



CENELEC

EUROPEAN COMMITTEE
FOR ELECTROTECHNICAL STANDARDIZATION

Enabling Multi-Vendor Systems by International Standardization of Functional Requirements

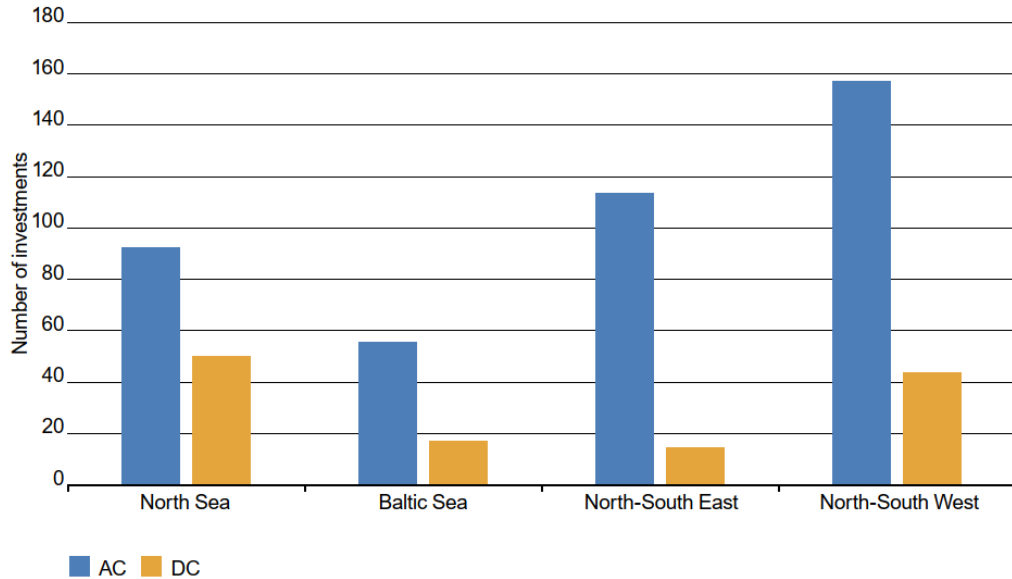
Horizon 2050, EC Workshop, 2020-04-02, Brussels

Dr. Frank Schettler, Siemens Gas and Power GmbH & Co KG

ENTSO-E's TYNDP

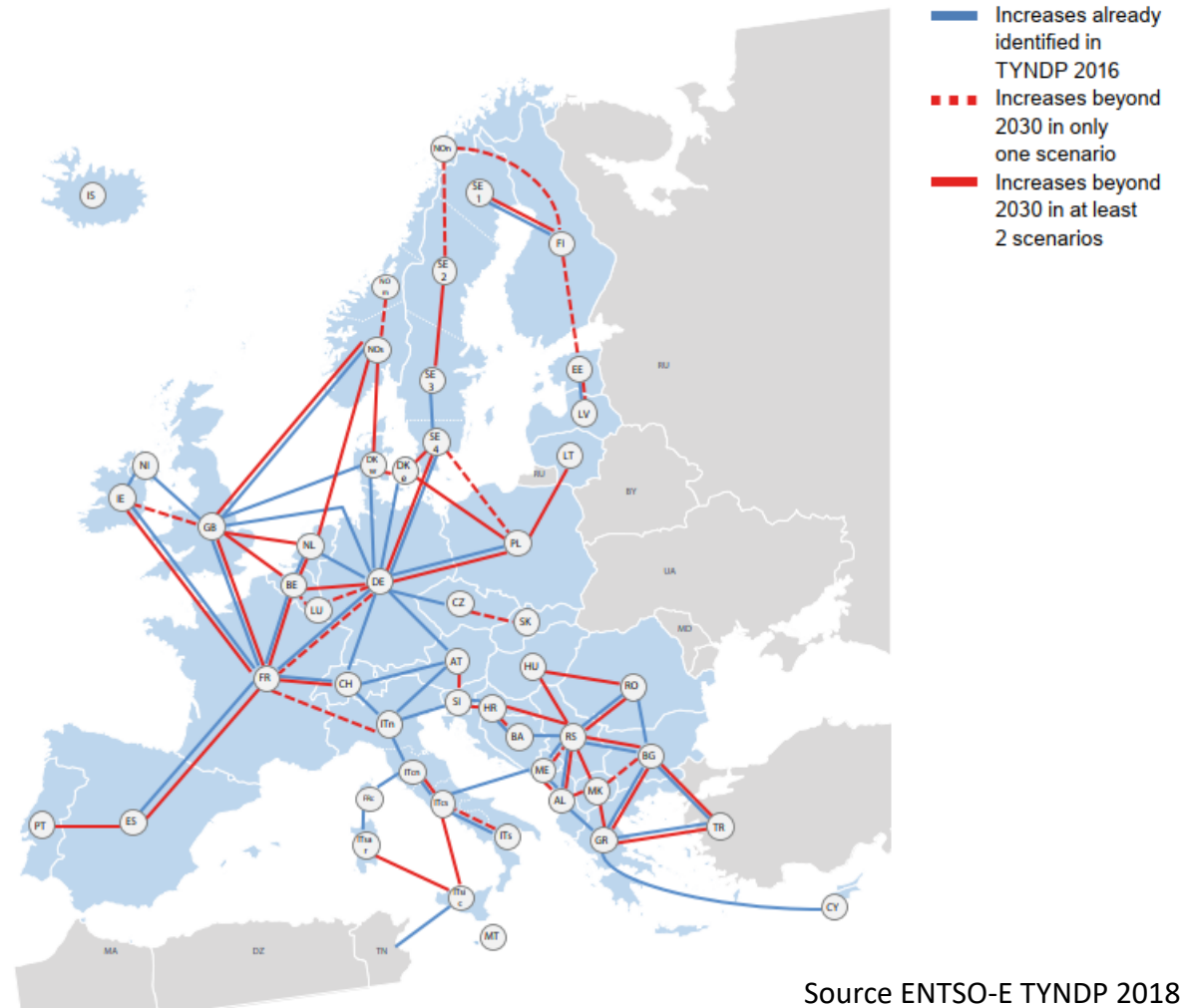
The Role of Power Electronics is increasing in AC and DC

