

Update on Technical Group High Penetration, ongoing and planned activities

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14th Grid Connection European Stakeholder
Committee Meeting

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Technical Group on High Penetration

Technical Group on High Penetration (TG HP)

- Volunteers from 6 stakeholder groups:
 - TSOs: 2 Representatives
 - Wind Manufacturing Industry: 4 Representatives
 - HVDC Manufacturing Industry: 2 Representatives
 - PV Manufacturing Industry: 1 Representative
 - Power System Analysis tool providers/Consultants: 2 Representatives
 - Academia: 2 Representatives
- Stage 2 (2017 – 2019): High Penetration (HP)
Longer term analysis and input into issues of extreme high penetration
- Is currently working on a joint report on grid forming capabilities
 - Contribution for setting up requirements on grid forming capabilities in future grid/network codes
- Inputs:
 - Links to research projects e.g. Migrate and Osmose
 - Projects with focus grid forming were already collected
 - Liaison with EG hosted by National Grid
- Meetings/webinars every 2-3 weeks

Organisational updates

- The Chair and TSO representatives have been replaced since May 2019
- The TG has agreed on a revised timeline so as to deliver the final report by the end of the year
 - ENTSO-E is engaging with more resources to achieve this goal
- Revised agenda:
 - *Last webinar on May 20*
 - Next webinars June 5 and June 17
 - Physical meeting on July 17 & 18
- Milestones until publication:
 - Complete drafting by the physical meeting (July 17)
 - Share draft with interest organisation & GC ESC (July 31)
 - Receive feedback by August 30
 - Refine report in response to comments by end of October
 - ENTSO-E approval-editing-issuing by end of December
- Current activities:
 - Reviewing and updating the executive summary (by June 5)
 - Recording outstanding questions (by June 5) – to be included separately in the report
- Dissemination activities - Preparation of a paper and presentation at the Wind Integration Workshop: 2019 Dublin.

Structure of the report

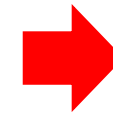
Executive Summary

- 1 Abbreviations.
- 2 Terminology and Definitions.
- 3 Situation of European Power Systems as of today.
- 4 Power System Development up to 2030.
- 5 Power System Needs.
 - 5.1 Classification of scenarios.
 - 5.2 Classes of Power Electronic Interfaced Power Systems.
 - 5.2.1 Class 1 PPMs or HCSs.
 - 5.2.2 Class 2 PPM / HCS.
 - 5.2.3 Class 3 PPM / HCS.
 - 5.3 Requirements for Grid Forming Power Electronic Interfaced Power Systems.
 - 5.3.1 Create system voltage.
 - 5.3.2 Contribute to fault level
 - 5.3.3 Fault current contribution.
 - 5.3.4 Sink for unbalances.
 - 5.3.5 Sink for harmonics.
 - 5.3.6 Contribution to inertia.
 - 5.3.7 First cycle survival / emergency support, survival of LFDD.
 - 5.3.8 Prevent adverse control interaction.
 - 5.4 Must-Run Units.
 - 5.5 Spatial Distribution of Grid Forming Units or Must-Run Units.
- 6 Proposed Tests and Benchmarking.
- 7 Literature References.
- 8 Annex.

