internacional de Métodes Numèrics en Enginyeria(CIMNE), Spain; 2: Universitat Politècnica de Catalunya(UPC),Spain</td>
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# Programme

Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.

## ASPECTS

- Quality
- Power
- Related Equipment
- System
- Safety
- Earthing
- EMC,分会
- Protection

## Wednesday 14 June

### Main Session 2

**LEVEL 0**  
**PLENARY ROOM 1**  
**POWER QUALITY & ELECTROMAGNETIC COMPATIBILITY**  

**Session 2** deals with any phenomena related to power quality (PQ). This includes e.g. flicker, unbalance, distortion in the frequency range from DC up to 500 kHz as well as events like sags or swells. The session covers also all aspects of electromagnetic compatibility (EMC) including emission, immunity, its coordination and the related standardisation. Conducted and radiated electromagnetic interferences, electric and magnetic fields (EMF) and grounding issues are also included.

### Block 1  
**09:00 – 10:30**

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<td>Evolution Of Earthing Impedance</td>
<td>Quinten Antoine (1), Sophie Van Wynendaele (1), David Decoux (2), David Valkema (3), Bastien Noël (4)</td>
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<td>10536</td>
<td>Practical Comparison Of Earth Impedance Testing Methods</td>
<td>Josef Schmidbauer, Friedrich Almer</td>
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<td>10680</td>
<td>Evaluation of High Harmonic Components in the Residual Earth Fault Current with Regards to the Earth Potential Rise and Personal Protection</td>
<td>Benjamin Küchler (1), Karla Frowein (2), Peter Schegner (2), Uwe Schmidt (1)</td>
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<td>10936</td>
<td>Solar Farm Earthing – Not Just an Extra-large Substation – Special Requirements Met by Risk–based Design and Focused Testing</td>
<td>William Carman (1), Matthew Bale (2)</td>
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<td>10942</td>
<td>Switching Overvoltages Caused by Shunt Reactor Switching and Mitigation Methods</td>
<td>Philipp Hackl (1), Katrin Friedl (1), Robert Schürhuber (1), Britta Heimbach (2), Bruno Wartmann (2), Andre Casura (2)</td>
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<td>11067</td>
<td>Effect of Time Delay of High-speed Autoreclosing on Variable Frequency Drives and Other Loads</td>
<td>Perti Pakonen, Ari Nikander, Pekka Verho</td>
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<td>Pseudometric Indices Analysis for Waveform Distortion from Rolling Stacks in Electrified Traction Systems</td>
<td>Rafael S. Salles (1), Sarah K. Rönngb (1), Andrea Mariscotti (2)</td>
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<td>10811</td>
<td>Advanced Techniques For Troubleshooting Solar Arrays And Generator Connections</td>
<td>Robert Weller (1), Kate Edwards (2), Duncan Dalton (2)</td>
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<td>Power Quality Analysis of LVDC Distribution System using Real–time Simulator</td>
<td>Seokwoong Kim, Jintae Cho, Youngpyo Cho, Hongjoo Kim, Woowon Kim, Juyong Kim</td>
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**11:00 – 13:00**

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<td>Requirements For Grid Supporting Inverter In Relation With Frequency And Voltage Support</td>
<td>Carina Lehne, Ziqian Zhang, Herwig Renner, Robert Schürhuber</td>
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<td>10483</td>
<td>Analysis and Modelling of Temporary Overvoltage Events and Comparison with OVRT Requirements</td>
<td>Christoph Wirtz (1), Max Murgiät (1), Simon Krahl (1), Albert Moser (2)</td>
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<td>10893</td>
<td>Modeling of Power Cables for Measurement Calibration and PLC Simulation up to 20 MHz</td>
<td>Amaia Arrinda, Jon Gonzalez Ramos, Asier Herranz, Alexander Gallarreta, Igor Fernández, David de la Vega, Itziar Angulo</td>
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<td>Modelling of Voltage Unbalance in Large Real Medium Voltage Distribution Networks</td>
<td>Adnan Bosovic (1), Herwig Renner (2), Andreas Abart (3), Ewald Traxler (3), Jan Meyer (4), Friedemann Möller (4), Mustafa Music (1)</td>
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<tr>
<td>11148</td>
<td>Modelling of Voltage Unbalance in Large Real Medium Voltage Distribution Networks</td>
<td>Seokwoong Kim, Jintae Cho, Youngpyo Cho, Hongjoo Kim, Woowon Kim, Juyong Kim</td>
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<td>11167</td>
<td>Probabilistic Estimation of Harmonic Distortion in Non–Radial Distribution Network</td>
<td>Yuqi Zhao (1), Jovica Milanovic (1), Pablo Rodríguez–Pajarón (2), Araceli Hernández (2)</td>
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<td>10674</td>
<td>Verification of Tool for Allocation of Harmonic Current Emissions Considering Frequency–Dependent Impedance</td>
<td>Tor Inge Reigstad (1), Bjørn Inge Oftedal (2), Thor Holm (3), Bendik Nybakke Torsøer (1), Henning Taxt (1)</td>
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**LEVEL 0**  
**PLENARY ROOM 1**  
**POWER QUALITY & ELECTROMAGNETIC COMPATIBILITY**
**Main Session 2**

**Plenary Room 1**

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**PLENARY ROOM 1**

**DATA ANALYSIS ADVANCED AND STANDARDS, REGULATIONS AND MEASUREMENTS**

**16.30 – 18.00**

**Session 6**

The energy transition is impacting the DSO’s business management. The vision to be the enabler of the transition is clear; however, the grid infrastructure is nothing that can be changed overnight. While traditional assets typically have long life-times, new business tools, methods and processes need to be adapted and demonstrated to match new priorities and the necessary speed of transition. The focus of Session 6 is to take the DSO business perspective including regulation compliance, cooperation with stakeholders including sector integration, reasonable risk management for flexibility and cybersecurity, customer expectation and overall business digitalization.

**10618**

**Impact of Reserve Market Participation on Power Quality of Flexibility Resources and Local Electricity Networks**

Antti Hildén (1), Pertti Pakonen (1), Joni Markkula (1), Eero Paavilainen (2), Mikko Kettunen (3), Pertti Järventausta (1), Pekka Verho (1)

1: Tampere University; 2: Siemens Oy; 3: Lämpölää Lämpö Oy

**10493**

**Monitoring Voltage Quality in Sweden**

Herlita Bobadilla Robles, Albin Emanuelsson, Abdirizak Aden, Carl Johan Wallnerström

Swedish Energy Markets Inspectorate, Sweden

**11206**

**New Interharmonic Subgroup Concept for Quantifying and Limiting Distortion in Distribution Networks: Further Developments and Experimental Validation**

Roberto Langella (1), Jiri Drapela (2), Mark Halpin (3), Jan Meyer (4), David Mueller (5), Harish Sharma (6), Alfredo Testa (1), Neville R. Watson (7), David Zech (8)


**11081**

**Assessment of Harmonic Emission Level of Customer Installations Considering Actual Level of Cancellation**

Morteza Pourarab (1), Jan Meyer (1), Oliver Doimianus (1), Thomas Naef (2), Max Ulrich (2), Roger Rolli (2)

1: Technische Universität Dresden, Germany; 2: Camille Bauer Metrawatt AG, Switzerland

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**Main Session 6**

**Customers, Regulation, DSO Business & Risk Management**

**Level 0 Plenary Room 4**

**WEDNESDAY 14 JUNE**

**09.00 – 10.30**

**10268**

**Swedish Approach For The Assessment And Monitoring Of The Smart Grid Development**

Maria Dalheim, Herlita Bobadilla Robles, Mohamadreza Baradar, Carl Johan Wallnerström

The Swedish Energy Markets Inspectorate, Sweden

**10393**

**The UMEI – Universal Market Enabling Interface. Enabling Standard Interaction with Various Flexibility Markets to Procure Grid Services**

Carlos Damas Silva (1), Gesa Milzer (4), Arnaud Debray (2), Mahtab Kaffash (3), Navre Sætre (4), Chloé Dumont (2), Evelyn Heylen (3), Oystein Dyvik Eide (4), Giancarlo Marzano (2)

1: E–REDS, Portugal; 2: N–SIDE, Belgium; 3: Centrica Business Solutions, Belgium; 4: NODES, Norway

**10445**

**Regulatory Learnings from EU Funded Flexibility Projects. The i–DE Case: Preparing the Future DSO**

Robbert Claeyaerts (1), Rémy Cleenwerck (1), José Pablo Chávez Ávila (2), Beatriz Alonso Santos (1), David Brummund (1), Gesa Milzer (2), Reinhilde D’hulst (3), Robbert Claeys (1), Rémy Cleenwerck (1, 2), Jos Knockaert (1), Max Domagk (1), Jan Meyer (1), Karl Scheida (2), Rene Braunstein (3), Ewald Traxler (4), Roland Zoll (5)

1: TU Dresden, Germany; 2: Oesterreichs Energie, Austria; 3: Energienetze Steiermark, Austria; 4: Netze Oberösterreich, Austria; 5: Wiener Netze, Austria

**10576**

**Volumetric Or Capacity-based Grid Tariffs: A Case Study For Residential Consumers In Flanders**

Carlos Damas Silva (1), Gesa Milzer (4), Arnaud Debray (2), Mahtab Kaffash (3), Navre Sætre (4), Chloé Dumont (2), Evelyn Heylen (3), Oystein Dyvik Eide (4), Giancarlo Marzano (2), Pablo Chávez Ávila (2), Beatriz Alonso Santos (1), David Brummund (1), Gesa Milzer (2), Reinhilde D’hulst (3), Robbert Claeys (1), Rémy Cleenwerck (1, 2), Jos Knockaert (1), Max Domagk (1), Jan Meyer (1), Karl Scheida (2), Rene Braunstein (3), Ewald Traxler (4), Roland Zoll (5)

1: E-REDES, Portugal; 2: N-SIDE, Belgium; 3: Centrica Business Solutions, Belgium; 4: NODES, Norway

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**Level 0 Plenary Room 1**

**WEDNESDAY 14 JUNE**

**09.00 – 10.30**

**10578**

**Market-Based Flexibility Services For Congestion Management – A Comprehensive Approach Using The Example Of German Distribution Grids**

David Brummund (1), Gesa Milzer (2), Reinhilde D’hulst (3), Paul Kratsch (4), Md Umar Hashmi (5), Louise Adam (6), Gil Sampiao (7), Mahtab Kaffash (8), Mitreutz Strom (1), NODES AS (3), VITO (4), EON (5), KU Leuven/EnergyVille (6), N-SIDE (7), INESC TEC (8), N-SIDE (9), INESC TEC (8)

1: E-REDES, Portugal; 2: N-SIDE, Belgium; 3: Centrica Business Solutions, Belgium; 4: NODES, Norway

**11131**

**Practical experiences of Flexibility market for DSO in Slovenia**

Jurij Curk, Boris Turha

Elektro Ljubljana, Slovenia

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**11023**

**Impact of Discontinuous Measurements on the Trend Analysis of Power Quality Parameters**

Max Domagk (1), Jan Meyer (1), Karl Scheida (2), Rene Braunstein (3), Ewald Traxler (4), Roland Zoll (5)

1: TU Dresden, Germany; 2: Oesterreichs Energie, Austria; 3: Energienetze Steiermark, Austria; 4: Netze Oberösterreich, Austria; 5: Wiener Netze, Austria

**10324**

**Automated Load Control Detection Using Power Quality Data And Machine Learning**

Christina Brester (1), Antti Hildén (2), Mikko Kolehmainen (1), Pertti Pakonen (2), Harri Niska (1)

1: University of Eastern Finland, Finland; 2: Tampere University, Finland

**11087**

**Deep Learning Graphical Tool Inspired by Correlation Matrix for Reporting Long-term Power Quality Data at Multiple Locations**

Roger de Oliveira, Naser Nakhodchi, Rafael Salles, Sarah Ronnberg

Luleå University of Technology, Sweden
### BLOCK 2: 11.00 – 12.30

**DSO**

**LEVEL 0**

**PLENARY ROOM 4**

<table>
<thead>
<tr>
<th>Session ID</th>
<th>Title</th>
<th>Speaker(s)</th>
<th>Affiliation(s)</th>
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</thead>
<tbody>
<tr>
<td>10366</td>
<td>Asset Owner Perspective on Managing Growth and Reinvestment Needs</td>
<td>Markus Taaveniku (1), Marcus Halvarsson (1), Matthias Hopfensitz (2), Heiko Spitzer (2)</td>
<td>1: Vattenfall Eldistribution AB, Sweden; 2: enteligenio GmbH, Germany</td>
</tr>
<tr>
<td>11400</td>
<td>Standardization ISO50000 &amp; PAS55</td>
<td>Ivan Valbuena, Carolina Morales</td>
<td>Enel Colombia, Colombia</td>
</tr>
<tr>
<td>10228</td>
<td>Assessment and Visualisation of Extreme Weather Impacts and Climate Change Risks on Distribution Network Operation</td>
<td>Lizaveta Troshka</td>
<td>National Grid, United Kingdom</td>
</tr>
<tr>
<td>10215</td>
<td>Real Time Quality Monitoring Of Electrical Distribution Network Affected By Heatwaves: A Data-oriented Approach</td>
<td>Giulia Muscarà (1), Gianluca Di Felice (1), Francesco Paolo Palazzotto (1), Roberto Brandi (1), Niccolò Corsi (1), Massimo Pompili (2), Luigi Calcarà (2)</td>
<td>1: e-distribuzione, Italy; 2: University of Rome La Sapienza, Italy</td>
</tr>
<tr>
<td>10522</td>
<td>Non-firm Grid Connections For Low-Voltage Generators: A Case Study</td>
<td>Louise Muller, Florent Cadoux</td>
<td>Roseau Technologies, France</td>
</tr>
<tr>
<td>10280</td>
<td>Assessing Gender Equality in the Distribution Sector</td>
<td>Sarah Ozszaux</td>
<td>ENGIE IMPACT - BRUXELLES, Belgium</td>
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### BLOCK 3: 14.30 – 16.00

**CUSTOMER**

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**PLENARY ROOM 4**

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<th>Title</th>
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<th>Affiliation(s)</th>
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<tr>
<td>10411</td>
<td>Advanced Electrical Energy Storage Technologies And Their Applications On Customer Side</td>
<td>Christian Noce, Luigi Lanuzza, Martina Radicioni</td>
<td>Enel X Srl, Italy</td>
</tr>
<tr>
<td>10117</td>
<td>Pilot Project where a Battery Energy Storage System is used for Fast Frequency Reserve</td>
<td>Hanne Sæle (1), Maren Istad (1), Signe Marie Oland (2)</td>
<td>1: SINTEF Energi AS, Norway; 2: Lede AS, Norway</td>
</tr>
<tr>
<td>10236</td>
<td>End-use Sector Coupling To Turn Customer Plants Into Prosumers Of Electricity And Gas</td>
<td>Andrea Adamollo (1), Albiana Ilo (2), Carlo Carcasci (1)</td>
<td>1: University of Florence, Italy; 2: TU Wien, Austria</td>
</tr>
<tr>
<td>10154</td>
<td>Potential of a Decentralized Load Management Concept and Transferability to Various Countries</td>
<td>Sonja Baumgartner (1), Veronika Barta (2), Stephanie Uhrig (2), Rolf Wittmann (3)</td>
<td>1: LEW Verteilnetz GmbH, Germany; 2: HM University of Applied Sciences Munich; 3: TUM Technical University of Munich</td>
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### BLOCK 3: 14.30 – 16.00

**CUSTOMER**

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<tr>
<td>10919</td>
<td>Data Quality Challenges in Existing Distribution Network Datasets</td>
<td>Frederik Geth (1), Marta Vanin (2), Dirk Van Hertem (2)</td>
<td>1: GridQube, Australia; 2: KU Leuven and EnergyVille, Belgium</td>
</tr>
<tr>
<td>11256</td>
<td>Making The Most Of Existing Data – A Data Lake Approach To Risk Quantification</td>
<td>Joanne Peacock, Dawn O’Brien</td>
<td>EA Technology, United Kingdom</td>
</tr>
<tr>
<td>10267</td>
<td>Anonymisation Score For Time Series Consumption Data</td>
<td>Cecilia Gerlitz (1), Axel Eriksson (1), Camilla Hansson (2)</td>
<td>1: Vattenfall AB, Sweden; 2: Vattenfall Eldistribution AB, Sweden</td>
</tr>
<tr>
<td>11009</td>
<td>Open Data; Delivering Results For Data Stakeholders</td>
<td>Lewis Jones, Liam McSweeney</td>
<td>National Grid Electricity Distribution, United Kingdom</td>
</tr>
<tr>
<td>10138</td>
<td>EleniaGO – Crowdsourcing Maintenance Inspections</td>
<td>Harri Salomäki (1), Pauliina Salovaara (1), Heikki Mäkikäki (2)</td>
<td>1: EleniKKO Oy; 2: Ambientia Oy</td>
</tr>
</tbody>
</table>
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.

Convener: Giovanni Valtorta (e-distribuzione, Italy)

Remote control and automation techniques to improve continuity of supply: performance requirements and evaluation

14.30 – 16.00

Convener: Giovanni Valtorta (e-distribuzione, Italy)

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.

