



Assemblea Cigre Italia

Roma, 29 Novembre 2018

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e-distribuzione S.p.A.

SC C6 – Active distribution systems and distributed energy resources

Novità principali 2018

~~Distribution Systems and Dispersed Generation~~



Active Distribution Systems
and Distributed Energy Resources



➤ **NEW C6 STRATEGIC PLAN**

➤ **SCOPE**

SC C6 facilitates and promotes the progress of engineering and the international exchange of information and knowledge in the field of distribution systems and distributed energy resources (DER). The experts contribute to the international exchange of information and knowledge by means of synthesizing state of the art practices and developing recommendations.

- ❑ **Chair: Christine Schwaegerl** - christine.schwaegerl@hs-augsburg.de
- ❑ **Webmaster: Christine Schwaegerl**
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C6

Active distribution systems and distributed energy resources



Assessment of the **technical impacts** which a more widespread adoption of DER could impose on the whole energy system and of **enabling technologies and innovative solutions for DER integration** in active distribution systems.

MAIN AREAS OF ATTENTION

- **Enabling technologies for renewables and DER integration and application:** *active network management, microgrids, virtual power plants, distribution management systems, DER monitoring and control, aggregation systems and platforms*
- **Innovative solutions for DER and distribution technology deployment:** *smart inverters and power electronic interfaces and interconnection device applications, MV/LV DC supply systems, distribution system modernization*
- **Storage technologies:** *deployment of various and also new storage technologies, multi-energy solutions (with thermal storage), power2X applications (power to heat, power to gas...), electric vehicles*
- **New approaches to configure distribution systems or enhanced reliability and resilience:** *islandable grid connected microgrids, power exchange between microgrids*
- **Consumer integration and empowerment:** *Demand side integration and participation, demand response, load management, smart load, new customer sectors such as electric vehicles*
- **Smart cities**

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Working Groups

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- **WG C6.28** 'Hybrid systems for off-grid power supply' (Conv. Ravi Seethapathy), in editorial stage
- **WG C6.31** 'MVDC grid feasibility study' (Conv. Zhao Ma)
- **JWG C6/D2.32** 'Utilization of data from smart meter system' (Conv. Yasuo Matsuura)

New WG

- **JWG C6/C1.33** 'Multi-energy system interactions in distribution grids' (Conv. B. Bak-Jensen)
- **JWG C6/C2.34** 'Flexibility provision from distributed energy resources' (Conv. P. Mancarella)
- **WG C6.35** 'DER aggregation platforms for the provision of flexibility services' (Conv. A. Oudalov)
- **JWG C6/B4.37** 'Medium Voltage DC distribution systems' (Conv. James Yu)
- **WG C6.38** 'Rural electrification' (Conv. Kurt Dedekind)
- **WG C6.39** 'Customer empowerment' (Conv. Jan von Appen)
- **JWG C1/C6.33/CIRED** 'Optimal transmission and distribution investment decisions under increasing energy scenario uncertainty' (Co-Convenor Fabrizio Pilo)
- **JWG D2/C6.47** 'Advanced consumer side energy resource management systems'

AGs

- **AG C6.12** 'Tutorials' (Conv. Samuel Jupe)
- **AG C6.17** 'Rural Electrification' (Conv. Britta Buchholz, Kurt Dedekind), presentation of activities on rural electrification

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Latest Publications

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- **TB 635** 'Microgrids 1: Engineering, Economics & Experience'
- **TB 672** 'Power quality aspects of solar power' (JWG C4.C6.29)
- **TB 678** 'Smart metering, regulatory aspects, standards and development status'
- **TB 711** 'Control and automation systems for electricity distribution networks of the future' (JWG C6.25/B5/CIREC - Conv. Giuseppe Mauri)
- **TB 721** 'The impact of battery energy storage systems on distribution networks' (WG C6.30 - Conv. Nikos Hatziargyriou)
- **TB 726** 'Asset management for distribution networks with high penetration of distributed energy resources' (WG C6.27 - Conv. Britta Buchholz)
- **TB 727** 'Modelling and dynamic performance of inverter based generation in power system transmission and distribution studies'

2018 Cigre Session

PS1 > Achieve flexibility through strategic distribution planning

PS2 > Energy storage in distribution systems

PS3 > Intelligent electrification for all



Principali temi di discussione

Active distribution networks

- *RES /DER integration*
- *Storage applications*
- *Electric Vehicles*
- *Rural electrification*
- *Multi energy systems*
- *Microgrids*

Flexibility

Resilience

DER aggregation platforms for the provision of flexibility services

Operational planning with DER

TSO-DSO cooperation & data exchange

Network Planning & Investments strategies in the new scenario of the electrical system

2020 Cigre Session: Preferential subjects

PS1 : Advanced distribution system design incorporating DER

- Configuring demand response and intelligent loads for customer empowerment
- Exploiting local energy storage possibilities and managing uncertainties
- Enabling multi-energy systems using intelligent inverters and controls

PS2 : Enabling technologies and solutions for distribution systems

- DER management and aggregation platforms
- Individual and multiple microgrid and virtual power plant design and control
- Rural electrification and off-grid distribution systems



Co-chaired by both C2 and C6

PS 3: System Operation Challenges with Increasing Distributed Energy Resources

- Enhancing flexibility, reliability and resilience
- Providing grid services through aggregators
- Aggregator interaction



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Prossimi eventi



CIGRÉ International Symposium

“GOING OFFSHORE - Challenges of the future power grid”

Aalborg (Denmark), June 3-6, 2019

Preferential Subjects di interesse per SC C6

- *Roles and functionalities of distribution and transmission networks*
- *Eco-design and environmental aspects, including asset management and public acceptance*



CIGRÉ International Symposium

“Towards active, sustainable digital networks that are resilient and integrated from UHV to distribution”

Chengdu (China), September 20 - 25, 2019

SC coinvolti: B3 – C6 – B5 – C1 – C3 – D2

- **SC C6 meeting**

Preferential Subjects

- *Planning for a future sustainable grid*
- *Integrating DER to build a sustainable future and integrating renewable*
- *Technology solutions for a future sustainable power system*