

CIGRE NEWSLETTER

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WELCOME TO CIGRE • THANK YOU GOTF™ SPONSORS**



PRESIDENT'S CORNER

BY: CHRIS ROOT
CIGRE USNC President

This newsletter follows the very successful Grid of the Future™ [GOTF™] Symposium, held November 11-14 in Raleigh, NC, and hosted by Quanta Technology. With over 400 participants, this was one of the highest-attended GOTF™ events in its 12-year history.

The quality of the four panel sessions was exceptional, featuring many senior executives in attendance. Keynotes were delivered by Damir Novosel, President of Quanta Technology, and Ed Baine, President of Dominion Energy, Virginia. The symposium also showcased 100 technical papers.

Other highlights included a memorable reception at the North Carolina Museum of Natural Sciences, four diverse and informative tours of local companies, and two engaging tutorials. In addition, Wednesday's luncheon featured presentations by John McDonald, who provided insights on Technical Activities, and Philippe Adam, CIGRE Secretary General, who discussed the global initiatives of CIGRE.



PRESIDENT'S CORNER

This year's symposium also featured two particularly impactful initiatives. The Women in Energy (WIE) hosted an empowering event that brought together local Girl Scouts to introduce them to STEM topics and connect them with women engineers. Supported by Quanta Technology, this event received glowing feedback from both the girls and their parents. A new initiative this year was inviting local university students to attend the symposium's afternoon sessions at no cost. Over two dozen students participated, engaging in technical paper sessions and panels while networking with sponsoring companies to explore possible internship and career opportunities.

The WIE Breakfast was another highlight, featuring an inspiring talk by Majida Malki from Quanta Technology, who shared her personal and professional journey. Similarly, the Next Generation Network (NGN) Breakfast hosted a presentation by Aditie Garg of NREL.

I would also like to thank the sponsors of the 2024 Grid of the Future™ Symposium. Without their support, this event would not have been possible. [A complete list of the GOTF™ sponsors is included on [page 14](#).] A special thanks go to Quanta Technology for being a fantastic host and to the Raleigh Convention Center for providing an excellent venue.

Looking ahead, planning is underway for the 2025 Grid of the Future™ Symposium, which will be held in Denver, CO, and hosted by POWER Engineers. More details will be shared as we approach the event.

Thank you for being part of the U.S. National Committee of CIGRE, the largest in the world. We continue to grow in individual and corporate membership. Wishing you a restful and joyful holiday season!

Chris Root
USNC President

AROUND THE SYMPOSIUM



2024 Highlights:

- 2024 CIGRE Paris Session => 117 Synopses Submitted to Paris (104 Synopses Accepted for 2024); USNC had 88 Papers Accepted – Third Behind China and India in Number
- CIGRE USNC Meeting in Paris => Most Comprehensive Overview of Technical Activities for each of the 16 Study Committees
- 2024 CIGRE USNC GOTF™ => 102 Papers Accepted (3 were Withdrawn)
- 33 new CIGRE WGs so far in 2024 => Many US Subject Matter Experts Nominated
- Mentorship Program (John McDonald article titled “The Mentor and the Mentee: A little philosophy, lots of practical advice” published in ELECTRA October 2024)

CIGRE WGs (Most Recent)

- TOR-WG A2.76: Power Transformer Passive Protection Against Internal Arcing Faults
- TOR-WG C5.40: Framework for Retail Competition in Electricity Markets
- TOR-WG A2.75: Tap Changer Specification, Condition Assessment, Testing and Maintenance Guidelines
- TOR-WG B1.95: Mechanical Performance and Limits of Submarine Power Cable Systems
- TOR-WG C5.39: Regulatory Frameworks and Market Integration for Assets Under Non-firm Grid Connection
- TOR-WG C5.38: Certificates of Origin for Electricity in Power Markets
- TOR-WG D2.61: High Voltage Power Line Carrier Communications Current State and Future Application
- TOR-WG D2.59: Intelligent Computing for Power Industry
- TOR-JWG A2/D1.74: Online Moisture Monitoring of Transformers for Ageing Assessment
- TOR-WG B5.86: PACS Interfaced Asset Management and Condition Monitoring Using Innovative Technologies
- TOR-WG C1.54: Assessment of System Reserves and Flexibility Needs in the Power Systems of the Future



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For power system expertise

CIGRE Publications:

- Reference Papers
- ELECTRA (bimonthly digital magazine)
- CIGRE Science & Engineering Journal [CSE] (published three times per year)
- Green Books (listed below)
- Papers and Proceedings
- Technical Brochures (most recent listed on [page 12.](#))
- eCIGRE (home to CIGRE's resource of 12,000+ technical publications)