Convener: Giovanni Valtorta (e-distribuzione, Italy)

Remote control and automation techniques to improve continuity of supply: performance requirements and evaluation
### Round Tables

**Level 0 • Plenary Room 3**

**09.00 – 16.00**

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Topic</th>
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<tbody>
<tr>
<td>09.00</td>
<td>RT9:</td>
<td>CAPACITY MANAGEMENT FOR PV AND EV</td>
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<tr>
<td>10.30</td>
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<tr>
<td>11.00</td>
<td>RT11:</td>
<td>ACCELERATING THE ENERGY TRANSITION, FROM AUTHORIZATION THROUGH TO COMMISSIONING</td>
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<td></td>
<td></td>
<td>Convener: Riccardo Lama (E-distribuzione, Italy)</td>
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<td></td>
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<td>Speakers: Jean Galand (Enedis, France)</td>
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<td>Joao Filipe Nunes (E-Redes, Portugal)</td>
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<tr>
<td>12.30</td>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>14.30</td>
<td>RT13:</td>
<td>NEW ROLE OF SMART METERING FUNCTIONALITIES</td>
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<td>16.00</td>
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### Planning of Power Distribution Systems

**Level 0 • Plenary Room 3**

**16.30 – 18.00**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
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<tbody>
<tr>
<td>16.30</td>
<td>11302</td>
<td>Integrated Physical And Probabilistic Modelling Of Low Voltage Cable Temperatures, Stress Cycles, And Damage Gordon McFadzean (1), Megan Taylor (2); Zoe Hodgins (2); Gruffudd Edwards (1), Nicole Lee (2), Rosemary Tawn (1), Ben Ingham (3) 1: TNEI Services Ltd, United Kingdom; 2: Frazer–Nash Consultancy, United Kingdom; 3: Electricity North West Ltd, United Kingdom</td>
</tr>
<tr>
<td>17.00</td>
<td>10108</td>
<td>A Risk–Based Approach for Development Planning of Radial Distribution Networks Zeljko Popovic (1), Stanko Knezevic (2), Draga Radojcic (1), Michael Metzger (1), Florian Steinke (2) 1: University of Novi Sad, Serbia; 2: Schneider Electric, Serbia</td>
</tr>
<tr>
<td>18.00</td>
<td>10354</td>
<td>Representing Topology Uncertainty For Distribution Grid Expansion Planning Domenico Tomaselli (1), Paul Stursberg (1), Michael Metzger (1), Florian Steinke (2) 1: Siemens AG, Germany; 2: TU Darmstadt, Germany</td>
</tr>
<tr>
<td>18.30</td>
<td>10360</td>
<td>Consistency Assessment Method of Urban Distribution Network Planning Geospatial Layout Based on Fractal Theory Jianmin Yin (1), Wangtao Ji (2), Chengmin Wang (1), Ning Xie (1), Zhipeng Chen (1) 1: Shanghai Jiaotong University, China; 2: Proinvent Technology, China</td>
</tr>
<tr>
<td>19.00</td>
<td>10575</td>
<td>Decision Support Tool For The Development Of Power Distribution Networks Based On AI Planning Sandra Castellanos (2,1), Marie–Cécile Alvarez–Herault (1), Philippe Lalanda (1) 1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, 38000 Grenoble, France; 2: Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG, 38000 Grenoble, France</td>
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<tr>
<td>19.30</td>
<td>10669</td>
<td>Integration of Environmental and Economical Impacts of Electricity Consumption in an Energy Community Based on Coalition Game. Adrien Bossu (1), Benoît Durillon (1), Arnaud Davigny (1), Hervé Barry (2), Sabine Kazmiersczak (2), Benoît Robyns (1), Fateh Belaid (3), Christophe Saudemont (1) 1: Univ. Lille, Arts et Metiers Institute of Technology, Centrale Lille, Junia,ULR 2697–L2EP, F–59000 Lille, France; 2: Lille Catholic Institute (ICL), FGES, Faculty of Business, Economics, and Sciences,59000 Lille, France; 3: Faculty of Management, Economics &amp; Sciences, Lille Catholic UniversityUMR 9221–LEM–Lille Economie® Management, F–59000, Lille, France</td>
</tr>
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WEDNESDAY 14 JUNE

POSTER SESSION 1

FORUM

LEVEL 1

NETWORK COMPONENTS

GUIDED TOURS 1 & 2

10:00 – 10.30 & 11.00 – 11.30

POSTER SESSION 1

FORUM

LEVEL 1

NETWORK COMPONENTS

10897 A9 Direct Current Circuit Breaker With Adjustable Current Injection

Wolfgang Grieshaber, Dan–Lucius Penache, Yang Yang, Florent Robert

SuperGrid Institute, Villeurbanne, France

11254 A10 Tubular DC Breaker

James Mannekutia (1), Johan Nohlert (1), Thomas Eriksson (1), Alessio Bergamini (2)

ABB AB, Corporate Research, Västerås, Sweden; 2: ABB S.p.A. SACE, Bergamo, Italy

11264 A11 Research Of Components For An Increase Of Transmission Capacity In Distribution Grids By Changing Existing AC Links Into DC Links

Robert Adam (1), Christian Hildmann (1), Matthias Hemen (1), Karsten Backhaus (1), Stephan Rupp (2)

Technische Universität Dresden IEEH, Germany; 2: Maschinenfabrik Reinhausen GmbH

10364 A12 A Novel Power Electronic Meshing Solution for Radial Medium Voltage Distribution Networks

Bharagav Swaninsathan, Benoît George, Aurel Garry

EDF R&D, France

11145 A13 Hybrid Power Solution Modelling Based on Artificial Intelligence

Antonin Colot (2), Bertrand Bastin (1), Bastien Ewbank (2), Fabrice Frebel (12), Benoît Bidane (1), Bertrand Cornélusse (2)

CE+T Power, Belgium; 2: ULiége – Belgium

12511 A14 Innovative Solutions for the Replacement of Underground Transformers

Alexandra Campbell, Ali Kazerooni, David Neilson, James Yu, Matthew Jones, Malcolm Bebbington

SP Energy Networks, United Kingdom

11317 A15 Lessons from the Installation and Commissioning of Novel Power Electronics for Active Response

Brendan Page (1), Andrew Burton (2)

Ricardo Energy and Environment, United Kingdom; 2: UK Power Networks, United Kingdom

11469 A16 Distributed Smart Soft Open Point

Wenlong Ming (1), Jinde Chen (1), Jiahong Wu (1), James Yu (2), Ali Kazerooni (2), Ranit Edgar (2), Alastair Ferguson (3)

SP Energy Networks, United Kingdom

11282 A17 A Smart Meter Based Charging System for Public EV Charge Points

Anish Babu, Ryan Sims

University of Strathclyde, United Kingdom

10322 A18 DC Electric Vehicle Charging Infrastructure – Methods for Periodic Verification

Daniel Herbst (1), Martin Furnschiß (1), Robert Schürhuber (1), Peter Reichel (2), Felix Lehfuß (3), Christian Auer (4), Ernst Schmautzer (5)

Graz University of Technology, Austria; 2: OEV Austrian Electrotechnical Association, Austria; 3: AIT Austrian Institute of Technology, Austria; 4: KS Engineers, Austria; 5: ESC Graz, Austria
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<th>Panel</th>
<th>Title</th>
<th>Speaker Information</th>
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<tr>
<td>M1</td>
<td>MADELAINE – A Multi-Adaptive and Cost-Efficient DC Charging System for EV Car Parks</td>
<td>Daniel Stahlheder (1), Stephan Ledinger (1), Florian Mader (2), Dominik Hartmann (2), Markus Litzbauer (3), Manuel Schmutz (3), Felix Lehfiuss (1)</td>
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<td></td>
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<td>1: AT Austrian Institute of Technology, Austria; 2: WEB Windenergie; 3: ENIO</td>
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<tr>
<td>M2</td>
<td>Validation Tests of Battery Based Mobile Generators for Islanding Operation During Works on the Distribution Grid Janalison Rodrigues Lima (1), Etienne Toutain (1), Ali El Akoum (1), Jeremy Leplux (2), Sebastien Cantet (2)</td>
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<td>1: EDF R&amp;D, France; 2: Enedis</td>
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<tr>
<td>M4</td>
<td>Battery Energy Storage System with Second Life EV Batteries</td>
<td>Camilla Ormae (1), Vitor Arioli (2), Aghatta Moreira (2), Victor Riboldi (1), Nathalia Freitas (1), Ricieri Ohashi (2)</td>
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<td>1: CPFL ENERGIA, Brazil; 2: CPQD, Brazil</td>
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<tr>
<td>M5</td>
<td>Recent superconducting cable installation in Chicago paves the way for a Resilient Electric Grid (REG) system Arnaud Allais (1), Nicolas Lalouette (1), Jean-Maxime Saugrain (1), Beate West (2), Erik Marzahn (2), Frank Frentzas (4), Mike Ross (3)</td>
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<td>1: Nexans, France; 2: Nexans, Germany; 3: American Superconductor, USA; 4: COMED, USA</td>
</tr>
<tr>
<td>M6</td>
<td>Superconducting Systems, a New Tool for Railway Power Grids</td>
<td>Jean-Maxime Saugrain (1), Arnaud Allais (1), Hervé Caron (2)</td>
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<td>1: NEXANS, France; 2: SNCF, France</td>
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<tr>
<td>M7</td>
<td>Improvement Of Thermal Performance Of Medium Voltage Circuit Breakers By The Implementation Of Heat Pipes Philipp Masmeyer, Michael Weuffel, Patrick Rumpe, Oliver Baier ABB AG Medium Voltage Products, Germany</td>
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<tr>
<td>M8</td>
<td>Improvement Of Lighting Resistance for Distribution Facilities Uki Kanenari, Junki Oiwa, Yuusuke Nishihiro, Tsuyoshi Inuma, Noriaki Kano, Yuki Kawachi, Keisuke Morita</td>
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<td>KANSAI Transmission and Distribution, Inc., Japan</td>
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<tr>
<td>M9</td>
<td>Modelling the Potential of Enhanced Capacity Transformers for Optimizing Material Efficiency and Asset Utilization</td>
<td>Roberto Fernandez (1), Fernando Nuno (2), Alberto Cracco (3)</td>
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<td>1: Cargill Bioindustrial, Spain; 2: European Copper Institute; 3: Westrafo</td>
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<tr>
<td>M10</td>
<td>Improving the Earth Electrode of Pole Mounted Transformers Malusi Mathonsi Eskom SOC, South Africa</td>
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<tr>
<td>M11</td>
<td>Evaluation Of Novel Corrosion Protected Aluminium Earth Wire For Use In Underground Cable Networks David Soderberg Erdal (1), Ingvar Hagman (2), Christian Andersson (2), Dietmar Gleich (2), Anders Persson (3)</td>
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<td>1: Vattenfall Eldistribution AB, Sweden; 2: NKT (Sweden) AB; 3: Dala Energi AB</td>
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<td>M12</td>
<td>Requirements For Large Scale Battery Storages In Low Voltage Grids – Lessons Learned From A Smart Grid Project Navreet Dutt, Benjamin Petters Avacon Netz GmbH, Germany</td>
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</tr>
<tr>
<td>M13</td>
<td>Battery Energy Storage System with Second Life EV Batteries Camilla Ormae (1), Vitor Arioli (2), Aghatta Moreira (2), Victor Riboldi (1), Nathalia Freitas (1), Ricieri Ohashi (2)</td>
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<tr>
<td>M14</td>
<td>Recent superconducting cable installation in Chicago paves the way for a Resilient Electric Grid (REG) system Arnaud Allais (1), Nicolas Lalouette (1), Jean-Maxime Saugrain (1), Beate West (2), Erik Marzahn (2), Frank Frentzas (4), Mike Ross (3)</td>
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<td>Modelling the Potential of Enhanced Capacity Transformers for Optimizing Material Efficiency and Asset Utilization Roberto Fernandez (1), Fernando Nuno (2), Alberto Cracco (3)</td>
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PROGRAMME UPDATED ON 26 APRIL 2023. TITLES AND SPEAKERS ARE SUBJECT TO CHANGE AT ANY TIME. CANCELLATION MAY OCCUR. DOWNLOAD THE APP TO SEE THE LAST UPDATES.

FORUM
LEVEL 1
11.00 – 12.30
09.00 – 10.30
FOR ASSET
AND SENSORS
DIAGNOSTICS
TOUR 2
C7 > D3
PANELS
C7 > D3
GUIDED TOURS 2
09.00 – 10.30 & 11.00 – 12.30

10206
C7 FORM: A Novel Principle for DLR
David Skrovanek (1), Christian Groesser (2), Georg Letsch (2), Uwe Ziebold (3)
1: University of Wisconsin-Madison, USA; 2: P!-COM Ingenieurbüro e.K., Germany; 3: 5G Hertz Transmission GmbH, Germany

10484
C8 Influence of Low Power Transformers (LPVT) on the Results of VLF Diagnostic Tests on Medium Voltage Cables Hamed Rezaei (1), Axel Winter (1), Manfred Bawart (2)
1: TE connectivity, Germany; 2: BAUR GmbH

10537
C9 Fault Location System for MV Distribution Underground Network
Francis Zavoda (1), Luc Provencher (1), Sébastien Leprohon (1), Frédéric Gervais (2), Dany Oielett (1)
1: CRHQ (Centre de recherche d’Hydro-Québec), Canada; 2: Hydro-Québec

10867
C10 Real Time Live Line High Voltage Measurement of Instrument Transformer’s Ratio and Phase Displacement Errors
Uroš Kovačević (1), Vladeta Milenkov (2), Senad Kartalović (3), Miodrag Stojanović (4), Dusan Vukotic (5)
1: Faculty of Mechanical Engineering, Innovation Center, University of Belgrade, Serbia; 2: Neticosolutions d.o.o; 3: Electrical Engineering Institute Nikola Tesla; 4: University of Niš, Faculty of Electronic Engineering; 5: DSO, Elektrodistribucija Srbije Ltd

11000
C11 Low-Voltage Network Point Measurement And Monitoring
Sudipta Sarawasti, Mukesh Hingar, Jayant Kamra
Secure Switzerland AG

11289
C12 Realising the Benefit of Short-Term Post-Fault Ratings using Smart OHL Sensors for Increased DER Integration
Samuel Jupe (1), Liza Troshka (2), Samuel Casallas (1), Sven Hoffmann (2)
1: Nortech Management Limited, United Kingdom; 2: National Grid Electricity Distribution, United Kingdom

11433
C13 Insight In The MV-grid With Low Effort Accurate RMU Retrofit Measurement To Accelerate Hosting Capacity And Energy Transition.
Wouter van den Akker (1), Denny Harmsen (1), Martin Binnendijk (2), Elise Morskiët (2), Gerard Schoonenberg (2), Peter Meijer (2)
1: Alliander; 2: Eaton

10120
C14 Failure Prediction for Circuit Breakers: Vibration and Trip Coil Current Feature Extraction for Machine Learning Applications
Jan Henning Jürgensen, Henrik Bohm, Camilla Hansson, Mikael Sollén, Anders Norström
Vattenfall Ejdistsland AB, Sweden

10231
C15 IoT Sensors To Increase Resilience Against Critical Weather Events
Andrea Ciolo (1), Giorgio Ghiillardi (2), Valerio Vallocchia (3)

10380
C16 TNB Network’s Asset Management Strategy Future Outlook through Advanced Asset Analytics
Muhammad Al Jundi Abdullah (1), Avinash Ashwin Raj Raja Gopal (2), Yogendra S. Balasubramaniam (2)
1: Tenaga Nasional Berhad, Malaysia; 2: TNB Research, Malaysia

10447
C17 Innovant Densimeter for GIS Tank, Insensitive to Temperature Variation
Philippe Brun (1), Diego Alberto (1), Raimund Summer (2)
1: Schneider Electric, France; 2: Schneider Electric, Germany

10687
C18 On-line Monitoring Condition of On-load Tap Changer of Power Transformers
Maurício Cueva (1), Davi Arpadottro (1), Mohammed Zouiti (2)
1: EDF, France; 2: ENEDIS, France

10937
C19 Asset Management Prepared Smart Secondary Substation
Ian Paul Gilbert, Juan Antonio Sanchez, Miren De La Cruz, Jon Aguirre, Iñaki Apellaniz
Ormaizabal, Spain

11366
C20 TNB Experience in The Use of Smart Meter For Real Time Monitoring on The Thermal Performance of In-Service Distribution Transformer
Young Zaidey Yang Ghazali (1), Mohd Azhar Abd Aziz (2)
1: Tenaga Nasional Berhad, Malaysia; 2: TNB Research Sdn. Bhd., Malaysia

11397
C21 Monitoring of Gas Evolution of Power Transformers Integrating Nanotechnology and Intelligent Techniques
Camila Albertin (1), Flavio Neto (2), Vagner Vasconcellos (3)
1: CPFL Paulista, Brazil; 2: CPFL Geração de Energia S.A; 3: CPFL Paulista, Brazil

2023
C22 Concept Of A Partial Discharge Analysis By Applying Specific Digital Twins
Erhard Aumann (1,2), Franck Voufo (3), Thomas Hammer (1,2), Svetlana Gossmann (1), Dirk Westermann (2)
1: Siemens AG, Germany; 2: Technische Universität Ilmenau; 3: Robert Bosch GmbH, Germany

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C23 New Approach for Online Detection of Partial Discharges in Cable Systems via VDS Ports
Manfred Bawart, Marco Engel
BAUR GmbH, Austria

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C24 Low Cost, High Performance Monitoring System for Underground Network
Hamed Rezaei (1), Axel Winter (1), Raimund Summer (2)
1: TE connectivity, Germany; 2: BAUR GmbH

10321
C25 Results of VLF Diagnostic Tests on Medium Voltage Cables
Uroš Kovačević (1), Vladeta Milenkov (2), Senad Kartalović (3), Miodrag Stojanović (4), Dusan Vukotic (5)
1: Faculty of Mechanical Engineering, Innovation Center, University of Belgrade, Serbia; 2: Neticosolutions d.o.o; 3: Electrical Engineering Institute Nikola Tesla; 4: University of Niš, Faculty of Electronic Engineering; 5: DSO, Elektrodistribucija Srbije Ltd

10547
C26 Concept Of A Partial Discharge Analysis By Applying Specific Digital Twins
Erhard Aumann (1,2), Franck Voufo (3), Thomas Hammer (1,2), Svetlana Gossmann (1), Dirk Westermann (2)
1: Siemens AG, Germany; 2: Technische Universität Ilmenau; 3: Robert Bosch GmbH, Germany

10687
C27 Monitoring of Gas Evolution of Power Transformers Integrating Nanotechnology and Intelligent Techniques
Camila Albertin (1), Flavio Neto (2), Vagner Vasconcellos (3)
1: CPFL Paulista, Brazil; 2: CPFL Geração de Energia S.A; 3: CPFL Paulista, Brazil

10937
C28 Concept Of A Partial Discharge Analysis By Applying Specific Digital Twins
Erhard Aumann (1,2), Franck Voufo (3), Thomas Hammer (1,2), Svetlana Gossmann (1), Dirk Westermann (2)
1: Siemens AG, Germany; 2: Technische Universität Ilmenau; 3: Robert Bosch GmbH, Germany

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1: Iberdrola Distribucion Electrica; 2: Ormanzabal; 3: Ihobe

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1: Hub ei Engineering Research Center for Safety Monitoring of New Energy and Power Grid Equipment, Hubei University of Technology, Wu han 430068, China; 2: School of Electrical Engineering and Automation, Wu han University, Wu han, China

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Corporate Research Center ABB Switzerland Ltd

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Kiryu Terada, Tadashi Koshizuka, Kunihiko Hidaka
Tokyo Denki University

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Jose Manuel Inchausti, Joseba Arostegui, Sergio Sebastian Ormanzabal, Spain

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Eivind Gramme
Lede, Norway

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1: Siemens AG, Germany; 2: Schneider Electric, France; 3: Nuventura, Germany; 4: Eaton, Netherlands

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1: Siemens AG, Germany; 2: TU Darmstadt, Germany; 3: Westnetz GmbH, Germany

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G&W electric, United States of America

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1: Enel, Italy; 2: Enel, Spain

