



EWEA
THE EUROPEAN WIND ENERGY ASSOCIATION



Implementing the Network Code Requirements for Generators

Daniel Fraile, senior analyst- grid
integration and market design

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EWEA's leading members

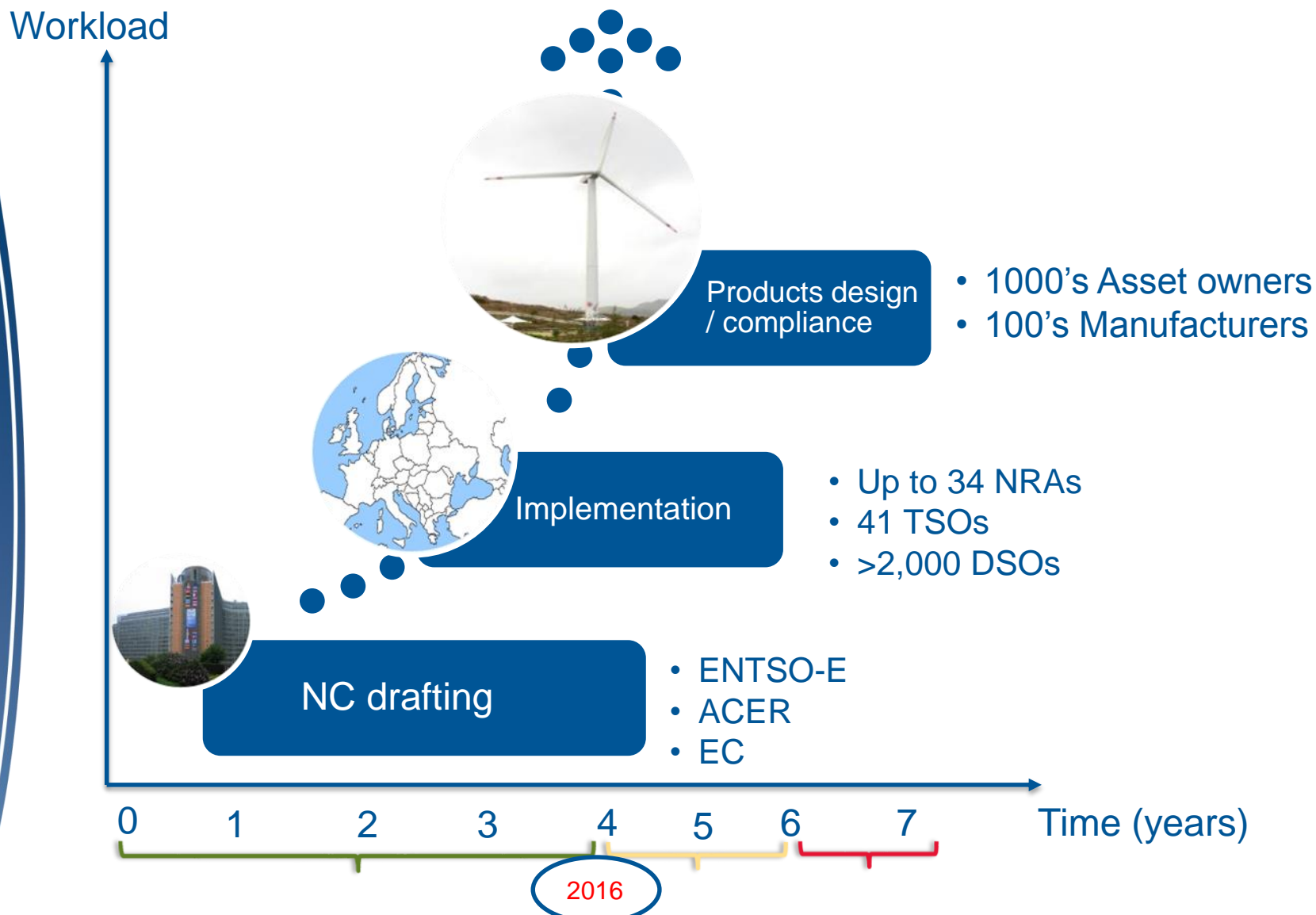
Market Leaders



Leading Members



We have already gone a long way but, ... this is just the beginning!