CIGRE Green Books:

- SC A2 Transformer and Reactor Procurement
- SC A3 Switching Equipment
- SC B1 Accessories for HV and EHV Extruded Cables – Volume 1: Components
- SC B1 Accessories for HV and EHV Extruded Cables – Volume 2: Land and Submarine AC/DC Applications
- SC B2 Overhead Lines
- SC B2 Compact Overhead Line Design
- SC B2 Techniques for Protecting Overhead Lines in Winter Conditions
- SC B2 Modelling of Vibrations of Overhead Lines Conductors
- SC B3 Substations
- SC B4 Flexible AC Transmission Systems
- SC B5 IEC 61850 Principles and Applications to Electric Power Systems
- SC C1 Power System Assets – Investment, Management, Methods and Practices
- SC C4 Power System Dynamic Modelling and Analysis in Evolving Networks
- SC D2 Utility Communication Networks and Services
- All SCs Electricity Supply Systems of the Future

Green Books are CIGRE's flagship reference publications. CIGRE members receive a 40% discount.

NEXT GENERATION NETWORK (NGN) CORNER

BY: JAMES BERGER

CIGRE USNC Next Generation Network Chair

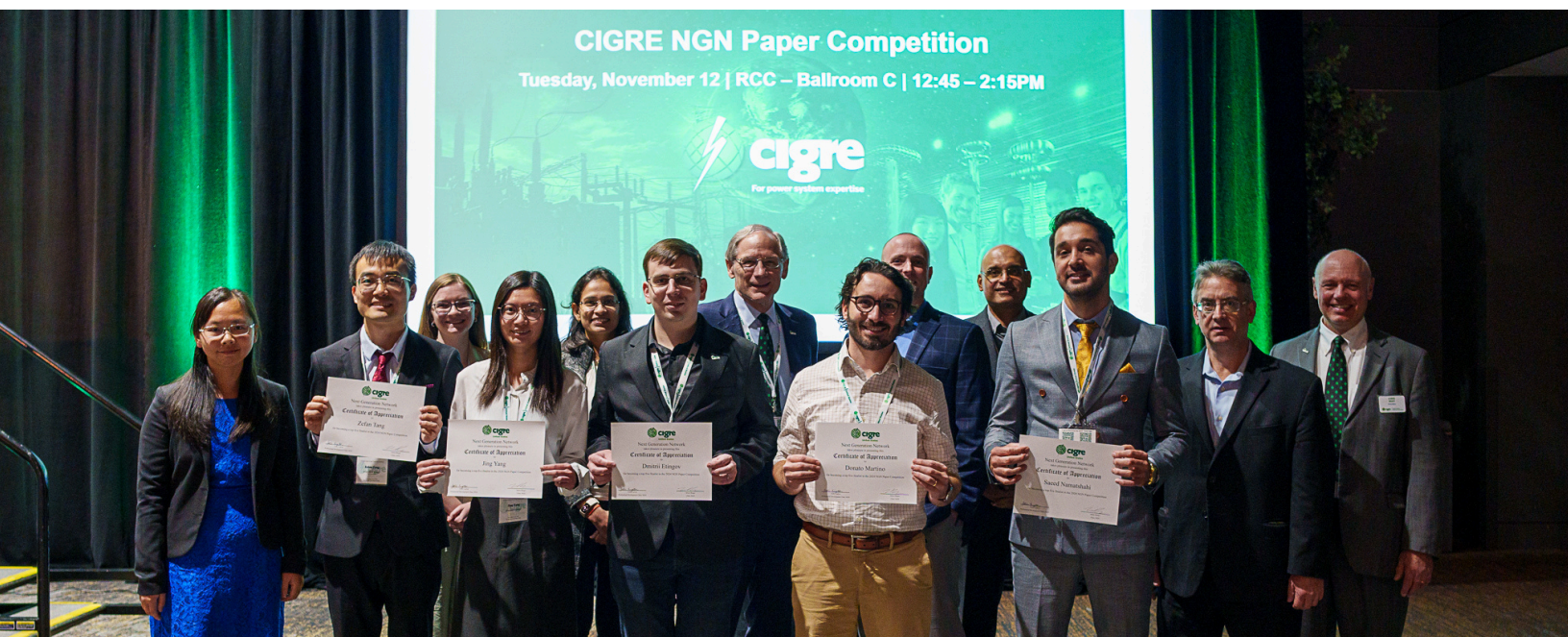


The Next Generation Network (NGN) hosted several events at the 2024 Grid of the Future™ Symposium in Raleigh, NC, including its annual NGN Paper Competition and NGN Dinner and Networking event.

