

Implementation Guidance Documents

CONSULTATION

Overview of the comments received during the
consultation and ENTSO-E conclusions

WG CNC meeting

13 September 2016 Brussels



Agenda

- **High Level overview of the Consultation on Implementation Guidance Documents**
- **Detailed Comments per IGD**
- **Conclusions**

High Level Overview of the Consultation on Implementation Guidance Documents

General comments:

- Need of earlier and more intense stakeholder involvement in nation implementation processes
- Need of a similar structure/content for all the IGDs; ENTSO-e should explain the structure of each IGD and the categories within.
- More technical details and values for parameters of non-exhaustive requirements
- Insufficient transparency of the coordination/collaboration at TSO-TSO/TSO-DSO at national decision making processes
- Missing indications / proposals on solutions for non-exhaustive requirements (in particular lack of harmonization of values)
- Lack of justification (technical details, system studies, etc.) and CBA for national decisions

Agenda

- High Level Overview of the Consultation on Implementation Guidance Documents
- **Detailed Comments per IGD**
- **Conclusions**

General guidance on making non-mandatory requirements at European level mandatory in a country (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	1	6.25%
No	12	75.00%
Not Answered	3	18.75%

Comments on the technical information within this IGD

There were 12 responses to this part of the question.

General (other) comments

There were 13 responses to this part of the question.

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	0	0%
No	13	81.25%
Not Answered	3	18.75%

General guidance on making non-mandatory requirements at European level mandatory in a country (2/2)

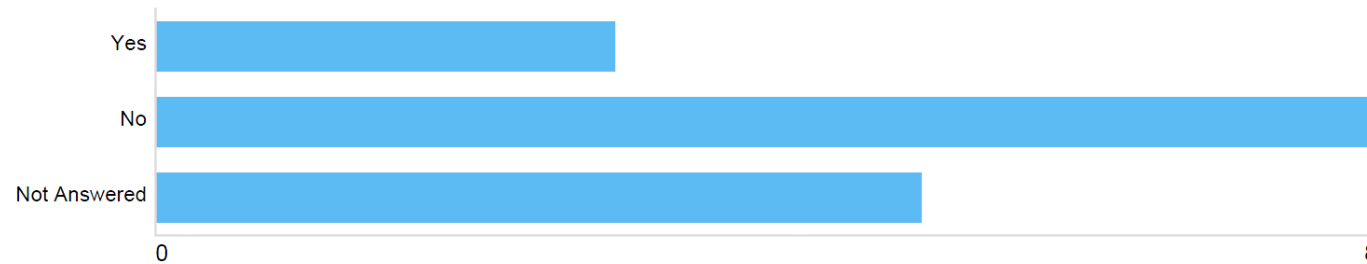
Main comments:

- The IGD could then benefit from proposal of methodologies/criteria to inform the national process on decision making.
- The IGD could benefit from a list of (non-) exhaustive and (non-) mandatory requirements
- Some comments recommended to keep existing parameters at national level as far as possible if efficiency has been proven
- Some comments recommended to stick to existing standards, of course if the existing standards meets the requirements
- Interdependency between requirements should be considered.

General guidance on Cost-benefit analysis (1/2)

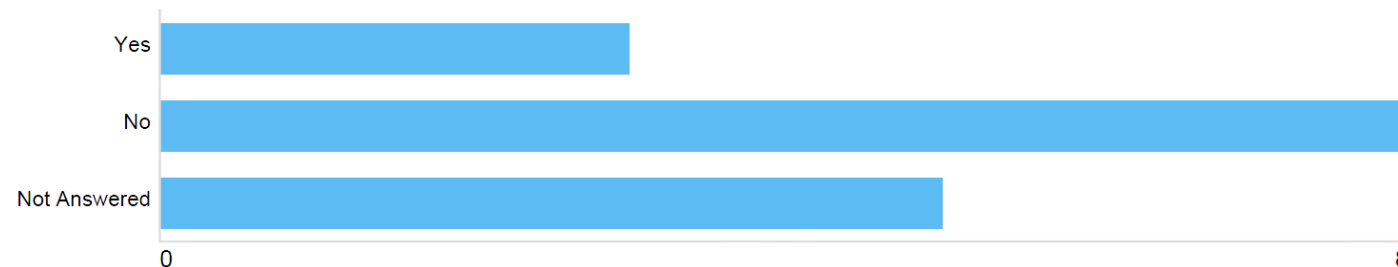
Question 6: For this IGD please give us your comments on:

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	3	18.75%
No	8	50.00%
Not Answered	5	31.25%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	3	18.75%
No	8	50.00%
Not Answered	5	31.25%

Comments on the technical information within this IGD

There were **9** responses to this part of the question.

General (other) comments

There were **10** responses to this part of the question.

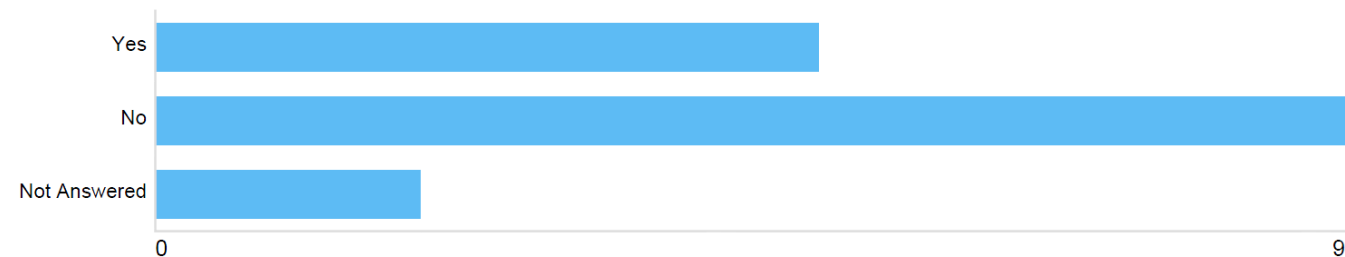
General guidance on Cost-benefit analysis (2/2)

