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Implementation Monitoring Report of the Network Code on Requirements for Grid Connection of Generators

Second edition

November 2019

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Note: All hyperlinks referred to in this document were correct and functioning at the time of publication.

1 Purpose, scope and data

1.1 Purpose of the report

- (1) This is the second Report presenting the progress towards the implementation of Commission Regulation (EU) 2016/631 of 14 April 2016, establishing a network code on requirements for grid connection of generators (denoted as “NC RfG” in the remainder of this Report).
- (2) Article 32(1) of Regulation (EU) No. 943/2019 requires the Agency for the Cooperation of Energy Regulators (“ACER” or the “Agency”, in the remainder of the Report) to monitor and analyse the implementation of the Network Codes and the Guidelines adopted by the European Commission (EC). Furthermore, the Agency shall monitor their effect on the harmonisation of applicable rules aimed at facilitating market integration, as well as on non-discrimination, effective competition and the effective functioning of the market, and report to the EC.
- (3) The primary purpose of this report is to fulfil the above-mentioned legal obligation. The Report further aims at:
 - identifying potential challenges in implementing the NC RfG and
 - recommending concrete actions and best practices that can lead to a more efficient implementation.

1.2 Scope

- (4) The NC RfG entered into force on 17 May 2016. Without prejudice to its Articles 4(2)(b), 7, 58, 59, 61 and Title VI, the NC RfG entered into application on 27 April 2019. Hence, at the date of publication of this Report, all the provisions set in the NC RfG apply.
- (5) The first edition of the Implementation Monitoring Report on the NC RfG was published on 7 November 2017. Its focus was on the status of the implementation of Articles 58, 59(2), 61(1) and Title VI¹.
- (6) In this second edition, the scope of the Report covers the following areas:
 - Determination of significance - banding values, pursuant to Article 5(2) of the NC RfG;
 - Establishment of requirements of general application, pursuant to Article 7(1) of the NC RfG;
- (7) It is worth pointing out that this Report also includes an update from National Regulatory Authorities (NRAs) on the status of certification and validation processes². However, because of the ongoing implementation, the Agency decided to exclude this topic from the main considerations of the Report. This choice is in line with the scope of the questionnaire, on which this Report is based (see Section 1.3 and Annex I of this Report).

¹ Specifically, the non-binding guidance on implementation (Article 58), the list of the relevant information for implementation monitoring (Article 59.2), the criteria for granting derogations (Article 61(1)) and the transitional Arrangements for Emerging Technologies (TITLE VI).

² Pursuant to Titles III and IV of the NC RfG.

- (8) The answers collected from the questions related to the certification and validation processes have been still analysed in this Report as these issues directly refer to the implementation of requirements of the NC RfG. However, in April 2019, the Agency already dealt with this issue, *inter alia*, by addressing a note to the NRAs, recommending them to take specific actions.
- (9) This Report does not cover Cyprus and Malta because the NC RfG does not apply to power-generating modules (PGMs) connected to the transmission system and distribution systems, or to parts of the transmission system or distribution systems, of the islands of Member States (MSs) of which the systems are not operated synchronously with either the Continental Europe, Great Britain, Nordic, Ireland and Northern Ireland or Baltic synchronous area (Article 3 (2)(a) of the NC RfG).

1.3 Data

- (10) In order to perform the task of monitoring the NC RfG implementation, the Agency asked 27 NRAs from EU MSs to fill in a questionnaire, which was circulated on 22 January 2019. This survey included detailed questions on the implementation of specific and general NC RfG provisions.
- (11) The 27 NRAs are³: E-Control (AT), CREG (BE), EWRC (BG), ERO (CZ), BNetzA (DE), DERA (DK), ECA (EE), CNMC (ES), EV (FI), CRE (FR), Ofgem (GB), UR (UK-NIR), RAE (GR), HERA (HR), CRU (IE), VERT (LT), PUC (LV), HEA (HU), ARERA (IT), ILR (LU), ACM (NL), URE (PL), ERSE (PT), ANRE (RO), EI (SE), AGEN-RS (SI), RONI (SK).
- (12) In the case of the United Kingdom, the questionnaire was sent to both the Utility Regulator, regulating the electricity, gas, water and sewerage industries in Northern Ireland, and Ofgem, the independent NRA, regulating the electricity and gas sectors in Great Britain.
- (13) The questionnaire was sent also to a non-EU country (Norway). However, NVE, the Norwegian Regulatory Authority, did not submit a reply.
- (14) NRAs were given a few opportunities to amend and update their input to the questionnaire with the cut-off date of 23 August 2019.
- (15) Unless stated otherwise, the results presented in this Report and the arising conclusions are based on the replies to the questionnaire as provided by the NRAs.
- (16) The Agency also used information included in the ENTSO-E's monitoring file⁴. Whether this information is used to complement the NRAs' answers or to fill in for missing replies, this will be clearly mentioned in the Report.

³ The complete list of abbreviations & country codes is in Annex II.

⁴ The file is publically available and it can be downloaded at <https://docs.entsoe.eu/cnc-al/>

2 Conclusions and recommendations

- (17) In the light of the analysis performed for this Report, the Agency has come to the following conclusions and recommendations:

(a) NC RfG implementation is well on track ...

- (18) The Agency considers that the formal approval of the proposals for maximum capacity thresholds (i.e. banding values) of PGMs by the relevant regulatory authority or, where applicable, the MS, in accordance with Article 5(3) of the NC RfG, has been timely carried out for 23 out of the 27 NRAs to which the questionnaire was sent⁵.
- (19) The Agency considers that the formal approval of the proposals for the requirements of general application by the designated entities, in accordance with Article 7(1) of the NC RfG, has been timely carried by 22 out of the 27 NRAs to which the questionnaire was sent⁶. In addition to these, it is worth pointing out that ACM (NL) has reached a partial decision, since two subjects⁷ from the proposals have not been approved yet.
- (20) As reported by the NRAs in the list above, the implementation of Articles 5(3) and 7(1) was accompanied by public consultations and an active coordination between TSO/DSOs (and in general between relevant stakeholders), which also acted as an effective measure to ensure the transparency during the implementation process⁸.
- (21) The Agency stresses that effective involvement of stakeholders is essential for the effective implementation of the NC RfG.

(b) ... but full implementation is still outstanding

- (22) Regarding the determination of banding values and the requirements of general application, CREG (BE) and CNMC (ES) affirmed that a formal approval of the proposals has not been reached yet.
- (23) Moreover, the Agency has not received feedback from EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR), which leads the Agency reasonably to assume that, in their corresponding MSs, the requirements might have not been formally implemented.
- (24) This conclusion is confirmed for FR and GR by the analysis of the relevant information included in the ENTSO-E RfG's monitoring file⁹. Moreover, according to ENTSO-E's information,

⁵ E-Control (AT), ERO (CZ), BNetzA (DE), DERA (DK), ECA (EE), EV (FI), UR (UK-NIR), HERA (HR), HEA (HU), CRU (IE), AREA (IT), VERT (LT), ILR (LU), PUC (LV), ACM (NL), URE (PL), ERSE (PT), ANRE (RO), EI (SE), AGEN-RS (SI) and RONI (SK).

⁶ E-Control (AT), ERO (CZ), BNetzA (DE), DERA (DK), ECA (EE), EV (FI), UR (UK-NIR), HERA (HR), HEA (HU), CRU (IE), AREA (IT), VERT (LT), ILR (LU), PUC (LV), URE (PL), ERSE (PT), ANRE (RO), EI (SE), AGEN-RS (SI) and RONI (SK).

⁷ The rate of change of frequency and the reactive power requirements for type B, C and D PGMs.

⁸ These actions have been performed in accordance with the provisions included in Art. 5, 7 and 10 of the NC RfG.

⁹ The file is publically available and it can be downloaded at <https://docs.entsoe.eu/cnc-all/>.

proposals for banding values have not even been submitted in BG, while requirements for general application are overall flagged as “approved”¹⁰, although some of the requirements are still flagged as “no consideration” or “preliminary – shared with stakeholders but not publically available”. With respect to UK, ENTSO-E’s file only refers to the approval reached by UR (the UK-NIR regulator), without providing a reference to the adoption of an Ofgem’s decision concerning the determination of banding values. On the other hand, with respect to the requirements of general application, a formal approval has been reached by Ofgem.

- (25) In general, since the NC RfG fully entered into force on 27 April 2019, the Agency urges a prompt implementation of the determination of significance for PGMs and the requirements of general application in those MSs where the process is still incomplete.
- (26) Therefore, the Agency recommends NRAs to perform¹¹ or promote¹² expeditious implementation of the NC RfG. For example, although NRAs might not always represent the entities designated by the MSs to approve and implement the provisions in Articles 5 and 7 of the NC RfG¹³, it is still the NRAs’ duty to ensure that relevant system operators and TSOs comply with the NC RfG¹⁴.
- (27) For the sake of transparency at the EU level, the Agency recommends NRAs to contact the Agency in case they identify any misalignments with the information published on ENTSO-E’s webpage. The Agency will in turn liaise with ENTSO-E.
- (28) The Agency’s task of monitoring the NC RfG implementation cannot rely only on the information retrieved from the ENTSO-E’s monitoring file. In fact, although the monitoring file may confirm a formal approval in a MS, it does not contain information useful to the assessment of a correct implementation process (e.g. (i) the date of submission for approval (thus the compliance with the legal deadlines), (ii) the proposal of specific requirements from relevant system operators other than the TSO (for the case of the requirements of general application) and (iii) the measures adopted to ensure the transparency of the process).

¹⁰ The link to a formal approving document is not available.

¹¹ In those MSs where the NRAs are the entities designated to approve the proposals and implement the requirements of the NC RfG.

¹² In those MSs where NRAs are not the designated entities to approve the proposals and implement the requirements of the NC RfG.

¹³ For example, in BE and ES, the entities designated to approve the proposals are the Ministry of Energy (in BE) and the Ministry for the Ecological Transition (in ES).

¹⁴ Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC – Article 37 (1b, 1q and 9).