The Paper Competition features a rigorous selection process with a panel of highly experienced judges, starting with the submission of a synopsis on each contestant's research topic. These synopses were narrowed down to the top 10 contestants, who then completed a full paper. From these, the top 5 were selected to present at this year's Grid of the Future™ Symposium in Raleigh, NC, where the winner was determined. Our top 5 contestants were:

- Dmitrii Etingov, Stony Brook University
- Sally Yang, Eversource
- Donato Martino, Exelon
- Zefan Tang, Eversource
- Saeed Nematshahi, University of Denver

The presentations covered a variety of topics, including AI, machine learning, and advanced wildfire planning. We are proud of our top 5 presenters and all the contestants who participated this year. It was a close race and a tough decision for our judges. This year's winner was Zefan Tang, with his paper and presentation on Enhancing Power Distribution Defect Identification with Video-Based Computer Vision: A Two-Step Defect Detection Method.



NEXT GENERATION NETWORK (NGN) CORNER



The NGN Dinner and Networking event was held at Watts & Ward in downtown Raleigh and saw a great turnout of NGN members. Doug Jones of POWER Engineers, Inc. gave an excellent presentation to the NGN members in attendance on how to advance in their career.

Are you an NGN member and have an exciting project you're working on right now? We want you to participate in the 2025 NGN Paper Competition! Be on the lookout for emails about the schedule for next year's competition in the coming months, and start brainstorming ideas for your paper now.



IT TAKES A WORLD, CIGRE, TO FULFILL THE ENERGY TRANSITION

BY: MIKE HEYECK
CIGRE VP Finance and Marketing

— CIGRE Energy Transition Vision in Action

The [CIGRE Strategic Plan for the Energy Transition](#) with 2030 horizon is well positioned to fulfill a net-zero carbon future for our world. Certainly, the “under the hood” elements of our technical structure, our digital platform, and our unbiased culture is evident in the strategic plan, but results matter as well.

The Energy Transition will not play according to your grandparent’s grid. Intermittent resources, such as solar and wind, provide challenges. The grid requires “throttling” beyond when the sun shines and the wind blows to meet moment-by-moment ever-increasing demands, requires extensive transmission reach to gather the distributed resources rather than point sources previously, and requires market and operational rules to aggregate hundreds and thousands of times more control points (e.g., distributed resources such as roof-top solar and distributed storage).



The electricity sector has decarbonized far greater than any other sector, so stay tuned for other sectors finding electricity for a resource. Artificial Intelligence has created exponential needs for data centers that are electricity hogs with little tolerance for voltage fluctuations. The end result is far greater electricity demands coming soon to a grid near you.

I believe that engineers and technology leaders will solve the issues ahead providing sustainable electricity for all with reliability, resilience, and quality far superior to today. They will succeed for the betterment of society.

CIGRE since 1921 has invited many to the table across the world to share knowledge and create outcomes far superior. What better way to enhance one’s career, one’s company, one’s country than to be at the table with peers globally sharing knowledge and best practices. You cannot do it alone, and CIGRE has demonstrated that for 103 years.



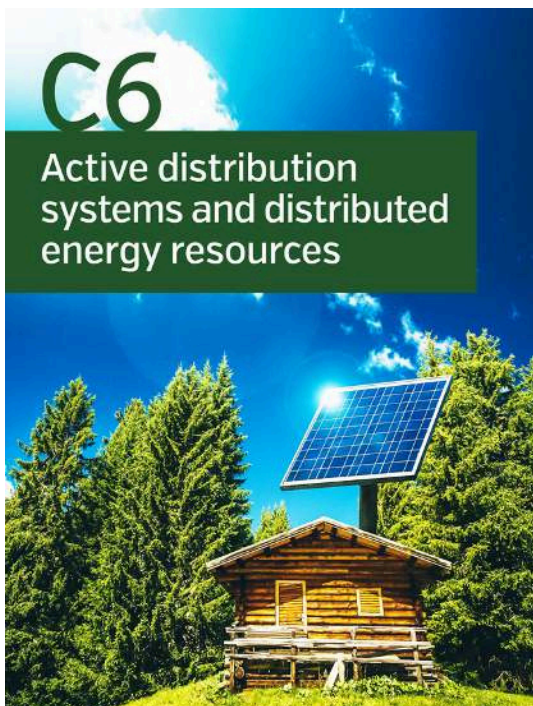
— CIGRE Knowledge Sharing

A few sample results recently released are below to highlight the Technical Brochures produced by thousands of CIGRE volunteers across the world by our Technical Council. Are you interested in topics such as Electricity Storage, Grid Flexibility and Sustainability?

