

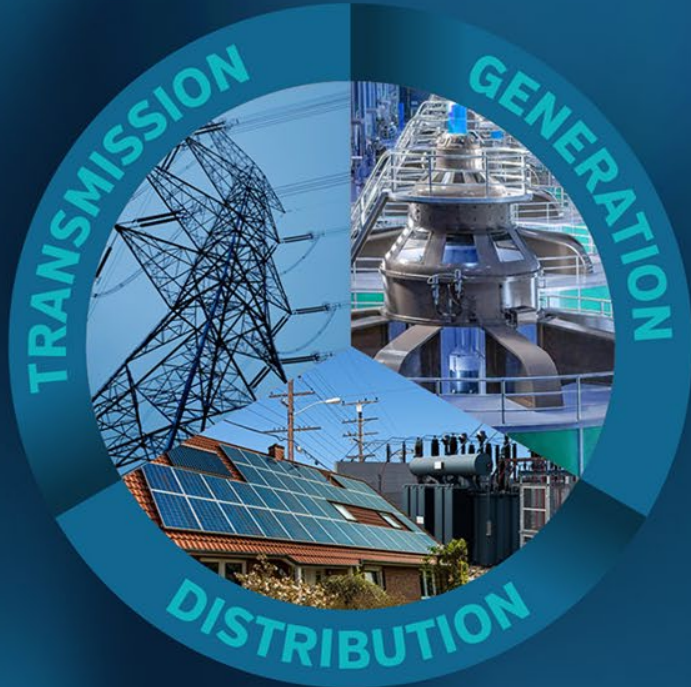


Power system engineering has entered a new age



All Segments are so intensively interrelated they cannot be dealt with separately, but integrated

Array of new technologies and requirements



- EVs
- Micro Grids
- Renewables
- Distributed Energy Resources
- Storage
- Big Data
- And more....

Today's presentation

- Since the turn of the Century CIGRE has been evolving its work to meet this need
- Short presentation today is to show you how CIGRE's work goes end to end across all aspects of the power system
- And how getting involved can help you find the solutions you need





Clear vision of the future power system landscape

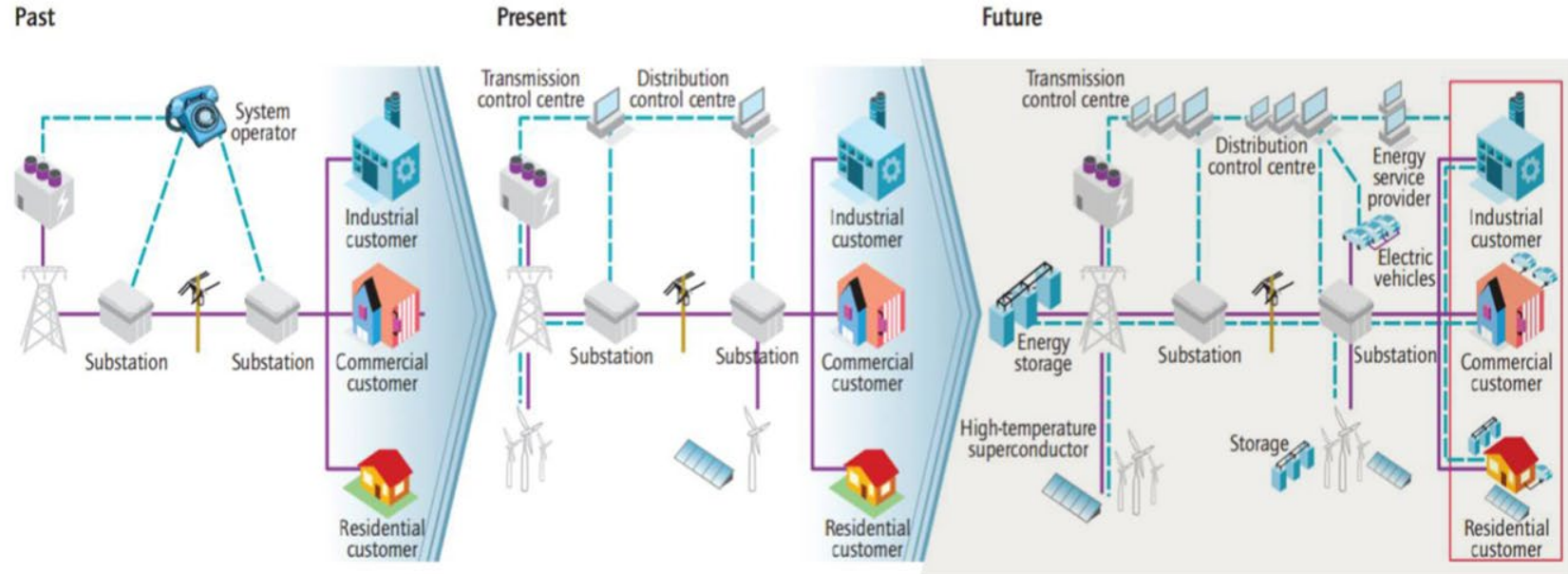


Providing a
doorway to
the future



The Disruptive Evolution of Power Systems

Credit: © OECD/IEA 2011 Technology Roadmap: Smart Grids, IEA Publishing. License: <http://www.iea.org/t&c/termsandconditions/>