PPM: Power Park Module

HCS: HVDC Converter Stations

LFDD: Low Frequency Demand Disconnection

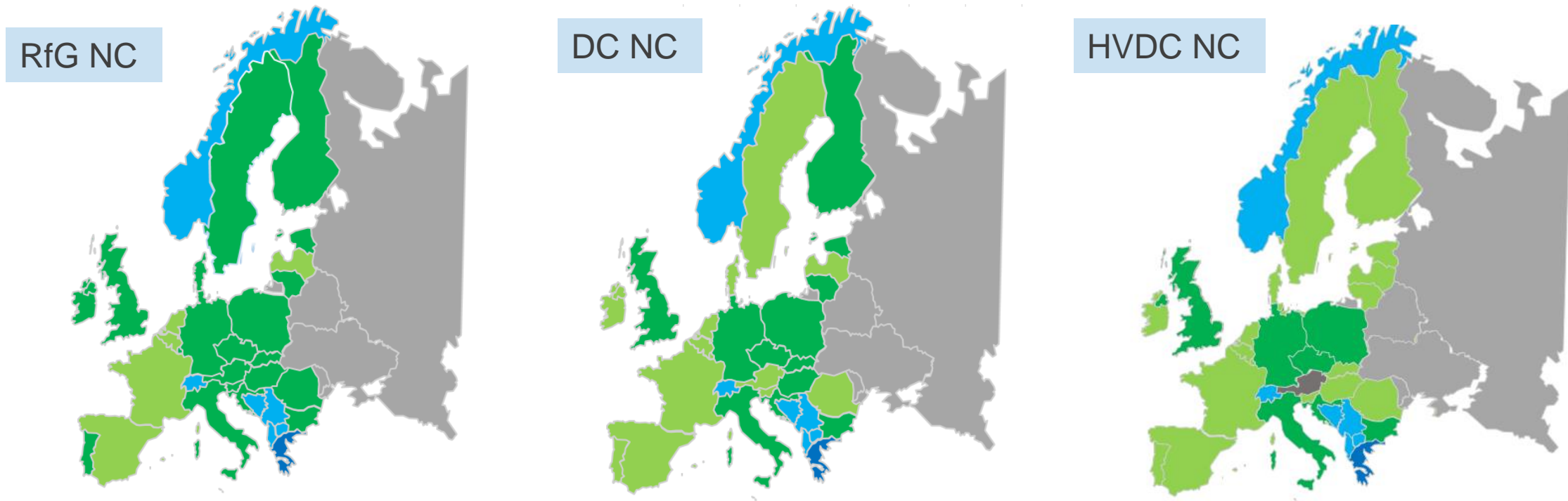


This chapter requires
more focus and
contributions by the
TG HP members

Final report >60 pages

Monitoring of non-exhaustive requirements

CNC Implementation Monitoring – May 2019



- For RfG: a handful of cases approved non-exhaustive parameters is pending
- Improved situation for DCC and moreover the HVDC, where approval of the final values is advancing with a view to September's deadline

Approved/binding
Submitted for approval
Submission & Approval is pending
Non EU MS - implementation under different framework
No proposals

More details on the proposals of the TSOs [here](#)

Active Library updates – Monitoring Excel File

- The monitoring excel file that was tracking the national proposals for the non-exhaustive requirements will have a new layout
- The new layout facilitates the filtering of each country's information and includes more information e.g. links to national websites/documentation (when available) and dates of approval – in collaboration with ACER.
- ENTSO-E continuously explores better and more transparent ways of displaying the information, therefore more updates may follow (feedback is welcomed)








New file available online by mid-June

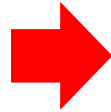
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Active Library – harmonizing the view with E&R

Current view based on the “old” ENTSO-E site
















Please, see below the [implementation maps](#)

Austria	 
Belgium	 
Bosnia and Herzegovina	
Bulgaria	
Croatia	



New view based on E&R and according to current ENTSO-E site style

Countries

Austria	 Docs  
Belgium	 Docs  
Croatia	 Docs 
Finland	 Docs  
Slovakia	 Docs 
United Kingdom	 Docs 

- **The new AL will provide easy access to:**

- Final approved documents (national documentation) when available
- National sites (update the current ones when required)
- Contact people (already incorporated in the old version)

- **Changes in each country in the current AL:**




- National Implementation Site and Contact will remain
- Final Documents will appear (listing the documents presented in the home site as above)
- “Documents” will be renamed as “Documents during the implementation”
- “Tasks” will be renamed as “Tasks during the implementation”
- Dates of submission and approval of values will be inserted in each country (as in the monitoring excel file)
- (Extra) – the existing vs new PGMs survey results (currently on the Issue Logger can also be incorporated in each country site

Spain

 National Implementation Site  Contact Tasks (7) Documents (14)

Overview of planning

Overview planning for next months

 Process for drafting proposal
 Public Consultation
 TSO deadline for submitting proposals

Level 1 Article content/activity	Level 2 Approach	2019												2020												Consultation Period
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Creation and maintenance of the Active Library for monitoring the implementation process + the monitoring excel file																										
Initial monitoring of non-exhaustive parameters definition - Implementation																										
Initial monitoring of non-exhaustive parameters definition - Implementation																										
Initial monitoring of non-exhaustive parameters definition - Implementation																										
RfG List of information to ACER (Monitoring activity)																										
DCC List of information to ACER (Monitoring activity)																										
HVDC List of information to ACER (Monitoring activity)																										
Monitoring (analysis and preparation of report) - possibly joint CNCs																										
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Technical Group on High Penetration (former Fast Fault Current Injection)																										
Technical Group on Compliance Monitoring - from April 2018 in collaboration with TC8X WG3 of CENELEC																										
Engage with certification and standardisation bodies i.e. IEC RE and CENELEC for consistency																										
Expert Group on pump storage hydro (EG PSH)																										
Expert Group on identification of storage devices (EG STORAGE)																										
Expert Group on mixed customer sites (EG MCS)																										
Engage with stakeholders/ACER/EC through the European Stakeholder Committee for Grid Connection (GC ESC)																										

GC ESC EGs

Expert Group on Pump Storage Hydro

- The final report requires fine tuning in the part of the variable speed technologies
- Specific expert inputs are needed and will be incorporated in the coming weeks
- Any respective adjustments in the table of requirements will take place

Expert Group on Identification of storage devices

- The final report is ready and needs to be put in right template.
- The table of requirements will be checked for fine tuning

Expert Group on Mixed Customer Sites

- The final report is ready

- Any dedicated comments/discussion to take place in the respective slots of today's meeting
- If no further comments, then ENTSO-E with the help of the EGs (where appropriate) can finalize the reports and have them publicly available
- The final report of EG PSH will be circulated separately for comments
- The status of the current EGs can be assumed close to "finalized" and therefore it doesn't hinder the initiation of new EGs
- *ENTSO-E will support the dissemination activities of the GC ESC EGs by preparing a paper for the [Wind Integration Workshop](#) in Dublin, 16-18 October*