

Study Committee C6 - Active Distribution Systems and Distributed Energy Resources

Introduction to C6 and call for NGN participation

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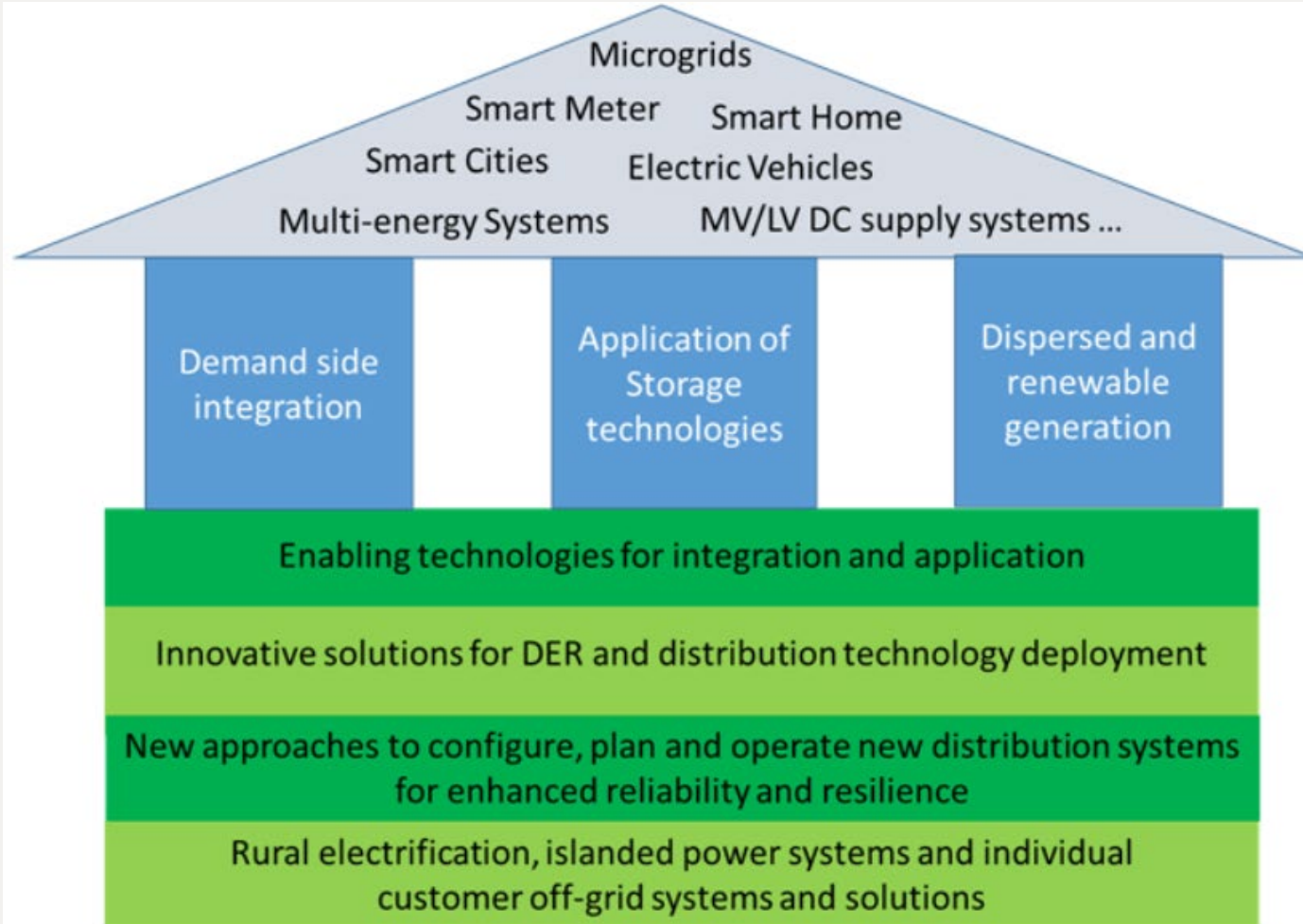
For power system expertise

