



BUSINESS PLAN

CENELEC/TC or SC	Secretariat	Date
TC 8X	Italy	2020-11-25

TC or SC title: System aspects of electrical energy supply

A Background

TC 8X was set up in 2003 in view of preparing the necessary standards framework and coordinating the development, in cooperation with other TC/SCs, of CENELEC standards needed to support the functioning of electricity supply systems in open markets. Electricity supply systems encompass transmission and distribution networks and connected user installations (generators and loads) with their network interfaces.

While relying on efficient and secure data communication and exchange, TC8's scope does not include standards for communication with appliances and equipment connected to the electric grid or for communication infrastructure serving the electric grid.

TC 8X is mostly composed of Experts representing the System Operators, Utilities, Regulators and technical designers, vendors or integrators. Other Experts in TC8X include representatives from energy using products and micro- and co- generation. Observership in TC and/or specific W G has been granted to several partners such as EURELECTRIC, CEER, ORGALIME, CECAPI, ECI, DerLab, ENTSO-E, EUTurbines.

IEC have been reorganizing their existing TC 8 with the purpose to address electricity sector evolution towards smart grids (establishment of SCs, system approach). The system approach is based on the definition of use cases and reference architectures for smart energy grids, covering the whole electricity supply chain from production at various levels down to the utilization at the customer level. It is promoted by System Committees (SyC) and especially IEC SyC Smart Energy.

In Europe, this vision that was initially supported by an EC Mandate (M/490) and the activity of TC8X (home grown standards or standards originated in IEC) contributes to the response from the ESOs, coordinated by the CEN/CLC/ETSI SEGCG (Smart Energy Grid Coordination Group).

By BT Decision in 2020, TC8X also covers High Voltage Direct Current (HVDC) transmission for DC voltages above 100 kV.

B Business Environment

B.1 General

The electricity supply market is undergoing rapid changes due to the ambitious European energy and climate targets. As a result, many new actors are entering the market and fundamental process changes are taking place, both for the generation and distribution activities.

Regulation authorities are interested in consensus documents that assist them to organize their activity, supervise the evolution of the market and make comparisons between operators and between countries.

Standards giving clear definitions of the essential characteristics and measurement methods of the relevant parameters are desirable tools (e.g. for the quality of the electricity supply). Clear and harmonized technical requirements for connection to the grid are needed, for example, for the new forms of power generation and transfer. They provide industrial solutions complying with the high level requirements stated by Grid Codes or other piece of the technical legal framework.

NOTE - taking into account the different grid characteristics across Europe in such standards is a challenging issue.

The relations between various parties and new actors are increasing complexity and new developments are evolving quickly in many areas, including communications, computing and sensing. Many types of equipment are now standardized, but putting them together requires a system approach to ensure that the entire “chain” will provide the expected services. Interoperability based on a system approach is today the most important deal to achieve a “smart grid” operation.

The EC is strongly supporting this standardization process and consider it as an essential step to fill the gaps and achieve the 2030 European ambition. Standardization mandates: M/490 (smart grid), M/468 (electric vehicle charging) and M/441 (smart metering) were issued in this context. The TCs of the three ESOs are monitored by the SEGCG which that is also developing appropriate methods and tools to ensure a sustainable, future oriented standardization process.

The coming “Clean Energy Package” (CEP) will require standardization effort as well.

B.2 Market demand

There is a need for standards to support opening the market to new actors, and new forms of business. Especially, opening the market should benefit consumers by offering new services and improved quality of the electricity supply in a frame where the reliability of the electric power system is increasing.

There is a general demand for standards that can be a reference to:

- implement the European regulatory framework;
- specify and design flexible solutions that enable technical and commercial innovation;
- define the essential technical and economical characteristics, and methods of assessment and measurement;
- clarify the rules to be respected by the different involved parties (power producers, grid operators, distribution network operators, system and equipment manufacturers, suppliers, consumers, authorities, industrial and private users...) for fair sharing of responsibilities, and proper operations of electricity supply systems
- provide a supply system of a quality and reliability sufficient to power electrical and electronic equipment,
- ensure a secure investment climate.

B.3 Trends in technology

New forms of power generation primarily based on renewable energy sources are being developed and are now being massively introduced into the electricity networks with a major impact on the system management and the local distribution networks.

Decentralized energy systems such as Microgrids, Virtual power plants, Off grid systems, are often seen as alternative, complement or precursor (in developing countries) for large interconnected systems.

Developments in information and communication technologies allowing a better connection of the end user to markets will allow demand response mechanisms. They will also foster markets of needed advanced solutions (network automation, smart metering...) for the benefits of users.

With the development of HVDC off-shore grids, there is a need for coordination, coherence and interoperability for equipment (converters, protection devices...) as well as grid topology (grid design, voltage level ...).

B.4 Market trends

Electrical energy supply has evolved from monopolistic environment to a market with many actors, increasing interest of new investors in electricity market opportunities, proliferation of distributed generation and increasing demand for flexibility. These new factors are changing the way electricity networks have been planned and operated up to now.

In addition, allowing a better connection of the end user to market is expected to allow new services and benefits.