3 Determination of significance – Banding Values

3.1 Objectives

- (30) Pursuant to Article 5 of the NC RfG, PGMs shall comply with the prescribed requirements on the basis of the voltage level of their connection point and their maximum capacity according to the categories set out in Table I.

Table I. Limits for thresholds for type A-D PGMs.

Synchronous areas	Limit for maximum capacity threshold from which a PGM is of type B	Limit for maximum capacity threshold from which a PGM is of type C	Limit for maximum capacity threshold from which a PGM is of type D
Continental Europe	1 MW	50 MW	75 MW
Great Britain	1 MW	50 MW	75 MW
Nordic	1,5 MW	10 MW	30 MW
Ireland and Northern Ireland	0,1 MW	5 MW	10 MW
Baltic	0,5 MW	10 MW	15 MW

- (31) The determination of the maximum capacity thresholds for type-A up to type-D PGMs, shall be carried out along the following provisions (Article 5(3) of the NC RfG):
- the relevant TSO shall establish proposals for banding values of PGMs, taking into consideration the thresholds in Table I;
 - in forming the proposals, the relevant TSO shall coordinate with adjacent TSOs and DSOs;
 - the relevant TSO shall conduct a public consultation in accordance with Article 10 of the NC RfG;
 - the proposal shall be subject to approval of the relevant regulatory authority or, where applicable, the Member State.
- (32) Pursuant to Articles 7(4) and 72 of the NC RfG, the deadline for the submission of proposals for maximum capacity thresholds was 17 May 2018 i.e. two years after the entry into force of the NC RfG.
- (33) Pursuant to Article 7(6) of the NC RfG, competent entities shall take decisions on proposals for requirements or methodologies within six months following the receipt of such proposals.

3.2 Implementation status

- (34) Concerning the determination of banding values for PGMs, the Agency included four questions within the questionnaire that was circulated to the NRAs.
- (35) The Agency sought replies from 27 NRAs. Answers to the questionnaire have not been provided by 4 NRAs: EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR).
- (36) The implementation of the provisions of Article 5 of the NC RfG is analysed in the continuation of this Section, while exhaustive summaries of NRAs' detailed responses are included in Annex I.

3.2.1 Submission of proposals

- (37) Initially, NRAs have been asked to provide evidence of the occurred submission (from TSOs) of the proposals for banding values. Figure 1 graphically summarises the collected answers. The bars indicate the dates of NRAs' receiving of the proposals from the relevant TSOs. The dotted line indicates the deadline for this action (17 May 2018, i.e. two years after the entry into force of the NC RfG).

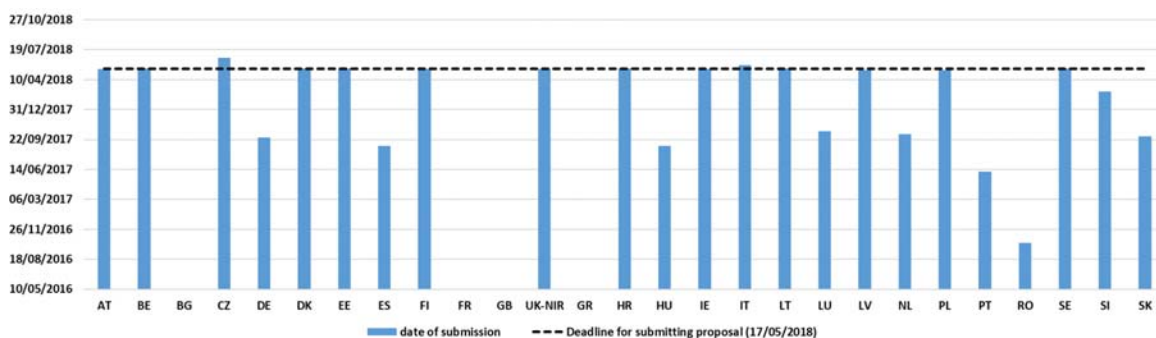


Figure 1 Submission date of the proposals for banding values of PGMs.

- (38) Despite the four NRAs that did not reply to the questionnaire, it is possible to infer that relevant TSOs were able to respect the deadline (with minor delays in CZ and IT). For 8 out of the 23 responding NRAs¹⁵, the submission of proposals for banding values was filed several months earlier than the deadline.

3.2.2 TSO coordination with adjacent TSOs/DSOs

- (39) Detailed explanations concerning the actual coordination between TSOs and adjacent TSOs/DSOs have been included in the responses to the questionnaire. Typically, a number of bilateral meetings have been arranged among the interested parties.
- (40) In general, the answers received from the NRAs confirmed that measures of coordination between interested parties were implemented, thereby meeting the requirement of Article 5(3) of the NC RfG.

¹⁵ BNetzA (DE), CNMC (ES), HEA (HU), ILR (LU), ACM (NL), ERSE (PT), ANRE (RO), RONI (SK).

- (41) For instance, the Nordic TSOs coordinated the proposals for banding values under a joint working group, where they usually handle all the connection regulations. Furthermore, both the TSOs in UK-NIR and IR (SONI and EirGrid, respectively) issued the same banding proposals for consultation, as well as held parallel consultations in NI and IE in relation to their proposals.

3.2.3 Public consultation

- (42) A third question was posed to the NRAs concerning any public consultation, prior to the approval of the proposals for banding values. The analysis of the NRAs' responses revealed that relevant TSOs have indeed set-up public consultations concerning the proposal of the thresholds, according to Article 5(3) of the NC RfG. In general, a reference (in the form of a web page link) has been included as further evidence.

3.2.4 Approval of proposals by designated entities

- (43) The last question concerning the determination of banding values aimed at assessing the status of the implementation, and in particular, the approval by the NRAs (or, where applicable, the MS¹⁶) of the proposals received by relevant TSOs.
- (44) 20 out of the 23 collected answers reported that the competent entities approving the proposals for banding values are the relevant NRAs. Concerning the remaining 3 MSs, the designated entities are the Minister of Energy for BE, the Ministry for the Ecological Transition for ES and the Direção-Geral de Energia e Geologia for PT.
- (45) Figure 2 illustrates the status of approval of the banding values proposals. The bars in blue indicate the number of days which have passed from the date of the submission of the proposals (see Figure 1) and the date of the official approval by the designated entities. The maximum time interval to approve the proposal is set at six months¹⁷ (i.e. 180 days, the dashed line in Figure 2) after receiving the proposals. Red bars refer to MSs in which the approval of the proposals for banding values has not been reached yet¹⁸, although the latter have been actually submitted (see Figure 1). Finally, blank spaces refer to EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR) i.e. the four NRAs from which the Agency did not receive any information through the circulated questionnaire¹⁹

¹⁶ In accordance with Article 5 (3) of the NC RfG.

¹⁷ As prescribed in Art. 7(6) of the NC RfG.

¹⁸ The corresponding number of days is calculated with respect to an indicative date (September 1st, 2019). Clearly, further delays in the approval process will lead to higher bars.

¹⁹ Additional information regarding the implementation status in these four MSs are discussed in the next section, based on ENTSO-E's data.

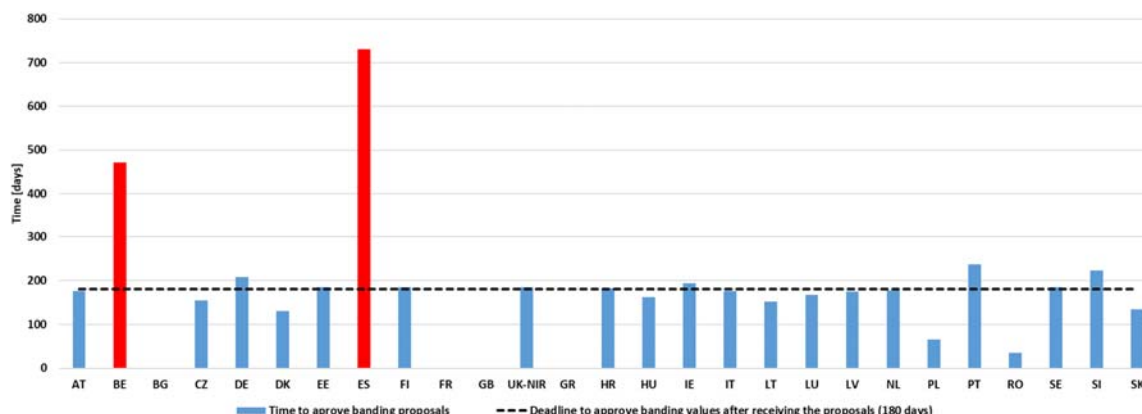


Figure 2. Approval of the proposals of banding values for PGMs.

- (46) The analysis of the collected answers indicates that the proposals for banding values have been successfully approved by the designated entities in 21 out of 23 MSs that replied to the questionnaire. Minor delays were registered in DE, IE, PT and SI.
- (47) On the other hand, CREG (BE) confirmed that the formal approval will be made by the government by royal decree. The NRA stated that the latter was expected to be published by 27 April 2019. However, based on the most up to date information in possession of the Agency (and ENTSO-E), it is not possible to confirm the actual publication of such a decree. Similarly, CMNC (ES) envisages the need for a public consultation prior to the actual approval from the Spanish Ministry for the Ecological Transition. CMNC claimed that the decision is expected within 2019.