Members get Technical Brochures for free. Non-Members need to pay, so why not [become a member](#)? If you participate in CIGRE Working Groups, the outcome is priceless.

Electricity Storage

Technical Brochure 932 - Aggregation of Battery Energy Storage and Distributed Energy Resources



Battery energy storages systems (BESS) are key enablers for the implementation of active distribution system functions by providing a range of grid services at the distribution level. This TB describes these grid-support services, distributed BESS aggregation approaches, BESS operating constraints in terms of battery technology, weight, maintenance, and coordination with other controllers and regulatory and legal frameworks for BESS grid service delivery, regulatory and market considerations.

[Download the Technical Brochure on eCIGRE](#)

Technical Brochure 935 - Feasibility Study and Application of Electric Energy Storage Systems Embedded in HVDC and STATCOM Systems

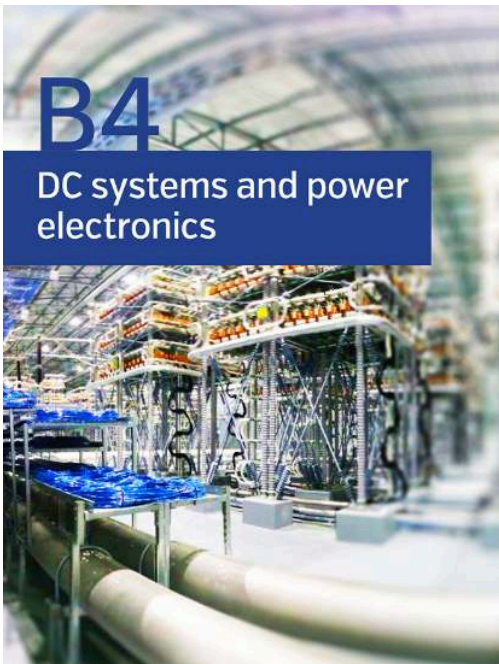
The integration of Energy Storage (ES) Systems, like batteries and supercapacitors, in power systems is accelerating globally due to their ability to enhance the flexibility and efficiency required to integrate intermittent renewable energy sources. ES systems embedded in HVDC and STATCOM devices can enhance network resilience and ancillary services. This brochure provides insights on converter topologies, modeling, integration options, ancillary services, benefits, and challenges of ES integration in HVDC/STATCOM systems.



[Download the Technical Brochure on eCIGRE](#)

Grid Flexibility

Technical Brochure 934 - Interaction Between Nearby VSC-HVDC Converters, FACTS Devices, HV Power Electronic Devices and Conventional AC Equipment



This Technical Brochure focuses on the interaction between VSC-HVDC converters and other power electronics or passive HV devices. It provides recommendations on analysis, modelling, and mitigation of interactions between VSC-HVDC converters or passive HV devices. The document is divided into several chapters, each focusing on a different aspect of the interaction between VSC-HVDC converters and other devices.

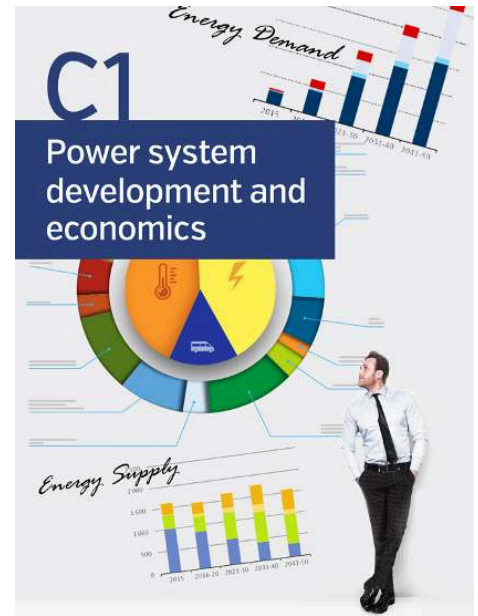
It provides a guideline for identification and classification of the main interactions between VSC-HVDC converters and other devices and grid components, as well as recommendations on analysis tools and methodologies, study area selection, and practical issues such as confidentiality and model exchange between vendor systems.

