
ENTSO-E Connection Codes Implementation Guidance Documents

Overview

Europe currently has three connection network codes: Requirements for generators (RfG), Demand Connection (DCC) and High Voltage Direct Current (HVDC). RfG has entered into force on 17 May 2016, the DCC on 18 August 2016 and the HVDC on 8 September 2016.

The Member States have the obligation to implement these codes no later than three years after their entry into force. Within this timeframe the Member states have 2 years to define the national specifications for the so-called non-exhaustive requirements.

In order to support the implementation at national level and also in line with the legal requirements of these network codes ENTSO-E has drafted and when necessary improved non-binding implementation guidance documents (IGDs), four of which we currently put forward for consultation.

These guidance documents are addressed to the transmission system operators and other system operators concerning the elements of the codes requiring national decisions. They shall explain the technical issues, conditions and interdependencies which need to be considered when complying with the requirements of these Regulations at national level.

The current IGD consultation is scheduled as follows:

5 April – 5 May 2017 – ENTSO-E publishes four (4) draft IGDs for consultation – one new and three consequent updates (please see the list below). The comments received will support the update of the IGDs.

Note: The IGDs **Fault current contribution from PPMs & HVDC converters**, **Need for synthetic inertia (SI) for frequency regulation** and **Rate-of-change-of-frequency (RoCoF) withstand capability** have been subject to the recent consultation between **8 December 2016 – 16 January 2017** <<https://www.entsoe.eu/major-projects/network->

code-implementation/cnc/Pages/default.aspx> and the relevant **outcomes** *<https://www.entsoe.eu/major-projects/network-code-implementation/cnc/Pages/default.aspx>* have been published on March 8.

Small adjustments to the above-mentioned IGDs were done for reasons of alignments with the results of the new IGD on High Penetration of Power Electronic Interfaced Power Sources (HPoPEIPS)

This note aims at helping the stakeholders and participants to this consultation be more targeted to their feedback

More information can be read **here** *<https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/++preview++/system-development/entso-e-connection-codes-implementation-guidance-d/user_uploads/160630_cnc_igd_introduction-document.pdf>* .

A preview of all the questions in this consultation can be accessed *<https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/++preview++/system-development/entso-e-connection-codes-implementation-guidance-d/user_uploads/160630_all-cnc-igds-drafts-for-consultation.zip-1>* **here** *<https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/++preview++/system-development/entso-e-connection-codes-implementation-guidance-d/user_uploads/160630_overview-igd-consultation-questions.pdf-2>* .

The IGDs under consultation are listed below and can be downloaded from the following **link**. *<https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/++preview++/system-development/entso-e-connection-codes-implementation-guidance-d/supporting_documents/160630_All%20CNC%20IGDs%20drafts%20for%20consultation.zip>*

- High Penetration of Power Electronic Interfaced Power Sources (HPoPEIPS)
- Fault current contribution from PPMs & HVDC converters
- Need for synthetic inertia (SI) for frequency regulation
- Rate-of-change-of-frequency (RoCoF) withstand capability

Why we are consulting

ENTSO-E is consulting the IGDs for three main reasons:

1. Although the main addressees of the IGDs are the system operators, the connection codes have a significant impact on manufacturers, power generating module operators, demand facilities and distribution networks.
2. The IGDs are drafted as supporting material for the connection codes implementation at the member state level and shall aim to give guidance for national specifications for non-exhaustive requirements.
3. The IGDs are legally requested to be consulted with stakeholders before their release within the six month of the entry into force of the Regulations.

Introduction

1 What is your name?

Name

2 What is your email address?

If you enter your email address then you will automatically receive an acknowledgement email when you submit your response.

Email

3 What is your organisation?

Organisation

High Penetration of Power Electronic Interfaced Power Sources (HPoPEIPS)

This IGD focuses on an overview of resilience issues related to the system technical challenges of operating a power system with high penetration of RES. This document deals with necessary capabilities to manage low Total System Inertia (TSI) and also with other system challenges arising from operation with low overall system strength such as low short-circuit power and low dynamic voltage support.

The IGD can be accessed from **here** <https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/user_uploads/igd-high-penetration-of-power-electronic-interfaced-power-sources.pdf>

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

Please select only one item

Yes No

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

Please select only one item

Yes No

3 Comments on the technical information within this IGD

4 General (other) comments

Fault current contribution from PPMs & HVDC converters

Its objective is to give guidance on the purpose of these requirements and on how to design these specific requirements for power park modules or HVDC systems connected to distribution or transmission networks to deliver an adequate reactive current injection during short circuits and after fault clearing when the voltage has not recovered.\

The IGD can be accessed from **here** <https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/user_uploads/igd-fault-current-contribution.pdf>

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

Please select only one item

Yes No

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Please select only one item

Yes No

3 Comments on the technical information within this IGD

4 General (other) comments

Need for synthetic inertia (SI) for frequency regulation

The purpose of this IGD is to define under what system circumstances synthetic inertia should be considered including considerations of forward needs, what are the alternatives, how could the functional requirements be defined and what is the readiness of technologies.

The IGD can be accessed from **here** <https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/user_uploads/igd-need-for-synthetic-inertia.pdf>

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

Please select only one item

Yes No

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

Please select only one item

Yes No

3 Comments on the technical information within this IGD

4 General (other) comments

Rate-of-change-offrequency (RoCoF) withstand capability

Its objective is to give advice on what considerations are appropriate before selecting a national value for RoCoF withstand for generators within scope of RfG. Consider also the relevance of the fully exhaustive withstand values in NC HVDC for both HVDC and for HVDC connected PPMs.

The IGD can be accessed from **here** <https://consultations.entsoe.eu/system-development/entso-e-connection-codes-implementation-guidance-d-3/user_uploads/igd-rocof-withstand-capability.pdf>

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

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Yes No

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Please select only one item

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4 General (other) comments