3.2.5 Conclusions and discussion

- (48) The Agency aimed at monitoring the implementation status concerning the provisions included in Article 5 of the NC RfG, which requires the determination of banding values for PGMs' maximum capacity.
- (49) The implementation should be considered successful when competent entities (e.g. NRAs) have approved, by a specified deadline, the proposals received from the relevant TSOs, which, in turn, have established them in coordination with adjacent TSOs/DSOs and have validated them by means of a public consultation.
- (50) Based on the analysis of the collected replies from NRAs, the Agency recognises a successful implementation process in AT, CZ, DE, DK, EE, FI, UK-NIR, HR, HU, IE, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK. Furthermore, the process of implementation of the provisions in Article 5 of the RfG cannot be considered concluded in BE and ES, since the relevant competent entities have not yet formally approved the proposals (which have been submitted).
- (51) The Agency reasonably presumes that the implementation in BG, FR, GB and GR is incomplete since the relevant NRAs have not provided answers to the questionnaire.
- (52) The conclusions above find validation through the information included in the RfG ENTSO-E's monitoring file (<https://docs.entsoe.eu/cnc-al/>). This database confirms that the proposals for banding values of PGMs have not been formally approved in BG, FR and GR. In particular, the implementation status in BG is flagged as *preliminary* since a proposal has been shared

with stakeholders, although not publically available yet. In FR and GR, relevant proposals have only been submitted (no information on the date though). With respect to the United Kingdom, the ENTSO-E's file only refers to the approval reached by UR (the UK-NIR regulator), without providing a reference of a formal decision from Ofgem.

- (53) It is worth noting that the ENTSO-E's file does not provide any information relevant to the TSOs' coordination with adjacent TSOs/DSOs and the organisation of public consultations²⁰.

²⁰ as envisaged in Article 5(3) of the NC RfG.

4 Establishment of requirements of general application

4.1 Objectives

- (54) Article 7(1) of the NC RfG establishes that requirements of general application shall be set by relevant system operators or TSOs, while the entity designated by the MS is responsible for their approval. The designated entity shall be the regulatory authority unless otherwise provided by the MS. The requirements of general application shall be published.
- (55) Pursuant to Article 7(3) of the NC RfG, MSs, competent entities and system operators shall:
- apply the principles of proportionality and non-discrimination;
 - ensure transparency;
 - apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;
 - respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;
 - consult with relevant DSOs and take account of potential impacts on their system;
 - take into consideration agreed European standards and technical specifications.
- (56) Pursuant to Article 7(4) of the NC RfG, the deadline for the submission of the proposals of requirements of general application was 17 May 2018 i.e. two years after the entry into force of the NC RfG.
- (57) Pursuant to Article 7(6) of the NC RfG, competent entities shall take decisions on proposals of requirements of general application within six months following the receipt of such proposals.

4.2 Implementation status

- (58) Concerning the determination and approval of requirements of general application, the Agency included five questions in the questionnaire that was circulated to the NRAs.
- (59) The Agency sought replies from 27 NRAs. Answers to the questionnaire were not provided by 4 NRAs: EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR).
- (60) The implementation of the above provisions is analysed in the continuation of this Section while exhaustive summaries of NRAs' detailed responses are included in Annex I.

4.2.1 Submission of proposals

- (61) As a first step to monitor the implementation of the requirements of general application, the Agency asked NRAs about the date of the actual submission of proposals by relevant system operators or TSOs. The answers are graphically presented in Figure 3, where the bars in blue

indicate the dates when the NRAs' (or the designated entities) received the proposals. The dotted line indicates the deadline for this action²¹.

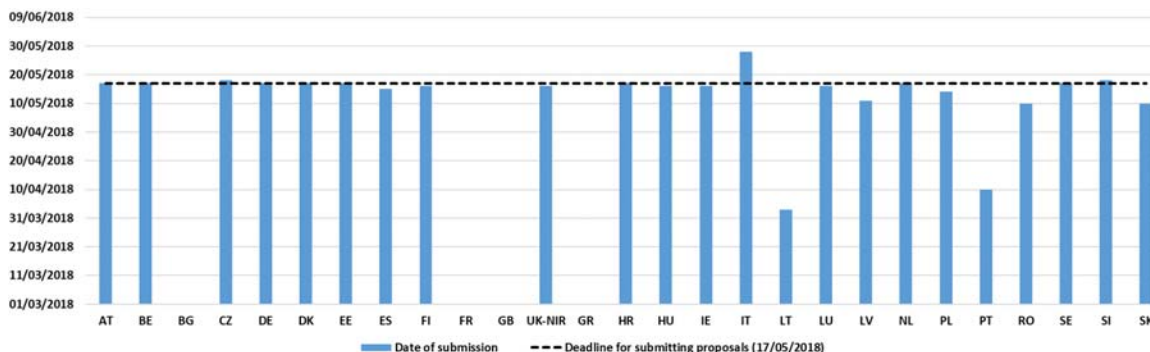


Figure 3. Submission of proposals for requirements of general application.

- (62) Beyond the 4 NRAs that did not reply to the questionnaire, the relevant system operators or TSOs in all the other 23 MSs submitted their proposals. The submission of proposals for requirements of general application was filed earlier than the deadline in 7 MSs (ES, LT, LV, PL, PT, RO and SK). Conversely, a delay was registered in IT.

4.2.2 Requirements of general application proposed by the relevant system operator other than the TSO

- (63) Concerning the application of Article 7(1) of the NC RfG, the Agency asked the NRAs whether certain requirements of general application (if any) have been proposed by the relevant system operator other than the TSO²². Moreover, it is worth pointing out that where the requirements are to be established by a relevant system operator that is not a TSO, MSs may provide that instead the TSO be responsible for establishing the relevant requirements (Article 7(9) of the NC RfG).
- (64) The answers collected from some NRAs have revealed misinterpretations (e.g. DERA (DK), RONI (SK)) and a lack of detail (ERO (CZ), CMNC (ES)). The replies from ERO (CZ) and CMNC (ES), do not specify which requirements are proposed by the relevant system operator other than the TSO. In particular, ERO (CZ) only referred to requirements proposed by the TSO and the system operator, either separately or in coordination, without providing further insight. Furthermore, EV (FI) did not provide an answer to the question.
- (65) CRU (IE) communicated that the requirements concerning Articles 13-28 of the NC RfG have been proposed by the relevant system operator other than the TSO. The remaining NRAs²³ confirmed that the requirements of general application were proposed only by the TSO, although, often, after consultation with the DSO.

²¹ 17 May 2018 i.e. within two years of entry into force of the NC RfG

²² The definition of relevant system operator and TSO are in line with Art. 2 of the NC RfG.

²³ Without considering EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR) that have not replied to the questionnaire.

4.2.3 Approval of the requirements of general application

- (66) The third question aiming at monitoring the implementation status of the requirements of general application asked NRAs about the formal approval of the requirements. Results are graphically presented in Figure 4 where the bars in blue indicate the number of days that have passed between the submission of the proposals for requirements of general application and the official approval from the designated entities. The maximum time interval for the proposal's approval is set at six months (180 days i.e. the dashed line) after receiving the proposals²⁴. The hollow bar refers to the case where only part of the proposed requirements have been approved. Instead, red bars refer to MSs in which the approval of the proposals for requirements of general application has not been reached yet²⁵, although the latter have been actually submitted (see Figure 3). Blank spaces refer to EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR), i.e. the four NRAs from which the Agency did not receive any information through the circulated questionnaire.

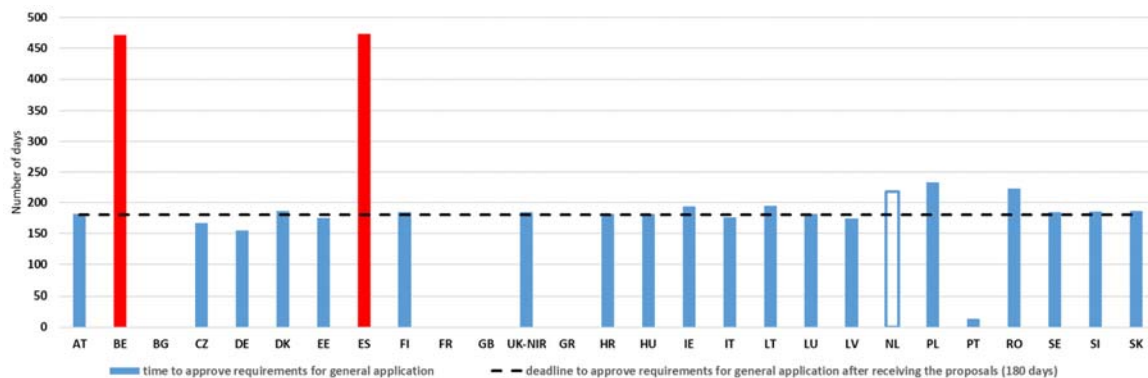


Figure 4. Approval of proposed requirements for general application.

- (67) The analysis of the received answers indicates that the proposals for requirements of general application have been successfully approved by the designated entities in 20 out of the 23 MSs that replied to the questionnaire. Minor delays were registered for AT, DK, IE, LT, PL and RO. Moreover, ACM (NL) has not approved all the requirements yet. The decision is still pending concerning the Rate of Change of Frequency (RoCoF) and reactive-power requirements for type B, C and D PGMs.
- (68) On the other hand, CREG (BE) confirmed that formal approval will be made by the government by royal decree, expected to be published by 27 April 2019. However, based on the most up to date information in possession of the Agency (and ENTSO-E), it is not possible to confirm the actual publication of such a decree. Similarly, CMNC (ES) claimed that the decision is expected by the end of 2019.

4.2.4 Ensuring transparency

- (69) Pursuant to Article 7(3) of the NC RfG, the NRAs were asked about the measures adopted to ensure transparency in the process leading to the approval of the requirements of general

²⁴ As prescribed in Article 7(6) of the NC RfG.

²⁵ The corresponding number of days is calculated with respect to an indicative date (1 September 2019). Clearly, further delays in the approval process will lead to higher bars.

application. Beyond the 5 NRAs that did not reply to the questionnaire, all the NRAs confirmed that the TSOs' proposals were discussed in coordination with relevant stakeholders. Moreover, public consultations were organised by the TSOs in order to ensure a high level of transparency.

