Network Code on Demand Connection

CENELEC (Mandate 490)

05 December 2011, Brussels
Topics

- Meeting objective
- ENTSO-E Network Code Development
- Demand Connection Code scope
- Principles of specific topics
- Timeline / next steps
Meeting objective
Meeting objectives

- Inform of network code development process & timeline
- Discuss initial scope of network code and receive feedback
- Note CENELEC’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

ENTSO-E

Stakeholder Consultation

EU Commission

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

ACER

Stakeholder Consultation & workshops

Stakeholder Consultation? and workshops

Member states

Impact on national codes

Expected flow
Prioritization of Network Codes

1. Discussed in the Florence Forum with all stakeholders
2. Regularly discussed by EC / ACER / ENTSO-E
3. 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
## Network Code Development

### Status August 2011

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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</thead>
<tbody>
<tr>
<td>Electric Products/legislation relevant for effective implementation of the IEM</td>
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<td>FG on capacity allocation and congestion management</td>
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<tr>
<td>NC on capacity allocation and congestion management</td>
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<td>NC on forwards markets</td>
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<tr>
<td>Regional progress, setup and testing (incl. AESAG process and Regional Initiatives Work Program)</td>
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<tr>
<td>EC comitology guideline on governance</td>
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<tr>
<td>FG on grid connection</td>
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<tr>
<td>NC on grid connection</td>
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<tr>
<td>NC on DSO and industrial load connection</td>
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<tr>
<td>FG on system operation</td>
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<td>NC on operational security</td>
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<tr>
<td>NC on operational planning and scheduling</td>
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<td>NC on load-frequency control and reserves</td>
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<tr>
<td>EC comitology guideline on transparency</td>
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<tr>
<td>FG on Third Party Access</td>
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**Legend:**
- Common scoping discussions
- ENTSO-E work
- ACER work
- Preparatory work including codes consistency work
- ACER evaluation of NC
- Comitology process (including EC input to Comitology)
- ACER consultations
- ENTSO-E consultations
Network Code on Demand Connection – timeline (provisional)

• 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
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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<tbody>
<tr>
<td>• Load shedding</td>
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| Frequency and voltage parameters; |  |
|----------------------------------|  |

| Requirements for reactive power; |  |
|----------------------------------|  |

| Load-frequency control related issues; |  |
|----------------------------------------|  |
| • Low Frequency Disconnection          |  |
| • When this occurs                    |  |
| • Why it is used                      |  |

| Short-circuit current;               |  |
|--------------------------------------|  |

| Requirements for protection devices; |  |
|--------------------------------------|  |

| Balancing capabilities and provision of ancillary services; |  |
|------------------------------------------------------------|  |

| Equipment requirements at connection point; |  |
### Demand Connection Code – Terms of References

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Disconnection/Islanding/Reconnection</strong></td>
<td>- Methods/Procedures</td>
</tr>
<tr>
<td><strong>Instructions provide by TSO/DSO to user;</strong></td>
<td>- Manual/Auto&lt;br&gt;- How they are provided/received</td>
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<tr>
<td><strong>Information/Data exchange</strong></td>
<td>- What is required&lt;br&gt;- By whom&lt;br&gt;- When&lt;br&gt;- How it is provided</td>
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<tr>
<td><strong>Compliance;</strong></td>
<td>- What is tested&lt;br&gt;- How testing takes place&lt;br&gt;- Stages of Compliance testing</td>
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<tr>
<td><strong>Derogation;</strong></td>
<td>- What it is&lt;br&gt;- Whom it applies to&lt;br&gt;- How it is applied&lt;br&gt;- Exemptions</td>
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<tr>
<td><strong>Enforcement period</strong></td>
<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)
• 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
– 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