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Giovanni Rizzello, Jean Pierre Goossens Alayon, Enrico Valigi, Francesco Amadei, Fabrizio Gasbarri
Enel, Italy

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1: Schneider Electric, Lette, France; 2: Schneider Electric, Grenoble, France; 3: Schneider Electric, Tokyo, Japan; 4: Schneider Electric, Paris, France

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1: Eskom Holdings SOC Ltd, South Africa; 2: University of the Witwatersrand

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1: Schneider Electric (MESA PLANT), Spain; 2: Iberdrola, Spain

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1: Kinetriecs UK Ltd, United Kingdom; 2: Energi Cable Engineering, United Kingdom; 3: NKT, Denmark; 4: MINS Elektro, Serbia; 5: Elektromreza Srbije, Serbia

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Pedro Sá Furtado, Jorge Mendes Santos, Hilário Lopes, Filipa Capela
E–REDES, Portugal

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Alessandro P Dadam (1), Geraldo R de Almeida (2), Walter Pinheiro (2), Simone C N Araújo (2)
1: Celesc Distribuição S.A., Brazil; 2: Tag Inovacao Tecnologica

D4 Statistically Validated Lifetime Assessment and Health Index Using Survival Analysis Stratifications
Mischa Vermeer, Gérard Cluteur, Bernd van Maanen
DNV, Netherlands, The

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1: ENEL, Italy; 2: e-distribuzione, Italy; 3: Streamer, Switzerland; 4: University of Naples, Italy

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Luigi D’Orazio (1), Gianluca Di Felice (1), Marco Bernardi (2), Stefano Malgarotti (2), Bruno Mario Ceresoli (2), Matteo Corti (2)
1: ENEL, Italy; 2: CESI, Italy

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Nathalie Barnel (1), Michel Cordonnier (2), Marie Laure Parussolo-Paupardin (3)
1: EDF, France; 2: ENEDIS, France; 3: EDF, France
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1: IAEW, RWTH Aachen, Germany; 2: Umlaut SE, Germany

E3 Zero–Sequence Blocking Transformers For Use In MV Distribution Systems – Design Comparison Of Single–Core Vs Multi–Core Designs
David Söderberg Erdal (1), Maarit Juhola (2).
1: Vattenfall Eldistribution AB, Sweden; 2: KKM Power OY, Finland

E4 Real And Virtual Testing Of The Future Electrical Power Systems
Iñaki Orue, Leire Redondo, Nabil Akroud, Ian Paul Gilbert Omañzabal, Spain

E5 Digital Twins Used For Condition Assessment Of Transformer Fleets – The Challenges of turning Data into Reality
Bastian Fischer, Dr Karsten Vierreck, Christian Hofmeister Maschinenfabrik Reinhausen GmbH, Germany

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Massimo Maffeis (1), Roberto Casavecchia (1), Andrea Casini (1), July Marcela Aparicio Cabrera (2), Mario Larcher (5), Antonio Nappi (1), Michele Fortas (1), Federico Pollacchini (1), Mario Fernandez (3), Giovanni Franzone (1), Francesco Amadei (1), Fernanda A. Paletta Piovezan (4), Ignacio Garcia Berenguer (4), Gianluca Toffoletto (4), Fabio Giammanco (1).
1: Enel Grids, Italy; 2: Enel Grids, Colombia; 3: Enel Grids, Spain; 4: Gridspertise; 5: Enel, Italy

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Thierry Cormanier (1), Francois Trichon (2), Dominique Serve (2), Mayank Sharma (2), Tom Berry (2).
1: Schneider Electric, Lattes, France; 2: Schneider Electric, Grenoble, France

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Andreas Hettich (1), Fabian Zehe (1), Gerald Jacob (2), Christian Ruester (2).
1: Netze BW GmbH, Germany; 2: A. Eberle GmbH & Co. KG, Germany

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Carsten Krüger, Jirapa Kamsamrong, Sebastian Leinhoff OFFIS e.V., Germany

E10 Cyber Security Of An Industrial IoT Gateway Device – A Threat Model View And Security Aspects
A Pavan Kumar Tatavarthi (1), Prof. Bijaya Ketan Panigrahi (2).
1: ABB, India; 2: IIT Delhi

E11 Standardization of Smart Distribution Substations in Cologne
Stephan van der Broeck, Sigrid Plötz, Mirko Wahl, Judith Schirrmann; Ulrich Groß, Rheinische NETGesellschaft mbH, Germany

Download the CIRED 2023 APP to see the last updates.
Available on the Apple Store and Google Play Store.
FORUM LEVEL 1
09.00 – 10.30
MANAGEMENT AND STRATEGIES
TOUR 1
F1 > F17
PANELS
FORUM LEVEL 1
Access with or without a guided tour for registered delegates only

FORUM LEVEL 1

WEDNESDAY 14 JUNE
OPERATION
LEVEL 1
POSTER SESSION 3

GUIDED TOURS 1 & 2
09.00 – 10.30

10109
F1 Hosting Capacity Improvement in Low Voltage Distribution Networks: A Risk-based Approach
Zlatko Popovic (1), Neven Kovacić (1), Marko Obranjac (1), Branislav Brbaklic (2)
1: University of Novi Sad, Serbia; 2: Schneider Electric, Serbia

10168
F2 Reallocation of Step Voltage Regulators in Distribution Networks to Overcome the Effects of Load Growth
Ali Radwan
Middle East Egypt Electricity Distribution Company, Egypt

10330
F3 V2X Integration in Self-Consumption Energy Management System
Samuel Matias (1), Joao Mateus (1), Manuel Pereira (2), Tarcisio Silva (3), António Furtado (3), Charalampous Ziras (4), Mattia Marinelli (4), Luiz Dias (1), Rafael Rodrigues (1), Hugo Morais (2)
1: EDP NEW R&D, Portugal; 2: INESC-ID/IST, Portugal; 3: EDA, Portugal; 4: DTU, Denmark

10358
F4 Integration Of Battery Aging Model in Ancillary Services And Self-consumption Combined Strategies.
Laurine Ferrando (1,2), Raphael Caire (1), David Frey (1), Jean-Marc Guenee (2)
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; 2: Wattmen, Saint-Priest-en-Jarez, France

10375
F5 The Next Generation of ADMS Functions for Predictive Management of DER
Paulo Viegas (1), José Simões (1), Pedro Silva (1), Dora Cabral (1), Miguel Gomes (1), Luis Gonçalves (2), Carlos Costa (2), Ricardo Bessa (3), Jorge Pereira (3,4), Pedro Benedicto (3), Micael Simões (3), Ricardo Andrade (3), João Viana (3), Maria Araújo (5), Manuel Azevedo (5)
1: EFACEC, Portugal; 2: ARMIS, Portugal; 3: INESC TEC, Portugal; 4: Faculty of Economics – University of Porto, Portugal; 5: PH Energia, Portugal

10420
F6 Joint Energy, Reserve, and Flexibility Scheduling of DERs in Power Distribution Networks
Niloofar Pourghaderi (1), Mahmoud Fotuhi-Firuzabad (1,2), Moein Meoenei-Aghtaie (1), Milad Kabirifar (1), Matti Lehtonen (2), Payman Dehghanian (3)
1: Sharif University of Technology, Iran, Islamic Republic of; 2: Aalto University, Finland; 3: George Washington University, USA

10427
F7 A Virtual Energy Storage System to Compensate for the Uncertainty in Distributed Renewable Generation
Safi Sam (1), Yue Zhou (1), Meysam Qadrdan (1), Evgeny Prokofyev (2), David Pampliega (2), Jianzhong Wu (1)
1: Cardiff University, United Kingdom; 2: Schneider Electric, Spain

10460
F8 A Novel Evaluation Method of Virtual Power Plant Effect on Distribution Networks Using Fuzzy Logic
Jihui Hwang, Jin-Oh Lee, Gyeong-Hun Kim, Jin-Hong Jeon
Korea Electrotechnology Research Institute, Korea, Republic of (South Korea)

10461
F9 Assessment of the impact of Hybrid Distributed Generation / Batteries Energy Storage Systems on DSO Operational Planning
Jamilson Junior (1), Ludovic Girault (2), Matthieu Alchourroun (2), Hugo Morais (1), Benoit Bouzigon (3)
1: INESC-ID/IST, Portugal; 2: EDF R&D; 3: ENEDIS

10489
F10 Scalable Uncertainty Aware Ancillary Services Procurement Tool For Active Distribution Systems
Muhammad Usman (1), Baara Mohandes (1), Florin Capitanescu (1), André Guimaraes Madureira (1), Martin Bořek (2), Zdravko Matićić (2), Filipe Joel Soares (3), Nuno Fonseca (3), Henrique Teixeira (3), Carlos Mateo (4)
1: Luxembourg Institute of Science and Technology, Luxembourg; 2: Hrvatska Elektroprivreda Operator Distribucijskog Sustava, Croatia; 3: Institute for Systems and Computer Engineering, Technology and Science, Portugal; 4: Institute for Research in Technology, Comillas Pontifical University, Spain

10598
F12 Investigation of Grid-Serving Flexibility Provision by Electric Vehicles in a Distribution Grid
Kevin Kratz (1), Sharon Müller (1), Krzysztof Rudion (1), Christian Körner (2)
1: University of Stuttgart, Germany; 2: Stuttgart Netze GmbH, Germany

10731
F13 Model Predictive Control for Smart Grid Charging of Autonomous Electric Vehicle Fleet using Local Renewable Energy Generation
Haider Ali (1), Bruno Francois (1,2), Zahra Foroozandeh (3), João Soares (3)
1: L2EP - Ecole Centrale de Lille, France; 2: INRIA Lille, INOCS; 3: EDA, Portugal; 4: DTU, Denmark

10771
F14 Optimal Management of Flexibility Services at LV Distribution Grid Level
Riccardo Nebuloni (1), Valentin Ilea (1), Cristian Bovo (4), Haider Ali (1), Bruno Francois (1), Luce Breton (2), Nuran Cihangir Martin, Floris van Lith, Niels Poiesz, Paul Capitanescu (3), Franco Conti (3), Andre Guimaraes Madureira (1), Martin Bořek (2), Zdravko Matićić (2), Filipe Joel Soares (3), Miguel Gomes (3), Jorge Pereira (3,4), Pedro Benedicto (3)

10818
F15 Flexibility Coordination Mechanism Between A Distribution System Operator And A Virtual Power Plant Involving Wind Parks And A Battery Energy Storage System
Niran Cihangir Martin, Floris van Lith, Niels Poiesz, Paul Capitanescu (3), Franco Conti (3), Andre Guimaraes Madureira (1), Martin Bořek (2), Zdravko Matićić (2), Filipe Joel Soares (3), Miguel Gomes (3), Jorge Pereira (3,4), Pedro Benedicto (3)
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France; 2: Wattmen, Saint-Priest-en-Jarez, France

10878
F16 Using Light Electric Vehicles For V2G services in the Arctic
Shayan Dadman (1), Bernt Bremdal (1,2)
1: UiT Campus Narvik; 2: Smart Innovation Norway
## POSTER SESSION 3

### OPERATIONS

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<td>Christoph Jatz (1), Benjamin Petters (1), Navreet Duit (1), Amir Ahmadifar (2), Antonello Monti (2)</td>
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<td>11089</td>
<td>H8: Dynamic Operation of MV Grids Based on Losses Optimization</td>
<td>João Nunes Carreira, João Pedro Baptista, Diogo Carrilho, Alexandra Monteiro, Ines Roca</td>
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<td>Arnaud Rosseel, Bashir Bakshideh Zad, Zacharie De Grève, François Vallée</td>
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<td>Amel Addala (1), Benoît Bouzigon (2), Andréa Laugère (1), Rishd Zorgati (1)</td>
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<td>1: E5, Technical University of Darmstadt, Germany; 2: elonia, Technical University of Braunschweig, Germany</td>
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<td>Kazem Ghaffari vostakolaie, Reza Ghaffari</td>
<td>Mazandaran electric power distribution company, Iran, Islamic Republic of</td>
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<td>Tania Vázquez</td>
<td>E-REDES (EDP networks Spain), Spain</td>
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<td>Martin Ruhfüt, Robert Schmaranz, Thomas Dietrichsteiner KNG—Kärnten Netz GmbH, Austria</td>
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<td>H25: Evaluation of Quota-based Predictive Congestion Management in Active Distribution Networks</td>
<td>Sharon Müller (1), Krzysztof Rudion (1), Marc–Aurel Frankenbach (2), Carmen Exner (2)</td>
<td>1: University of Stuttgart, Stuttgart, Germany; 2: Netze BW GmbH, Stuttgart, Germany</td>
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<td>H26: Evaluation of Transit Power Flows in High Voltage Distribution Grids using Fuzzy Logic</td>
<td>Paul Burkhardt (1), Krzysztof Rudion (1), Andreas Frank (2), Alexander Probat (2)</td>
<td>1: University of Stuttgart, Germany; 2: Netze BW GmbH, Stuttgart, Germany</td>
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**Tour:** 2 OPERATION CENTER 09:00 – 10:30

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1. Institute of Informatics, HES-SO Valais Wallis, Switzerland;  
2. Institute of Sustainable Energy, HES-SO Valais Wallis, Switzerland |
| 11170 | II An Automation Approach Towards The Preparation Of Switching Orders Involved In The Planned Outages of Network Elements | Jérôme Bausier (1), Pierre Stoupuy (2), Rafael Michielis (3)  
1. N-SIDE, Belgium;  
2. ELIA, Belgium;  
3. N-SIDE, Belgium |
| 11339 | I2 Rethink Grid Management – Challenges, Use Cases And Design Principles For The Next Generation Of Grid Operation Systems | Ben Gemisjaeger (1), Robert Wenz (1), Dr. Michael Ebert (1), Sigurd Kvistad (2), Jens Tore Holene (2), Jürgen Sivertsen Årud (2), Sergio Manno (3), Emmanuele Maria Petruzzello (3), Nikolai Demydov (1)  
1. Siemens AG, Germany;  
2. Elvia AS, Norway;  
3. IRETI S.p.A, Italy |

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Imperial College London, United Kingdom |
| 1109 | F19 Optimal Cross-Voltage Operation of Active Distribution Networks Considering Flexibility and Production Schedule of an Industrial Customer with Various Business Models | Nasratullah Mohseni, Sergio Contreras, Johanna Myrzik  
University of Bremen, Germany |
| 11148 | F20 Demonstration for New Type SVR Using Commercial Distribution System with DERs | Naoyuki Takahashi, Yuya Tachibana, Satoshi Uemura  
Central Research Institute of Electric Power Industry, Japan |
| 11177 | F21 Optimal Scheduling of EVs Route Considering Integrated Power and Transportation System | Myeongseok Chae (1), Hee June Cha (2), Dongjun Won (1), Taesik Kim (3)  
1. Inha University, Korea, Republic of (South Korea);  
2. Incheon International Airport Corporation; 3. Department of Electrical Engineering and Computer Science Texas A&M University–Kingsville, Kingsville, TX 78363, USA |
| 11179 | F22 Performance Evaluation and Operational Logistics in Energy Distribution Utility Fleet Electrification | Lucca Zamboni (1), Bruno Martin de Alcântara Dias (2), Cynthia Thamires da Silva (2), José Sidnei Colombo Martini (1), Andre Polatschek Rodrigues (3), Nathalia Rubo Nobre de Freitas (3)  
1. GESEL – Grupo de Estudos do Setor Elétrico – Brazil;  
2. USP – Universidade São Paulo – Brazil;  
3. CPFL Energia |
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<td>Transactive-based Control of Electric Vehicle Charging Stations Considering Network Congestion</td>
<td>Sajjad Fattaheian Dehkordi (1,2), Raffael La Fauci (1), Rafaela Tsaousi (2), Raphael Wu (2), Christophe Fritsch (2), Vanessa Schröder (1), Evangelos Vrettos (2)</td>
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<td>Islanding Detection with Universal Grid-forming Inverter-based Generation</td>
<td>Hannu Laaksonen (1), Rolf Witzmann (1), Tobias Lechner (2), Sebastian Seifried (2), Dirk Menker (3), Dario Brankovic (1), Robert Schürhuber (1), Andreas Abart (1)</td>
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<td>Placement of Virtual Inertia in Islanded Distribution Networks With High Penetration of Inverter-based Resources</td>
<td>Fadi Kelada (1), Jérôme Buire (1), Nouredine Hadjiaïd (1,2), Univ. Grenoble Alpes, CNRS, Grenoble INP, C2ELab, 38000 Grenoble, France; 2: Nanyang Technological University, Singapore 639798, Singapore</td>
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<td>Johanna Timmermann (1), Claudia Bernecker-Castro (1), Tobias Lechner (2), Sebastian Seifried (2), Dirk Menker (3), Christian Dellmann (4), Günther Störzer (5), Michael Finkel (2), Rolf Witzmann (1)</td>
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<td>On Dynamic Behaviour of Active Distribution Grids During Flexibility Provision</td>
<td>Florian Klein-Helmkamp, Philipp Linnartz, Kardeniz Elbil, Andreas Ullbig, IAEW at RWTH Aachen University, Germany</td>
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<td>Vanessa Schröder (1), Evangelos Vrettos (2), Martina Bossio (3), Michael Auer (1), Raphael Wu (2), Christophe Fritsch (2), Rafaela Tsaousi (2), Raffael La Fauci (1)</td>
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<td>Madalena Lacerda (1), Gonçalo Gloria (2), Mateo Cardenas (2), Rui Pestana (3), Aleksandr Egorov (2), Carlos Damas Silva (1), Alexandre Lucas (4), Miguel Louro (1)</td>
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<td>Robust Determination of Reactive Power Potentials from Subordinate Networks in Close-to-Real-Time Operation</td>
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<td>Management of the Distribution System Operation During the Crisis – Earthquakes in Republic of Croatia in 2020</td>
<td>Marina Cavlovic (1,2), Damir Piric (2), Ivan Perisa (2), 1: SAG 3, Croatia, 2: HEP ODS Ltd, Croatia</td>
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<td>I13</td>
<td>Suppling Of Portion Of MV Network During Blackout Periods Involving Generators Of Grid Users</td>
<td>Luigi D’Orazio (1), Fabio Zanellini (2), Ettore De Bernardis (3), Niccolò Corsi (4), 1: ENEL, Italy; 2: Renantis, Italy; 3: CESI, Italy; 4: e-distribuzione, Italy</td>
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<td>I14</td>
<td>Fitness–check for Power Plants in Distribution Networks for Black Start and Regional Islands</td>
<td>Luca Brankovic (1,2), Norbert Rechberger (3), 1: Graz University of Technology, Austria; 2: Netz Oberösterreich, 3: Energie AG Erzeugung GmbH</td>
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<td>Calculating Probability of Critical System States by Using Bayesian Distribution System State Estimation</td>
<td>Eva Buchta (1,2), Mathias Duckheim (1), Michael Metzger (1), Paul Stursberg (1), Stefan Niessen (1,2), 1: Siemens AG, Germany; 2: TU Darmstadt, Germany</td>
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<td>Simulating the Voltage Stability in a Power System Network using OpenModelica and Comparing the Results with PowerFactory</td>
<td>Nimir Regmi (1), Dietmar Winkler (2), Shailendra Kumar Jha (1), 1: Kathmandu University; 2: University of South-Eastern Norway</td>
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# Programme