Investments needed in AC and DC



Interoperability of Multi-Vendor systems becomes essential

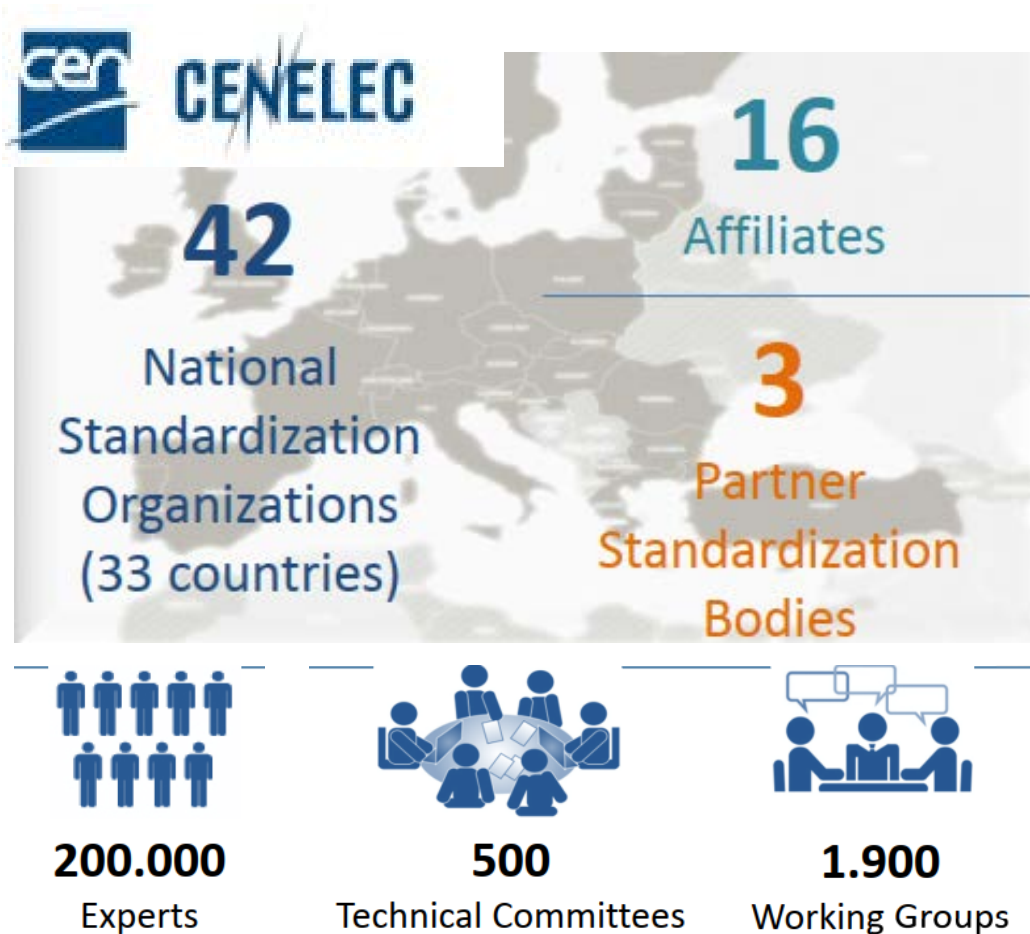
HVDC can serve as interconnectors and embedded systems; HVDC and FACTS can provide important system ancillary services