Main comments:

- The IGD could benefit from good examples
- Comments propose to recommend CBAs for non-exhaustive/non-mandatory requirements.
- The different parties involved in the process and their responsibilities could be clearly defined, including the way the CBA conclusions shall be evaluated
- A 1 month public consultation on the quantitative CBA elaborated by the TSO seems to be much too short for grid users considering the potential consequences at stake.
- Further guidance should be provided, for instance:
 - on how to ensure consensus on the quality of the data used
 - on the conditions to use non-public or confidential data provided by power generating facility owners
 - on the methodology to assess the impacts of interconnections
 - or on the methodology to assess alternative solutions
- To organize dedicated workshop to elaborate common proposals to refine the process and prepare a more detailed guidance on CBA methodology.

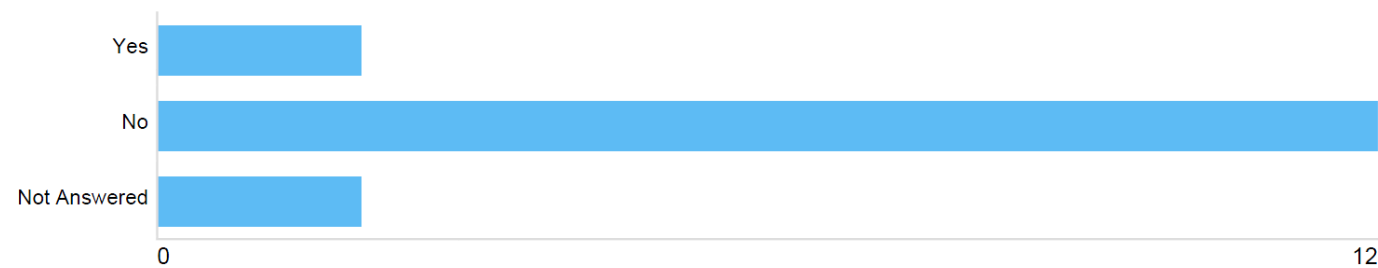
General guidance on parameters for non-exhaustive requirements (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	5	31.25%
No	9	56.25%
Not Answered	2	12.50%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	12	75.00%
Not Answered	2	12.50%

Comments on the technical information within this IGD

There were **14** responses to this part of the question.

General (other) comments

There were **10** responses to this part of the question.

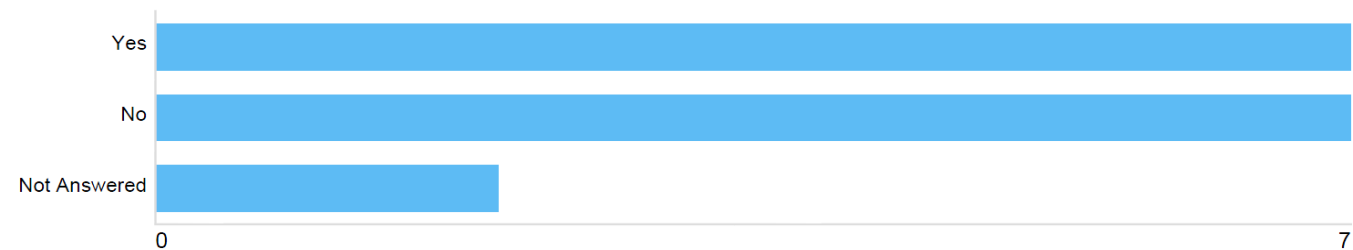
General guidance on parameters for non-exhaustive requirements (2/2)

Main comments:

- Comments propose to include a guidance on the process for defining the non-exhaustive requirements which should involve stakeholders.
- Analysis of system needs should also consider the implementation cost for generators and manufacturers and to rely existing standards where the benefits are demonstrated
- Clarification of the need for coordination with neighboring countries. At minima, this should include the sharing of implemented values of the parameters between TSO.

General guidance on Compliance monitoring (1/3)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	7	43.75%
No	7	43.75%
Not Answered	2	12.50%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	3	18.75%
No	11	68.75%
Not Answered	2	12.50%

Comments on the technical information within this IGD

There were 14 responses to this part of the question.

General (other) comments

There were 13 responses to this part of the question.

General guidance on Compliance monitoring (2/3)

Main comments:

- It is appreciated that the IGD points out that the relevant TSO shall identify the advantages and disadvantages for different compliance monitoring schemes
- The IGD could include a description of potential challenges for national implementation with discussion of approaches that could be taken
- More guidance should also to be given on the level of detail required for model submission and validation. Good examples such as the one of National Grid in the UK could be provided (See Guidance Notes for Power Park Modules, September 2012).
- The IGD could include a defined list of evidences (which support material will be accepted) and processes in order to demonstrate compliance, based on current practice (Data submission, Factory Acceptance Tests (FATs), Site Acceptance Tests (SATs), test procedure profiles for frequency response or islanding, steady state, transient and dynamic studies, data trending such as disturbance recording, SCADA recording, post event investigation reports).

