Network Code on Demand Connection

stakeholder discussion IFIEC

23 November 2011, Brussels
Topics

• Meeting objective
• ENTSO-E Network Code Development
• Demand Connection Code scope
• Principles of specific topics, relevant for industrial demand
• Timeline / next steps
Meeting objective
Meeting objectives

- Inform of network code development process & timeline
- Discuss initial scope of network code and receive feedback
- Note IFIEC’s perspective on a European network code on demand connection
ENTSO-E Network Code Development
Key activities set out in Regulation 714/2009 (on cross-border electricity trade, part of the 3rd Internal Energy Market Package)

- Deliver **network codes**
- Deliver **network plans** European / regional view of system needs (“TYNDP”)
- Deliver crucial aspects of **market integration** (“market coupling”)
- **R&D Plan** (fully included in EEGI – European Electricity Grid Initiative, part of the SET Plan)

Through its members deliver the **infrastructure** to:
- enable markets to function,
- secure energy supply,
- meet climate change objectives through connecting RES

Represents **41 members from 34 countries**
Drafting teams on grid connection Network Codes
Why European Network Codes?

The development of *European wide Network Codes* in various domains by

- bringing together the expertise of diverse stakeholders
- in an open and transparent process
- creating a coherent approach on common issues

is a crucial enabler of *Europe’s Energy goals* in

- increasing the amount of renewables
- guaranteeing an adequate Security of Supply
- contributing to an Internal Energy Market
Article 8 – Tasks of ENTSO-E

6. “The network codes … cover the following areas, taking into account, if appropriate, regional specificities:”

- network security and reliability rules incl. rules for technical transmission reserve capacity for operational network security;
- network connection rules;
- third-party access rules;
- data exchange and settlement rules;
- interoperability rules;
- operational procedures in an emergency;
- capacity-allocation and congestion-management rules;
- rules for trading related to technical and operational provision of network access services and system balancing;
- transparency rules;
- balancing rules incl. network-related reserve power rules;
- rules regarding harmonised transmission tariff structures incl. locational signals and inter-transmission system operator compensation rules; and
- energy efficiency regarding electricity networks.
General Framework - Regulation 714/2009

3-year Work programme

Request for FWGL

Preparation of draft Network Code (max. 12 months)

Mandate letter

Framework Guidelines (max. 6 months)

Evaluation

Decision

Comitology (+/- 2 years)

Legally binding Network Code

Stakeholder Consultation

Stakeholder Consultation & workshops

Stakeholder Consultation & workshops

Stakeholder Consultation & workshops

Member states

Impact on national codes

Expected flow
Prioritization of Network Codes

- Discussed in the Florence Forum with all stakeholders
- Regularly discussed by EC / ACER / ENTSO-E
- Resulting in a three-year work program
  - **High priority**: Listing all Network Codes that are to be finalized by 2014 (creation of the European internal energy market)
  - **Low priority**: timeline to be discussed
  - Under public consultation by EC (April 2011):
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<tr>
<th>Deliverable</th>
<th>Products/legislation relevant for effective implementation of the IEM</th>
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<td>NC on capacity allocation and congestion management</td>
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<td>NC on forward markets</td>
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<td>EC comitology guideline on transparency</td>
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<td>FG on Third Party Access</td>
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<th>Deliverable</th>
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- FG: Finalisation Group
- NC: National Competent Authority
Drafting team active since May 2011

July 2011: ACER final framework guideline on electricity grid connection

July – December 2011: initial stakeholder discussions
- Sequence of meetings with DSO associations
- IFIEC
- Relevant working groups of Mandate 490

Early 2012: Mandate letter EC

Q1 2012: code drafting / internal ENTSO-E consultation

Q2/Q3 2012: public consultation & review code draft

End 2012: submission code to ACER
Demand Connection Code scope
Demand Connection Code – Terms of References

based on the high level requirements set out in ACER’s Framework Guidelines on Electricity Grid Connections (20 July 2011)

<table>
<thead>
<tr>
<th>Demand Management Capabilities</th>
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<tr>
<td>• Load shedding</td>
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<tr>
<th>Frequency and voltage parameters;</th>
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<th>Requirements for reactive power;</th>
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<th>Load-frequency control related issues;</th>
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<tr>
<td>• Low Frequency Disconnection</td>
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<td>• When this occurs</td>
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<td>• Why it is used</td>
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<th>Short-circuit current;</th>
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<th>Requirements for protection devices;</th>
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<th>Balancing capabilities and provision of ancillary services;</th>
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<th>Equipment requirements at connection point;</th>
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<tr>
<td>Demand Connection Code – Terms of References</td>
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<td><strong>Disconnection/Islanding/Reconnection</strong></td>
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<td>• Methods/Procedures</td>
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<td><strong>Instructions provide by TSO/DSO to user;</strong></td>
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<td>• Manual/Auto</td>
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<td>• How they are provided/received</td>
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<td><strong>Information/Data exchange</strong></td>
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<td>• What is required</td>
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<td>• By whom</td>
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<td>• When</td>
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<tr>
<td>• How it is provided</td>
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<td><strong>Compliance;</strong></td>
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<tr>
<td>• What is tested</td>
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<tr>
<td>• How testing takes place</td>
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<tr>
<td>• Stages of Compliance testing</td>
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<tr>
<td><strong>Derogation;</strong></td>
</tr>
<tr>
<td>• What it is</td>
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<tr>
<td>• Whom it applies to</td>
</tr>
<tr>
<td>• How it is applied</td>
</tr>
<tr>
<td>• Exemptions</td>
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<tr>
<td><strong>Enforcement period</strong></td>
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<tr>
<td>• No longer than 3 years</td>
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Network Code for Generator Connection