4.2.5 Connection in absence of establishment of requirements of general application

- (70) The Agency asked NRAs about the set of rules that would apply to a new connecting PGM in case the requirements for general application have not been adopted yet. In particular, the question aimed at assessing whether connecting PGMs have to comply with the *old rules*²⁶ or wait for the establishment of new requirements. In this context, NRAs could:
- act within their powers concerning the determination of existing vs. new PGMs (last paragraph of Article 4(2) of the NC RfG) or,
 - explore, as per Article 60 of the NC RfG, the possibility of granting PGM owners and/or relevant system operators derogations from one or more provisions listed in the NC RfG (including the requirements of general application, especially if these have not been formally established yet).
- (71) Several NRAs deemed the issues included in the question of the survey as not applicable²⁷ or did not provide any answer²⁸. It is possible to infer that the reason for the lack of response is due to the fact that the requirements for general application in these MSs have already been approved. However, it is worth pointing out that the approval of the requirements of general application may not necessarily imply the application of the new requirements to connecting PGMs. For example, BNetzA (DE) has already decided to postpone the application of the NC RfG, namely by treating as existing those PGMs which will be put into operation until 30 June 2020²⁹.
- (72) CRU (IE) affirmed that it had proposed parameters for the requirements of general application, which have been approved and are already in force. However, a number of derogations are expected to be submitted to CRU by EirGrid (the Irish TSO). The derogations are related to the Frequency Sensitive Mode Active Power Range and Voltage withstand capability and associated reactive power maximum voltage.

²⁶ i.e. the existing regulation before the NC RfG entry into force.

²⁷ ECA (EE), HEA (HU), ILR (LU), URE (PL), ERSE (PT) and EI (SE).

²⁸ E-control (AT), BNetzA (DE), EV (FI), VERT (LT) and PUC (LV). It is worth pointing out to add EWRC (BG), CRE (FR), Ofgem (GB) and RAE (GR) to the list of NRAs, which did not provide an answer.

²⁹ http://www.gesetze-im-internet.de/enwg_2005/_118.html

Unofficial translation of part of Art. 118(25) of the German Energy Act:

“PGMs within the meaning of Regulation (EU) 2016/631 (RfG) shall be considered existing, if they are put into operation until June 30th 2020 and there has been

- either a building permit or a permit under the Federal Emission Protection Act granted for them prior to 27 April 2019 or,

- where such permits are not required, the owner has requested the grid connection for them prior to 27 April 2019.

The PGM owner may waive its right to be determined as an existing PGM owner. The waiver has to be declared in written form to the relevant system operator”.

- (73) The remaining NRAs confirmed that the deadline for the application of the new rules is 27 April 2019 (or the date of approval of the requirements of general application e.g. RONI (SK)) and derogations would not be considered.
- (74) The cases of CNCM (ES) and CREG (BE) are worth being considered separately as, so far, the proposals for the requirements for general applications have not been approved. According to the answer provided by CNCM (ES), the current national rules (i.e. the old rules) will still apply until the actual approval of the requirements for general application. CREG (BE) provided the circumstances to determine whether a PGM should be considered existing or new (Article 4(2) of the NC RfG). It is reasonable to infer that an extension is granted to connecting PGMs that submit the application for approval to CREG no later than six months after 27 April 2019.

4.2.6 Conclusions and discussion

- (75) The Agency aimed at monitoring the implementation status concerning the proposal and approval of the requirements of general application (as per Article 7 of the NC RfG).
- (76) The implementation should be considered successful where competent entities (e.g. NRAs) have approved, by the specified deadline, the proposals established by relevant system operators or TSOs.
- (77) Based on the analysis of the collected replies from NRAs, the Agency can ascertain a successful implementation in AT, CZ, DE, DK, EE, FI, UK-NIR, HR, HU, IE, IT, LT, LU, LV, PL, PT, RO, SE, SI and SK. Note that the implementation process reached an advanced status in NL, since all the requirements of general application have been approved except those concerning the RoCoF settings and the reactive power requirements for type B-D PGMs.
- (78) Conversely, the implementation process is incomplete in BE and ES, since the corresponding competent entities have not formally approved the proposals (which have been already submitted by the relevant system operators or TSOs).
- (79) The Agency reasonably presumes that the implementation in BG, FR, GB and GR is incomplete since the relevant NRAs have not provided answers to the questionnaire.
- (80) The conclusions above were validated using the information available on the ENTSO-E's web page, in particular the RfG's monitoring file. The ENTSO-E's file confirms that a proposal for the requirements of general application has not yet been formally approved in FR and GR.
- (81) Finally, it is worth pointing out that the ENTSO-E's file extends the information in possession of the Agency (through the questionnaire) for the case of BG and GB.
- (82) The ENTSO-E's file states that the requirements of general application have been approved in BG³⁰. However, it is not possible to retrieve the date and the link to the formal approving document.

³⁰ It is worth pointing out that although the overall status for BG is "approved/binding", some of the requirements are still flagged as "no consideration" or "preliminary – shared with stakeholders but not publically available". An example of the former case is the frequency stability settings and in particular the time period for frequency stability to be reached. An

- (83) Similarly, the proposal for the requirements of general application has been formally accepted in GB by Ofgem, on 15 May 2018³¹. However, information concerning (i) the date of submission for approval (thus on the respect of the established deadlines), (ii) the proposal of specific requirements from relevant system operators other than the TSO and (iii) the measures to ensure the transparency of the process cannot be obtained from the ENTSO-E's monitoring file.

example of the latter case is the expected behaviour of the PGM once the minimum regulating level is reached, under the limited frequency sensitive mode (LSM).

³¹ <https://www.nationalgrideso.com/document/114771/download>,
<https://www.nationalgrideso.com/document/114766/download>

5 Certification and Validation

5.1 Objectives

- (84) The NC RfG defines a set of specific tasks for the relevant system operator and the PGM owner with respect to compliance-monitoring issues. In particular:
- The system operator shall ascertain and monitor the compliance of a PGM with the applicable requirements defined in the NC RfG throughout the lifetime of the PGM and inform the owner of the PGM of the outcome of the assessment (Article 41(1) of the NC RfG)³²;
 - The owner of a PGM shall ensure that the PGM complies with the NC RfG throughout the lifetime of the PGM (Article 40(1) of the NC RfG). The NC RfG allows the owner of a PGM to demonstrate the compliance in two ways. The PGM owner may either:
 - i. carry out a set of tests and simulations to demonstrate the compliance with the relevant NC RfG³³.
 - ii. rely upon equipment certificates (EqCs) i.e. documents issued by an Authorised Certifier for the purpose of replacing specific (or all) parts of the compliance process. For instance, EqCs may include models that have been verified against actual test results. An Authorised Certifier is an entity, whose accreditation is given by the national affiliate of the European cooperation for Accreditation³⁴.
- (85) However, the lack of clear specifications (i.e. non-exhaustive requirements) or their late approval/implementation within national grid codes by NRAs have introduced, in turn, further delays in the resolution of EqCs and the consequent creation of validating Authorised Certifiers. These concerns have been expressed in a Stakeholders' letter to the EC and the Agency, sent on 14 March 2019.
- (86) Moreover, in order to demonstrate its effectiveness, a certification needs a well-defined and accredited programme and underlying evaluation schemes. In the context of EqCs for the compliance with the NC RfG, concerns arise due to lack of certification and validations programmes, for instance in term of:
- *increased costs of existing projects*: the project risk for investors, manufacturers and prospective PGM owners is expected to increase, with a consequent increment of the final cost for implementing the technology. This issue might be particularly relevant to those entities that may have taken their decisions on the basis of draft codes and old specifications, speculating on the outcome of the national process and in the absence of validated EqCs. This increase in costs would be largely driven by onerous retrofitting processes of newly purchased equipment.
 - *potential termination of existing/future projects*: the identified uncertainty related to the creation and validation programmes for EqCs and the expected increase of the project

³² Ultimately, the relevant SO shall refuse the connection of a PGM, which does not comply with the applicable requirements and/or it is not covered by a derogation granted by any regulatory authority (second paragraph of Art. 3(1) of the NC RfG).

³³ Common provisions for compliance testing and simulation are included in Art. 42 and 43 of the NC RfG.

³⁴ In accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council.

cost may lead to the early termination of existing projects. Similarly, investors may opt to cancel future investments in the field.

- Delays on confirmed projects and prematurely stranded projects would cause MSs not to be able to meet national and international targets on the integration of renewable energy sources.

- (87) It is to be noted that it is the responsibility of the NRAs to ensure the existence of an Authorised Certifier able to produce and validate EqCs for the PGM installations in its MS. However, the NRA has the duty to ensure that relevant system operators comply with the NC RfG and, in particular, verify the compliance of the new installations with the NC RfG before allowing their connection³⁵.
- (88) Furthermore, the NC RfG does not mandate the establishment of an Authorised Certifier in each of the MSs (e.g. 'national' authorised certifiers). Hence, an Authorised Certifier is able to issue EqCs with respect to PGMs, which seek for connection in any of the MSs, as long as the EqCs are in line with the requirements of general application of the jurisdiction in which the PGM is to be connected³⁶. Note that an EqC may not cover all connection requirements.
- (89) In order to assist the accomplishment of NRAs' tasks and facilitate the process of determination of Authorised Certifiers able to emit EqCs, the Agency:
- Prepared a note suggesting that each NRA (a) act, as per Article 4(2) of the NC RfG, within its given powers concerning the determination of *existing* vs *new* PGMs or (b) explore, as per Article 60 of the NC RfG, the possibility of granting PGM owners and/or relevant system operators time-limited or indefinite derogations from one or more provisions listed in the RfG;
 - Convened a meeting³⁷ with NRAs to provide more insights concerning the verification and certification programs;
 - Performed an investigation on the presence and the status of advancement of the certification and validation programmes, by including specific questions in the survey circulated to NRAs. Results of the inquiry are discussed in the next section.

5.2 Implementation status

- (90) Concerning the status of certification and validation programmes, the Agency included four questions within the survey that was circulated to the NRAs.

³⁵ Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC – Article 37 (1b, 1q and 9).

³⁶ This concept has been already discussed during the 13th meeting of the Grid Connection European Stakeholder Committee (minutes of the meeting are available [here](#)).

³⁷ The 16th SO GC TF meeting held in Ljubljana (ACER offices) on June 6th, 2019.