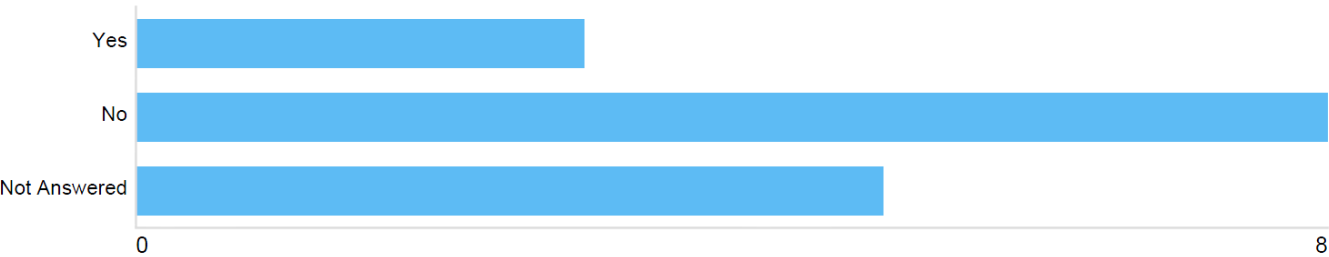
General guidance on Compliance monitoring (3/3)

Main comments:

- Recommendation for harmonization of compliance testing, simulation and monitoring would be of great benefit to all stakeholders. It should be avoided that at the end there are "difficult" and "easy" countries regarding obtaining the compliance certificate for the same requirement.
- Comments request further explanation on the conditions under which equipment certificates could be used instead of tests and simulation for types B/C/D.
- The IGD could describe the expected content of equipment certificates and the process to elaborate them in absence of standards .
- Comments request an analysis of advantages and disadvantages of the delegation by RSO of the compliance to third parties.
- A flowchart of the process and its explanation is to be provided.

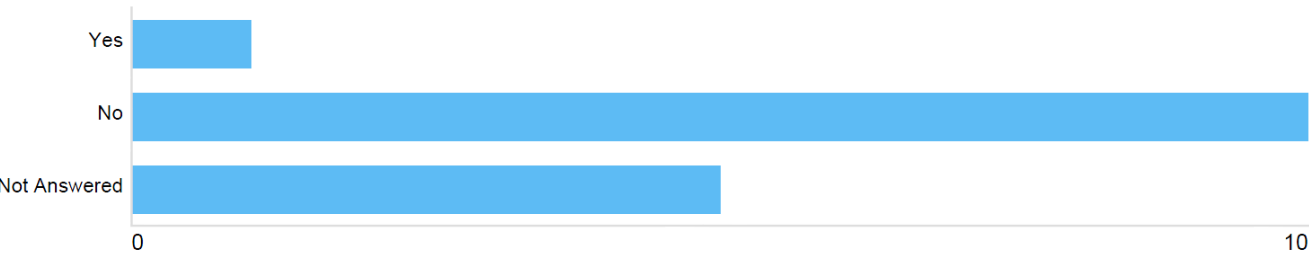
General guidance on reactive power management at transmission/distribution interface (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	3	18.75%
No	8	50.00%
Not Answered	5	31.25%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	1	6.25%
No	10	62.50%
Not Answered	5	31.25%

Comments on the technical information within this IGD

There were 10 responses to this part of the question.

General (other) comments

There were 9 responses to this part of the question.

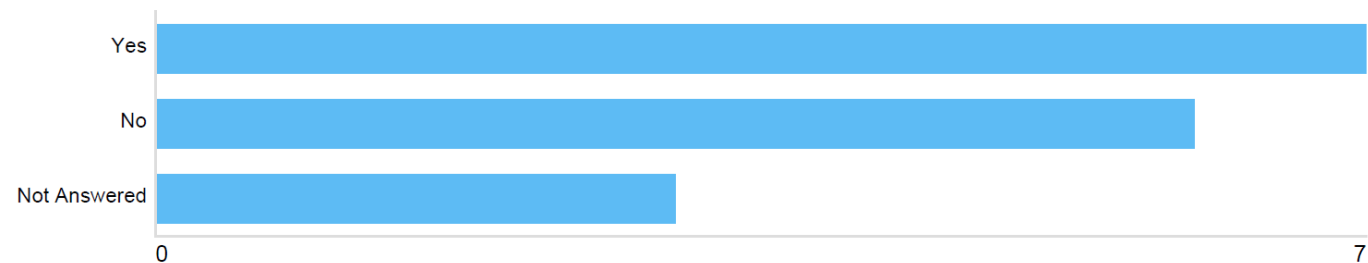
General guidance on reactive power management at transmission/distribution interface (2/2)

Main comments:

- The IGD could benefit from clarification of the relationship between reactive support criteria at T-D boundaries and required reactive support to Power Generation facilities
- Details on the provided CBA are missing
- Clarification on the possibility/benefits/drawback to aggregate reactive power compensation devices could be added.
- Harmonization of the reactive power capabilities at the DSO level could be added.
- Other comments request to advocate for more flexibility on the implementation of these requirements in order to optimize the corresponding investments.

General guidance on Rate-of-change-of-frequency withstand capability (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	7	43.75%
No	6	37.50%
Not Answered	3	18.75%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	11	68.75%
Not Answered	3	18.75%

Comments on the technical information within this IGD

There were 13 responses to this part of the question.

General (other) comments

There were 11 responses to this part of the question.

General guidance on Rate-of-change-of-frequency withstand capability (2/2)

Main comments:

- Comments request to clarify the responsibility of the TSO-DSO-RSO
- IGD could further clarify the motivation for different values between the NC RfG and the NC HVDC: Technical generation experts request very careful justification of the 2.5Hz/sec. since this may lead to significant costs

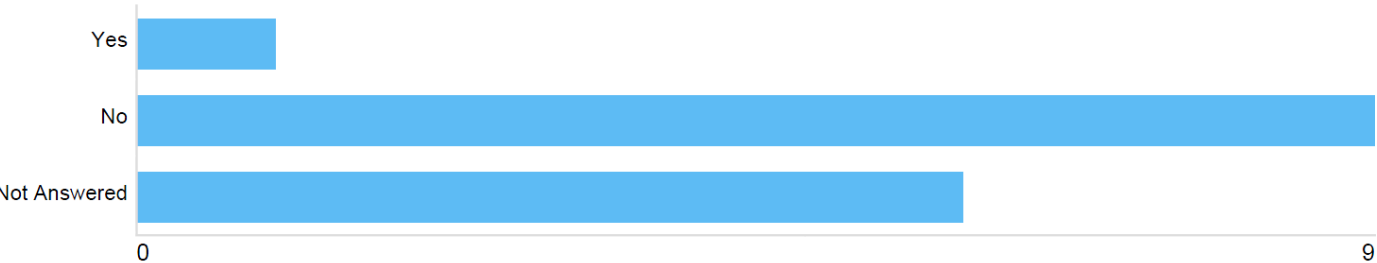
General guidance on Reactive power requirement for PPMs & HVDC converters at low / zero active power (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	2	12.50%
No	8	50.00%
Not Answered	6	37.50%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	1	6.25%
No	9	56.25%
Not Answered	6	37.50%

Comments on the technical information within this IGD

There were 10 responses to this part of the question.