[Download the Technical Brochure on eCIGRE](#)

Sustainability

Technical Brochure 938 - Global Interconnected and Sustainable Electricity System - Effects of Storage, Demand Response and Trading Rules

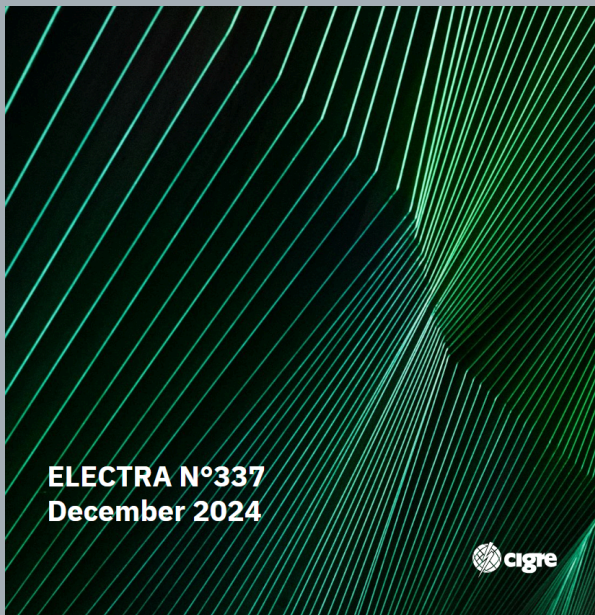
Following an initial pre-feasibility study on the global power grid concept, which highlighted the value of interconnections between continents for more efficient implementation of wind and solar power worldwide, an extension was conducted to consider alternative solutions such as storage and demand response. In addition, the commercial rules and governance issues of a global grid have been added to the scope.



[Download the Technical Brochure on eCIGRE](#)

[For more about CIGRE and the energy transition visit our section on \[cigre.org\]\(http://cigre.org\)](#)

ELECTRA CIGRE's Digital Magazine



[READ MORE](#)

ELECTRA N°337 December 2024

[Featured in this edition:](#)

GLOBAL CONNECTIONS

- It takes a World, CIGRE, to fulfill the Energy Transition
- Realizing More from Less: Co-evolution of Supply and Demand in the Technologically Transformative Era
- CSG Promotes the Construction of New Type of Power Systems through Technology Innovation

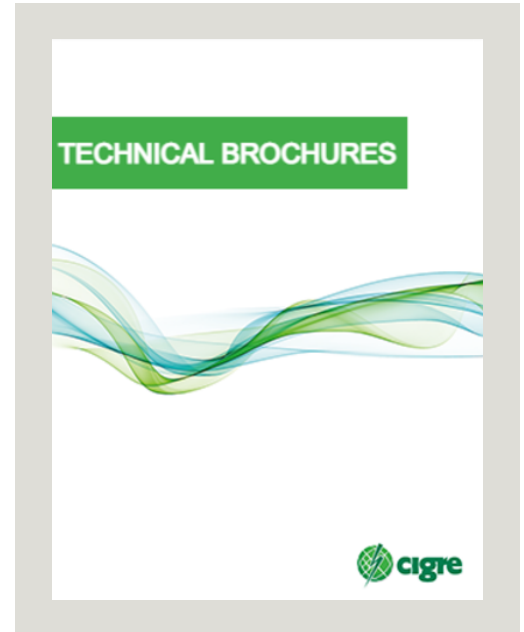
TECHNOLOGY E2E

- Challenges for Mitigating Natural Disasters on Overhead Transmission Lines - Strong Wind
- Development of Microgrids for Rural Electrification in India: The Case of Keonjhar
- Recent Development of Eco-Friendly Power Transformer Fluids in Korea
- Key Technology for Large-scale Clean Energy Transmission

PUBLICATIONS

The latest Technical Brochures are now available on eCIGRE:

- **TB 941:** The Impact of Electricity Market Interventions by System Operators during Emergency Situations
- **TB 940:** Power Transformer Audible Sound Requirements
- **TB 939:** Analysis of AC Transformer Reliability
- **TB 938:** Global Interconnected and Sustainable Electricity System - Effects of Storage, Demand Response and Trading Rules
- **TB 937:** Condition of Cellulose Insulation in Oil Immersed Transformers after Factory Acceptance Test
- **TB 936:** Enhanced Information and Data Exchange to Enable Future TSO-DSO Coordination and Interoperability
- **TB 935:** Feasibility Study and Application of Electric Energy Storage Systems Embedded in HVDC and STATCOM Systems
- **TB 934:** Interaction Between Nearby VSC HVDC Converters, FACTS, Devices, HV Power Electronic Devices and Conventional AC Equipment
- **TB 933:** Requirements and Application of UHF PD Monitoring Systems for Gas Insulated Systems
- **TB 932:** Aggregation of Battery Energy Storage and Distributed Energy Resources
- **TB 931:** Technical Requirements and Field Experiences with MV DC Switching Equipment



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