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**FORUM**

11093  
I7 High-level Resilience Strategizing Using Data-Driven Inputs  
Xavier Weis(1), Lars Nordström (1), Arne Berlin (2)  
1: KTH Royal Institute of Technology, Sweden; 2: Vattenfall Eletion AB

11408  
I8 Black Start In Distribution Grids Through Solid-State Transformer  
Mario Couto, Alessio Coccia  
Electric Power Research Institute, Ireland

10145  
I9 Impact of Cyberattacks Targetting Distributed Photovoltaic Inverters  
Martina Gomis Domènech, Yassine Naimi, Xavier Le Pivert  
Univ. Grenoble Alpes, CEA, Liten, Campus INES, Le Bourget du Lac – France

10534  
I20 Towards a Control System Simulator Based on a Digital Twin for Cyber-Physical Power Systems  
Dennis van der Velde (1), Armin Fatemi (2), Immanuel Hacker (1), Raphael Bäumer (3), Michael Andreas (1), Andreas Ulbig (2)  
1: Fraunhofer FIT, Germany; 2: IAEW at RWTH Aachen, Germany; 3: RWTH Aachen, Germany

10415  
I21 Analysis and Insights from Reactive Power Measurements of Low Voltage Users  
Marta Vanin (12), Hakan Ergun (12), Reinhold D’Hulst (2,3), Koen Vanthournout (2,3), Dirk Van Heremert (12)  

10667  
I22 Field Validation of Distribution System State Estimation Based on a Limited Number of Measurement Devices  
Riccardo Vaspapollo (1), Lorenzo Zanni (1), Paolo Romano (1), Daniel Gross (2), Elaheh Mashayekhi (2)  
1: Zaphiro Technologies, Switzerland; 2: Netze BW GmbH

11455  
I8 A Methodology for the Evaluation of Congestion Induced Costs in Distribution Grid Operation  
Damianos Chelias, Henrik W. Bindner, Tilman Weckesser  
Technical University of Denmark

## GUIDED TOURS

**GUIDED TOURS 5 & 6**

14.30 – 16.00

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Elisabeth Feldhoff, Tom Dorphorn, Steffen Schlegel, Dirk Westermann  
Immanuel University of Technology, Germany |

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| G7 Determination of Q(P)- And Q(U)-Characteristics By Means Of Time-Series Based Optimal Power Flow Calculations To Optimize Distribution Grid Operation  
Manuel Schwenke, Jutta Hanson, Rafael Stopp, Anna Pfendler  
Technical University Darmstadt, Germany |

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| G9 An Automated System for Overhead Line Inspection with Traveling Wave Measurement and Unmanned Aerial Vehicles  
Frederik Puhe (1), Maximilian Schmalen (1), Björn Keune (1), Carsten Herrmanns (1), Mitja Wittersheim (2), Johannes Bleser (3)  
1: Westnetz GmbH, Germany; 2: Beagle Systems GmbH, Germany; 3: Siemens AG, Germany |

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Daniel Mitcan, Bertrand Godard, Rena Kwahata  
Ampacimion SA, Belgium |

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Sophie Crommelinck, Katharina Gill, Jürgen Scholz, Mario Gnädig, Bartholomäus Surmann  
Netze BW GmbH, Germany |

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Maschinenfabrik Reinhausen GmbH, Germany |

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Ralf Gitzel (1), Vadim Migunov (1), Tanja Torneke (2)  
1:ABB, Germany; 2: Karlsruher Institut für Technologie (KIT), Germany; 3: SUEC Coburg, Germany |

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1: Centrais Eléctricas de Santa Catarina, Brazil; 2: Federal University of Santa Catarina, Brazil |

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| G13 Thermal Monitoring of Medium Voltage Switchgear: Testing in Operation Environment  
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1: ABB, Germany; 2: Karlsruher Institut für Technologie (KIT), Germany; 3: SUEC Coburg, Germany |

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1: Centrais Eléctricas de Santa Catarina, Brazil; 2: Federal University of Santa Catarina, Brazil |

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| G17 Single Point Lidar Technology For Ground Clearance Measurement In Medium Voltage Overhead Lines With The Deployment Of Unmanned Aerial System (UAS) In TNB Distribution Network Division  
Muhammad Fazli Nozlan, Mohd Faris Ariffin  
Tenaga Nasional Berhad (TNB), Malaysia |
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<td>Karlsruhe Institute of Technology (KIT), Germany</td>
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<td>G23 Optimized Deployment of Online Partial Discharge Monitoring Solutions for Branched MV Networks</td>
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<td>10772</td>
<td>I24 How Disruptive Artificial Intelligence Solutions Can Enhance Safety Of Field Operations In The Electrical Sector</td>
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<td>I30 Benefits for the Distribution Network from the Installation of Synchronized Edge Devices</td>
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<td>10372</td>
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<td>I32 Decentralized Smart Charging of Large-scale EVs using Adaptive Multi–Agent Multi–Armed Bandits</td>
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<td>10490</td>
<td>I33 Energy Charging of a fleet of electric vehicles based on Reinforcement Learning</td>
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<td>I34 An Experience Of Detection And Classification Of Quality–Of–Service Problems In MV/LV Distribution Substations Using Artificial Intelligence: Senegale Case Study</td>
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<td>10676</td>
<td>I35 Digital Twin Based on CIM CGMES for Smart Grid and Data Based Use Cases</td>
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LEVEL 1
16.30 – 18.00
MANAGEMENT AND STRATEGIES
TOUR 7
G24 > H17
PANELS
10754
I36 Detecting Power Outages In Low-Voltage Networks From Telecommunications Networks Data
Marleen Bahe (1), Matthias Herlich (1), Peter Dorfger (1), Josef Leist (2), Christian Wohlsein (2), Markus Radasuer (3), Gerald Hörack (3), Walter Schaffer (3)
1: Salzburg Research Forschungsgesellschaft mbH, Austria; 2: Sabsburg AG, Austria; 3: Salzburg Netz GmbH, Austria

J1 Distribution Network Reconfiguration Strategy with Soft-Open Point using GA and PSO
Hyun-Woo Kim, Seon-Ju Ahn, Sang-Yun Yun, Joon-Ho Choi
Chonnam National University, Korea, Republic of (South Korea)

J2 Near-Real-Time Topology Estimation in LV Network with PLC Smart Meters
Lucia Suarez-Ramon (2), Pablo Arboleya (1), Jose Manuel Carou Alvarez (2)
1: University of Oviedo, Spain; 2: EDP Redes España

J3 Application of Graph Theory in Urban Infrastructure Analysis
Matej Vrtal, Vit Kral, Petr Toman
Brno University of Technology, Czech Republic

GUIDED TOURS 7 & 8
16.30 – 18.00
FORUM
LEVEL 1
10148
G24 On-line Medium Voltage Panel & Transformer Maintenance
Anggoro Primadianto, Cyrillus Ekana, Yosephus Devalsey, Wahyu Prabowo
PLN Indonesia

10884
G25 The New Condition-Based Maintenance of MV Cable Lines Supported by Diagnostic Data
Slawomir Noske (1), Sebastian Grzelka (1), Krzysztof Kołodziejczyk, (2)
1: ENERGA-OPERATOR SA, Poland; 2: Globema Sp. z o.o.

10983
G26 Data Analytics For Pruning Optimization Around Power Lines
Charles Demay, Pierre Achaicha, Philippe Tuloup
ENEDIS, France

11060
H1 The Implementation of Linear Asset Management As A Framework Solution In Distribution Electricity Network in Indonesia
Very Fernando (1), Kharisma Utomo Muyyodinoto (1), Indratno Pardisaynah (1), Revi Aldrian (1), Yopi Ardian Noval (1), Nanda Tommy, Wirawan (2)
1: PT PLN (Persero), Indonesia; 2: University Of Putra Indonesia, Indonesia

11253
H2 Mapping Maintenance Road on Iran Power Distribution Network
Tara Khayyamim, Sara Khayyamim, Bit A Noupavar, Armansafai, Mojtaba Gilvanejad
Niroo Research Institute, Islamic Republic of Iran

POSTER SESSION 3
OPERATION
LEVEL 1
FORUM
10366
H6 Phase Identification of Single-phase Users in a Distribution Network
Sreten Davidov, Jurij Cuyk
Elektro Ljubljana d.d., Slovenia

10458
H7 LV Grid state estimation using local flexible assets: A Federated Learning approach
Selma Caustevic, Shreshtha Sharma, Syrine Ben Aziza, Aliene van der Veen, Elena Lazovik
Netherlands Organisation for Applied Scientific Research (TNO), Netherlands, The Netherlands

10741
H8 Validating Real LV Feeder Models Using Smart Meter Data: A Practical Experience From Project EDGE
Michael Z. Liu (1), Angela Simonovska (1), Luis F. Ochoa (1), Michael K.C. Wong (2), Kenneth Cheu (2), John Theunissen (2)
1: The University of Melbourne, Australia; 2: AusNet Services, Australia

10968
H9 Techno-economic Comparison Of Reactive Power Control Modes For Distributed Generators For Voltage Regulation In LV Grids
Cyril Gisbert (1), Josselin Fournel (2), Géraud Rias (2), Mathieu Gondolé (2)
1: EDF R&D, France; 2: Enedis, France

11035
H10 Distribution Smart Transformer Pilot Experience for LV Grid Real Time Operation
Luis Del Rio Etayo (1), Patrick Mulroy (1), Iker Garcia Ribote (1), Luis Del Rio Etayo (2), Luis F. Ochoa (2)
1: Ormazabal; 2: i-DE

11049
H11 DeepGrid: Bringing the Operational Awareness to the LV Grid
Rui Couto (1), Joana Faria (1), José Oliveira (1), Gil Sampaio (2), Ricardo Bessa (2), Francisco Rodrigues (3), Ricardo Santos (3)
1: ENEIDA.IO, Portugal; 2: INESC TEC, Portugal; 3: E-Redes, Portugal
WEDNESDAY 14 JUNE

LEVEL 1 FORUM

POSTER SESSION 3 OPERATION

PANELS G24 > H17

TOUR 7 STRATEGIES AND MANAGEMENT 16.30 – 18.00

LEVEL 1 FORUM

11127 H12 Performance Analysis of a State Estimator for Low Voltage Unbalanced Grids Using Different Advance Metering Infrastructure Technologies
Mahmoud Rashad Ahmed (1), José Manuel Cano (1), Bassam Mohamed (2), Pablo Arboleya (1)
1: University of Oviedo, Spain; 2: PLEXGRID, Spain

11184 H13 E-REDES Adopt New Monometallic Technology and Predictive Algorithm to Minimize and Predict LV Neutral Loss Failures Detection
Carolina Marques, Cláudia Gaspar, Carlos Vieira Santos, Jorge Mendes Santos, Susana Margarido Morgado, João Nunes Carreira, Ricardo Principe Santos, Alcides Gomes, Jorge Alves Dias, Frederico Lourenço, Jard Azar, Patricia Duarte, Luís Fonseca, Miguel Veríssimo, Miguel Louro
E-REDES, Portugal

11261 H14 Use of Voltage Regulation on HV/MV Substations to Increase Hosting Capacity in the LV Grid
Johannes Jargstorf, Ward Boeraeve, Piet Lauwers
Fluvius System Operator CV, Belgium

11268 H15 Simulating Integration Of New Flexibilities And DER In A Low–Voltage Grid
Arthur Forestier (1), Chloé Lucas (1), Philippe Deschamps (1), Christophe Dufour (2)
1: Oddt-e, France; 2: SICAE de la Somme et du Cambrai, France

11336 H16 Demand Response Using Remote Modification Of Smart-Meters’ Subscribed Power To Protect Low-Voltage Feeders In Ouagadougou, Burkina Faso
Bennoí Grosjean (1), Antoine Lassauce (1), Christophe Dufour (2)
1: Odit-e, France; 2: SONABEL, Burkina Faso

11398 H17 Linear State Estimation in Distribution System Using Smart Meter Data
Izar Lopez-Ramírez (1), Lakshan P. Piyasinghe (3), Inmaculada Zamora (2), J. Emilio Rodríguez-Seco (1)
1: Tecnalia, Basque Research and Technology Alliance (BRTA), Spain; 2: Department of Electrical Engineering, University of the Basque Country (UPV/EHU), Spain; 3: Hubbell, Inc., USA

10343 J4 An Innovative Toolbox for the Optimal Design and Operation of Integrated Local Energy Communities
Marialaura Di Somma (1), Christina Papadimitriou (2), Andréi Morch (3), Hanne Sæle (3), Peter Richardson (4), Alessio Coccia (4), Amedeo Buonanno (1)
1: ENEA; 2: Eindhoven University of Technology; 3: SINTEF Energy Research; 4: EPRI Europe

10515 J5 Implications of Forecast Uncertainty on the Optimal Operation of Renewable Energy Communities
Robin Sudhoff (1,2), Sebastian Schreck (1,2), Sebastian Thiem (1), Stefan Niessen (1,2)
1: Siemens AG, Technology, Germany; 2: TU Darmstadt, Technology and Economics of Multimodal Energy Systems, Germany

10883 J6 Coupling Optimal Energy Management and Allocation through Keys of Repartition in Energy Communities
Alyssa Diva Mustika (1,2), Rémy Rigo–Mariani (1), Vincent Debusschere (1), Amaury Pachurka (2)
1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, France; 2: Sween, France

10895 J7 EV Charging Microgrid: Electrical and Operation Modeling of Energy Management
UFSM, Brazil

TOUR 8 NEW USE CASES & SPECIAL APPLICATIONS 16.30 – 18.00

LEVEL 1 FORUM

10900 J8 The Lac-Mégantic Microgrid: A Shared Vision of Energy Transition and the new role for Microgrid Control
Kevin Morrissey (1), Mark Jaggassar (1), David-Olivier Goulet (2), Robert MacDonald (1), Mark Collins (1)
1: Smarter Grid Solutions; 2: Hydro-Québec

10901 J9 Stochastic Reliability-Constrained Scheduling of Multi-Resource Microgrids
Mahsa Omri (1), Mohammad Jooshaki (2), Mahmud Fotuhi-Firuzabad (1,3), Matti Lehtonen (3)
1: Sharif University of Technology, Iran; 2: Geologian Firuzabad (1,3), Matti Lehtonen (3)
2: Sween, France

11017 J10 Demonstrating Interactions of Distribution Network and Local Energy Communities Operating in Hierarchically Autonomous Control Architecture Paradigm
Nelson Knak Neto
UFSM, Brazil

11147 J11 Impact of Charging Stations on Voltage Quality - Island and Grid Operation of Real Installation
Petr Mastny, Jan Moravec, Martin Vojtek, Michal Vrana, Matej Vrati
Brno University of Technology, Czech Republic

11359 J12 Frequency Response Of A Microgrid Under The Influence Of Enhanced Spatial And Orientational Smoothing Of Photovoltaic Output
Nida Riaz, Lasse Peitonen, Antti Hildén, Sami Repo, Pertti Jarventausta
Tampere University, Finland

Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.
SESSION 4 deals with design and implementation of systems for protection, control and automation in distribution networks. The consideration of historical grown concepts as well as the latest developments in the world of protection, control, communication, and automation are topics in this session. Emphasis is also placed on practical application and experience in operating the systems. But the latest developments, scientific findings and considerations as well as algorithms and simulations are also of great importance.

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<td>Electrifying East Nusa Tenggara with Smart Microgrid – Study Case on Semau Subsystem</td>
<td>Daniel Tamphubolon, Halomoan Siahaan, Albertus Hendriyanto</td>
<td>PT PLN INDONESIA, Indonesia</td>
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<td>J15</td>
<td>Coordination Operation of Electricity and Natural Gas Network Considering Power-to-Gas based on the Symmetrical Semidefinite Programming</td>
<td>Liang Min, Jin Yang, Chengwei Lou, James Yu, Zhbin Yu</td>
<td>University of Glasgow, United Kingdom, 2: SP Energy Network</td>
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<td>J16</td>
<td>DR Business Model Suggestion Applying IoT Solutions with Mesh Network Technology Based on IEEE 802.15.4</td>
<td>Si hyeong Jang, Jun ho Lee, Jung won Kim, Jae myeon Hong</td>
<td>KEPCO ES, Korea, Republic of (South Korea), KEPCO ES, Korea, Republic of (South Korea), Merlot Laboratories Inc., Korea, Republic of (South Korea)</td>
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<td>by Themistoklis Yygkis, Crestis Darmis, Georgios Karvelis, Aris Dimeas, George Korres, Nikos Hatsiargyiou</td>
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<td>A Cyber-Physical Digital Twin Approach to Replicating Realistic Multi-Stage Cyberattacks on Smart Grids</td>
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<td>by Omer Sen (1), Nathalie Bleser (2), Martin Henze (3), Andreas Ulbig (2)</td>
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<td>Characterisation of Sequence Components of Islanded Microgrid with Low Fault Current</td>
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<td>by Nadia Afin, Mark Hibbert, Aidan McDonnell eleXXys energy, Australia</td>
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<td>Centre of Angles based Remedial Action Scheme using Synchrophasor Measurements in SP Transmission Network</td>
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<td>1: Brno University of Technology, Czech Republic; 2: ELVAC a.s.; 3: EQLD, a.s.</td>
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<td>Open Phase Fault Analysis in MV Distribution Grids with Resonant Grounding</td>
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Main Session 5: Planning of Power Distribution Systems

Level 0: Plenary Room 4

**Block 1**: 09.00 – 10.30

**10474** The Reliability Of The Electrical Distribution System Using The Markov Modeling Methodology
Enrico Carletti, Luciano Coccia, Francesco Amadè, Giovanni Franzone, Jessica Rizzati, Massimo Bolognesi, Pierpaolo Moschella
Enel Italy

**11076** Machine Learning-based Identification and Mitigation of Vulnerabilities in Distribution Systems against Natural Hazards
Balaji V Venkatasubramanian (1), Mohamed Lotfi (1), Pierluigi Mancarella (2), André Aguas (3), Mohammad Javadi (4), Leonel Carvalho (4), Clara Gouveia (4), Mathais Panteli (1)
1: University of Cyprus, Cyprus; 2: University of Manchester, UK; 3: E-REDES, Portugal; 4: NESC TEC, Portugal