General (other) comments

There were 10 responses to this part of the question.

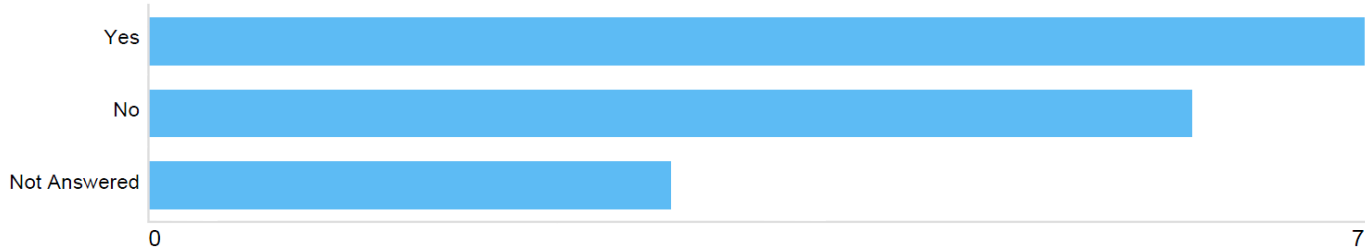
General guidance on Reactive power requirement for PPMs & HVDC converters at low / zero active power (2/2)

Main comments:

- Comments request clarification of the conditions under which these requirements are necessary to avoid stranded investment.

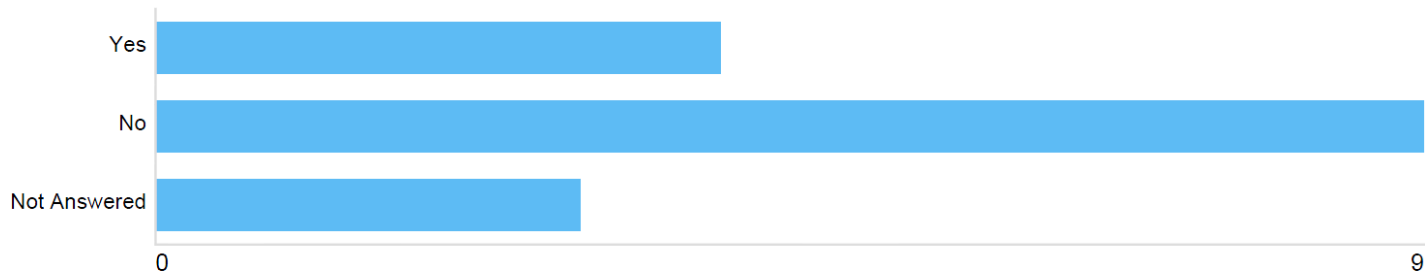
General guidance on Post fault active power recovery (1/2)

Do you consider tis IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	7	43.75%
No	6	37.50%
Not Answered	3	18.75%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	4	25.00%
No	9	56.25%
Not Answered	3	18.75%

Comments on the technical information within this IGD

There were 12 responses to this part of the question.

General (other) comments

There were 11 responses to this part of the question.

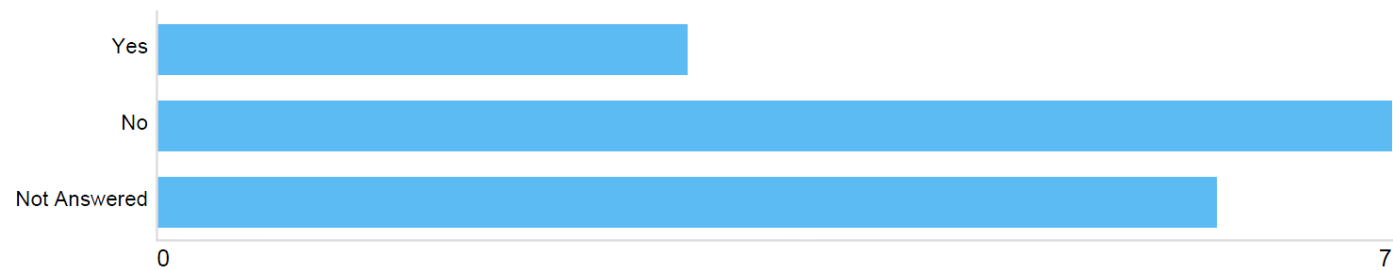
General guidance on Post fault active power recovery (2/2)

Main comments:

- The IGD should list all relevant parameters to be considered
- Comments request to extend the information regarding the HVDC converters
- Recommendation to take the provisions for guidance document written by stakeholder (i.e. Wind Europe)
- Clarify the relation between inherent response of synchronous PGM vs NC RfG requirements