... and where are we?



Code text

- Critical definitions without consensus among stakeholders
- **75% requirements non-exhaustive**

Implementation

- Technical focus diluted and focus now on regulatory process to achieve tight deadlines
- **Risks of misinterpretation in translations**
- **Risks of hasty copy-pasting unnecessary requirements**

Manufacturer product development

- High uncertainty
- Increased costs
- Tight deadline for compliance

Areas that require further work



1. Addressing **non-exhaustive requirements** in close cooperation with industry to avoid unnecessary and heterogeneous requirements
2. **Compliance & testing**- how does the NC relates to existing standards?
3. Clarity on **scope** (e.g. RfG vs. HVDC, retrofiting measures) and **timing** for compliance with new rules
4. Aiming for **structural harmonization and clarity** in national codes
5. **Formal engagement of national stakeholders** and transparent monitoring mechanism

1. Addressing technical issues: non-exhaustive requirements

A plethora of key technical requirements with a direct cost impact on the wind industry will be regulated **as non-exhaustive requirements**, with the national implementation phase being crucial:

Fault Ride Through

- Fast reactive current injection at FRT
- Post fault active power recovery: minimum recovery time
- Time and voltage parameters of FRT profiles
- Limitations to U-Q/Pmax range for < 110 kV connected plant

Reactive power

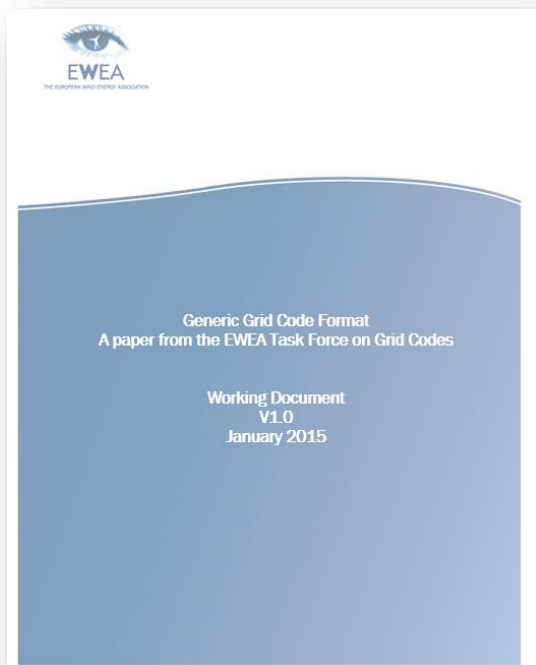
- specifications of the U/Q/Pmax – capability significantly more demanding than present codes - especially for distribution networks. Proper justification including a cost-benefit analysis is lacking.
- Q capability below maximum capacity, particularly at P near 0 for type C
- Voltage range for Q provision : Clear distinction to be made between < 110 kV and > 110 kV connected plant
- ...

