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Draft Network Code "Requirements for Grid Connection Applicable to All Generators":

1. NC RfG versus Alternatives (CBA methodology)
2. Technology/Regional Specificities

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Structure of the presentation

- NC RfG versus alternatives (CBA methodology)
- Technology/regional specifities
- Other issues

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CBA rules of the NC RfG are not compliant to ACER's FG

ACER's FG	ENTSO-E's NC
"Where the minimum standards and requirements introduced by the network code(s) deviate significantly from the current standards and requirements, there should be a cost-benefit analysis performed by ENTSO-E"	Is there any rigorous analysis to support deviation from current standards and requirements? There is no sign of a CBA in the draft NC RfG
"The format and methodology or principles of the cost-benefit analysis shall be prescribed by the network code(s)"	The format, methodology or principles of the CBA are not laid down in the draft NC RfG. The "quantitative" and "qualitative" CBAs are not defined; nor is the "filtering process
"The network code(s) shall always require the system operators to optimise between the highest overall efficiency and lowest total cost for all involved stakeholders"	The NC RfG does not give evidence to this point. Could you please elaborate on this crucial point?

Cost-benefit analysis (CBA): Scope and provisions (I)

- Retro-active application of the requirements contained in the Draft NC RfG to existing users should be the exception; therefore CBA is crucial!
- Application to existing facilities would result in major costs or premature closure of generation; alternatively, very large numbers of derogations could be required
- Art. 3: The draft Code says very little about the CBA. A more detailed description is needed:

  ⇒ Performing CBA, TSOs should embark stakeholders on board, giving an opinion on the need for a change and for "thumb" data

  ⇒ CBA shall also consider alternative solutions other than increasing requirements on PGF such as requirements on transmission, demand or market-based solutions, therefore full transparency e.g. on costs, (alternative) technical solutions, assumptions, time frame is needed

  ⇒ All costs of compliance should be borne by the relevant TSO

  ⇒ Methodology should ensure the lowest overall costs

Cost-benefit analysis (CBA): Scope and provisions (II)

- Art. 3: The time period for re-assessment of the applicability of the requirements set forth in the Draft NC RfG is too short: should be extended to every 10 years to bring it closer to industrial investment cycles

  ⇒ "Every three years" brings uncertainty and creates undue risks as the treatment of power generating facilities could change over time and industrial investment cycles are not reflected

  ⇒ Existing provisions should be kept until all legal cases/appeals are decided

- Art. 55, 2: Conditions to refuse network access are already subject to directive 2009/72/EC; network operator is obliged to issue LON if no derogation is applied

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- **Technology / regional specifities**
- **Other issues**

Technology/Regional Specificities: Roles and responsibilities are not in balance

- The NC RfG defines **several mandatory requirements** (e.g. frequency control/response, reserve, reactive power, black start) **that PGF units shall comply with.**
- E.g. Art. 4.1, 12.3.b: **Widening these requirements to all generating units is beyond the scope of the NC RfG** and is likely to result in higher electricity prices – by increasing PGF investment and operational costs.
- **In order to ensure an efficient and cost optimised power supply, the requirements with reference to ancillary services shall**
  - be **defined only for PGF which qualify for it** and
  - be **without prejudice to the creation of market places and mechanisms for contracting such services**.

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The draft code introduces new and onerous requirements

- The draft NC RfG appears to consider all generation as "significant" and having cross-border impact
- ENTSO-E introduces major requirements deviating from current standards (i.e. frequency & voltage ranges) without rationale
- When considered combined, some requirements are not achievable (Fault Ride Through & voltage against reactive power (UQ) profile)
- Technical requirements should set minimal standards but should not put constraints on the means (PSS - power system stabiliser)

Requirements impossible to be complied with by state-of-the-art power plants

Frequency stability and frequency change (2hz/s; unrealistic value – e.g. blackout Nov 2006 showed 0,13 hz/s))

Dynamic behaviour of the Power Generating Facility (PGF) on the grid
e.g. forced gradients, activation of active power, load steps etc.

Fault ride through requirement to stay connected to the grid (short-circuit-current capability) for most of the operation points of the PGF

Requirements difficult to be complied with

Required withstand capability of torsional forces of 50% above the nominal value leads to major component tress => it reduces the component life time!

Unnecessary Requirements on reactive power lead to new transformer and tap changer-design => currently not available on the market!

Thanks for your attention!

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