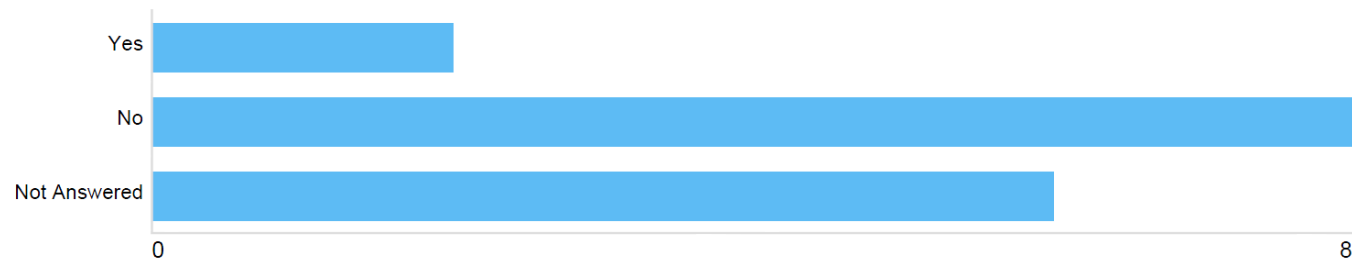
General guidance on Fault current contribution from PPMs & HVDC converters (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	3	18.75%
No	7	43.75%
Not Answered	6	37.50%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	8	50.00%
Not Answered	6	37.50%

Comments on the technical information within this IGD

There were 10 responses to this part of the question.

General (other) comments

There were 8 responses to this part of the question.

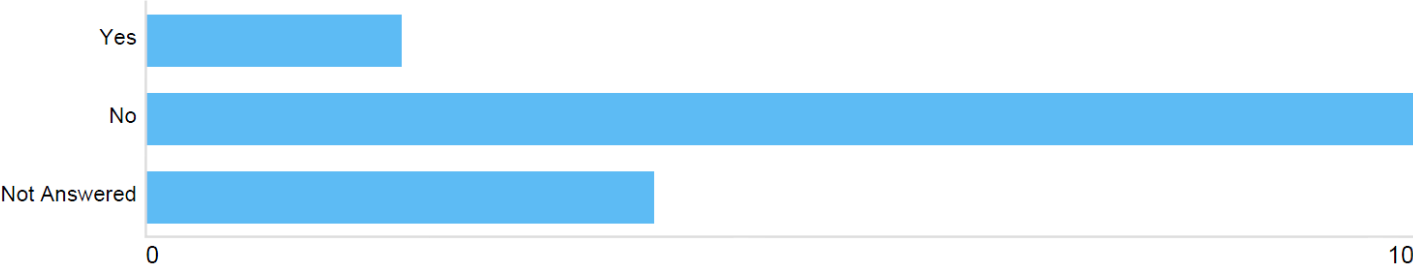
General guidance on Fault current contribution from PPMs & HVDC converters (2/2)

Main comments:

- The IGD should better explain the advantage and drawbacks of defining the fault current contribution in phase voltages or in sequence components
- This IGD should consider describing the impact of fault current contribution on the DSO networks
- Comments proposes to discuss the possibility to use Statcoms and other such equipments within the user facilities.

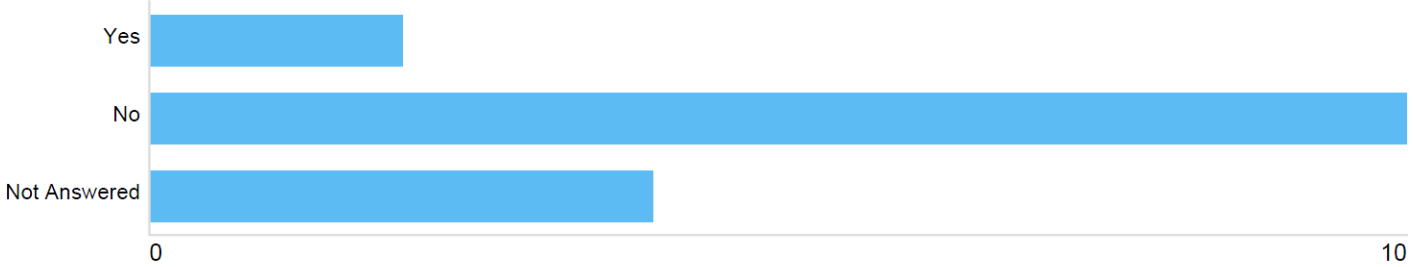
General guidance on Need for synthetic inertia for frequency regulation (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	2	12.50%
No	10	62.50%
Not Answered	4	25.00%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	10	62.50%
Not Answered	4	25.00%

Comments on the technical information within this IGD

There were 11 responses to this part of the question.

General (other) comments

There were 6 responses to this part of the question.

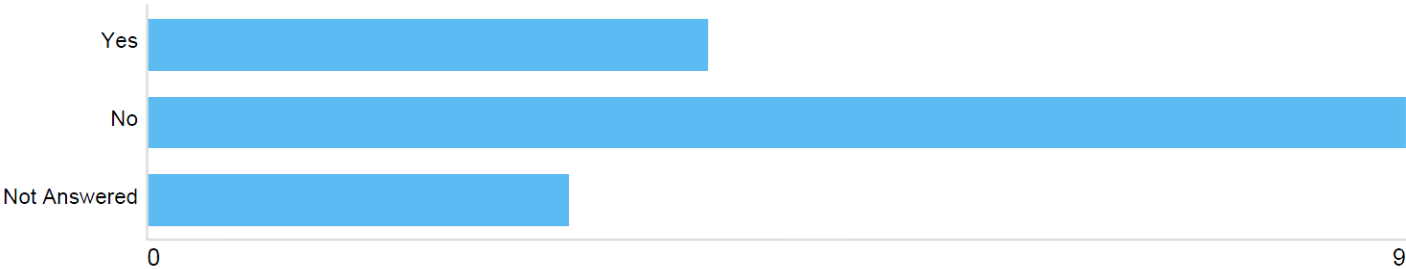
General guidance on Need for synthetic inertia for frequency regulation (2/2)

Main comments:

- Comments request the IGD to explain the physics behind the NC definition of the Synthetic Inertia
- The IGD could specify the system needs and detail the advantages/disadvantages and limits of technologies to provide Synthetic Inertia
- The IGD could provide more details about the implementation challenges such as the problem of frequency measurement
- Comments propose that the IGD advocate for a synchronous area study of the problematic.