**10739** Quantifying Resiliency Benefits of Networked Microgrids using PowerModelsONM.jl
David Fobes (1), Russell Bent (1), Rishab Jain (2), Francisco Flores–Espino (2), Annabelle Pratt (2), Ryan Mahoney (3), George Walker (3), David Pinney (3), Trupal Patel (4), Matt Reno (4)
1: Los Alamos National Lab, United States of America; 2: National Renewable Energy Lab, United States of America; 3: National Rural Electric Cooperative Association, United States of America; 4: Sandia National Lab, United States of America

**10255** Investment Efficiency Assessment On The Electric Grid by Group Of Control
Guillaume Kevin, Lacombe Bertrand, Sevault Pierre, Lacroix Bastien, Dirion Jean-Louis, Faivre Odillon
Enedis, France

**10383** Climate Adaptation Plan for Distribution Networks
Anna Lisa Frau, Gabriele Licasale, Alessio Pastore, Alessandro Rodella, Valerio Vallocchia
Enel Grids, Italy

**Block 2**: 11.00 – 12.30

**Network Development**
Level 0: Plenary Room 4

**10512** Domestic Demand Shift Trial for Local Network Management
David Flores-Espino (2), Annabelle Pratt (2), Ryan Mahoney (3), George Walker (3), David Pinney (3), Matt Reno (4), Matt Reno (4)
1: EPRI Europe, Ireland; 2: University College Dublin, Ireland; 3: ENA, Canada

**10714** How Can Flexibility Support Power Grid Resilience Through The Next Level Of Flexibility And Alternative Grid Developments
Santiago Gallego Amores (1,2), Emil Hillberg (3), Antonio Iliceto (2), Ewa Matczynska (4), Albana Ilo (5), Panagiotis Goutis (6), Niko Juszkiewicz (6)
1: i-DE, Redes Eléctricas Inteligentes (Iberdrola), Spain; 2: ENA, Canada; 3: ENA, Canada; 4: EPR; 5: ENA, Canada; 6: ENA, Canada

**11273** 2030 Snapshot of Public Smart EV Charging Stations
Kailash Singh (1), Russell Byans (1), Malcolm Beebington (1), Guy Shapland (1), Gerard Boyd (1), Wendy Mantle (1), Kieron Stopforth (2), Simona Burchill (2)
1: SP Energy Networks, United Kingdom; 2: Smarter Grid Solutions, United Kingdom

**11043** A 2030 Vision for Power Grid Resilience
Guy Shapland (1), Gerard Boyd (1), Wendy Mantle (1), Kieron Stopforth (2), Simona Burchill (2)
1: SP Energy Networks, United Kingdom; 2: Smarter Grid Solutions, United Kingdom

**Block 3**: 14.30 – 16.00

**BYAA**: 11:00 – 12.30

**10636** Network Reconfiguration Under a Stochastic Optimisation Framework for Day-Ahead Operation Planning for Future Distribution Networks
Gregorio Higuera, Behzad Kazemtabrizi
Durham University, United Kingdom

**11425** Distribution Planning Model Requirements for Smart Community Integration
Mark McGowan (1), Treasa Ravi Sahaya (2), Jouni Peppanen (3)
1: EPRI Europe, Ireland; 2: University College Dublin, Ireland; 3: EPRI, USA
Flexibility as a Cost-effective Solution Applied to MV Lines Investment Deferral: Guidelines to Study and Pinpoint Opportunities
Julien Luquet, Jerome Moiziat
Enedis, France

14.30 – 16.00
BLOCK 4
16.30 – 18.00

Efficiency of Demand Side Management Programs in Modern Distribution Planning – Challenges and Opportunities
Davis Montenegro, Alison O’Connell, Jason Taylor
EPRI, United States of America

Efficient Integration of Electric Vehicles Through Optimal Charging and Reactive Power Support
Damir Jakus, Josip Vasilj, Bosko Poljak, Daniel Jolevski
University of Split – FESB, Croatia

The Impact of Forecasting Accuracy On The Economic Performance of Flexibility Provision
Gary Howarth (1), Ivana Kockar (1), Paul Tuohy (1), Graeme Flett (2), John Bingham (2)
University of Strathclyde, United Kingdom; 2: Engineering Technology Centre Ltd (ETC), United Kingdom

Determining the Accuracy of Average Fault Rates in Assessing the Risks of Individual Circuits
Felix Peterken, Paul Morris
National Grid, United Kingdom

14.30 – 16.00
BLOCK 4
16.30 – 18.00

Graph Computing Techniques for Power Flow Resolution Considering Real Distribution Networks
Francesca Soldano, Enea Bionda, Carlo Tornelli
RSE S.p.A., Italy

Non-technical Losses Identification in Distribution Grids: A Hybrid Approach
Marc Jene-Vinuesa, Monica Araguetes-Perahina, Andreas Gummer
Universitat Politècnica de Catalunya, Spain

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 renewal of equipment. In addition, today’s technologies such as IoT, Big data and AI offer new possibilities to optimize the lifespan of equipment.

Considering climate change as one of the most important challenges to mankind, the reduction of CO2 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 industry to develop solutions for reducing CO2 emissions in the complete life cycle of electrical equipment.

Considering climate change as one of the most important challenges to mankind, the reduction of CO2 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 industry to develop solutions for reducing CO2 emissions in the complete life cycle of electrical equipment.
Fault Ride Through Of DC Solid State Transformer In Medium Voltage DC Systems

Pierre Le Métayer (1,2), Drazen Dujic (3), Cyril Buttay (2), Piotr Dworakowski (1)

1: Supergrid Institute, 69621 Villeurbanne, France; 2: Univ Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, Ecole Centrale de Lyon, Ampère, UMR5005, 69621 Villeurbanne, France; 3: Power Electronics Laboratory, EPFL, Lausanne Switzerland

DC short-circuit Behaviour of LVAC Fuses

Djamel Hadbi (1), Luis Chinchilla Delgado (1), Frederic Raymond-Laruita (1), Michel Cordonnier (2)

1: EDF Lab les Renardières; 2: Enedis Direction technique

Impacts of Low Voltage Distribution Grid Resilience Constraints on AC/DC Converter Sizing

Frédéric Raymond-Laruita (1), Marc Petit (2), Loïc Queval (2), Djamel Hadbi (1), Philippe Egrot (1), Michel Cordonnier (3), Stéphane Mercier (4)

1: EDF Lab les Renardières; 2: Laboratoire de Génie Electrique et Electrotechnique de Paris; 3: Enedis Direction technique; 4: Socomex

Tubular DC Breaker

James Mannekutla (1), Johan Nohlert (1), Thomas Eriksson (1), Alessio Bergamini (2)

1: ABB AB, Corporate Research, Västerås, Sweden; 2: ABB S.p.A. SACE, Bergamo, Italy

Predictive Maintenance On Overhead Medium Voltage Network Using Transient Faults Data

Odillon Faivre, Martial Joseph, Jérémie Mérigeault, Ilyes Kabbourim, Alain Tholon, Nicolas Bailloeuil

Enedis, France

Deep Learning–Based Automatic Detection of Defective Steel Bars in Concrete Poles

Junhyeong Pak, Yoonbo Shim, Jonghyup Song, Sang Jun Kim, Jae Heon Lee, Sangoh Jeong

Korea Electric Power Corporation (KEPCO), South Korea

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.

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.
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<td>11176</td>
<td>Partial Discharge Diagnostics on Medium–Voltage Switchgears – Measurement Methods and Benefits Maurizio Zijadatz, Christophe Lemmer, Aaron Fischer, Michael Suriyah, Thomas Leibfried Karlsruhe Institute of Technology (KIT), Germany</td>
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<td>10461</td>
<td>Assessment of the impact of Hybrid Distributed Generation / Batteries Energy Storage Systems on DSO Operational Planning Jamilson Junior (1), Ludovic Girault (2), Matthieu Alchourroun (2), Hugo Morais (1), Benoit Bouzigon (3) 1: INESC-ID/IST, Portugal; 2: EDF R&amp;D; 3: ENEDIS</td>
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<td>10741</td>
<td>Validating Real LV Feeder Models Using Smart Meter Data: A Practical Experience From Project EDGE Michael Z. Liu (1), Angela Simonovska (1), Luis F. Ochoa (1), Peter K.C. Wong (2), Kenneth Chew (2), John Theunissen (2) 1: The University of Melbourne, Australia; 2: AusNet Services, Australia</td>
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<td>10387</td>
<td>Evaluation of Quota-based Predictive Congestion Management in Active Distribution Networks Sharon Müller (1), Krzysztof Rudion (1), Marc-Aurel Frankenbach (2), Carmen Exner (2) 1: University of Stuttgart, Stuttgart, Germany; 2: Netze BW GmbH, Stuttgart, Germany</td>
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<td>11408</td>
<td>Black Start In Distribution Grids Through Solid-State Transformer Mário Couto, Alessio Coccia Electric Power Research Institute, Ireland</td>
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<td>10637</td>
<td>Accuracy Analysis of a Sensitivity-Based Distribution System Model for the Centralized Redispatch of Distributed Flexibilities Daniel-Leon Schultis AIT Austrian Institute of Technology GmbH, Austria</td>
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<td>11351</td>
<td>An Economical Operation Strategy of Multi-Energy Virtual Power Plant in a Distribution Network Jin-Wook Lee (1), Kyu-Sang Cho (2), Sung-Yong Son (1) 1: Gachon University, Korea Republic of (South Korea); 2: ATE Solutions, Korea, Republic of (South Korea)</td>
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<td>10338</td>
<td>Using Local Renewable Energy To Energize a Portion of a LV Grid in Islanded Mode Jane Marchand (1), Jérôme Buiré (1), Vincent Debusschere (1), Nabil El-Jarrai (2), Jean Pompee (2), Marie-Cécile Alvarez-Herault (1), Naouredine Hadjaïd (1) 1: Univ. Grenoble Alpes, CNRS, Grenoble INP*, G2Elab, F-38000 Grenoble, France; 2: Enedis, France</td>
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<td>10883</td>
<td>Coupling Optimal Energy Management and Allocation through Keys of Repartition in Energy Communities Alyssa Diva Mustika (1,2), Rémy Rigo-Mariani (1,2), Vincent Debusschere (1), Amaury Pachurka (2) 1: Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, France; 2: Sween, France</td>
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Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.

DOWNLOAD THE CIRED 2023 APP to see the last updates
Available on the Apple Store and Google Play Store
GUIDED TOUR 1  09.00 – 10.30

10197 A1 Transient overvoltages caused by four pole Miniature Circuit Breakers (MCB) in three-phase circuits
Kristof Vliegen (1), Quentin Antoine (2)
1: Fluvius, Belgium; 2: ENGIE Laborelec, Belgium

10213 A2 Medium Voltage Cable Network in the Mountains – Verification of the Earth Potential Rise Voltage by Calculation
Christoph Groß (1), Katrin Friedl (2)
1: Salzburg Netz GmbH, Austria; 2: TU Graz, Austria

10283 A3 Assessing the Bonding Distance of the HV Grounding System and Instrumentation to Reduce Electromagnetic Interferences Due to Lightning Strikes in the EMTP-RV Environment
Mahmoud Eshagh Ahmadi, Mostafa Hoorzad, Mobin Davoudi Samangani, Mohammad Shahabi
Mashhad Electric Energy Distribution Company, Iran, Islamic Republic of

10288 A4 Evolution Of Earthing Impedance
Quentin Antoine (1), Sophie Van Wynendaele (1), David Decoux (2), David Valmacco (3), Bastien Noël (4)
1: ENGIE Laborelec, Belgium; 2: Ores, Belgium; 3: Resa, Belgium; 4: Sibelga, Belgium

10334 A5 Impact of Protective Multiple Earthing (PME) in TN-C Earthing Schemes in Public Low Voltage Networks
Quentin Antoine (1), Kristof Vliegen (2), Wouter Dierckx (2), Henri Grandjean (3), Bastien Noël (4), Minh-Duc Hoang (5)
1: ENGIE Laborelec, Belgium; 2: Fluvius, Belgium; 3: Ores, Belgium; 4: Sibelga, Belgium; 5: Resa, Belgium

10356 A7 The Benign Earthing System: A New Method to Classify the Earthing of Substations
Christian Ehert (1), Christin Schmogler (2)
1: Avacon Netz GmbH, Germany; 2: E.DIS Netz GmbH, Germany

10368 A8 Application of Artificial Neural Networks for Overhead Distribution Lines Magnetic Flux Density Estimation
Ajdin Ahlodzic, Adrian Muzajnovic, Emir Turalje, Nedja Dautbasic, Maja Mufic Dedovic
University of Sarajevo – Faculty of Electrical Engineering, Bosnia and Herzegovina

10443 A9 Earth Resistivity Tomography Simulations Over An Earthing System
Benjamin Jauk, Robert Schürhuber, Katrin Friedl
Graz University of Technology, Austria

10444 A10 The First Outlook on The Implementation of Groundless Lightning Arrester in Indonesia, Case Study: East Nusa Tenggara Province, Indonesia
Hendra Aditia, Ragil Wicaksana, Yuniarto Frayitno, Revi Aldrianto, Akbar Swastika
PT PLN (Persero), Indonesia

10463 A11 Effective Lightning Mitigation Method on Unshielded Distribution Line by Using High Charge Ratings Externally Gapped Line Arresters (EGLA)
Florent Giraudet (1), Partal Erdurgical (2), Murat Serkan Sert (2), Meric Ger (2)
1: METARRESTERS, Consultant, Germany; 2: ADM Elektrik Dağıtım, Distribution System Operator, Turkey

10503 A12 Sensitivity Of Household Appliances To Supply Voltage
Dumitru Miceneanu (1), Ludovic Bertin (1), Aurel Garry (2), Nicolas Carteau (2)
1: EDF R&D, France; 2: Enedis, France

10536 A13 Practical Comparison Of Earth Impedance Testing Methods
Josef Schmidbauer, Friedrich Almer
OMICRON electronics GmbH, Austria

10640 A14 Steady-State Zero-Sequence Currents in a Transmission System: a Parameter Analysis
Sjoerd Nauta (1), Jeroen van Waes (2), Leonor Noris (2), Kees Koreman (2)
1: Alliander, The Netherlands; 2: TenneT TSO B.V., The Netherlands

10680 A15 Evaluation of High Harmonic Components in the Residual Earth Fault Current with Regards to the Earth Potential Rise and Personal Protection
Benjamin Küchler (1), Karla Frowein (2), Peter Schegner (2), Uwe Schmidt (1)
1: Hochschule Zittau/Görlitz – University of Applied Sciences, Germany; 2: Dresden University of Technology, Germany

10683 A16 Methodology For The Evaluation By Simulation Of Electromagnetic Fields In Live Working Areas In Substations
João Tarquínio (1), Andreia Leiria (1), Francisco Bessa Silva (2), José Manuel Cardoso (3), José Mendes Ribeiro (3)
1: EDP Labelec; 2: EDP SA; 3: E-REDES

10849 A17 Realistic Maximum Touch Voltages in Global Earthing Systems
Benjamin Jauk, Lothar Fickert, Katrin Friedl, Robert Schürhuber
Graz University of Technology, Austria

10899 A18 Floating Neutral Detection Using a 2S Form Meter: Dağıtım, Distribution System Operator, Turkey
Iban Vicente (1), Lakshan Piyasinghe (2), Amaia Arrinda (3), J. Emilio Rodríguez-Seco (1)
1: TECNALIA, Basque Research and Technology Alliance, Spain; 2: METARRESTERS, Consultant, Germany; 3: ENEL, Italy

THE POSTER AREA IS OPEN FROM 09.00 TO 18.00
Access with or without a guided tour for registered delegates only
A10 Solar Farm Earthing – Not Just an Extra–large Substation – Special Requirements Met by Risk–based Design and Focused Testing
William Carman (1), Matthew Bale (2)
1: Bill Carman Consulting, Australia; 2: Safearth Consulting, Australia

A20 Switching Overvoltages Caused by Shunt Reactor Switching and Mitigation Methods
Philipp Hackl (1), Katrin Friedl (1), Robert Schürhuber (1), Britta Heimbach (2), Bruno Wartmann (2), Andre Casura (2)
1: Graz University of Technology, Austria; 2: ewz, Switzerland

A21 Investigations Of 3D Meshed Earthing Systems
Martin Fünrschü (1), Stephan Pack (2), Ernst Schmutzer (3), Robert Schürhuber (4)
1: Institute of Electrical Power Systems, Graz University of Technology, Austria; 2: Institute of High Voltage Engineering and System Performance, Graz University of Technology, Austria; 3: ESC Engineering Service & Consulting, Graz, Austria; 4: Institute of Electrical Power Systems (Head of the institute), Graz University of Technology, Austria

A22 Does Transformer Inrush Challenge Future Grids? – Laboratory Insights
Alexander Winkens (1), Florian Klein–Helmkamp (1), Markus Stroot (1), Mathias Nkaa (1), Andreas Ulbig (1), Tilman Wippenbeck (2)
1: RWTH Aachen University, Germany; 2: Westnetz GmbH, Germany

B1 Development of Measuring a Combined Impedance of Ladder Networks Using Unbalanced Current on Neutral Line in 4–wire Distribution System
Dae Young Kim, Sunkyu Choi, Junhyuk Kang
KEPCO, Korea, Republic of

B2 Earthing Design of EV Charging Substations in Fuel Stations – UK Requirements and Experience
Dionysis Skevis (1), Mark Davies (1), Denis Baudin (1), Stephen Tucker (2)
1: RINA, United Kingdom; 2: UK Power Networks, United Kingdom

B3 Managing Impressed Voltages Near High Voltage Installations – UK Requirements, Common Problems and Solutions
Paul Jones, Mark Davies
RINA, United Kingdom

B4 A New Algorithm to Estimate Uniform Soil Resistivity For Earthing Design Calculations
Stephen Lilley (1), Paul Jones (1), Mark Davies (1), Stephen Tucker (2)
1: RINA, United Kingdom; 2: UK Power Networks, United Kingdom

B5 Effect of Time Delay of High–speed Autoreclosing on Variable Frequency Drives and Other Loads
Pertti Pakonen, Ari Nikander, Pekka Verho
Tampere University, Finland

B6 Radiated Emissions from an Electric Railway: Review of Methods and Measurements mainly from 9 kHz to 150 kHz
Babak Sadeghi (1), Per Westerlund (1), Rafael S. Salles (1), Jonna Willén (2)
1: Luleå University of Technology, Sweden; 2: Umeå University, Sweden

B7 Investigating The Impact Of External Fields On The Accuracy Of LFVTs
Roberto Schulze, Erik Sperling, David Gopp
OMICRON electronics GmbH

