Introduction to Connection Network Codes

Implementation of electricity network codes in the Energy Community
Vienna, 25/04/2017
Electricity Network Codes

3rd Package Network Codes

Connection Codes
- Requirements for Generators (RFG)
- Demand Connection Code (DCC)
- HVDC Connections (HVDC)

Market Codes
- Capacity Allocation & Congestion Management (CACM)
- Forward Capacity Allocation (FCA)
- Balancing Network Code (EB)

Operational Codes
- Operational Security (OS)
- Operational Planning & Scheduling (OPS)
- Load Frequency Control and Reserves (LFCR)
- System Operation (SO)
- Emergency and Restoration (ER)
## Connection Network Codes

- Lay down requirements for grid connection to the interconnected system, of **NEW**:

### RfG

**Power-generating facilities:**
- Synchronous modules
- Power park modules
- Offshore modules

### DCC

**Demand facilities or units**
- Transmission-connected demand facilities
- Transmission-connected distribution facilities
- Distribution systems, including closed distribution systems
- Demand units (used to provide demand response services to system operators)

### HVDC

**HVDC facilities**
- HVDC-connected systems
- DC-connected power park modules
Connection Network Codes

- Also aimed to:
  - Ensure fair **conditions of competition** in the internal electricity market
  - Ensure **system security**
  - Ensure the **integration of renewable electricity sources**
  - Facilitate Union-wide **trade in electricity**
  - Make **appropriate use of the facilities’ capabilities** in a transparent and non-discriminatory manner
  - Provide a **level playing field** throughout the Union

- Not applicable for:
  - **Islands of Member States** of which the systems are not operated synchronously
  - **Temporary or backup devices** operating in parallel mode (under specified conditions)
  - **Storage devices** except pump-storage modules (under specified conditions)
## Connection Network Codes

### Implementation aspects:

- **Entered into force** *(published)*:
  - **RfG**: 27 April 2016
  - **DCC**: 18 August 2016
  - **HVDC**: 8 September 2016

- **Guidance** on implementation – non-binding, ENTSO-E to prepare *6 months* after entry into force

- **Monitoring** of implementation – according to Articles 8 and 8 of Regulation EC 714/2009 – performed by ENTSO-E, data submitted by the TSO, ACER to prepare a list of relevant data *12 months* after entry into force

- **Derogations** – granted by NRA (or other authority) upon request from the facility operator or TSO, NRA to publish criteria and procedure *9 months* after entry into force (subject to a review by the EC) and maintain a Register of derogations, ACER to monitor the derogations

- **Application to existing facilities** – under specified conditions and upon proposal by the TSO and NRA decision – based on cost-benefit analysis

- **Compliance** – assessed by the NRA, including testing and simulation of the compliance criteria based on specified procedures (disconnection and reconnection)
Connection Network Codes

Connection (technical) requirements:

- **Exhaustive requirements** – fully defined in the NCs - no further national specification needed

- **Non-exhaustive requirements** – NCs do not contain all the information necessary to apply the requirement immediately and needs further specification at national level – amending technical regulations (national grid codes) may be required
  
  • *project specific* non-exhaustive requirements
  
  • non-exhaustive requirements at a synchronous system or national level

- **Interrelated requirements** – HVDC heavily relies on RfG technical requirements

- Typical technical requirements:
  
  • **Frequency** (deviation) requirements
  
  • **Voltage** (deviation) requirements
  
  • **Short circuit** requirements
  
  • **Power** requirements (active, reactive)
  
  • Protection and control
  
  • Information exchange (notifications)

- Specific requirements (e.g. subsynchronous torsional interaction damping capability of HVDC)
Proposal for Energy Community

Requirements for adaptation:

- **Standard adaption** – (EU → Energy Community, EC → ECS, Member State → Contracting Party)

- **Special requirements for MD, UA, and GE (proposals)**
  - exemption of non-synchronous networks / islands – (reference to Continental Europe synchronous area)
  - application of “agreed European standards and technical specifications” – (on national level)

- **No duplication of already imposed obligations to EU authorities (EC, ENTSO-E, ACER) or MSs**

- **References to ENTSO-E and ACER in agreed format**

- **Adapted reference for entry into force, no adjustment of embedded deadlines and stipulated procedures**

- **No general adjustment of the specified technical requirements**

- **Reference to general EU law (e.g. confidentiality) – reference to corresponding national law**

- **Reference to the Third Package acquis and TYNDP – applied “as adapted by the EnC MC”**