General guidance on Frequency related parameters for non-exhaustive requirements (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	4	25.00%
No	9	56.25%
Not Answered	3	18.75%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	11	68.75%
Not Answered	3	18.75%

Comments on the technical information within this IGD

There were 13 responses to this part of the question.

General (other) comments

There were 13 responses to this part of the question.

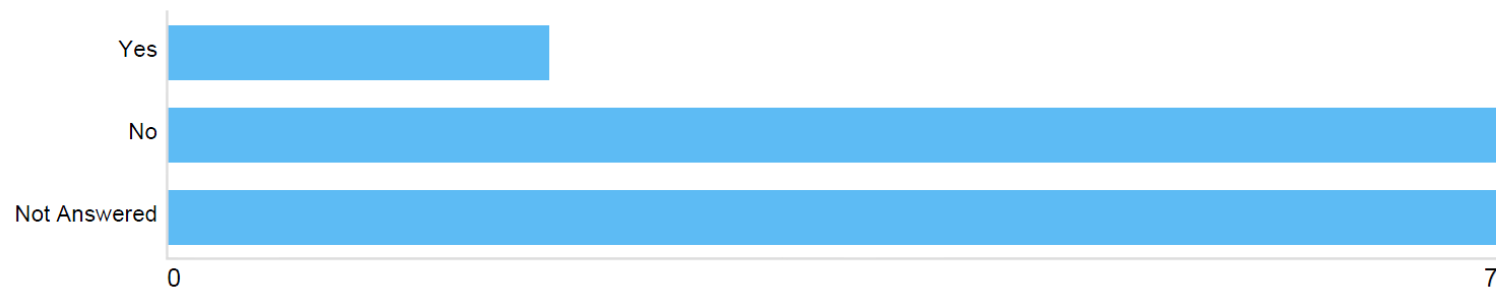
General guidance on Frequency related parameters for non-exhaustive requirements (2/2)

Main comments:

- Comments request more information about the implementation of the LFSM-O, especially the settling time of this function
- The IGD should clarify the different constraints and possibilities of PPM based on renewable sources and with or without rotating masses
- Comments on the link between HVDC technology (VSC, CSC) and requirements.
- IGD should advocate for strong coordination between neighboring TSOs or even harmonized at synchronous area level.
- Comments request the IGD to also cover special mode of operation such as Islanding and system splits.
- The IGD could benefit from strong manufacturer/users/TSO involvement.

General guidance on Instrumentation, simulation models and protection (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	2	12.50%
No	7	43.75%
Not Answered	7	43.75%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	1	6.25%
No	8	50.00%
Not Answered	7	43.75%

Comments on the technical information within this IGD

There were **9** responses to this part of the question.

General (other) comments

There were **7** responses to this part of the question.

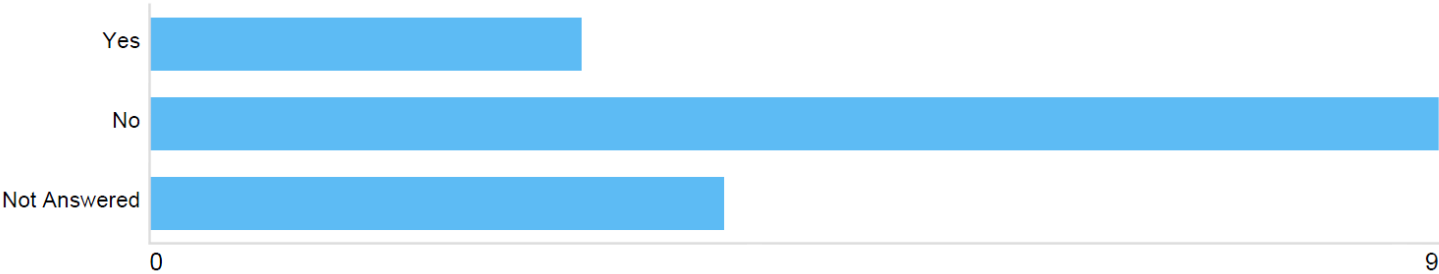
General guidance on Instrumentation, simulation models and protection (2/2)

Main comments:

- Comments request a stronger emphasis on requiring simulation models in generic form (block diagrams, IEC standard models and data sheets) and in particular software packages should be made.
- The IGD could cover the recommended minimum protections and minimum instrumentation needed.
- The IGD could benefit from a list of parameters to be set.
- Comments request definition of tolerance and accuracy of the simulation performed as well as the link with black box models
- The IGD could benefit from connection examples
- The IGD could benefit from strong manufacturer/users/TSO involvement.

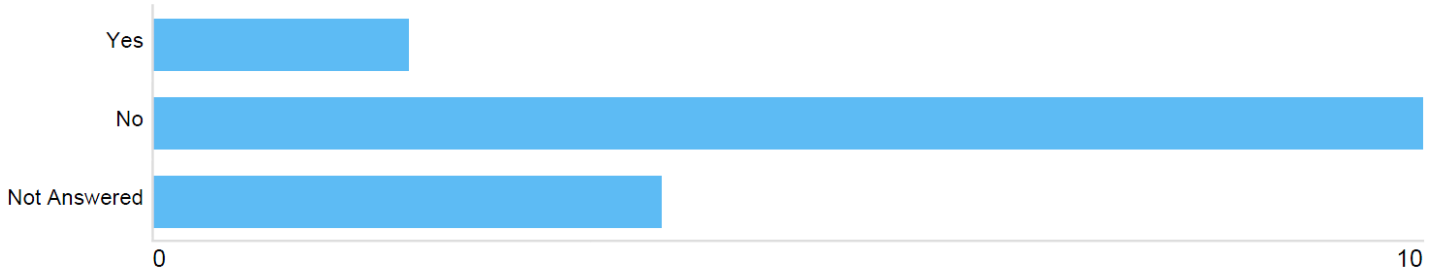
General guidance on Voltage-related parameters for non-exhaustive requirements (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	3	18.75%
No	9	56.25%
Not Answered	4	25.00%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	10	62.50%
Not Answered	4	25.00%

Comments on the technical information within this IGD

There were **10** responses to this part of the question.