- (91) The Agency sought replies from 27 NRAs. Answers to the questionnaire have not been provided by 5 NRAs, while 3 NRAs provided an answer only to one question.
- (92) The implementation of the above provisions is analysed in the continuation of this section while exhaustive summaries of NRAs' detailed responses are included in Annex I.

5.2.1 Authorised certifiers issuing equipment certificates

- (93) Initially, NRAs were requested to provide details about the presence in their respective MS of any Authorised Certifiers issuing EqCs and other type of PGM documents related to their connection request. Figure 5 shows the feedback received on this question.

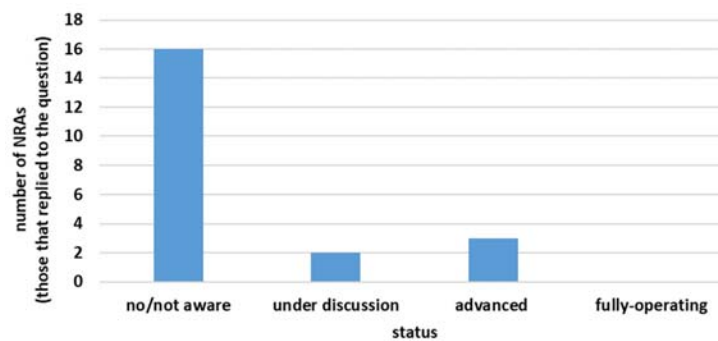


Figure 5. Status of advancement of establishment and operation of Authorised Certifiers.

- (94) The analysis of the collected answers indicates the existence of issues in the establishment and operation of Authorised Certifiers issuing EqCs. None of the responding NRAs could confirm a *fully-operating* status.
- (95) An *advanced* status was recognised for BNetzA (DE), EV (FI) and ARERA (IT) since these NRAs affirmed the presence of Authorised Certifiers entities, which were in the process of enhancing their accreditation capabilities. This process aims at allowing Authorised Certifiers to test and certify the compliance of PGMs with the new grid connection rules included in the NC RfG (especially the requirements of general application).
- (96) The remaining NRAs (among those that provided a reply to the first question) affirmed that, currently, there are no Authorised Certifiers in their MS (or they are not aware of) or the relevant discussions are ongoing.

5.2.2 Certification and validation processes

- (97) Furthermore, NRAs were asked about the adoption of certification and validation processes in their respective MSs. In case of absence of any process, NRAs were asked to provide an indication of the timeline leading to its adoption.
- (98) The majority of the NRAs explained that certification and validation processes have not been set yet in their MS (or they are not aware of).
- (99) UR (UK-NIR) opened up to UK DNOs accepting manufacturers' self-certification of generation equipment capabilities in lieu of a formal Equipment Certificate regime. According to the

answer provided by ANRE (RO), relevant system operators, in collaboration with the TSO, are in charge of the certification and validation processes in RO. A similar approach is in place in IE, as explained by CRU.

- (100) More advanced demonstrations of certification and validation processes are claimed by the NRAs in DE and FI. In fact, in accordance with European legislation, FINAS (the Finnish Accreditation Service) has been named the national accreditation body in Finland. BNetzA affirmed that the most important standardised certification programme has been established by the FGW, following the new certification in the “Technical Directive No 8 of the FGW”.

5.2.3 Documents/information in absence of equipment certificates

- (101) Concerning the operational notification (Title III of the NC RfG), the Agency asked the NRAs to provide information concerning the documents required by the relevant system operator in the absence of equipment certificates. Moreover, NRAs were asked to elaborate the relevant details concerning different types of power-generating modules.
- (102) The majority of the responding NRAs affirmed that they might not be aware of the specific documents mentioned or that the process to define such documents/information is still under development.
- (103) In BE, the compliance of the connection installations with regard to all technical requirements is determined by the satisfactory implementation of the conformity tests and the simulations as referred to in the grid code. For type A PGMs, the compliance assessment is limited to the submission of a complete installation document to the TSO (Article 30 of the NC RfG). For type B and C PGMs, a simplified procedure based on a technical file is followed for the assessment of the compliance (Article 44 and 45 of the NC RfG). Based on the results of the compliance tests, the TSO shall, where necessary, provide an interim operational notification (ION) to the transmission system user for a maximum duration of 24 months with regard to type D PGMs. This interim operational notification contains an enumeration of the elements that have to be made compliant within a given time.
- (104) In DK and FI, it is possible to submit installation documents, which contain a number of pre-approved information in relation to the relevant technical requirements (i.e. national technical requirements and NC RfG-requirements). Each type of PGM (A-D) has to submit a separate document, showing the compliance to requirements which may differ moving from type A PGMs up to type D units.

5.2.4 Compliance testing

- (105) The Agency asked NRAs about how the compliance with the requirements of the NC RfG is tested in the absence of equipment certificates. In doing so, NRAs were asked to provide the relevant details concerning different process for each types of PGMs.
- (106) E-Control (AT), ERO (CZ), CNMC (ES), HERA (HR), PUC (LV), ACM (NL), and EI (SE) affirmed that they might be not aware of specific compliance testing procedures, or the process to define the latter is still under development.

- (107) Finally, BNetzA interpreted well the question in the questionnaire and provided a detailed explanation of the compliance testing procedure³⁸ in case of absence of equipment certificates.

³⁸ This procedure is defined in the “Technical Connection Rules” (“Technische Anschlussregeln (TAR)”) of the VDE|FNN VDE-AR N 4110, VDE-AR N 4120 and VDE-AR N 4130) in each case in chapter 11.6.

Annex I: Summary of NRA responses to the questionnaires

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1 Overview

- (1) This annex summarises the responses received to the NRA questionnaire on the implementation monitoring of derogation criteria and emerging technologies (status as of end of July 2019).
- (2) The questionnaire was circulated on 22 January 2019 and NRAs were asked to submit their answers by 20 February 2019. The report is based on answers NRAs submitted by 31 July 2019³⁹.

2 Determination of significance – Banding Values

2.1 Submission of proposals

- (3) **Q When has the relevant TSO submitted the proposal for thresholds according to Article 5(2)?**
- (4) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (5) Remaining 22 out of the 27 NRAs confirmed that they have submitted the proposals for banding values of PGMs according to Article 5(2) of the NC RfG.

(6) Table II: Submission of proposals for banding values of PGMs.

MS	Answer
AT	16 th of May 2018
BE	On 17 May 2018, the relevant TSO (Elia) has submitted the formal proposal on maximum capacity thresholds of type B, C and D PGM.
BG	<i>no reply</i>
CZ	The proposal was submitted by the relevant TSO (ČEPS) on the 22nd of June.
DE	The relevant TSOs have submitted the proposals on 28th September 2017.
DK	17-May-18
EE	17.05.2018
ES	<u>Proposal was submitted on September 2017. The document can be found on TSO webpage.</u>
FI	16.5.2018. However, the thresholds have been presented before in different public events hosted by the relevant TSO.
FR	<i>no reply</i>
GB	<i>no reply</i>

³⁹ NRAs were given an opportunity to further amend and update their initial inputs.

UK-NIR	<i>SONI, as the Northern Ireland TSO, submitted the proposal for thresholds on the 16th of May 2018.</i>
GR	<i>no reply</i>
HR	<i>17. 5. 2018 first proposal was sent to HERA.</i>
HU	<i>MAVIR has submitted the proposal on 31 August 2017.</i>
IE	<i>The TSO proposals were submitted on May 16th 2018, with a minded to position published by the TSO on 14th July 2017. The decision on Thresholds interacted with the development of technical parameters and so the final TSO position on appropriate thresholds was not concluded until the appropriate technical parameters had been consulted on and proposed to the regulator.</i>
IT	<i>28-May-18</i>
LT	<i>On 2018-05-17 TSO submitted proposal to NRA</i>
LU	<i>19-Oct-17</i>
LV	<i>11-May-18</i>
NL	<i>The proposal has been submitted on October 10, 2017.</i>
PL	<i>PSE S.A. submitted the proposal for thresholds to ERO on May 11, 2018.</i>
PT	<i>TSO submitted the proposal at 2017-06-06.</i>
RO	<p><i>As in RfG it is stipulated : (Art. 66 – Emerging Technology) :</i></p> <p><i>2. A power-generating module shall be eligible to be classified as an emerging technology pursuant to Article 69, provided that:</i></p> <p><i>(a) it is of type A;</i></p> <p><i>(b) it is a commercially available power-generating module technology; and</i></p> <p><i>(c) the accumulated sales of the power-generating module technology within a synchronous area at the time of application for classification as an emerging technology do not exceed 25 % of the maximum level of cumulative maximum capacity established pursuant to Article 67(1).</i></p> <p><i>(Art. 68 – Application for classification as an emerging technology)</i></p> <p><i>1. Within six months of the entry into force of this Regulation manufacturers of Type A power-generating modules may submit to the relevant regulatory authority a request for classification of their power-generating module technology as an emerging technology.</i></p> <p><i>Note: 6 months means 17.11.2016</i></p> <p><i>(Art. 69 - Assessment and approval of requests for classification as an emerging technology)</i></p> <p><i>1. By 12 months of the entry into force of this Regulation, the relevant regulatory authority shall decide, in coordination with all the other regulatory authorities of a synchronous area, which power-generating modules, if any, should be classified as an emerging technology. Any regulatory authority of the relevant synchronous area may request a prior opinion from the Agency, which shall be issued within three months of receipt of the request. The decision of the relevant regulatory authority shall take into account the opinion of the Agency.</i></p> <p><i>Note: 12 months means 17.05.2017</i></p>

	<p><i>It was necessary to be defined type A before 17.11.2016, in the order to be able to take the decision for emerging technologies (we have not type A PGM defined in Romania in 2016), as it was shown.</i></p> <p><i>Our OTS (CNTEE Transelectrica SA) send us their proposal with address 35531/ 12. 10.2016 (ANRE number 72374/12.10.2016).</i></p>
SE	<i>The relevant TSO submitted the proposal for thresholds according to article 5(2) on the 17th of May 2018.</i>
SI	<i>01. 03. 2018</i>
SK	<i>October 3, 2017</i>

2.2 TSO coordination with adjacent TSOs and DSOs

- (7) **Q: Has the relevant TSO coordinated with adjacent TSOs and DSOs the proposal for thresholds according to Article 5(3)? Provide an explanation.**
- (8) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (9) Remaining 22 out of the 27 NRAs provided evidence of the respective TSO setting up coordination with adjacent TSOs and DNOs in order to consult them on the proposals for banding values for PGMs.