Study Committee (SC) C6 - Main areas of attention

- **Enabling technologies for renewable and distributed energy resource integration and application:**
 - Active network management, microgrids, virtual power plants, distribution management systems (DMS, ADMS, DERMS), DER monitoring and control, aggregation systems and platforms, block-chain applications
- **Innovative solutions for DER and distribution technology deployment:**
 - Smart inverters and power electronic interfaces, interconnection and integration requirements, MV/LV DC supply systems, distribution system modernization
- **Storage technologies:**
 - Deployment of various storage technologies such as electrochemical electric battery energy storage systems, flywheels, flow batteries, and new storage technologies, hydropower, hydrogen, multi-energy solutions (including thermal storage), power2X applications (including power to heat, power to gas), electric vehicles
- **New approaches to configure new distribution systems for enhanced reliability and resilience:**
 - Islandable grid connected microgrids, power exchange between microgrids
- **New approaches to determine the impact and plan and operate distribution systems in the context of a wide deployment of DER:**
 - Including the analysis of hosting capacity and protection
- **Consumer integration and empowerment:**
 - Demand side integration and participation, demand response, load management, smart load, new customer sectors such as electric vehicles, smart home and smart meter applications with impact on distribution systems
- **Smart cities:**
 - Integrated distribution system technologies, power, control, and information and communication technology deployment for flexibility, integration of multi-energy systems
- **Rural Electrification:**
 - Islanded power systems and individual customer off-grid systems, new solutions, weak grid connected systems.



Study Committee (SC) C6 - Main areas of attention



The rooftop:
Applications of interest

The pillars:
DER in distribution
systems

The base:
Areas of attention



2022 in review for C6

Paris Session 2022

- 41 formal contributions to the C6 GDM with 6 industry experts presenting
- 52 C6 papers were accepted
- 49 C6 posters were presented

Webinars & tutorials

- Smart Cities (21/04)
- Electric Vehicles as Distributed Energy Resources (Paris Session)
- Medium Voltage DC Distribution Systems (18/10)

Technical Brochures published

- TB 875 - Medium Voltage DC Distribution Systems (JWG C6/B4.37)
- TB 863 - Multi-energy System Interactions in Distribution Grids (JWG C6/C1.33)

Other events

- The Kyoto Symposium - 154 papers from 21 countries were presented
- SEERC 2022 – 15 presentations, 30 posters, and 9 tutorials



Technical Activities – NGN involvement

Working Groups (WG) – WG deliver a technical document that covers a topic of interest to the SC. NGN members can provide an invaluable contribution to this process whilst gaining an international perspective on the subject.

Paper reviews – C6 are involved in organising a range technical Symposiums, Colloquiums, and the Paris Session part of the organisation includes reviewing abstracts and papers. NGN members who take part in the review process gain an understanding of the ideas at the forefront of the industry.

Strategic Plan – The SC are currently drafting the new strategic direction of the community for the next four years. All ideas and contributions are welcomed by the SC with NGN members able to provide a unique outlook on the changing distribution system industry.



NGN Involvement – C6 Chair and NGN views

Kurt Dedekind (SC Chair)

“Study Committee C6 stands at the forefront of the energy transition. NGN members will thus participate in shaping the future of the energy industry by being involved in the Study Committee activities. We thus invite NGN members to actively engage with our structures. Your technical acumen, organisational capability and link to the future world of work is crucial to the strategic success of our C6 activity”

Jacqui Mills (C6 NGN Member Australia)

“I was drawn to C6 and in particular the Rural Electrification working group with Kurt because it gave me an opportunity to share what I was learning at the forefront of the energy transition in Australia (VPP demo lead, demand response projects, consumer education research) with developing nations, to advance access to electricity. Kurt has created a great culture for committee and NGN members to meaningfully contribute to CIGRE work. I have had significant input into the Rural Electrification technical brochure development (as Secretary) and play an instrumental role in fostering and facilitating the dialog between external stakeholders for the joint CIGRE-World Bank Africa working group (as Communications Lead).

Contributing my time beyond my regular work is made special by collaborating with likeminded, passionate people who focus on impactful work. I feel honoured to have grown my professional network with international experts working on energy access challenges in the context of the energy transition.”