1. Wind Industry has developed further specifications on non-exhaustive requirement and gray zones of the RfG code



Expected for end March

Leading Participating industry



1. Wind Industry is developing further specifications on non-exhaustive requirement and gray zones of the RfG code

Example: Under voltage FRT profile

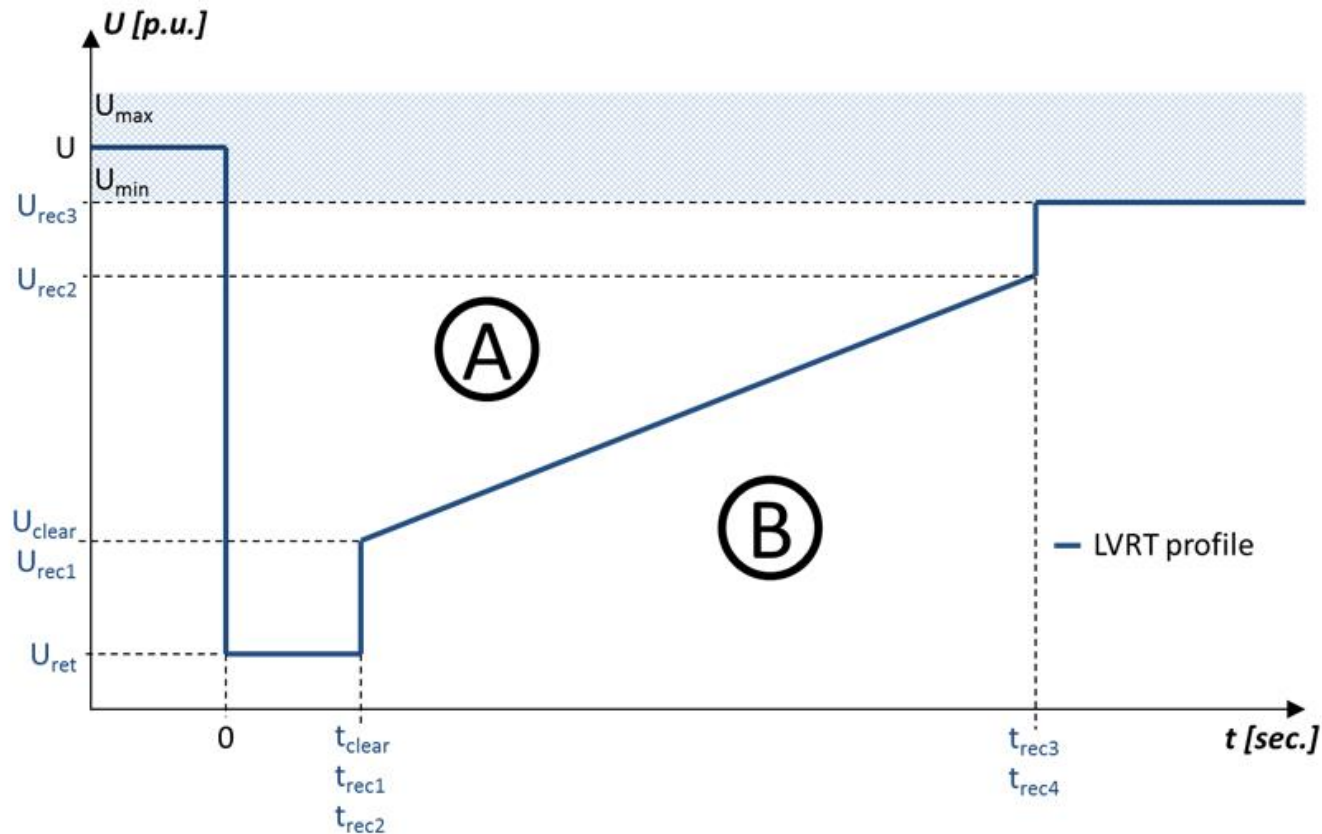
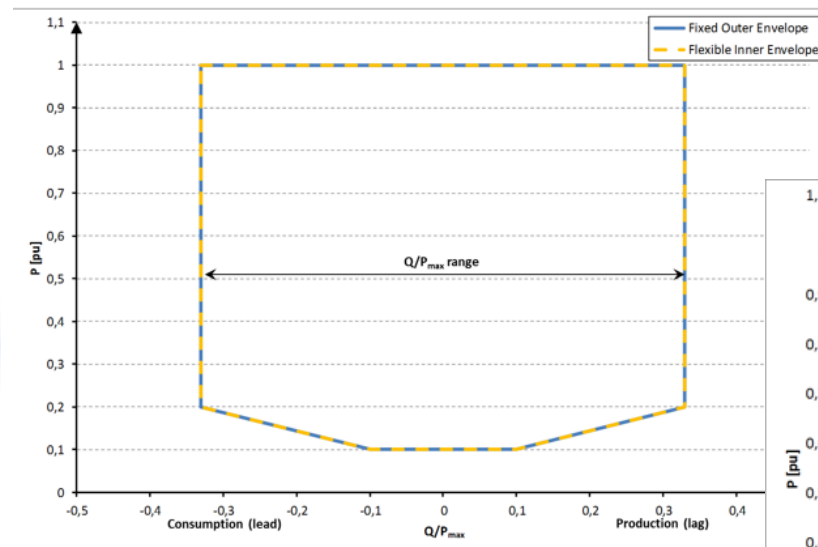