- Based on same ACER Framework Guideline
- Trajectory started in Summer 2009
- To allow parallel work with different timeline and avoid confusion the Demand and Generator code are based on superposition of requirements
- Demand code will follow similar principles for existing users, derogations, compliance testing
- Codes developed within same ENTSO-E WG
Network Codes on System Operation aspects

- Final ACER Framework Guideline expected end of 2011
- ACER acknowledges overlap in guidelines
- Operational codes deal with operational issues
- Connection codes set functional requirements necessary to meet the needs of secure operation of the Transmission network (cross-border impact)

Market Network Codes

- Distinction between mandatory requirements of capabilities (grid connection codes) and the provision of ancillary services based on these capabilities (market / system operation codes)
Table of Contents *(preliminary)*

- General Provisions
- Glossary
- Subject matter
- Scope
- Non-discrimination and Transparency
- Confidentiality
- Relationship to National Law provisions
- Requirements
  - Voltage/frequency ranges
  - Short circuit current
  - Reactive power usage/provision/compensation
  - IEC equipment standards/ Other Equipment Standards
  - Protection and control
  - Information Exchange
  - Replacement/upgrading
  - Disconnection/island mode
  - Demand response requirements
  - Power quality
  - Simulation models
- Operational notification Procedure
  - General Requirements
  - Stages EON/ION/FON/LON
- Compliance
  - General Requirements
  - Responsibilities
  - Common Provisions
  - User specific provisions
- Derogations
  - General Requirements
  - Request
  - Decision
  - Existing users
  - Register
- Final Provisions
Principles of specific topics, relevant for industrial demand
Principles – Frequency and voltage parameters

- Follow NC RfG requirements for frequency and voltage ranges over Europe
- If generation is staying connected demand should also be able to do so for stability reasons
- Say nothing on standard voltages issues below 110kV
- Use RfG requirements rather than replicate in DCC for embedded industrial generation
- Flexibility for wider ranges on Frequency due to geographic differences - Islanding
Principles – Low Frequency/Voltage Disconnection and On Load Tap Blocking

- Existing requirements in Grid codes across Europe for LFDD
- LVDD used in some countries recent ENTSO-E work expects much wider use across Europe
- LVDD and OLTC Blocking expected to be required in tandem
Principles – Short-circuit current

- Short circuit ratings of equipment must not be exceeded
- Short circuit contribution must be provided for protection operation/quality (i.e. EMC)/stability
- Short circuit information must be given to TSO/DSO
- Inform users of what to expect from system
Principles – Disconnection/Islanding/Reconnection

- Islanding varies and therefore applications should be flexible
- Reconnection should be allowed following agreement with Relevant System Operator
- Synchronism devices to be fitted as specified by Relevant System Operator
- Automatic Disconnection from network must be able to be fitted, application will be specified and method also
Principles – demand management capabilities, balancing capabilities and provision of ancillary services

Some services are voluntary driven by market, but once volunteered requirements will be mandatory

- System reserve
- Frequency Response (LFDD i.e. binary on/off)
- Frequency Response (Active power modulation control autonomous)
- Frequency Response (Active power control SO controlled)
- Very fast Frequency Response (Active power controlled SO controlled)
- Voltage Control (LVDD i.e. binary on/off)
- Voltage Control (Reactive power modulation control autonomous)
- Voltage Control (Reactive power control SO controlled)
Principles on requirements for reactive power

- Reactive compensation most cost effectively provided at point of use
- For equitability a maximum European reactive power range should be set
- Specific local driven reactive requirements should be permissible (within the maximum range)
- Reactive power ranges should allow for the effective use of capability requirements of embedded generation
Principles for equipment requirements at connection point

- Standard of connection not included i.e. 1 or 2 circuits, capacity of circuits, etc – Left to relevant SO and national standards/regulation/procedures

- Equipment specified not separate section but as part of each requirement, i.e.
  - Need for communications equipment within signals section
  - Automatic disconnection under controls
  - Relays within protection
  - Monitoring equipment within monitoring requirements
  - etc

- Equipment specified at highest functional level allowing most technological variation
• Instructions themselves will be covered in Operation Code

• DCC Code will specify capabilities to provide/receive instruction and as a consequence some of the principles/rights for instructions i.e.
  • Set points for voltage control
  • Disconnection/Reconnection
  • Compliance – tests/procedural steps
  • Monitoring

• Not exclude manual operation only specify response times
Principles on information/data exchange, derogation, compliance

– In line with requirements in Network Code for Generators (cfr. working draft version 27/10/2011)
Next steps

- First draft network code
- Public consultation (Q2/2012)
- Final submission end of 2012 (subject to EC mandate)

Stakeholder interaction throughout the development process
Thanks for your attention any questions