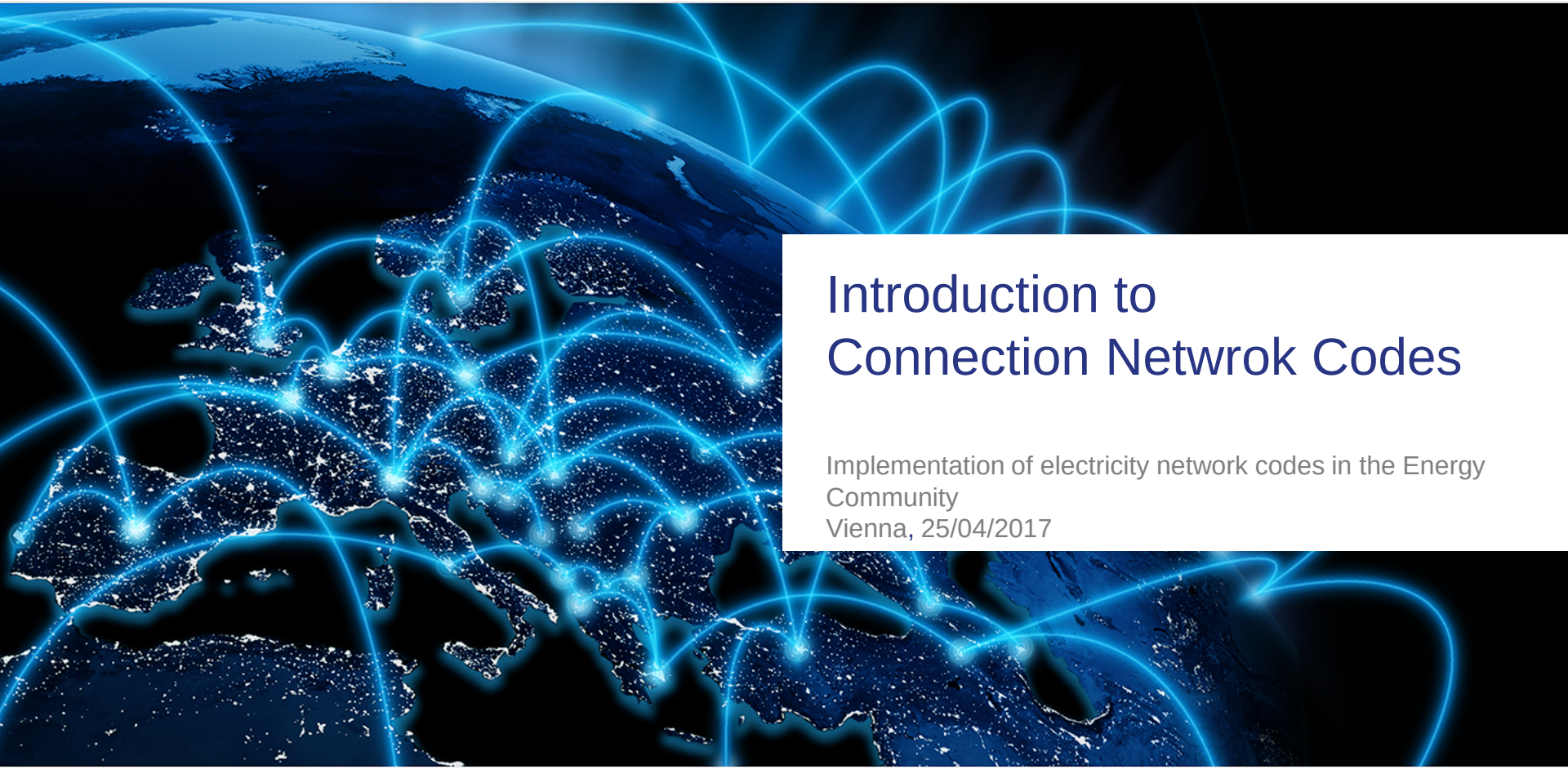

Introduction to Connection Netwrok Codes

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 fie**ld 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	DCC	HVDC
27 April 2016	**18 August 2016**	**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 **adaption**:
  - *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"*

Thank you
for your attention!

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