— Electrical infrastructure - - - Communications



CIGRE has the working groups, people and knowledge development programme focus on the future power system



Our work is in four key areas



Integrating all aspects of power system development, economics, planning, operation, control, performance, markets and regulation and environmental aspects

Equipment

**System
holistic
view**

**Markets,
operations
& controls**

**Emerging
technologies**



There are 16 key domains under these categories

Plus more than 250 working groups, covering every conceivable area



It's all in an end to end and global context

- Working groups populated by professionals from across the whole industry
- Drawn from CIGRE's 60 National organisations representing 94 countries
- A proven knowledge development programme that includes:
 - Dozens of events all over the globe
 - The Paris Session, the massive biennial congress
 - Regular Webinars
- Producing the world's foremost real world technical publications

CIGRE work covers all areas including distribution. Here are examples of our study committee work for distribution

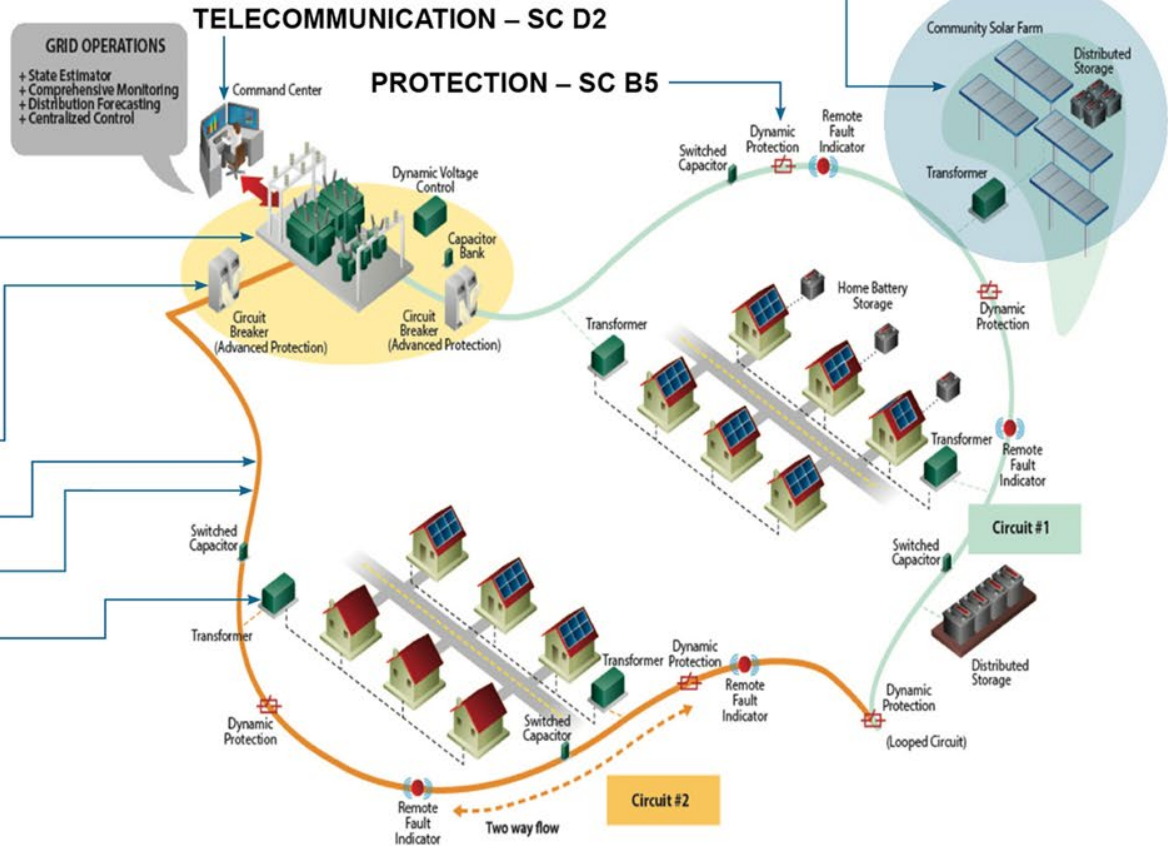
SUBSTATIONS – SC B3

EQUIPMENT – SC A3

CABLES – SC B1

OVERHEAD LINES – SC B2

TRANSFORMERS – SC A2



You can solve your technical challenges in one place

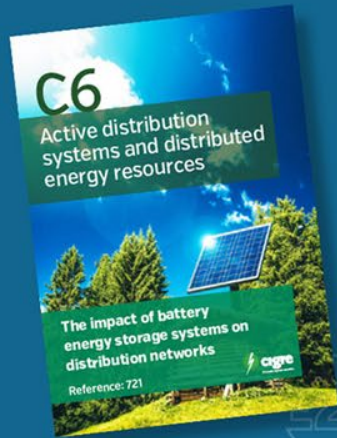
- Connect with professionals from across the whole industry value chain
- Join a working group to solve problems and share knowledge with peers
- Access the unique publications the working groups produce
- Webinars, events and more
- Practical knowledge on everything conceivable issue