Table III: TSO coordination with adjacent TSOs and DSOs.

MS	Answer
AT	<i>Yes, the relevant TSOs are stated and the meeting dates are given.</i>
BE	<p><i>Yes. A process of discussion and benchmarking of the proposed thresholds has been held within ENTSO-e through bilateral and multilateral meetings with neighbouring TSOs. More specifically Elia has held discussions with RTE, TENNET BV, CREOS, TENNET GmbH, AMPRION and TransnetBW GmbH, respectively the French, Dutch, Luxemburgish and (a representation of) the German TSOs.</i></p> <p><i>Elia coordinated also with the DSOs connected to the Elia-grid. The proposal for the limits was discussed with the DSO's. During preliminary interactions with stakeholders results of the alignment with the DSOs had been put forward.</i></p> <p><i>In addition Elia interpreted NC RfG art. 5(3) in a broad way and decided to also coordinate with the CDSOs (Closed Distribution System Operators). The concerns of the CDSOs have been heard during several stakeholder interactions.</i></p>
BG	<i>no reply</i>
CZ	<i>Yes, the proposal for thresholds had been coordinated with adjacent TSOs mainly at physical meetings of working groups under ENTSO (adjacent TSOs being TSOs from Austria (APG), Germany (50Hertz), Poland (PSE) and Slovakia (SEPS) and also with the relevant DSOs within the Czech Republic (ČEZ Distribuce, E.ON Distribuce and PREdistribuce).</i>

DE	<p>The German TSOs had started the coordination with their neighbouring TSOs in the beginning of 2017.</p> <p>In order to enhance the efficiency of the consultations the four German TSOs had decided to present the proposed approach jointly to all their neighbouring TSOs. The occasion of a meeting, hosted by ENTSO-E on 31 January 2017, was used in order to coordinate with RTE, Elia, TenneT TSO BV and Creos. On 4 July 2017 a follow up meeting was held via a webinar session in which the thresh-olds have finally been coordinated with these western neighbouring TSOs.</p> <p>Following an invitation of APG, the final coordination of the thresholds was al-so achieved with APG and ČEPS on 26 June 2017.</p> <p>Coordination was also achieved with Energinet.dk in July 2017 by means of electronic communication and a final content finding during a web conference held on 6 September 2017.</p> <p>The Polish TSO PSE had received the German TSOs' threshold proposal via e-mail. The internal "PSE Network Codes Implementation Committee" has con-firmed its consent with the proposal on 5 September 2017.</p> <p>All neighbouring TSOs have finally confirmed their consent to the German TSOs' threshold proposal via e-mail.</p>
DK	<p>i. Yes, the TSO facilitated 3 open stakeholder seminars, where DSO's (among others) where invited.</p> <p>ii. TSO initiated direct meetings with DSO organization Danish Energy to meet their criticism regarding coordination.</p> <p>iii. Thresholds take into account German and Swedish thresholds. Energinet has pointed out similarities between the German and Danish PGM portfolio in particular. The threshold for Type B (125 kW) is therefore also very close to the German Threshold of 135 kW.</p> <p>iv. The similarity of North German wind power has been taken into account vs. the much different composition of PGMs in Sweden and Finland (Hydro and Nuclear power).</p>
EE	<p>Yes. TSO conducted a public consultation.</p>
ES	<p>There was a dedicated working group and a public consultation process in which DSOs and other agents shared their view on this issue. Threshold proposal has been discussed among adjacent TSOs based on the information reported by Spanish TSO.</p>
FI	<p>Relevant TSO and DSOs have been in a working group that handles the coordination of RfG. Relevant TSO has also organized conferences and public events about the requirements of RfG.</p>
FR	<p><i>no reply</i></p>
GB	<p><i>no reply</i></p>
UK-NIR	<p>Yes, there was very close co-ordination between SONI as the Northern Ireland TSO and EirGrid as the Ireland TSO. Both TSOs issued the same banding proposals for consultation as well as holding parallel consultations in NI and IE in relation to the proposals. In addition, there was close coordination with NIE Networks (NI DNO) in relation to the development of the proposal. This coordination was in relation to a number of items including possible modifications to the existing Grid and Distribution Codes, resulting from the proposed banding threshold.</p>

GR	<i>no reply</i>
HR	<i>Yes. TSO explained that it contacted all relevant parties.</i>
HU	<i>MAVIR explained in its proposal that MAVIR informed adjacent TSOs in a dedicated forum under the umbrella of ENTSO-E about the public consultation of its proposal. However, no feedback was received from adjacent TSOs. Regarding DSOs – apart from the public consultation – MAVIR held several consultations with them.</i>
IE	<i>"Yes, there was very close co-ordination between SONI as the Northern Ireland TSO and EirGrid as the Ireland TSO. Both TSOs issued the same banding proposals for consultation as well as holding parallel consultations in NI and IE in relation to the proposals. In addition, there was close coordination with ESBN and NIE in relation to the development of the proposal. This coordination was in relation to a number of items including possible modifications to the existing Grid and Distribution Codes, resulting from the proposed banding threshold.</i>
IT	<i>The Italian TSO has submitted the proposal for thresholds in accordance with the ENTSO-E Implementation guidance, in particular the document "Selecting national MW boundaries" (https://docstore.entsoe.eu/Documents/Network%20codes%20documents/NC%20RfG/161116_IGD_Selecting%20national%20MW%20boundary_for%20publication.pdf), discussing that proposal with Italian DSOs throughout a Working Table at the Italian Electrotechnical Committee (CEI, which is a non-profit Association operating, at national level, for technical standardisation in the electrotechnical, electronic and telecommunication field). In Italy, technical rules for connection are defined by TSO (Terna) in relation to HV and HHV level, and by the Italian Electrotechnical Committee in relation to LV and MV level (carried out by DSOs). In both cases, technical rules for connection are finally approved by Italian NRA.</i>
LT	<i>TSO coordinated thresholds on the task forces and working groups established by the regional TSOs.</i>
LU	<i>Yes, with Luxembourgish DSOs and with the adjacent German TSO (see text of the consultation where Creos mention that the thresholds have been aligned with the ones proposed in Germany).</i>
LV	<i>According to the cover letter of the submitted proposal on requirements of general application for grid connection of generators including thresholds according to Article 5(2), Latvian TSO developed the proposal in coordination with Lithuanian and Estonian TSO as well as with the DSOs in Latvia.</i>
NL	<i>Yes, on January 31, 2017 and July 4, 2017 meetings have been held between the Dutch national TSO and the adjacent TSO's from the neighbouring countries.</i>
PL	<i>Yes. Submitted proposal was developed in cooperation with transmission system operators from the neighbouring EU Member States. More information about this process is available on: https://www.pse.pl/rfg</i>

PT	Yes, TSO (one in Portugal) has several meetings with adjacent TSO (Spain), as well with more relevant DSO. As a result of those meetings, TSO made a proposal.
RO	<p>Yes, it was a coordination between OTS and ODs (you can see page 22 from Report on Inter-TSO coordination in connection network codes implementation (Working Group CNC – 12.12.2017) hereto attached). The thresholds proposed correspond to actual thresholds stipulated by our national legislation (1MW, 5 MW, 20 MW). In the workshop dated 10.08.2016 and organized by CNTEE Transelectrica, where ANRE was invited together with producers, DSOs and Ministry of Energy, it was launched proposal to be approved thresholds mentioned.</p> <p>Concerning coordination with adjacent TSOs, CNTEE Transelectrica SA informed us they consulted at the level of working groups, as it is mentioned in ENTSO-E Report on Inter-TSO coordination in connection network codes implementation (Working Group CNC – 12.12.2017), page 22.</p> <p>To avoid any doubt concerning this point, CNTEE Transelectrica organized a physical meeting at Bucharest in 2017 to confirm again this values (see page 28 from Report on Inter-TSO coordination in connection network codes implementation (Working Group CNC – 12.12.2017) hereto attached)).</p>
SE	The Nordic TSOs has a working group where they handle all the connection regulations. The relevant TSO has in the working group coordinated with the adjacent TSOs through physical meetings, telephone meetings and email. The Swedish Energy Market Inspectorate has conducted a public consultation for among others the DSOs.
SI	Coordination with neighbouring TSO has been provided at TSO-CNC coordination, as well as mutual contacts with TSO's of neighbouring countries and coordination with Slovenian DSO.
SK	Yes, through public consultation.

2.3 Public consultation

- (10) **Q: Has the relevant TSO conducted a public consultation on the proposal for thresholds according to Article 5(3)? If yes, provide the reference to the call for public consultation. If no, provide an explanation.**
- (11) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (12) Remaining, 22 out of the 27 NRAs provided evidence of the public consultation on the proposals for banding values of PGMs.

Table IV: Public consultation on the proposals for banding values of PGMs.