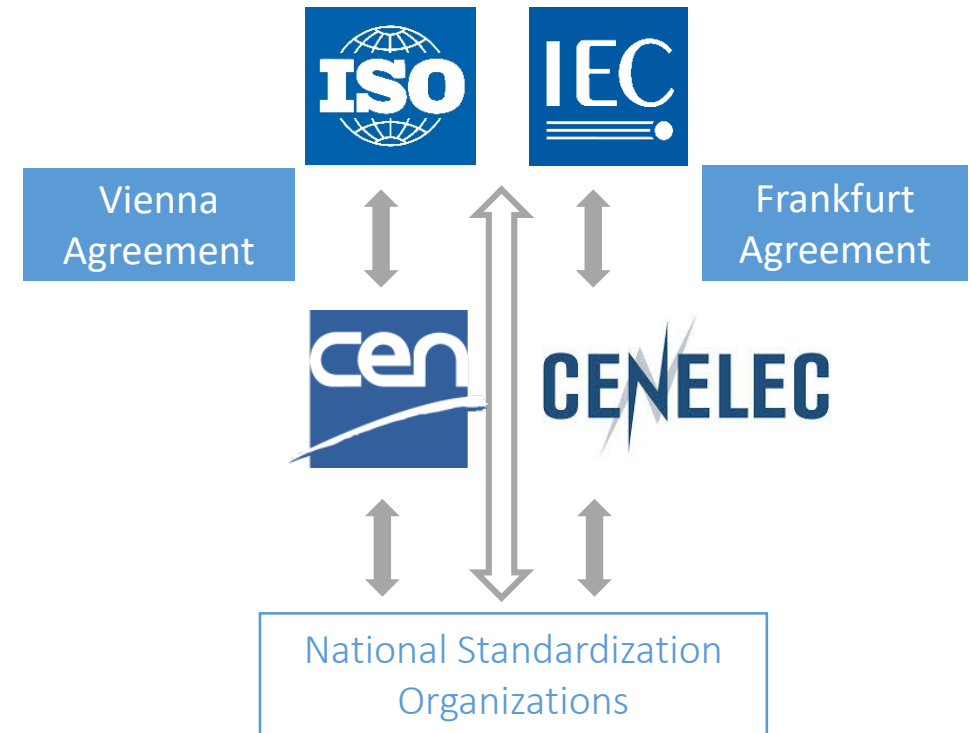
Source ENTSO-E TYNDP 2018

Multi-Vendor System Integration can be supported by European Standardization

Powerful resources ...



... connected to worldwide as well as national organizations



A common language for requirements and aligned **functional specifications** serve both:

Customer	Industry
Broad market of competitive, state-of-the-art solutions	Freedom of innovation to improve quality and cost position
Compatible solutions (e.g. multi-vendor)	Clear interfaces
Market driven prices	Cost efficient development

The Lifecycle of a Standard is dedicated to serve these Win-Win Goals

- 1) Elaborate documents involving all interested stakeholders
- 2) Discuss and comment in public consultation
- 3) Publish standard document
- 4) Maintain and update the standard as necessary

Define functions needed in HVDC Grids *)

- Derive common understanding of relevant physical phenomena
- Categorize technical principles
- Define functions (e.g. How to control power flow)

Define parameters describing a function

- Focus on the required behavior at the interface
- Assure technology independence
- Describe parameters (e.g. Voltage/Power Characteristics)

Define parameter values (not part of the WG 06 work item)

- *Investigate applications*
- *Define scenarios where appropriate*
- *Derive parameter values and describe reasoning (e.g. kV, signal protocols)*
- *Standardise values*

*) Note:

Functions needed for HVDC Grids (and Multi-Terminal) can also be relevant for Point-to-Point links

The Worldwide 1st Standard on HVDC Grids Result of a Collaborative Work of Various Stakeholders



The standard is dedicated to support system planning and specification of multi-vendor HVDC grid projects

- AC system integration
- HVDC grid wide aspects of design and operation
- AC/DC Converter Stations
- HVDC Grid System Installations (e.g. DC Switching Stations)

Work continues on a worldwide basis

- Voting in CENELEC ongoing until 03/2020
- IEC TC 115/WG 15 starting based on WG 06 results



Dr. Frank Schettler

Siemens Gas and Power GmbH & Co KG

Product Lifecycle Manager HVDC PLUS

Convenor CLC TC 8X/WG 06 and IEC TC 115/WG 15

frank.schettler@siemens.com