B8 Evaluation On Safety Of People On Ground Generated Voltages In Unconventional Networks.
Miguel Martins (1), Pedro Henrique Sebastiányi (1), Roberta Stefanello (1), Leonardo Felipe Da Silva Santos (1), Leyla Kraulich (1), Leonardo De Freitas Silveira (1), Diego Ramos (1), Ghendy Cardoso Jr. (1), Rogimar Rêgo (2)
1: Universidade Federal de Santa Maria, Brazil; 2: Grupo Equatorial / CEEE–D

A9 A Practical Method for Improving Low Voltage Ride–Through Capability of Inverter–based AC Microgrid
Gary Chang (1), Kha T. Nguyen (1), Guan–Yi Li (1), Roberto Langella (2)
1: National Chung Cheng University, Taiwan; 2: Univ. of Campania «Luigi Vanvitelli», Italy

B10 Analysis of Harmonic Current Injections of Electric Vehicles
Pablo Rodríguez–Pajarón (1), Leo Cassolosa (1), Alberto Contreras (1), Arcelis Hernández (1), Jovica Milanovic (2)
1: Universidad Politécnica de Madrid, Spain; 2: The University of Manchester

B11 Harmonic and Suprapharmonic Emissions of Fast Charging Infrastructure – Field Measurements in LV Grids
Manuel Wingenfelder (1), Daniela Frank (1), Constantin Reese (2), Lutz Hofmann (1)
1: Leibniz University Hanover, Institute of Electric Power Systems, Electric Power Engineering, Germany; 2: enercity AG, municipal utilities Hanover

B12 Minimization Strategies Of Harmonics in Microgrid Connected Wind–Driven PMSG
Maged Nashed, Mona Eskander
Electronic Research Institute, Egypt

B13 Advanced Techniques For Troubleshooting Solar Arrays And Generator Connections
Robert Weller (1), Kate Edwards (2), Duncan Dalton (2)
1: Electrical Investigation Ltd, United Kingdom; 2: Outram Research, United Kingdom

B14 Power Quality Impact on Light Intensity and Flicker Sensitivity of LED Lamps
Elena Gutierrez–Ballesteros (1), Sarah Rönnberg (1), Aurora Gil–de–Castro (2)
1: Luleå University of Technology, Sweden; 2: Universidad de Córdoba, Spain
### Panel B9 > B32

#### 10200
**B15 Comparing Methods to Mitigate The Effect of Grid Voltage Sag And Frequency Variation On The Operation of Variable Speed Drives**  
Maged Nashed, Mona Eskander  
Electronic Research Institute, Egypt

#### 10229
**B16 Requirements For Grid Supporting Inverter In Relation With Frequency And Voltage Support**  
Carina Lehmal, Ziqian Zhang, Herwig Renner, Robert Schürhuber  
Graz University of Technology, Austria

#### 11333
**B17 Planning And Operation Of An Intelligent Voltage Regulator For PQ Improvement In PV–Rich Power Distribution Systems**  
Rocco Di Gregorio (1), Stefan Hoppert (2), Riccardo Trevisan (3), Emilio Ghiani (3)  
1: Volta S.p.a.; 2: A-elerle GmbH; 3: Università degli Studi di Cagliari, Italy

#### 10483
**B18 Analysis and Modelling of Temporary Overvoltage Events and Comparison with OVRT Requirements**  
Christoph Wirtz (1), Max Muglbl (1), Simon Kral (1), Albert Moser (2)  
1: FGH e.V., Aachen, Germany; 2: IAEG RWTH Aachen University, Aachen, Germany

#### 10518
**B19 Comparative Analysis of Grid Forming Inverters Based Power Systems in Phasor Domain and Electromagnetic Transient Domain**  
Said Daoudi, Thai Phuong Do  
Univ . Grenoble Alpes, CEA, Liten, Campus Ines, 73375 Le Bourget du Lac, France

#### 10538
**B20 Electric Vehicle Charging Stations and their Impact on Power Quality**  
Francesc Zavoda  
CRHQ (Centre de recherche d’Hydro-Québec), Canada

#### 10556
**B21 Managing Distribution Network Stability with Penetration of Distributed Energy Resources**  
Mohammad Raiza Abdul Aziz, Mohd Syahir Kyairi Ahmad Fuad, Hidzar Radzi Mohd Husin  
Tenaga Nasional Berhad, Malaysia

#### 10591
**B22 A Study on the Application of Power Electronics Technology in Secondary Substation to Improve Power Quality**  
Boo-Hyung Shin (1), Hye-seon Lee (1), Dong-yeol Shin (1), Soo-yong Hur (2), Sung-Min Kim (2)  
1: KEPRI / KEPCO, Korea, Republic of (South Korea); 2: KEPCO, Korea, Republic of (South Korea)

#### 10617
Hyeseon Lee, Boohyun Shin, Byungsung Lee, Sooyoung Hur, Sungmin Kim  
KEPCO, Korea, Republic of (South Korea)
FORUM LEVEL 1

14.30 – 16.00

QUALITY

B33 Harmonics in the Transmission and Distribution Grid and their Relation to Geomagnetically Induced Currents
Alexandre Malfoy (1), Roger de Oliveira (2), Sarah Rönneberg (2)
1: Bordeaux Institute of Technology – ENSIEB – MATMECA; 2: Luleå University of Technology

B34 Case Studies of Estimation of Harmonics in Partly Monitored Residential Networks
Pablo Rodríguez-Pajarón (1), Araceli Hernández (1), Yuqi Zhao (2), Jovica Milanovic (2)
1: Universidad Politécnica de Madrid, Spain; 2: The University of Manchester

B35 Transfer of Supratures through a MV/LV Transformer
Tim Slagenta (1), Erik de Jong (2), Vladimir Cuk (1), Sjef Cobben (1)
1: Eindhoven University of Technology, Netherlands; 2: KEMA Labs, Netherlands

B36 Comparative Study of Unipolar and Bipolar Industrial DC Microgrids Through Linear Power Flow
Eduardo Vasquez Mayen, Emmanuel De Jaeger
UCLouvain, Belgium

C1 The Impact of a Bi-directional V2G Electric Vehicle Charging Station to the Frequency Dependent Grid Impedance (10 – 150 kHz)
Bernhard Grasel (1), José Baptista (2), Manfred Tragner (1), Subin Puthenvalam (3)
1: FH Technikum Wien, Austria; 2: University of Trás-os-Montes and Alto Douro; 3: Magna International

C2 Continuous Non-invasive Resonance Detection in Residential Low-Voltage Networks
Shrinath Kannan, Jan Meyer, Peter Scheegner
TU Dresden, Germany

C3 Impedance Characteristics at Socket Outlets in Residential and Commercial Buildings in the Frequency Range 2–150 kHz
Victor Khokhlov (1), Robert Stiegler (1), Jan Meyer (1), Stefano Lodetti (2), Peter Davis (2), Paul Wright (2), Igor Fernandez (3), Jon Gonzalez–Ramos (3), Alexander Galarreta (3), David de la Vega (3)
1: Technische Universität Dresden, Germany; 2: National Physical Laboratory (NPL), United Kingdom; 3: University of the Basque Country (UPV/EHU), Spain

C4 Operation of Micro Sources and Impact of High Penetration on Low Voltage Distribution Grid
Martin Kaspierek, Martin Kurft, Tomas Valta, Daniel Koubia, Zdenek Maca
EGLD (E.ON group), Czech Republic

C5 Harmonic Distortion in Microgrids in Islanded Operation
Angela Espin-Delgado (1), Sarah Rönneberg (2)
1: RISE Research Institutes of Sweden, Sweden; 2: Luleå University of Technology, Sweden

C6 A Case Study on the Changes in Short Circuit Power to Analyze the Impact on Voltage Dips
Joris Hoeksena (1), Roobzhela Torkzadeh (1), Jeroen van Waes (2), Sjef Cobben (1), Vladimir Cuk (1)
1: Eindhoven University of Technology, Netherlands, The; 2: TenneT TSO BV, Netherlands, The

C7 Verification of Tool for Allocation of Harmonic Current Emissions Considering Frequency-Dependent Impedance
Tor Inge Reistad (1), Bjørn Inge Oftedal (2), Thor Holm (3), Bendik Nybakk Torsø (1), Henning Taxt (1)
1: SINTEF Energy Research, Norway; 2: REN AS; 3: PQA AS

C8 The Beat Phenomenon and Flicker Caused by the Difference in Switching Frequencies between Two Grid-connected Inverters
Kentarou Fukushima, Naotaka Okada
Central Research Institute of Electric Power Industry, Japan

C9 Modelling of Voltage Unbalance in Large Real Medium Voltage Distribution Networks
Adnan Bosovic (1), Henwig Rinners (2), Andreas Ambart (3), Ewald Traxler (3), Jan Meyer (4), Friedemann Möller (4), Mustafa Music (1)
1: Public Electric Utility Elektroprivreda of Bosnia and Herzegovina d.o.o. – Sarajevo, Bosnia and Herzegovina; 2: Graz University of Technology, Austria; 3: Netz Obersösterreich GmbH, Austria; 4: Technische Universität Dresden, Germany

C10 Survey of Harmonic Distortion Measurements from Customer Grid Supply in Trains
Rafael S. Salles (1), Sarah K. Rönneberg (1), Rebecca Askland (2)
1: Luleå University of Technology, Sweden; 2: Trafikverket, Sweden

C11 Large Scale Flexibility Requirements for Voltage Control in Low Voltage Distribution Network Analysis
Blaz Dobravec, Viktor Andonovic, Nejc Petrovic
Elektro Gorenjska d.d., Slovenia

C12 Probabilistic Estimation of Harmonic Distortion in Non-Radial Distribution Network
Yuqi Zhao (1), Jovica Milanovic (1), Pablo Rodriguez-Pajarón (2), Araceli Hernández (2)
1: the University of Manchester, United Kingdom; 2: Universidad Politécnica de Madrid, Spain

C13 «Combining Single Phase and Three Phase EV Charging: A way for increasing Harmonic Hosting Capacity”
Manav Giri, Naser Nakhodchi, Sarah Rönneberg
Luleå University of Technology, Sweden

C14 Analysing Electric Vehicle Charging Power Quality in Large-Scale Charging Sites – A Data-Driven Approach
Toni Simolin, Antti Hilden, Pertti Pakonen, Pertti Jarventaus
Tampere University, Finland
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<td>Frequency-Dependent Impedance Identification For Lvdc Pq Analysis</td>
<td>César Augusto Slongo (12), Xavier Yang (1), Octavian Curea (2), Manuel Billaud (3)</td>
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<td>C16</td>
<td>Analysing The Impact Of Operating Strategies Of Active Customers On Flicker And Voltage Unbalance</td>
<td>Alexander Vanselow (1), Garm Till (2), Albert Moser (3), Bernd Engel (2)</td>
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<td>C17</td>
<td>Modeling and Simulation of the Impact of a Fast Charging Infrastructure on Harmonic Disturbance Levels</td>
<td>Sascha Müller (1), Jan Meyer (1), Julius Jacob (2)</td>
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<td>C18</td>
<td>Assessment of Harmonic Emission Level of Customer Installations Considering Actual Level of Cancellation</td>
<td>Morteza Pourarab (1), Jan Meyer (1), Oliver Dominian (1), Thomas Naef (2), Max Ulrich (2), Roger Röll (2)</td>
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<td>C19</td>
<td>Analysis of the Propagation of Distortion in the Frequency Range 2-150 kHz using Iterative Harmonic Analysis</td>
<td>Adam Collin (1), Roberto Langella (2), Alfredo Testa (2)</td>
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<td>C20</td>
<td>Evaluation of Harmonic Transfer Between Transmission and Distribution Network Based on Measurements</td>
<td>Robert Stiegler (1), Jan Meyer (1), Robert Dommerque (2), Mohammad Nazerni (2), Daniel Scherbart (2)</td>
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<td>C21</td>
<td>Opportunistic Impact Of Simultaneous EV Charging On Stochastic Hosting Capacity</td>
<td>Enoch Mulenga (1), Taís T De Oliveira (2)</td>
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<td>C22</td>
<td>A Study on VRE Grid Connection Code for LVDC System</td>
<td>Junwoo Lee, Younggyo Cho, Seokwoong Kim, Juyong Kim, Korea Electric Power Research Institute, Korea, Republic of (South Korea)</td>
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<td>C23</td>
<td>Solar PV Battery Storage Estimation For Overvoltage Mitigation Using Measurement Data</td>
<td>Enoch Mulenga (1), Taís T De Oliveira (2)</td>
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<td>C24</td>
<td>Harmonic Resonances Analysis Methods in Power Distribution Networks</td>
<td>Leopold Herman, Jure Lokar, Bostjan Blazic, Faculty of Electrical Engineering, University of Ljubljana, Slovenia</td>
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<td>C33</td>
<td>Determining Faults Cause Based On Disturbance Records From PQ Monitors</td>
<td>Irena Sagovac, Marijan Lukac, HEP ODS d.o.o. Elektra Zagreb, Croatia</td>
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<td>C25</td>
<td>Determination Of Frequency-Dependent Impedances Of Large 110 kV Grids</td>
<td>Matthias Schilcher (1), Jonathan Hänsch (2), Frank Wirtz (3), Uwe Schmidt (4)</td>
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<td>C26</td>
<td>Analysis of the Voltage Unbalance Phenomenon in a Three-phase Two-wire Distribution System</td>
<td>Leonardo de Freitas Silveira (1), Aécio de Lima Oliveira (1), Ghendy Cardoso Junior (1), Gustavo Marchesan (1), Leyla Kraulich (1), Leonardo Felipe da Silva dos Santos (1), Miguel Spagnolo Martins (1), Rogimar Matias Rêgo (2)</td>
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<td>C27</td>
<td>Investigation of Supraharmonic Emission from a Microgrid</td>
<td>Mattewos Tefferi (1), Nick Nakamura (2), Gaurav Singh (3), Brad Barnes (4), Nenad Uzelac (1)</td>
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THURSDAY 15 JUNE

POSTER SESSION 2
LEVEL 1 FORUM
POWER QUALITY & ELECTROMAGNETIC COMPATIBILITY

10417  C34 Deep Learning for Power Quality with Special Reference to Unsupervised Learning
        Roger de Oliveira, Rafael Salles, Sarah Ronnberg
        Luleå University of Technology, Sweden

10433  C35 Power Quality Survey in Industrial Zones in Alexandria
        Ihab Elfiky, Mohamed Elhoseiny, Hanaa Karawia
        Alexandria Electricity Distribution Company, Egypt

10493  C36 Monitoring Voltage Quality in Sweden
        Herlita Bobadilla Robles, Albin Emanuelsen, Abdirizak Aden,
        Carl Johan Wallnerström
        Swedish Energy Markets Inspectorate, Sweden

10525  D1 System Strength Measurement, Testing and Validation
        Daniel Gheorghe (1), Daniel Landreman (2), Poria Astero (3)
        1: Reactive Technologies Ltd, UK; 2: Eaton, USA; 3: Reactive
        Technologies, Finland

10566  D2 Innovative High-Power Exiting Inverter for Frequency
        Dependent Grid Impedance Measurements
        Jakob Velling, Simon Schramm, Georg Kerber
        H# Munich University of Applied Sciences, Germany

10578  D3 Techniques to Generate Test Waveforms for Power
        Grid Measurement Methods up to 150 kHz
        Alexander Gallarreta (1), Igor Fernández (1), Deborah
        Ritzmann (2), Stefano Lodetti (2), Victor Khokhlov (3),
        Jan Meyer (3), Paul Wright (2), David de la Vega (1)
        1: University of the Basque Country (UPV/EHU), Spain;
        2: National Physical Laboratory (NPL), United Kingdom;
        3: Technische Universität Dresden (TUD), Germany

10581  D4 Evaluation of the Light–QP Measurement Method for
        Extended Measurements
        Alexander Gallarreta, Jon González-Ramos, Igor Fernández,
        David de la Vega, Amaia Arrinda, Itziar Angulo
        University of the Basque Country (UPV/EHU), Spain

10618  D5 Impact of Reserve Market Participation on Power
        Quality of Flexibility Resources and Local Electricity
        Antti Hildén (1), Pertti Pakonen (2), Harri Niska (1)
        1: University of Eastern Finland, Finland; 2: Energienetze
        Steiermark, Austria; 3: NetzE Oberösterreich, Austria;
        4: Wiener Netze, Austria

10622  D6 Assessment of Harmonic Network Impedance
        through Transient Harmonic Signals measured at an
        Industrial Power System
        Tom Van Acker (1,2), Kris De Wit (1), Jose Antonio de la O
        Serna (3)
        1: BASF Antwerp NV, Belgium; 2: KU Leuven, Belgium;
        3: Universidad Autonoma de Nuevo Leon, Mexico

10733  D7 Harmonics Analysis for Distribution Systems of Urban
        Areas in Japan
        Naotaka Okada
        CRIEPI, Japan

10747  D8 Applying Machine Learning To Power Quality Signals
        To Detect Component Failure Signatures And Prevent
        Unplanned HV Outages
        Paul Morris (1), Andrew Forster (2), Samuel Jupe (2)
        1: National Grid Electricity Distribution, United Kingdom;
        2: Nortech Management Limited, UK

10866  D9 Harmonic Phasor Measurement Technology from DC
        to 500 kHz with Time Resolution of a Single Line Cycle
        Jan-Philipp Kitzig (1), Gerd Bumiller (2)
        1: Ingenieurbüro Ritzig, Germany; 2: Hochschule Ruhr West,
        University of Applied Sciences, Germany

10879  D10 Suprapharmonics Assessment: Methods Comparison
        Based on a Used Case in a Metalworking Shop
        Philippe Blanchard (1), Roger Bergeron (2), Manouane
        Caza-Szoka (1), Daniel Massicotte (1)
        1: Université du Québec à Trois-Rivières; 2: les services
        Électrogénies

10993  D11 UK Grid Disturbances Measurements From 9 kHz To
        150 kHz On A Low Carbon LV Network
        Peter Davis, Stefano Lodetti, Deborah Ritzmann, Paul Wright
        National Physical Laboratory (UK), United Kingdom

11023  D12 Impact of Discontinuous Measurements on the Trend
        Analysis of Power Quality Parameters
        Max Domagk (1), Jan Meyer (1), Karl Scheida (2), Rene
        Braunstein (3), Ewald Traxler (4), Roland Zoll (5)
        1: TU Dresden, Germany; 2: Oesterreichs Energie, Austria;
        3: Energienetze Steiermark, Austria; 4: Netze Oberösterreich,
        Austria; 5: Wiener Netze, Austria