NGN Involvement – How to get involved

- **NGN routes for participation:**
 - **Complete this survey to register your interest in C6 activities:** <https://s.surveyplanet.com/elrkrnkk>
 - **Reach out to Harry Evans (harry.evans@ghd.com) if you wish to discuss anything further**
 - **Contact the C6 Regular Member in your country**



Ongoing Working Groups

- 16 working groups are currently active
- 7 of these are joint working groups
- Full details can be found at: <https://c6.cigre.org/GB/technical-activities/working-groups-list>
- Technical Brochures under review:
 - C6.36 - Resource Models for Impact assessment
 - JWG C1/C6.37/CIREN - Optimal transmission and distribution investment decisions under increasing energy scenario uncertainty
- Call for active participation:
 - WG C6.39 - Customer Empowerment
 - WG C6.42 - Electric Transportation Energy Supply Systems
 - WG C6.45 - The Impact of DER on the Resilience of Distribution Networks
 - JWG D2/C6.47 - Advanced consumer side energy resource management systems
 - JWG C5/C6.29 - New markets, Local Energy Communities



C6 Upcoming Events and Key Dates

Event	Dates	Timeline	Link
CIGRE International Symposium Muscat 2023 (C6 & B4)	06/03/23 - 08/03/23	Submission of full paper - 20/12/22 Notification of paper acceptance - 19/01/23	https://sym2023.cigre-gcc.org/
CIGRE International Symposium Cairns 2023 (C6 & CIDER)	04/09/23 - 08/09/23	Submission of full paper – 03/04/23 Final notification of paper acceptance -16/06/23	https://cigrecairns23.com.au/
CIREN 2023 Rome	12/06/23 - 15/06/23	Submission of full paper - 23/01/23	https://www.ciren2023.org/
Paris Session 2024	26/08/24 – 30/08/24	TBD	Not yet setup



We would encourage you all to participate in these events.

Preferential Subjects - SC C6 Paris Session 2024

Preferential Subject 1:

Enabling flexibility with increased Multi-Energy integration in Distribution Networks

- Integration of energy storage systems into distribution systems with the associated provision of their grid services
- The impact of evolving planning objectives and criteria, with increased electrification, coupled with the changes in end-use technology behaviours
- Electric Vehicle integration and impacts in Distribution Systems

Preferential Subject 2:

Power electronic based solutions for Smart Distribution Systems

- Evaluating and quantifying the value of smart inverter functions and their integration into Distribution Networks.
- Case Studies of DC and DC/ AC hybrid grid solutions for the future
- Provision of support services for the stability of Distribution Networks.

Preferential Subject 3:

The adoption of appropriate rural electrification standards, practices and technology options.

- Microgrid and multi-microgrid installations (including industry networks)
- Off-grid and island DER applications including appropriate resilience measures
- Applications highlighting the interface between technical and non-technical aspects for rural electrification



CIGRE Terminology

Acronym	Term	Definition
C6	Study Committee Title	Active Distribution Systems and Distributed Energy Resources
GDM	General Discussion Meeting	Each SC hosts a GDM at the Paris Session. The discussion is based upon the preferential subjects of the SC with a number of presentations on each subject by members of the SC.
KMS	Knowledge Management System	An online platform used to store CIGRE information.
NGN	Next Generation Network	A group within CIGRE supporting and promoting young members.
N/A	Preferential Subjects	Study Committee subjects of interest for the Paris Session with papers accepted that relate to these topics.
RM	Regular Member	National Representative involved in SC activities.
SC	Study Committee	Committee with a defined technology focus.
TB	Technical Brochure	Output of a WG – an extensive technical document covering a topic related to the SC activities.
TC	Technical Council	Defines the technical strategy and direction of CIGRE.
TF	Task Force	Members involved produce a paper on a specific topic not typically covered in WGs.
TOR	Terms of Reference	Defines a WGs scope, aims, and objectives.
WG	Working Group	Members involved produce a TB on a specific topic linked to a SC.
WiE	Women in Energy	A group within CIGRE supporting and promoting women in the energy industry.