MS	Answer
AT	Yes - https://www.apg.at/de/netz/Network-Codes/Netzanschluss/RfG
BE	Yes, Elia has organized beforehand a public consultation on the maximum capacity thresholds B, C and D from 19 May till 20 June 2017: http://www.elia.be/en/about-elia/publications/Public-Consultation/Archives/Public-consultation-Elia-proposal-for-maximum-capacity-thresholds-for-type-B-C-and-D

BG	<i>no reply</i>
CZ	<p>The relevant TSO (ČEPS) conducted a public consultation between the 24th of April 2017 and the 6th of June 2017, during which there were no remarks. The general public was also informed about the details of the public consultation through a workshop which was organised by the TSO on the 5th of May 2017, at their premises.</p> <p>As the approval of the thresholds took place more than a year ago, we could not locate the relevant link on the TSOs website anymore however during the approval procedure we did review the relevant link.</p>
DE	<p>Yes, the German TSOs have conducted a public consultation of their thresholds proposal. In order to guarantee a well-balanced professional discussion and critical input by all stakeholders the TSOs contracted the “Verband der Elektrotechnik Elektronik Informationstechnik e. V., Forum Netztechnik/Netzbetrieb (VDE FNN)” to organize the consultation. The German TSOs are themselves members of this entity, along with about 36,000 other persons (1,300 of which are undertakings) from the energy sector.</p> <p>The service provider VDE FNN opened the public consultation on 2 August 2016 on its website. The public, including of course the VDE FNN members, were given the opportunity to comment and propose amendments to the proposal until 12 September 2016.</p> <p>Additionally, the TSOs held a consultation workshop in Berlin on 22 September 2016 in which they explained their proposal and the reasoning behind it and invited the stakeholders to discuss the proposal and the comments addressed in the course of the public consultation. BNetzA had participated in this workshop.</p>
DK	<p>i. Yes – 15 February – 16 March 2018</p> <p>ii. Internet link was not available so here’s the e-mail consultation we received:</p> <p>iii. - document in the questionnaire</p>
EE	<i>Yes. https://elering.ee/loppenud-konsultatsioonid#accordion5</i>
ES	<i>TSO proposal was submitted to public consultation for a period of two months (31/05/2017-31/05/2017). There is a dedicated document answering all the comments on the public consultation on TSO webpage.</i>
FI	<i>Yes. The relevant TSO has conducted the public consultation before the relevant TSO has send the proposal to regulator. However we can’t find the reference to the call anymore. The Consultation has been held from 15.2.2018 to 25.3.2018. Draft can be found here: https://www.fingrid.fi/sivut/ajankohtaista/tapahtumat/muut-tilaisuuudet/</i>
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	<i>Yes, a consultation document for comment by the industry was issued on the 7th of April 2017 by SONI, as TSO, which sets of the proposal for the banding thresholds for Northern Ireland. This consultation was open until the 15th of May 2017. The consultation paper can be viewed here.</i>
GR	<i>no reply</i>

HR	Yes. 10.7. – 21.8.2017 http://www.hops.hr/wps/portal/hr/web/dokumenti/savjetovanja/euuredberasprave/
HU	Yes, there was a public consultation from 26 June 2017 till 18 August 2017. http://mavir.hu/web/mavir/lezart-nuksz-konzultaciok
IE	An industry (public) consultation on the proposed banding thresholds was issued on the 7th of April 2017 by EirGrid. This consultation ran until the 15th of May 2017. The consultation document can be viewed on the EirGrid website - click http://www.eirgridgroup.com/site-files/library/EirGrid/RfG-Banding-Thresholds-Consultation-Ireland.pdf
IT	http://download.terna.it/terna/0000/1015/57.PDF
LT	Yes, the public consultation was announced which occurred during 2018-04-03 – 2018-05-03. Also, public discussions with stakeholders were held on 2018-02-22 and 2018-03-15. http://www.litgrid.eu/index.php/naujienos-ir-ivykiai/naujienos/viesoji-konsultacija-del-reikalavimu-gamintojams-tinklo-kodekso-slenkstiniu-verciu-ribu-ir-bendruju-reikalavimu/3882 (in Lithuanian)
LU	Yes, from 1 to 30 September 2017. https://www.creos-net.lu/actualites/actualites/article/consultation-publique-concernant-la-proposition-de-mettre-en-place-des-seuils-de-puissance-maximale.html
LV	The websites to the call for public consultation: in Latvian http://www.ast.lv/lv/events/priekslikuma-tikla-piesleguma-prasibas-generatoriem-sabiedriska-apsriesana in English http://www.ast.lv/en/events/public-consultation-proposal-network-connection-requirements-generators
NL	i. Yes; ii. Reference: https://www.tennet.eu/nl/nieuws/nieuws/consultatie-in-het-kader-van-eu-verordening/
PL	Yes. More information on: https://www.pse.pl/biuro-prasowe/aktualnosci/-/asset_publisher/fwWgbbtxcZUt/content/informacja-osp-w-sprawie-rozporozczenia-publicznych-konsultacji-propozycji-progow-mocy-maksymalnych
PT	In our national meetings, the high level group (with representatives of Member State, regulator, TSO and relevant DSO) it was accorded that the public consultation was to be made by Member State, due to national competences. However, TSO prepared a contextualization about that proposal, to annex the public consultation. The public consultation was launched at 2017-08-25.
RO	See answer to the point b and link : http://www.transelectrica.ro/web/tel/norme-le-in-curs-de-implementare (point Diseminarea informatiei prin conferinte in care are loc dezbaterea codului)
SE	Yes, the relevant TSO has conducted a public consultation on the proposal for thresholds according to article 5(3). Reference to the call for public consultation: https://www.svk.se/om-oss/nyheter/natkoder/offentligt-samrad-om-troskelvarden-for-kraftproduktionsmoduler/

SI	<u>Slovenian TSO has conducted public consultation on preliminary proposal for thresholds and public consultation on final proposal for thresholds (both published at NC portal: https://www.agen-rs.si/izvajalci/elektrika/kodeksi-omrezja/posvetovanja-o-predlogih-odlocitev</u>
SK	Yes. The public consultation lasted from 15 June to 14 July 2017. https://www.sepsas.sk/Informacie.asp?Kod=25&Aktualita=880&Nadrad=880

2.4 Approval of proposals by designated entities

- (13) **Q: Which entity approved the proposal for thresholds in accordance with Article 5(3) and when has the approval taken place? Provide the internet link to the approval. In case the thresholds haven't been adopted yet, provide an indication of the timescales for their adoption.**
- (14) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (15) 2 NRAs, CREG (BE) and CNMC (ES) reported that the proposals have not been officially approved yet.
- (16) Remaining 20 out of the 27 confirmed the approval of the proposals for the banding values of the PGMs.

Table V: Approval of proposals of banding values for PGMs.

MS	Answer
AT	Draft decree approved 7th of November 2018 by E-Control for regulatory advisory board: https://www.e-control.at/documents/20903/388512/Entwurf+RfG+Schwellenwert-V.PDF/4f13ba0f-efbf-78b2-7d7c-511332ced3fd Final decree by E-Control will shortly be published on: https://www.e-control.at/recht/bundesrecht/strom/verordnungen
BE	The formal approval will be made by the government by royal decree. The final version of this decree is submitted to the Minister of Energy and the approval procedure is ongoing. It is expected that the royal decree will be published before 27 April 2019.
BG	<i>no reply</i>
CZ	The thresholds were approved by the relevant entity (the ERO) on the 23rd of November 2017. Link: http://www.eru.cz/documents/10540/4590977/Rozhodnut%C3%AD%20ER%C3%9A.pdf/29cdb9a6-7906-4f5d-b423-4891d464a7cf (only available in the Czech language).
DE	BNetzA has approved the proposal for the thresholds on 24 April 2018. See here: https://www.bundesnetzagentur.de/DE/Service-Funktionen/Beschlusskammern/1_GZ/BK6-GZ/2016/2016_0001bis0999/BK6-16-166/BK6-16-166_Beschluss_vom_24_04_2018.html?nn=721730

DK	<i>DUR approved the proposal on 24 September 2018.</i>
EE	<i>Estonian Competition Authority. https://www.konkurentsiamet.ee/index.php?id=28831</i>
ES	<i>The entity responsible for the approval of the thresholds is the Spanish Ministry for the Ecological Transition. Regulation aimed at approving thresholds and some other matters related to NC RfG implementation, among others, is currently on its way to be submitted to public consultation. This consultation is a necessary step before regulation can be adopted which is expected within 2019.</i>
FI	<i>Regulator (Energy authority) has approved the proposal in 16.11.2018. In addition to RfG, the proposal covered all technical requirements for connecting power systems. Requirements came into force after approval, in 16.11.2018. Relevant TSO has asked 30.11.2018 to update the approval so that some of the requirements should entry into force not until 17.5.2019. Regulator has accepted these updates with a new decision in 14.12.2018. Link to the approval: https://www.energiavirasto.fi/documents/10191/0/Fingrid2018_vahvistusp%C3%A4%C3%A4t%C3%B6s_liitteineen.pdf/8de8609d-54c8-4de1-be59-c29e127c03fb</i>
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	<i>The Utility Regulator (Northern Ireland) approved on the 16th of November 2018. The decision paper can be accessed here. - in the folder</i>
GR	<i>no reply</i>
HR	<i>HERA. Approved on 15.11.2018 based on final proposal from 12.11.2018. http://www.hops.hr/wps/wcm/connect/30368a9b-ff85-414e-8bd5-060532ad3f0a/Pragovi_odobreno.pdf?MOD=AJPERES http://www.hops.hr/wps/wcm/connect/3af1ca45-4975-4073-828c-ad4f18bfd42a/Odluka+HERA.pdf?MOD=AJPERES</i>
HU	<i>HEA (NRA) approved the proposal on 08 February 2018. http://www.mekh.hu/download/e/07/50000/784_2018.pdf</i>
IE	<i>The CRU approved the proposals on the 26th of November 2018, at the same time as approving the technical parameters. Link here https://www.cru.ie/wp-content/uploads/2018/11/CRU18242-RfG-Parameters-Decision-Paper-.pdf</i>
IT	<i>The Italian NRA approved the proposal for thresholds by means of resolution 592/2018/R/eel. https://www.arera.it/it/docs/18/592-18.htm</i>
LT	<i>VERT approved parameters on 2018-10-15 by its resolution No O3E-323 https://www.regula.lt/Docs/nutarimas_2018_323.pdf#search=O3E%2D323 (in Lithuanian)</i>