General (other) comments

There were **13** responses to this part of the question.

General guidance on Voltage-related parameters for non-exhaustive requirements (2/2)

Main comments:

- Design rules for voltage range and time period need to be considered in the IGD. This could be considered a typical application for a CBA
- Guidance on which way to proceed to meet both alternator standards and NC requirements shall be addressed in the IGD.
- Guidance is required to realistically treat the impact of both frequency and voltage variations.

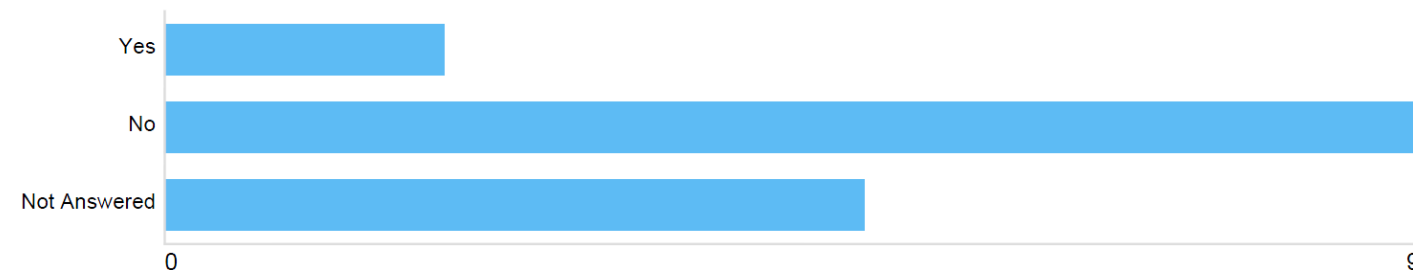
General guidance on Determination of the thresholds for Types B, C & D power generating modules (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	5	31.25%
No	4	25.00%
Not Answered	7	43.75%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	9	56.25%
Not Answered	5	31.25%

Comments on the technical information within this IGD

There were **11** responses to this part of the question.

General (other) comments

There were **5** responses to this part of the question.

General guidance on Determination of the thresholds for Types B, C & D power generating modules (2/2)

Main comments:

- Comments request to clarify the process involving the public consultation and coordination with neighboring TSOs.
- IGD should support the clarification of the definition of power generating units and more specially the concept of individual set of installation
- The IGD could provide methodologies that could help setting up the limits.

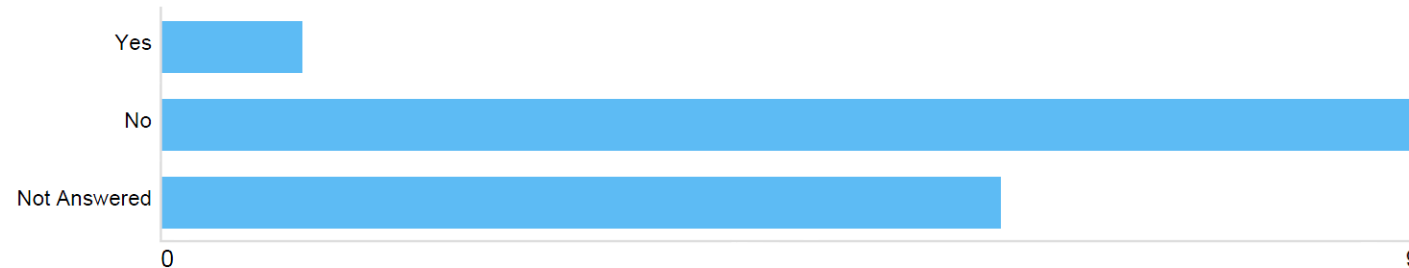
General guidance on Reactive power control mode (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	2	12.50%
No	8	50.00%
Not Answered	6	37.50%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	1	6.25%
No	9	56.25%
Not Answered	6	37.50%

Comments on the technical information within this IGD

There were **10** responses to this part of the question.

General (other) comments

There were **3** responses to this part of the question.

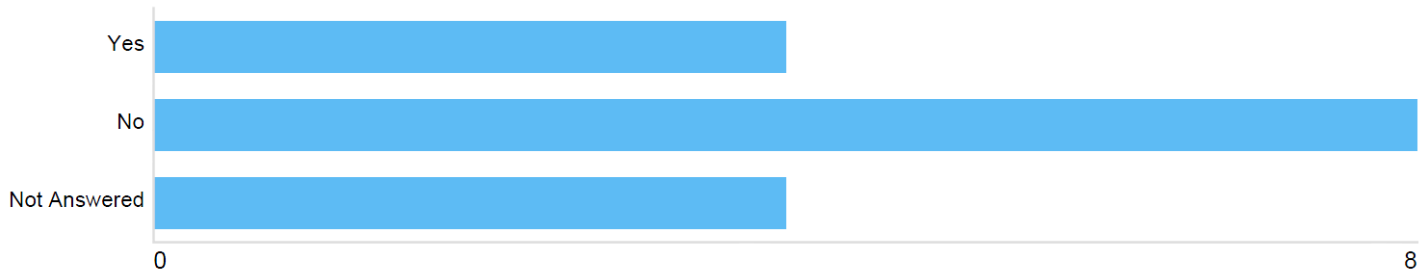
General guidance on Reactive power control mode (2/2)

Main comments:

- Comment request further clarification of the different parameters of the NC to be considered
- Current example from the IGD could be improved
- Special cases of several users sharing the same connection point could be considered.