11087  D13 Automated Load Control Detection Using Power
        Quality Data And Machine Learning
        Christina Brester (1), Antti Hildén (2), Mikko Kolehmainen (1),
        Pertti Pakonen (2), Harri Niska (1)
        1: University of Eastern Finland, Finland; 2: Tampere
        University, Finland

11206  D14 New Interharmonic Subgroup Concept for
        Networks
        Roberto Langella (1), Jiri Drapela (2), Mark Halpin (3), Jan
        Meyer (4), David Mueller (5), Harish Sharma (6), Alfredo Testa
        (1), Neville R. Watson (7), David Zech (8)
        1: University of Campania «Luigi Vanvitelli», Italy; 2: Brno
        University of Technology; 3: Auburn University; 4: Technische
        Universität Dresden; 5: EnerNex; 6: Southern Company
        Services; 7: University of Canterbury; 8: Duke Energy

11269  D15 Artificial Expansion of Power Quality Datasets using
        Generative Adversarial Networks
        Markus Stroot (1,2), Katharina Alesfs (3), Ömer Sen (1,2),
        Andreas Ulbig (1,2)
        1: IA EW at RWTH Aachen University; 2: Fraunhofer ICT
        FIT; 3: RWTH Aachen University
### POSTER SESSION 2

**LEVEL 1 FORUM**

**POWER QUALITY & ELECTROMAGNETIC COMPATIBILITY**

#### 10230

**F1 Challenges And Opportunities When E-Mobility Is Incorporated In Argentinian Scenarios**
Dario Slaifstein, Fernando Nicchi
Universidad de Buenos Aires, Argentine Republic

#### 10117

**F2 Pilot Project where a Battery Energy Storage System is used for Fast Frequency Reserve**
Hanne Søele (1), Maren Isstad (1), Signe Marie Oland (2)
1: SINTEF Energi AS, Norway; 2: Lede AS, Norway

#### 10122

**F3 Assessment Of The Significance Of Features For The Identification Of Domestic Appliances**
Liya Ma, Maximilian Schmidt, Peter Schegner
Technische Universität Dresden, Institute of Electrical Power Systems and High Voltage Engineering, Faculty of Electrical and Computer Engineering

#### 10143

**F4 Advanced Electrical Energy Storage Technologies And Their Applications On Customer Side**
Christian Noe, Luigi Lanuzza, Martina Radicioni
Erel X Srl, Italy

#### 10162

**F5 A New Customer-Oriented Approach For Residential Demand-Side Flexibility: The Case Of The Zealand Region In The Netherlands**
Fabien Berger
FRACIAL ENERGY, France

#### 10112

**F6 Viable LINK-based Energy Community: Increasing Flexibility and Resilience of Electricity Infrastructure**
Gaurav Singh (1), Jon Bickel (2), Daniel Sabin (1)
1: Schneider Electric, United States of America; 2: Schneider Electric, United States of America

#### 10233

**F7 Method for Determining the Impact of Local Energy Markets on the Distribution Grid Expansion**
Klemens Schumann (1,2), Luis Böttcher (1), Simon Braun (1), Andreas Ulbig (12)
1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT, Aachen, Germany

#### 10236

**F8 End-use Sector Coupling To Turn Customer Plants Into Prosumers Of Electricity And Gas**
Helmut Bruckner (1), Markus Olofsgard (3), Robert Stiegler (2), Mario Klemens Schumann (1,2), Luis Böttcher (1), Simon Braun (1), Andreas Ulbig (12)
1: IAEW at RWTH Aachen University; 2: Fraunhofer FIT, Aachen, Germany

#### 10254

**F9 Nation-wide Projection of Motivators and Consumer Willingness for Direct Load Control Demand Response in Finland**
Taimur Zaman (1), Zhiwang Feng (1), Mazheruddin Syed (1), Benedict Pilscour Soraytec (3), David Flynn (2), Graeme Burt (1)
1: University of Strathclyde, United Kingdom; 2: University of Glasgow; 3: Soraytec
## Programme updated on 26 April 2023.

**Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.**

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<td>Behavioral Approaches to Reduce Household Energy Consumption</td>
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<td>Traceability of power generation in a Multi-Energy Virtual Power Plant using Blockchain</td>
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<td>Identification and Characterization of Inverters used for PV Generation and Storage Systems</td>
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<td>On the Role of Industrial Kitchens in sustainable Energy Systems: The Nexl Vision</td>
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<td>The EUniversal Portuguese Demonstrator: From MV-LV Coordinated Identification Of Flexibility To Activation Through The UMEI</td>
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<td>The Multi Objective Optimization of Flexibilities In Ski-Resorts – CO2, Power Peaks, And Day-Ahead Market</td>
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<td>F21 Coordination of Community Electricity Markets and Distribution Network Operation</td>
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<td>F22 Flexibility Settlement For Congestion Management: Two Practical Studies</td>
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<td><strong>10681</strong></td>
<td>F23 Study of Electrical Consumption Flexibility Offered by HVAC System Based on Rooms Thermal Modelling - Tertiary Building Case Study</td>
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<td><strong>10136</strong></td>
<td>H24 The Use Of Virtual Reality In The Training Of Employees in Electricity Distribution Companies</td>
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<td>H25 Risk Management to avoid the Safety accidents</td>
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<td><strong>10215</strong></td>
<td>H26 Real Time Quality Monitoring Of Electrical Distribution Network Affected By Heatwaves: A Data-oriented Approach</td>
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<td><strong>10228</strong></td>
<td>H27 Assessment and Visualisation of Extreme Weather Impacts and Climate Change Risks on Distribution Network Operation</td>
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09.00 – 10.30
DSO 2
H24 > I4
PANELS
LEVEL 1
FORUM

10260
H28 Electric Energy Distribution – Control of NTL (Non Technical Losses)
Miguel Pulice
Edenor, Argentine Republic

10280
H29 Assessing Gender Equality in the Distribution Sector
Sarah Cuijpers
ENGIE IMPACT – BRUXELLES, Belgium

10323
H30 Optimal Strategies for the Management of Electric Power Distribution Systems Considering Diversified Age Structures of the Electrical Equipment and Their Economic and Technical Implications
Robin Schubert, Markus Zdrallek
Institute of Power Systems Engineering, University of Wuppertal, Wuppertal, Germany

10340
H31 Estimation Of Impact Of Extreme Weather Conditions On Distribution Asset And Improvement Of Operational Procedures Supported By Evolved Tools
Luigi D’Orazio (1), Roberto Calone (1), Gianluca Di Felice (2), Marina Bernardi (3)
1: ENEL, Italy; 2: e-distribuzione, Italy; 3: CESI, Italy

10366
H32 Asset Owner Perspective on Managing Growth and Reinvestment Needs
Markus Taaveniku (1), Marcus Halvarsson (1), Matthias Hopfenits (2), Heiko Spitzer (2)
1: Vattenfall Eldistribution AB, Sweden; 2: entellegio GmbH, Germany

10422
H33 Extreme Weather and Power Distribution System Resilience
Mohammed Al Ghenaimi
Mazoon Electricity Company, Oman

10462
H34 Climatological Changes And New Applications For System Grid Operators
Kerstin Weindl (1), Lukas Schwalt (2), Klemens Reich (1)
1: Austrian Power Grid, Austria; 2: TU Graz, Austria

10482
H35 A Framework for Dynamic Risks and Resiliency Assessment of Critical Infrastructure a Case Study on Power Distribution Transformers
Mohsen Farzadmehr (1), Mostafa Aliyari (2), Vahid Baghshani (1), Yonas Zewdu Ayele (2,3)
1: KEDC Company; 2: Østfold University College, Norway; 3: IFE, Institute for Energy Technology

10499
H36 Technical And Economic Grid Reinforcement Analysis For The Danish DSO Networks
Jasmin Mehmadsadik, Peter Kjar Hansen
Green Power Denmark, Denmark

10500
II Resilience of the Energy System to Climate Change
Perrin Nicolas (1), Drobinski Philippe (2), Roche Nicolas (1)
1: Enedis, France; 2: LMD – Laboratoire de Météorologie Dynamique, France

FORUM
11.00 – 12.30
CUSTOMER 2
TOUR 3
F24 > G19
PANELS
LEVEL 1
FORUM

10522
I2 Non-firm Grid Connections For Low-Voltage Generators: A Case Study
Louise Muller, Florent Cadoux
Roseau Technologies, France

10625
I3 Quantitative Approach of A Novel Disaster–Based Vulnerability Index in Distribution System By Utilizing Geographical Information System Study Case in Palu After Disaster
Very Fernando, Revi Aldrian, M.Soffin Hadi, Yohanes Sukrisilismono, Indratno Pardiansyah
PT PLN (Persero), Indonesia

10844
I4 Hierarchical Forecasting for the Management of Distribution Grids
Simon Carnal (1), Dennis Van Der Meer (1), Fabrizio Sossan (2), Georges Kariniotakis (1)
1: MINES PARIS – PSL University – Research Center PERSEE, France; 2: HES–SO Valais Wallis – Institut de Recherche Energie et Environnement

POSTER SESSION 6
JUNE 15TH
LEVEL 1 II FORUM

10716
F24 Grid Performance Optimization Supported By An EV Charging Dynamic Price Formation Model
Diogo Lopes (1), Luis Almeida (2), Jose Sousa (2), Rita Mourão (2)
1: Cappgemini; 2: E-Redes

10728
Patricia Duarte, Miguel Verissimo, Jao Azar, Luis Fernandes, Tiago Penedos, Carolina Marques, Jorge Santos
E-REDES, Portugal

10752
F26 A DSO View On Implementing Residential Customer Flexibility In Rural Communities
Ciaran Geaney, Fergal Egan
ESB Networks, Ireland

10775
GI Preferences in EV’s Smart Charging – Customer Survey
Antti Raassina (1), Juhani Lepistö (1), Samuli Honkapuro (2), Ville Tikka (2)
1: Helen Electricity Network Ltd, Finland; 2: LUT University

10786
G2 Resilience Services from Battery Storage Degradation
Mohamed Galeela, Wentao Zhu, Diptargha Chakravorty
TNEI Services, United Kingdom

10829
Mohamed Yasko (1,2), Hans Wouters (1,2), Attila Balint (1,2)
1: KU Leuven, Belgium; 2: EnergyVille, Belgium

10840
G4 Flexible activation for grid purposes – Experiences from a Norwegian pilot
Hanne Sæle (1), Mariona Zhuri (2), Andrei Mørch (1), Ivan Schytte (2)
1: SINTEF Energi AS, Norway; 2: Lede AS, Norway
10903  G5 Smart Transformer as an Energy Community Service Node and Integrator of Local Resources
Kari Maki (1), Sergio Motta (1), Marius Baranauskas (1), Mika Silpanpa (2), Tommi Vahtera (3), Pasi Ylinisku (3), Verneri Kohonon (4).
1. VTT Technical Research Centre of Finland, Finland; 2. MSc Electronics, Finland; 3. THI Control, Finland; 4. Caruna, Finland

10928  G6 Incentive Design for Hybrid ESS Considering Additional Services based on Monte–carlo Simulation
Yong Soon Kim, Gye Hyun Park, Dam Kim, Seung Wan Kim Chungnam National University, Korea, Republic of (South Korea)

10936  G7 Integrating Digital Building Flexibility through Sub-aggregator Business Model
Kari Maki (1), Matti Aro (1), Utkarsha Agwan (2), Hari Prassana Das (2), Yu-Wen Lin (2), Costas Spanos (2).
1. VT Technical Research Centre of Finland, Finland; 2. University of California Berkeley, USA

10952  G8 Optimal Scheduling of Flexible Residential Loads Under Demand Response Programs Considering User Comfort
Mohdi Nasrani (2), Mohammad Jooshaki (4), Mahmud Fotuhi–Firuzabad (2), Matti Lehtonen (1), Fei Wang (3).
1. Aalto University, Finland; 2. Sharif University of Technology; 3. north China Electric Power University; 4. Geoblogin tutkimuskeskus

11051  G9 Grid–Friendly Renewable Energy Communities Using Operating Envelopes Provided by DSOs
Juliana Kainz (1), Rbin Sudhoff (2), Ruben Liedey (1), Daniel Hauer (1), Alfred Einfalt (1), Gerhard Engelbrecht (1), Ines Fohler (1), Christopher Kahler (4), Daniel Menz (3), Sebastian Schreck (2), Andreas Schuster (3), Sebastian Thiern (2).
1. Siemens AG OEsterreich, Austria; 2. Siemens AG, Germany; 3. ASCR, Austria; 4. Wiener Netze GmbH, Austria

11053  G10 Environmental And Financial Impact Assessment Of Off–Grid Microgrids Using Energy Storage And PV
Edmund Schaefer (12), Yohannes Desta (1), Erik Goselink (1), Gerwin Hoogsteen (2), Johann Hurink (2), Richard van Leeuwen (2).
1. Saxion University of Applied Sciences, University of Twente, Netherlands, The; 2. University of Twente, the Netherlands

11098  G11 Enabling Heavy–Duty Charging Infrastructure in a Capacity Constrained Grid
Olav Henrik Skonnd (1), Ilkka Iiiva (1), Stig Ødegaard Ottesen (1), Lars Erik Olsen (2).
1. Smart Innovation Norway, Norway; 2. ASKQ, Norway

11099  G12 Review of Emerging Advanced Smart Charging Flexibility Business Models
Goncalo Mendes (1), Ville Tikka (1), Vahid Vahidinasab (2), Jasmhid Aghaie (1).
1. LUT University; 2. Nottingham Trent University

11152  G13 Exploring The Opportunities Of Sector Coupling – The Conflicting Interests Of Urban And Rural Energy Systems
Tuomas Vanhanen (12), Perri Järventausa (1).
1. Tampere University, Finland; 2. City of Tampere, Finland

11196  G14 Industrial Flexibility Options: Impact And Usage As A Service In The High–Voltage Level
Erik Zipperling (1), Markus Zdraal (1), Franziska Schmaltz (2).
1. University of Wuppertal, Germany; 2. Yncoris GmbH & Co. KG, Germany

11235  G15 Demonstration Of A Whole Energy Systems Accelerator
Joseph Melone (1), David Wyatt (2), Priya Bhagavathy (1), Federico Cofeile (1).
1. PND – University of Strathclyde, United Kingdom; 2. Energy Systems Catapult, United Kingdom

11307  G16 Green Fleet Project
Stanislav Hes, Jan Kula, Katerina Penkavova, CEZ Distribuce, a.s., Czech Republic

11320  G17 Use Of Performance Indicators To Encourage Proactive User Behaviours In Renewable Energy Communities
Riccardo Trevisan, Emilio Ghiani, Fabrizio Piló Università degli Studi di Cagliari, Italy

11346  G18 Business Models For Virtual Power Plants And Their Impact On Economic Operation
Gary Howorth (1), Iana Kockar (1), Paul Tuohy (1), Graeme Flett (1), John Bingham (2).
1. University of Strathclyde, United Kingdom; 2. Engineering Technology Centre Ltd (ETC), United Kingdom

11489  G19 Effects of Tariff Structures to the Revenue Streams of Local Energy Systems
Nikolaos Chrysanthopoulos, Dimitrios Papadaskalopoulos, Goran Strbac Imperial College London, United Kingdom

10852  G15 Why DSO Involvement In Energy Community Planning Is Expedient
Selina Kerscher (1), Naser Hashemipour (2), Pedro Crespo del Granado (2).
1. University of Oviedo supported by Phoenix Contact, Spain; 2. Norwegian University of Science and Technology, Norway

10916  G16 How Energy Efficiency Business affects Power System and New Business Model Suggestion from DSO
DeukSeon Yoon (1), Kyunghoon Kim (2), Junho Lee (3).
1. KEPCO ES, Korea Republic of (South Korea); 2. KEPCO ES, Korea, Republic of (South Korea)

10970  G17 Developing An Electricity Network For Net Zero
Shauna Graham, Jonathan Pollock, Anne Clarke NIE Networks, United Kingdom
### FORUM LEVEL 1

#### PROGRAMME

**FORUM LEVEL 1**

**11.00 – 12.30**

**10973**

I8 All Models Are Wrong, But Some Are Useful: An Exploration Of Validity And Confidence  
Daphne Geelen (1), Veronika Barta (2), Age van der Mei (4), Elias Hartvigsson (2), Jan-Peter Doornenink (1), Ricardo Pastor (6), Balint Hartman (3)  
1: Enexis DSO; 2: Endre; 3: Budapest University of Technology and Economics; 4: Dün; 5: IM University of Applied Sciences Munich; 6: R&D Nester

**10979**

I9 Solutions to Manage Local Flexibility Services for the Distribution Grid in the Energy Transition Scenario  
Serena Cianotti (1), Giulio Lenaz (2), Macarena Morgaz (3), Pablo Vargas Barrero (4)  
1: enel grids, Italy; 2: enel, Italy; 3: enel grids, Spain; 4: enel grids, Colombia

**11062**

I10 Development Possibilities of Distribution Network Service Charges of Low-Voltage Customers – Apartment Houses as Energy Communities  
Kimmo Lummi, Juha Koskela, Perni Jarventausta  
Tampere University, Finland

**11080**

I11 Technical Impacts of the Deployment of Renewable Energy Communities on Electricity Distribution Grids  
Julien Allard (1), Arnaud Rosseel (1), Louise Sadoine (2), Jamal Faraji (1), Thomas Brihaye (2), Filippo Capizzi (3), Boniface Nteziyaremye (4), François Bordes (4), François Vallée (1), Zacharie De Grève (1)  
1: University of Mons, Electrical Power Engineering Unit, Power Systems and Markets Research Group Belgium; 2: University of Mons, Dept of Effective Mathematics, Belgium; 3: ENGIE Laborollec, Belgium; 4: WeSmart, Belgium

**11236**

I12 Flexibility Solutions To Adapt E-REDES Business Management To Face Network Challenges  
Joao Torna (1), Margarida Siborro Lopes (1), Pedro Godinho Matos (1), Pamela Catrinque Martins (2)  
1: E-REDES, Portugal; 2: ENEDIS, France

**11247**

I13 Climate Analysis to Prevent Risk to Distribution Network Assets  
Charlie Dodds, Susan Miller, Alexandra Campbell, Matthew Jones, Malcolm Bebbington, David Cupples  
SP Energy Networks, United Kingdom

**11255**

I14 Meter Placement Algorithm for Reliable Distribution System State Estimation  
Rafael Steppan, Anna Pfendler, Jutta Hanson  
Technical University of Darmstadt, Germany

**11258**

I15 A Long-term Risk-based Approach To Investment Optimisation  
Dawn O’Brien, Joanne Peacock  
EA Technology, United Kingdom

**11281**

Diedoune Ecile Ewanga (1), Irfan Shaikh (2)  
1: University of Liège, Belgium; 2: Indian Institute of technology, India