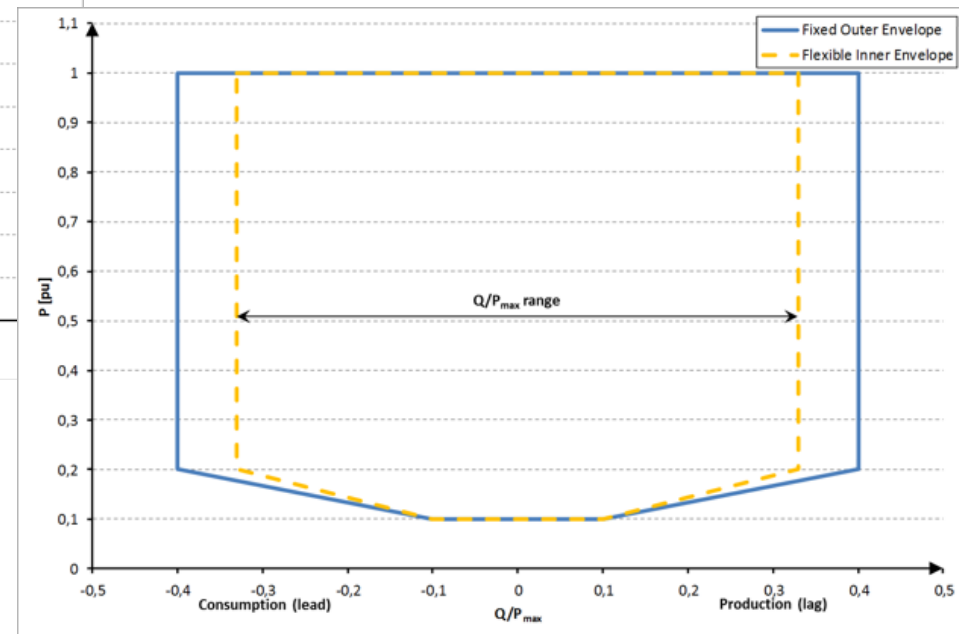
Figure 1 - LVRT profile of Power Generating Module of type B, C & D.

1. Wind Industry is developing further specifications on non-exhaustive requirement and gray zones of the RfG code

Reactive power Inner and outer envelope – How will it be justified and how to implement?



EWEA proposes P/Q profiles for below and above 110KV



2. Compliance and testing



- Manufacturers need to test their products for compliance with rules that are not fully defined yet.
- Requirements are set at the point of connection (system level), thus not all individual units may need to have the same capabilities
- What is the role of EN standards in testing for compliance of RfG NC?
- Wind industry would like to have single testing/compliance standard to optimize cost and time

3. Clarity on scope and inconsistencies



- (in UK) Offshore wind plants need to fulfill:
 - the RfG code @PoC offshore +
 - The HVDC code @PoC onshore (for DC connected windfarms)
- If they are isolated from main AC grid, and connected through a HVDC interconnector, why should they fulfill RfG?
- This kills the flexibility on running the offshore wind park at the most convenient way

You have our support on the implementation process...

Wind industry has been calling since 2006 for:

- harmonize grid code with particular requirements for wind
- Sharp and clear common agreed technical specifications
- All relevant aspects included (common utility practice)
- All requirements to be specified at the POC

...But you need to get us involved

- First step: adoption of EWEA specifications for FRT and Q within the Implementation guidelines
- Second step: set up transparent national platforms/processes with TSO/manufacturers/developers



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Thanks for your attention!

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Imagine what can national implementation of excessive non-exhaustive requirements lead to...?