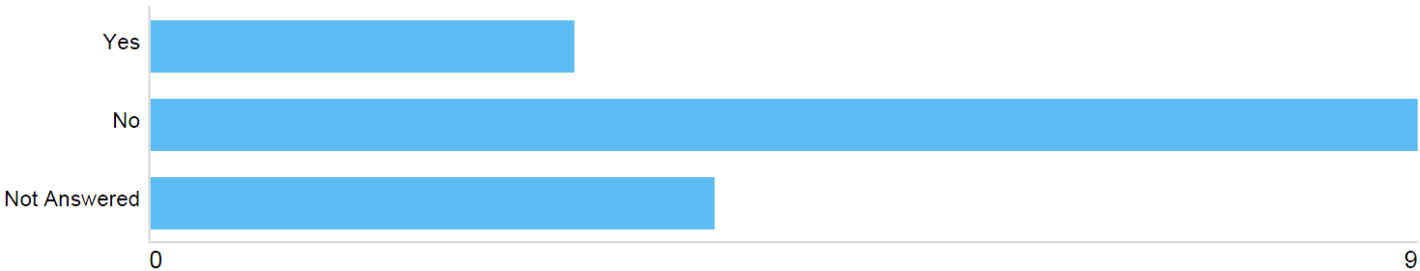
General guidance on Harmonisation (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	4	25.00%
No	8	50.00%
Not Answered	4	25.00%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	3	18.75%
No	9	56.25%
Not Answered	4	25.00%

Comments on the technical information within this IGD

There were 11 responses to this part of the question.

General (other) comments

There were 9 responses to this part of the question.

General guidance on Harmonisation (2/2)

Main comments:

- Comments request IGD to take position against current practices in case of high penetration of type A units which is currently demonstrating compliance against standards rather than against CNCs.
- The IGD would benefit from examples showing the use of existing standards for harmonization purposes.
- The IGD should advocate for harmonization of requirements as well as an harmonized approach of “significant modification”.
- The IGD could clarify the relationship between European codes and eventually National more severe requirements.
- The IGD could benefit from strong manufacturer/users/TSO involvement.

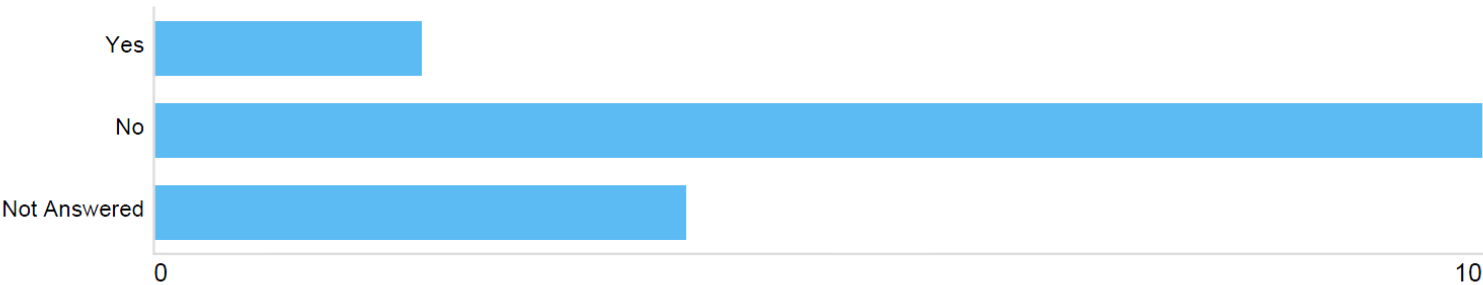
General guidance on Real time data, communication and redundancy (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	5	31.25%
No	7	43.75%
Not Answered	4	25.00%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	10	62.50%
Not Answered	4	25.00%

Comments on the technical information within this IGD

There were 11 responses to this part of the question.

General (other) comments

There were 5 responses to this part of the question.

General guidance on Real time data, communication and redundancy (2/2)

Main comments:

- Comment request further guidance on the process as well as on the data format and communication protocols to be used.

General guidance on Special issues for Type A generators (1/2)

Do you consider this IGD helpful to reasonably support the national implementation process?



Option	Total	Percent
Yes	2	12.50%
No	5	31.25%
Not Answered	9	56.25%

Does the content of the IGD cover the technical issues of this topic appropriately?



Option	Total	Percent
Yes	2	12.50%
No	5	31.25%
Not Answered	9	56.25%

Comments on the technical information within this IGD

There were 7 responses to this part of the question.

General (other) comments

There were 6 responses to this part of the question.

General guidance on Special issues for Type A generators (2/2)

Main comments:

- Comment request further guidance on how to prove conformity of type A generators
- The IGD could further discuss the compliance of aggregated behavior from a collection of individual behaviors.
- The IDG should emphasis the need for equipment certification based on standards as a proof of compliance.

Agenda

- High Level Overview of the Consultation on Implementation Guidance Documents
- Detailed Comments per IGD
- **Conclusions**

Conclusions (1/2)

- ENTSO-e is currently taking into account all comments to update the IGDs. In addition an answer to the comments will be provided together with the updated IGDs.
- A compromise between the two extremes on implementation guidance needs to be found
 - Safeguarding flexibility for national decisions on non-exhaustive requirements as foreseen in the NCs
 - Proposing technical solutions on non-exhaustive requirements through (almost) definite parameter values
- ENTSO-e will greatly advocate for transparency and stakeholder interaction / engagement

Conclusions (2/2)

- IGDs shall be improved in terms of providing more detailed technical information on the most critical aspects and ENTSO-e will facilitate technical discussions with stakeholders on selected technical items.
 - The objective being to provide guidance on methodologies and tools to facilitate the national decision making processes.
 - Timing of the issue of updated version of the IGD shall be defined accordingly.
 - IGDs, which are delivered within 6 months after entry into force, do not have to be final and may be updated whenever needed or reasonable.



Reliable Sustainable Connected