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**GUIDED TOURS 5 & 6**

**14.30 – 16.00**

**11018**

G20 EleniaGO – Crowdsourcing Maintenance Inspections  
Harri Salomäki (1), Pauliina Salovaara (1), Heikki Malkamäki (2)  
1: Elenia Verkko Oy; 2: Ambientia Oy

**110205**

G21 Electrification Technologies And Grid Services Testing Inside Enel X Labs  
Christian Noce, Luigi Lanuzza, Massimiliano Maurizio De Benedetti  
Enel X Srl, Italy

**110217**

G22 Towards the digital transformation of Distribution System Operators using Knowledge Graphs and Conversational AI  
Ioan Toma (1), Juergen Umbrich (1), Sonja Laengle (1), Marc Iosp (1), Martina Theil (2), Alexander Sas (2), Werner Horst Reinwald (2), Andreas Theil (2), Alexander Wahler (1), Umutcan Simsek (3), Dieter Fensel (3)  
1: Onlim Gmbh, Austria; 2: Wiener Netze Gmbh Austria; 3: University of Innsbruck, Austria

**110267**

G23 Anonymisation Score For Time Series Consumption Data  
Cecilia Gerlitz (1), Axel Eriksson (1), Camilla Hansson (2)  
1: Vattenfall AB, Sweden; 2: Vattenfall Eldistribution AB, Sweden

**110373**

G24 Using Smart Meter Data to Predict and Identify Consumer Vulnerability  
Rob Wadsworth (2), Marnie Ellis (1), Lizaveta Troshka (1), Zoe Hodgins (2)  
1: National Grid; 2: Frazer-Nash Consultancy

**110384**

G25 SIORD, a New DSO-shared Data Hub to Monitor and Control Distributed Energy Resources in Spain  
Daniel Daví-Arderius (1), Moises Canales Lazo (2), Albert Estapé Vilà (3), David Martin Utrilla (4), Alberto Suárez Fontenla (5), Marta Viñas Gómez (6), Marta Castro Pérez-Chirinos (7)  
1: e-Distribución Redes Digitales, Spain; 2: Viesgo Distribución (Grupo EDP); 3: ASEM; 4: I-DE Redes Eléctricas Inteligentes, S.A.U.; 5: Unión Fenosa Distribución; 6: CIDÉ; 7: AELEC
TOUR 5
G20 > H8
PANELS
FORUM

10514
G26 Central Monitoring Application used at Brno University of Technology
Tomáš Bajánek (1), Viktor Jurák (2), Jaroslava Orságová (2), Lubomir Novák (2)
1: ABB, Czech Republic; 2: Brno University of Technology, Czech Republic

10560
H1 Smart Meters Technology Intervention – benefits to Consumers and Utility
Ruban Makroja, Shriram Savarkar, Devanjay Dey, Vishal Agrawal
Tata Power Mumbai Distribution, India

10601
H2 New Tool To Improve The Grids Status Monitoring And Customer Connections Process
Rosalba Russo (2), Francesco Armadei (1), Giovanni Franzone (1), Luciano Cocchi (1), Massimo Bolognesi (1), Alberto Cerretti (1)
1: Enel grids srl; 2: ENEDIS, France

10673
H3 Renewable Energy Data Platform Including Electric Power Transmission and Distribution System
Sung-Ho Park, Jaein Kim, Simin Sung, Joo-Young Moon
KEPCO(Korea Electric Power Corporation), Korea, Republic of (South Korea)

10684
H4 HAPe Optimizing Customer Relation by Automatic Task Distribution Using Constrained Optimization and Natural Language Processing
Romain Gemignani (1), Eunice Akan (1), Jean-Pierre Delrieux (1), Abdoulaye Sayouti Souleymane (2)
1: ENEDIS, France; 2: Avignon University – France

10785
H5 Smart Metering, Monitoring & Optimising LV Network performance
Gary Macdonald (1), Caroline Loughran (2), Cianar Higgins (3)
1: Scottish Power Energy Networks, United Kingdom; 2: Scottish Power Energy Networks, United Kingdom; 3: DerryHerk LTD, United Kingdom

10804
H6 Cybersecurity In DSO OT Environment Using Advanced Anomaly Detection
Peter Ceferin (1), Damjan Bobek (2), Aljaž Kmeč (2), Toma Kolar (2), Igor Štih (1)
1: SmartCom, Slovenia; 2: Elektro Celje, Slovenia

10863
H7 Time Series Machine Learning Augmented With Social Network Events To Improve National Electricity Consumption Profile Estimation
Amir Alyafi (1), Pierre Cauchois (2), Benoit Delinchant (1), Alain Berges (2)
1: G2ELAŚ, France; 2: ENEDIS, France

10919
H8 Data Quality Challenges in Existing Distribution Network Datasets
Frederik Geth (1), Marta Vanin (2), Dirk Van Hertem (2)
1: GridQube, Australia; 2: KU Leuven and EnergyVille, Belgium

10113
I20 Incentive Regulation For Lower Losses And More Efficient Use Of The Grid When Random Photovoltaic DG Is Connected In Argentinian LV Networks
Alejandro Jurado, Edgardo Vinson, Fernando Nicchi
Universidad de Buenos Aires, Argentina Republic

TOUR 6
I20 > J3
PANELS
FORUM

10240
I21 Model and Tariff Design for Multifunctional Distribution Networks
Senad Aganovic (1), Elvira Becirovic (2), Edina Aganovic (3)
1: Regulatory commission for energy in Federation on Bosnia and Herzegovina; 2: Public Company «Elektroprivreda BiH» d.d. Sarajevo; 3: Independent System Operator in Bosnia and Herzegovina

10268
I22 Swedish Approach For The Assessment And Monitoring Of The Smart Grid Development
Maria Dalheim, Herlita Bobadilla Robles, Mohamadreza Baradar, Carl Johan Wallnerström
The Swedish Energy Markets Inspectorate, Sweden

10317
I23 Metrics for the Validation of Agent-Based Local Flexibility Markets
Alexandra Karrman (1), Maximilian Kilthau (1), Jan-Philipp Beck (1), Christian Derksen (2), Kamil Korotkiwicz (3), Martin Asman (4), Alexander Fay (1)
1: Helmut Schmidt University / University of the Federal Armed Forces Hamburg; 2: University of Duisburg–Essen; 3: PSI GridConnect GmbH; 4: University of Wuppertal

10391
I24 Relax Regulation and Market Frames to Increase Sector Coupling
Eduardo Corsetti
RSE, Italy

10393
I25 The UMEI – Universal Market Enabling Interface. Enabling Standard Interaction with Various Flexibility Markets to Procure Grid Services
Carlos Darnas Silva (1), Gesa Mizar (4), Arnaud Debray (2), Mahtab Kaffash (3), Narve Sætre (4), Chloé Dumont (2), Giancarlo Marzano (2)
1: E-REDES, Portugal; 2: N-SIDE, Belgium; 3: PSI GridConnect GmbH; 4: NODES, Norway

10407
I26 Design of an Auction-based Local Energy Market for Integrated Electricity and Heat Networks Coordinated with Wholesale Market
Sara Haghiham, Hannu Laaksonen, Miadreza Shafi-kehah
University of Vaasa, Finland

10411
I27 Public Consultation Platform for Network Development Plan
Tina Salmi (1), Harri Salomäki (2), Ilkka Luoma (3)
1: Elnia Oy; 2: Elenia Verkko Oyj; 3: Vincit Oyj

10445
I28 Regulatory Learnings from EU Funded Flexibility Projects. The i-DE Case: Preparing the Future DSO.
Santiago Gallego Amores (1), David Martín Utrilla (1), José Carlos Damas Silva (1), Carlos Chávez Ávila (2), Beatriz Alonso Santos (1), Santiago Gallego Amores (1), David Martín Utrilla (1), José Carlos Damas Silva (1), Carlos Chávez Ávila (2), Beatriz Alonso Santos (1)

10465
I29 Real-Time Pricing Tariffs for Flexible Energy Storage Systems Considering the Market and Grid Conditions
Oliver Koch (1), Christian Möller (1), Marcus Zdrallek (1), Alexander Rothe (1)
1: University of Wuppertal, Germany; 2: WSW Energie & Wasser AG
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<td>I30 An Assessment Of The GB Energy Market’s Suitability For Delivering A Customer–Focused Net-Zero Approach</td>
<td>Lawrence Hunter (1), Yiango Mavrocostanti (1), Helena Tauber (2), Ann Zhang (2), Alex Whittaker (2), Sarah Deasley (2)</td>
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<td>10569</td>
<td>I31 Privacy by Design in Local Electricity Markets: A Differentially Private Market Mechanism</td>
<td>Milad Hoseinpour, Mahmoud-Reza Haghifam</td>
<td>Tarbiat Modares University, Iran, Islamic Republic of</td>
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<td>10576</td>
<td>I32 Volumetric Or Capacity-based Grid Tariffs: A Case Study For Residential Consumers In Flanders</td>
<td>Robbert Claeya (1), Rémy Cleenwerck (1), Jos Knockaert (1), Jan Desmet (1)</td>
<td>1: Ghent University, Belgium; 2: Vrije Universiteit Brussel, Belgium</td>
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<td>10629</td>
<td>I33 Reactive Power Flows From MV To HV Grids</td>
<td>Mauro De Masi (1), Andrea Vincenzo Calamera (1), Giovanni Valtorta (1), Sergio Severa (1), Giulio Lenaz (2)</td>
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<td>10653</td>
<td>I34 Business, Regulatory, and Technical Challenges for Integration of Network Aware Algorithms in Local Flexibility Markets</td>
<td>Pau Plana i Ollé (1), Farhan Farrukh (1), Andrea Mazza (2)</td>
<td>1: Smart Innovation Norway, Norway; 2: Politecnico di Torino</td>
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<td>10682</td>
<td>I35 Business Case of DSO Peak Shaving to Reduce Capacity Payments to Upstream Network Operators</td>
<td>Pau Plana i Ollé (1), Farhan Farrukh (1), Maite Thoma (2), Gesa Milzer (3)</td>
<td>1: Smart Innovation Norway; 2: Badenova gmbh; 3: NODES Market</td>
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<td>10697</td>
<td>I36 Incentive Scheme for Efficient Grid Utilization and Use of Flexibility Services</td>
<td>Marie Swenman, Maria Dalheim, Carl Johan Wallnerström, Staffan Wikstedt, Linn Sjöström, Albin Emanuelsson</td>
<td>The Swedish Energy Markets Inspectorate</td>
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<td>10709</td>
<td>J1 Performance Comparison of Three Network Tariffs in Combination With a Local Electricity Market</td>
<td>Sjoerd Droumen, Phuong Nguyen, Koen Kok</td>
<td>Eindhoven University of Technology, Netherlands, The Netherlands</td>
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<td>10814</td>
<td>J3 Remuneration And Coordination Aspects Of Flexibility By Power–to–Gas And Gas–to–Power Technologies In Distribution Networks</td>
<td>Nuran Changir Martin, Floris van Lith, Anne van der Molen Stedin</td>
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**Guided Tours**

**Security, Regulation & Data Protection**

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<td>H9 Leveraging Smart Metering Data To Estimate The SAIDI</td>
<td>François Cordel, Emmanuel Vialis, Laure Detoc, Lisa Laisné, Michél Lapacherie</td>
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<td>10989</td>
<td>H10 Data Science Challenges; A Wholes Systems Lens of Solving Energy Issues</td>
<td>Liam McSweeney (1), Stephan Haben (2), Samuel Young (2)</td>
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<td>11009</td>
<td>H11 Open Data; Delivering Results For Data Stakeholders</td>
<td>Lewis Jones, Liam McSweeney</td>
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<td>1110</td>
<td>H12 Estimating Local Electricity Consumption And Production For Small Geographic Areas using smart meters</td>
<td>Anne De Moliner, Pierre Cauchois</td>
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<td>11121</td>
<td>H13 A State Of the Art Language Model Trained On A Corpus Of Texts Generated From The Set of DSO Activities</td>
<td>Eunice Akani (1), Romain Gemignani (1), Rim Abrougui (2)</td>
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<td>11130</td>
<td>H14 Automated Development of the Software Model of the Distribution Network Based on Field Collected Data and GIS Coordinates</td>
<td>Vasyl Makohonchuk (1), Vsevolod Pavlovsky (2), Levan Khukhunashvili (3)</td>
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<td>11243</td>
<td>H16 Supervised Machine Learning For False Data Injection Detection: Accuracy Sensitivity</td>
<td>Jaime Turanzas, Monica Alonso, Hortensia Amares, Josue Gutierrez, Sergio Pastrana</td>
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<td>H17 Smart Metering Project Serbia 2022 Prospective For DSO Operation Improvements</td>
<td>Jovan Vujasinovic (1), Saša Gavrilovic (2), Nikola Rajakovic (1)</td>
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<td>11256</td>
<td>H18 Making The Most Of Existing Data – A Data Lake Approach To Risk Quantification</td>
<td>Joanne Peacock, Dawn O’Brien</td>
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<td>H20</td>
<td>Leveraging Big Data Technologies For Supporting DSO Operations And Adding Business Value To The Collected Data</td>
<td>Leon Maruta (1), Kristijan Koželj (1), Miran Rožer (1), Boštjan Turinek (1), Rok Dolinšek (2), Jure Kop (2), Andrej Somrak (2)</td>
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<td>H22</td>
<td>Architectural And Systems Approach To Sustainable Digital Transformation Of Distribution Utilities</td>
<td>Māyanks Sharma (1), Nand Kishor Narang (2), Tom Berry (1)</td>
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<td>H23</td>
<td>Proactive Complaint Management with ClientID</td>
<td>Davide Raposo (1), Inês Graça (1), Isabel Preto (2), Ricardo Santos (1)</td>
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<td>J4</td>
<td>DN-FLEX: Local-fl exibility Market Platforms For Distribution Networks</td>
<td>Klemen Knz (1), Boštjan Blažič (1)</td>
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<td>J5</td>
<td>Dynamic Network Tariffs for Efficient Distribution System Utilization</td>
<td>Tadej Šinkovec (1), Maja Savinek (1), Elektro Ljubljana d.d. (1), Slovenia</td>
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<td>J6</td>
<td>Proposal For Improvement Of The Supply Continuity Regulation In Brazil</td>
<td>Cristiano Silveira (1), Gustavo Silva (1), Alden Antunes (1), Carlos Oliveira (1), Mauricio Dutra (2), Jyvago Terceiro (2), Thiago Souza (2)</td>
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<td>J7</td>
<td>Predicting Peak Prices in the Current Day-Ahead Market</td>
<td>Bernt Bremdal (1), Shayan Dadman (2)</td>
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Programme updated on 26 April 2023. Titles and speakers are subject to change at any time. Cancellation may occur. Download the APP to see the last updates.
POSTER SESSION 6
CUSTOMERS, REGULATION,
DSO BUSINESS & RISK MANAGEMENT

11155
J19 Simulation And Comparison Of The Impact Of Different Price Tariffs On Grid Utilization
Alexander Vanselow (1), Lukas Kalisch (1), Simon Krahl (1), Albert Moser (2)
1: FGH e.V., Germany; 2: RWTH Aachen University, Germany

11381
J20 A Scalable Open-Source Co-simulation Framework for Assessing the Effectiveness of Flexibility Activation Mechanisms on Congestion in Dutch Distribution Networks
Bart van der Holst (1), Gijs Verhoeven (1), Edwin Matthijssen (2), Mark Vrijlandt (2), Ruduan Plug (2), Arjen van der Meer (3), Koen Kok (1)
1: Eindhoven University of Technology, Netherlands, The; 2: TNO, Netherlands, The; 3: Delft University of Technology, Netherlands, The

11385
J21 Flexibility Baselining In The UK – An Assessment Of Historic Methods
Owen Patrick (1), Sarah Sheehy (1), Gordon McFadzean (1), Genghao Tian (2), Nisha Doshi (2), Daniel Burke (2)
1: TNEI, United Kingdom; 2: SSEN, United Kingdom

11394
J22 A Review on Local Flexibility Market Advancements: Practices in Nordic Countries
Milad Mousavi (1), Manuel Alvarez (1), Jin Zhong (2)
1: Luleå University of Technology, Sweden; 2: The University of Hong Kong

11404
J23 Method for the Assessment of Structural Parameters for Distribution Grid Cost Drivers
Luis Böttcher, Simon Braun, Antigona Selimaj, Antoni Chajan, Andreas Ulbig
IAEW at RWTH Aachen University, Germany

TECHNICAL VISITS

Two technical visits will take place on Friday 16 June, with a coach departure from the Congress Centre La Nuvola. Tickets had to be purchased before the Session.

TECHNICAL VISIT 1
E-DISTRIBUTIONE PRIMARY SUBSTATION VILLANOVA DI GUIDONIA
PRIMARY SUBSTATION VILLANOVA DI GUIDONIA AND NEW TECHNOLOGIES EXPERIENCE

The Primary Substation of Villanova di Guidonia is located 40mn from the conference venue.
Transportation to the Primary Substation will be organized for participants:
1. Departure at 09.00 from the Conference Centre La Nuvola
2. Return at La Nuvola around 13.00 (departure from Villanova scheduled at 12.15)

PROGRAMME:
The Primary Substation of Villanova di Guidonia serves over 10,000 grid customers in the North Eastern area outside Rome (cities of Guidonia Montecelio and Tivoli). It is a typical E-Distribuzione standard Primary Substation. It is equipped with 2 25 MVA HV/MV transformers, 2 HV Hybrid Modules (Air-SF6) and a MV compact air insulated switchgear. Besides the visit of the Primary Substation and its equipments, participants will be invited to experience the new technologies currently in use in E-Distribuzione. Booths with examples of new technology applications (VR, AR, Drones, 3D Modeling) will be installed inside the PS perimeter. It will also be possible for visitors to test some of them.

TECHNICAL VISIT 2
L’AQUILA E-DISTRIBUTIONE TRAINING CENTRE

The Training Centre of L’Aquila is located 1,5 hours from the conference venue. Transportation to the Training Centre will be organized for participants:
1. Departure at 08.30 am from the Conference Centre La Nuvola
2. Return at La Nuvola around 14.30 (departure from L’Aquila scheduled at 13.00)

PROGRAMME:
1. Presentation of the E-Distribuzione Training Centers and Training Policy (about 45 minutes)
2. Indoor and outdoor training facilities visit (18,500 sqm, about 2 hours):
   1. The Primary Substation: HV section, HV/MV transformers and MV section
   2. The MV network and switching devices, joints and terminals laboratories, the remote control devices
   3. Secondary substations and Pole Mounted Transformers
   4. The LV network: LV power components, meters and remote meter management
   5. Virtual Reality training system

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