B.5 Ecological environment

The publication of connection standards for renewable energy sources, and standards supporting the opening of the market (e.g. a better connection of the end user to markets allowing demand response mechanisms), will help to reach the EU targets related to CO₂ emissions and energy efficiency and implement EC "Clean Energy Package".

B.6 Involvement of societal stakeholders

Active participation of representatives of regulating authorities and more generally from all concerned parties including consumers is expected.

B.7 Involvement of SMEs

Massive installation of Distributed Energy Resources, as well as new approaches relating to smart grid, are bringing business opportunities for Small and Medium size enterprises. They are more and more interested and active in the standardization for the electricity supply sector.

C System approach aspects

The object and scope of TC 8X deals with system aspects of electricity supply and this affects many stakeholders. For this reason, several Technical Committees and international organizations have been invited to participate in TC 8X work. Liaisons and cooperation activities have been very active. This cooperation is to be reinforced due to the growing complexity of the power system (e.g. massive deployment of distributed generation, smart grid ...). Particular attention will be given to coordination with projects in standardization bodies such as TC 13, TC 57, TC 82, TC 88, TC 120.

In the smart grid, the relations between various parties are increasing in complexity, requiring the use of specific methods and tools. A use case driven approach is necessary for a top down development of standards. From a use case perspective, actors and deliverables are identified and requirements are derived. IEC Syc Smart energy took over from IEC TC 8 as coordinator of the development of Use Cases in collaboration with the relevant TCs. It promotes a system perspective and avoids conflicts between the individual use case definitions. The method is defined in the IEC/PAS 62559 "Methodology for Developing Requirements for Energy Systems". TC8X must keep a close contact and observe the major developments in the different use case areas. A close connection must be ensured in order to optimally align future European standardization work, under the coordination of CEN/CLC/ETSI SEGCG.

D Objectives and strategies (3 to 5 years)

- To improve major reference standards (EN 50160, EN 60038, EN 60059 and EN 60196) and promote their use,
- To develop - or contribute to develop - standards and recommendations which support network changes, e.g:
 - o To develop technical conditions for the connection of distributed generation to the network in line with "Requirements for Generators" - and technical conditions in line with other parts of the European Grid Code where relevant,
 - o To cooperate with Product and Installation Technical Committees in view of developing standards permitting to demonstrate compliance with grid connection requirements,
 - o To provide inputs on Smart Grid development to other TCs by processing IEC TC8 publications under parallel procedures or providing homegrown deliverables,
 - o To develop guidelines and standards in the HVDC grid domain (system aspects of DC supply systems) in close cooperation with IEC TC115.
- To promote European TC8X approach in IEC current work concerning here above topics.

E Action plan

TC 8X:

- To develop projects on system aspects of HVDC supply systems through IEC TC115.
- To continue the partnership with ENTSO-E, in charge of the drafting/maintenance of the Grid Codes in Europe and participation in the Connection Codes European Stakeholder Committee (ESC) (e.g.):
 - o Requirements for all Generators (Connection Code for Generators),
 - o Demand Connection Code (Connection Code for Demand facilities and Distribution Network),
 - o HVDC Connection Code;
 - o Possibly other codes (Operational Security Code, Operational Scheduling code...).
- To develop standards in compliance to the requirements of the European network codes, once they will come into force;

Besides the development of system/installation standards a contribution to the development of product standards may be necessary for certification purposes.

- To liaise closely with CEN/CLC/ETSI Smart Electric grid Coordination Group.
- To monitor the activity of IEC SC 8A "Grid Integration of Large-capacity Renewable Energy (RE) Generation", IEC SC8B "Decentralized energy systems" and IEC SC8C "Network management in interconnected systems"

WG01: "Physical characteristics of electrical energy"

- To liaise closely with TC8X WG3, in view of optimizing PQ criteria in networks with increasing embedded generation,
- To monitor developments at the international level (future IEC/TS 62749, IEC 60038),
- To prepare amendments to EN 50160 (consideration of issues raised in TR 50422 and others raised by cooperating partner CEER)

WG03: "Requirements for connection of generators to distribution networks"

- To publish EN 50549 series: Requirements for the connection of generators to the LV distribution system and to the MV distribution system,
- To liaise and cooperate with Product and Installation TCs (such as TC 82, TC 88, TC 95, TC 64 ...) in order to contribute to the development of standards permitting to demonstrate compliance with grid connection requirements,
- To prepare a part 10 of EN 50549, on Testing for both LV and MV network connections to demonstrate the compliance of generating units to part 1 and 2 requirements.
- To monitor and support developments at the international level (future IEC 62786)
- To advise TC officers about CLC representative appointment in Connection Codes ESC.

WG06 : "HVDC system aspects"

- To propose projects and monitor developments in IEC TC 115

F Useful links to CENELEC web site

TC home page giving access to Membership, TC/SC Officers, Scope, Publications, Work programme [password-protected area].

https://www.cenelec.eu/dyn/www/f?p=104:7:1410378225533901:::FSP_ORG_ID,FSP_LANG_ID:1258595,25

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