Examples of what the working groups produce

- Every year 40 new technical brochures you can source or be involved in the creation of
- Answering the key questions we all face
- Here are some pertinent examples

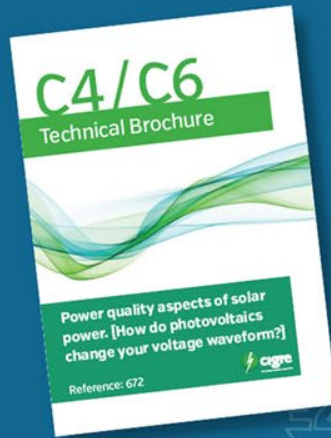




TB 721

The impact of battery energy storage systems on distribution networks

- Focuses on planning and operational issues as well as providing input to standards, grid codes and use cases. It also covers practical experiences with storage systems.



TB 672

Power quality aspects of solar power. [How do photovoltaics change your voltage waveform?]

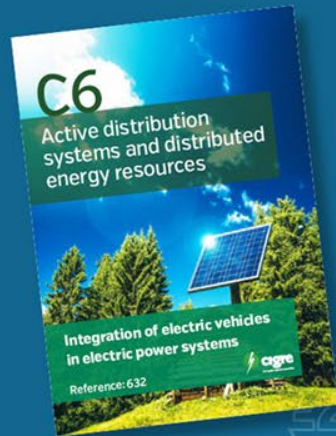
- The principle aim of this TB is a mapping and quantification of that impact where it concerns power quality disturbances.



TB 714

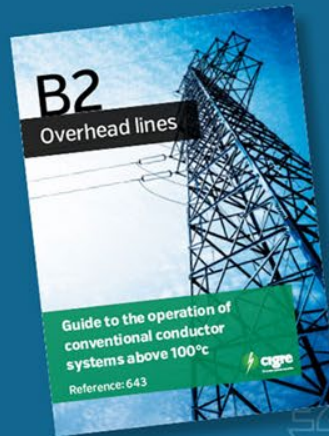
Long term performance of soil and backfill systems

- provides straightforward assessment methods to determine the suitability of soil and backfill systems for cables of all voltages.



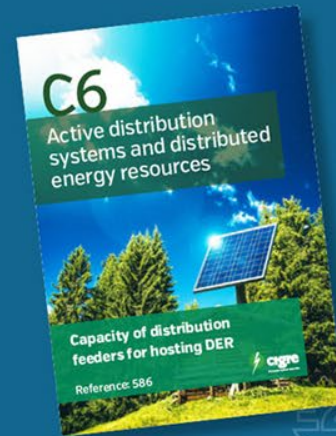
TB 632
**Integration of electric vehicles
in electric power systems**

- Looks at operational problems in the electricity networks caused by EV's. Including new technology and adequate recharging strategies.



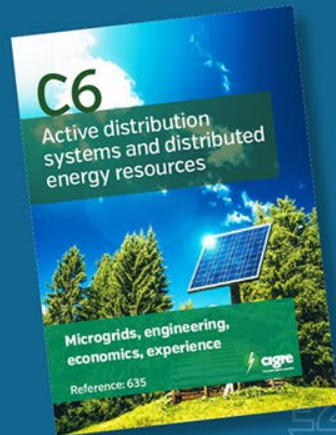
TB 643
**Guide to the operation of
conventional conductor systems
above 100°C**

- Provides information on the operation of conventional conductor systems at temperatures higher than traditional ratings of 75°C. It also deals with continuous operation and 100°C emergency short excursions.



TB 586
**Capacity of distribution feeders
for hosting DER**

- Studies the limits of distribution feeders for hosting DER and the derivation of practical guidelines for the connection of DER.



TB 635
**Microgrids, engineering,
economics, experience**

- This TB covers the definition of microgrid, and describes the necessary equipment and methods needed to implement one.



TB 733
**System operation emphasizing
DSO/TSO interaction and
coordination**

- Catalogues the impacts of distributed energy resources (DER), renewable energy resources, distributed dispatchable generators, storage, and demand-side response – on grid operations.



TB 681
**Planning criteria for future
networks with greater variability**

- Given the growth in DER, active distribution systems, smart grids and demand response, this report suggests how the TSO-DSO data exchange should evolve to future-proof grid planning.



CIGRE offers

- End to end knowledge, expertise and people connections all in one place
- Globally diverse technically orientated perspectives
- Not for profit, for power system expertise
- Inexpensive to join





cigre

For power system expertise