LU	ILR issued a decision to approve the thresholds. https://assets.ilr.lu/energie/Documents/ILRLU-1685561960-506.pdf
LV	The proposal for thresholds was adopted on 1 November 2018 with the Decision No.1/31 of the Board of the Public Utilities Commission "Amendments to the Public Utilities Commission Decision No 1/4 of 26 June 2013 "Network Code for Electricity Sector"" https://www.sprk.gov.lv/index.php/cmaa/type_2?year=2018&sector=26&category=7 Paragraph 2 of the Annex 7 of the Network Code for Electricity Sector determines the Thresholds according to Article 5(2) https://likumi.lv/doc.php?id=257943
NL	i. The ACM is the entity in the Netherlands for establishing this proposal; ii. The decision on the proposal was made by ACM on April 5, 2018; iii. The decision was published on April 10, 2018; iv. Reference: https://zoek.officielebekendmakingen.nl/stcrt-2018-19834.html .
PL	URE approved the proposal for thresholds on July 16, 2018. Information is available on PSE S.A. website: https://www.pse.pl/documents/20182/31216853/20180806_decyzja_ure/717e22be-85b2-4aa3-b006-c365ae577f05 Administrative decision approving the proposal for thresholds was also published on July 17, 2018 on URE website: https://bip.ure.gov.pl/bip/taryfy-i-inne-decyzje-b/inne-decyzje-informacj/3634,Inne-decyzje-informacje-sprawozdania-opublikowane-w-2018-r.html
PT	The entity that approved the thresholds was Direção-Geral de Energia e Geologia (DGEG) at 2018-01-29, accessible at www.dgeg.gov.pt è "Áreas setoriais" è "Energia Elétrica" è "Códigos de Rede Europeus" è "Requisitos Geradores (RfG)". http://www.dgeg.gov.pt/pagina.aspx?back=1&codigono=6363644789338934AAAAAA A
RO	ANRE received proposal in 12. 10.2016. It was organized a second public consultation started in 17.10.2016 , see link: https://www.anre.ro/ro/energie-electrica/legislatie/documente-de-discutie-ee1/coduri-paneuropene/regulamentul-ue-nr-631-2016-nc-rfg&page=2 ANRE approved classification on the date 16.11.2016 by order no. 79/2016. See link: https://www.anre.ro/ro/energie-electrica/legislatie/coduri-paneuropene/1476186098/regulamentul-ue-nr-631-2016-rfg NB. Our OTS (CNTEE Transelectrica SA) attended discussions from 2016 to 2018 (at European level), concerning implementation of RfG, especially at PGM of category A where is not specified obligativity for LVRT (due to fact that LVRT is nor required in R631/2016 for A type) and sending information to relevant system operators. Because our OTS predicts a development for small PGMs and introduction of them in national system, coordinated with the fact that NC RfG was not modified yet, in the purpose to allow introduction of LVRT and information exchange with relevant system operators (even if it was discussions concerning this aspect) its intention, together with DSOs, is to change the threshold between A and B category (to decrease the threshold) in 2019 year, after a process of consultations with adjacent TSOs (3 years according to art. (5) alin. (3) from RfG) and to send accordingly a proposal to ANRE.

SE	The Swedish Energy Market Inspectorate approved Article 5(3) together with Article 7(1) on the 17th of November 2018 by announcing a regulation. Internet link to the approval: https://www.ei.se/sv/for-energiforetag/el/Natforeskrifter-och-kommissionsriktlinjer-for-el/natkod-requirements-for-generators-rfg/pagaende-arenden-rfg/Artikel-71-och-53-Generellt-tillampliga-krav-pa-kraftproduktionsmoduler-och-Maximala-troskelvarden-for-kraftproduktionsmoduler/
SI	<u>Proposal for threshold has been approved on 10. 10. 2018 by NRA (Energy Agency), published at: https://www.agen-rs.si/izvajalci/elektrika/kodeksi-omrezja/odlocitve-agencije.</u>
SK	The Decision of the Office No. 0005/2018/E-EU of February 13, 2017 http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/webFormRozhodnutiaOther?OpenForm&Category=E http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/0/214298438BD706E2C125822700488658/\$FILE/0005_2018_E-EU.pdf

3 Establishment of requirements of general application

3.1 Submission of proposals

- (17) **Q: When have the requirements of general application in accordance with Article 7(1) been proposed by the relevant system operator or TSO?**
- (18) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (19) Remaining 22 out of the 27 NRAs confirmed that they have submitted the proposals for requirements of general application according to Art. 7(1) of the NC RfG.

Table VI: Approval of proposals of banding values for PGMs.

MS	Answer
AT	17 th of May 2018
BE	On 17 May 2018, the relevant TSO (Elia) has submitted the final proposals for general requirements for NC RfG, but also for NC DCC and NC HVDC to the competent authorities.
BG	<i>no reply</i>
CZ	The requirements of general application in accordance with Article 7(1) have been prepared by an expert team (where TSO and DSO representatives were included). The TSO proposed the requirements of general application on the 18th May 2018. DSOs proposed the requirements on the following dates: ČEZ Distribuce on the 17th of May 2018, E.ON Distribuce on the 17th of May 2018 and PREdistribuce on the 17th of May.
DE	The requirements of general application have been proposed by the relevant system operator or TSO: - by 31 July 2017 as far as requirements for maximum voltage grid connection are concerned,

	<p>- by 23 June 2017 as far as requirements for low voltage grid connection are concerned, - by 28 April 2017 as far as requirements for high voltage grid connection are concerned and - by 17 February 2017 as far as requirements for medium voltage grid connection are concerned.</p>
DK	<p>i. Energinet and Danish Energy proposed two separate proposals of general requirements, cf. RfG ii. Both were submitted 17 May 2018 (Danish Energy resubmitted their proposal 10 July 2018)</p>
EE	17.05.2018
ES	Proposals were presented in May 2018.
FI	16.5.2018
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	SONI and NIE Networks' proposal for the general application of technical requirements in accordance with Articles 13 – 28 of the Commission Regulation (EU) 2016/631 establishing a network code on requirements for grid connection of generators was submitted to the Utility Regulator on the 16th May 2018.
GR	<i>no reply</i>
HR	17. 5. 2018 first proposal was sent to HERA (together with the banding values proposal)
HU	MAVIR submitted the proposal on 16 May 2018.
IE	16th May 2018
IT	28-May-18
LT	On 2018-04-03 TSO announced public consultation
LU	16-May-18
LV	On 11 May 2018
NL	i. The proposal has been submitted by the TSO on May 17, 2018.
PL	PSE S.A. submitted the proposal of requirements of general application relevant to transmission system on May 14, 2018. Requirements were approved by administrative decision dated November 9, 2018. After amendment to the Energy Act in November 2018, granting the TSO competence to present the requirements for whole energy system, including distribution (pursuant to art. 7 par. 9 of Regulation (EU) 2016/631, PSE S.A. presented new complex version on December 18, 2018 and previous decision was changed (extended) on January 2, 2019.
PT	TSO submitted the proposal at 2018-04-10.
RO	Our TSO proposed general requirements us by address: 5877/16.02.2017 (ANRE number 11916/17.02.2017) and 18787/10.05.2018 (ANRE number 36188/10.05.2018)

SE	<i>The relevant TSO submitted the proposal for requirements of general application according to article 7(1) on the 17th of May 2018.</i>
SI	<i>18. 5. 2018 first proposal has been submitted to NRA.</i>
SK	<i>May, 10 2018</i>

3.2 Requirements of general application proposed by the relevant system operator other than the TSO

- (20) **Q: Specify which requirements of general application have been proposed by the relevant system operator other than TSO.**
- (21) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (22) Remaining 22 out of the 27 NRAs explained whether any of the requirement of general application was actually proposed by the relevant system operator other than the TSO.

Table VII: Requirements of general application proposed by relevant system operator other than the TSO.

MS	Answer
AT	<i>The requirements have been proposed by the Association of Austrian Electricity Companies on behalf of all system operators.</i>
BE	<i>At this moment only the relevant TSO (Elia) has submitted requirements for general application.</i>
BG	<i>no reply</i>
CZ	<i>According to our reading for the NC RfG there were requirements which were supposed to be proposed by the:</i> <ol style="list-style-type: none"> 1. TSO 2. System operator 3. System operator in coordination with the TSO <i>In our opinion the TSO should have proposed those requirements that were in group 1 and 2. System operators (DSOs) should have proposed those requirements that were in group 2 and 3.</i>
DE	<i>The above mentioned requirements for low voltage grid connection and for medium voltage grid connection have been proposed by the relevant DSOs. However, all four above mentioned sets of requirements were elaborated within the framework of the VDE FNN in a consensual way (see below). Hence, DSOs and TSOs alike were involved.</i>
DK	<i>All mandatory general requirements have been proposed? Not sure what specification is needed here?</i>
EE	<i>There is only one TSO, which is relevant system operator (Elering AS). There was only one proposal, made by Elering AS.</i>

ES	<i>The document can be found on TSO webpage.</i>
FI	-
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	<i>Those requirements specified by the relevant system operator other than the TSO have been indicated in the proposal for general application submitted to the authority on 16th May 2018.</i>
GR	<i>no reply</i>
HR	<i>None.</i>
HU	<i>None of the requirements of general application have been proposed by the relevant system operator other than TSO.</i>
IE	<i>Articles 13-28 of RfG</i>
IT	<i>In Italy, Terna is the only TSO and also the only System Operator. So, no one else proposed requirements of general application</i>
LT	<i>There were no requirements proposed by other entities than TSO.</i>
LU	<i>See the relevant articles mentioned in the table in annex of the regulation issued by ILR (see link in the answer to point c.)</i>
LV	<i>All requirements were proposed by TSO which developed the proposal in coordination with the DSOs in Latvia.</i>
NL	<i>none.</i>
PL	<i>None. The TSO has elaborated all requirements of general application in accordance with Article 7(9).</i>
PT	<i>TSO made a conjunct proposal with relevant DSO.</i>
RO	<i>Proposal for requirements of general application, before to be send to ANRE, supported a public consultation where DSOs had opportunity to coordinate with TSO. ANRE received this coordinated shape.</i>
SE	<i>There has not been any other proposal other than that from the relevant TSO.</i>
SI	<i>All requirements of general application have been proposed by TSO, but coordinated with DSO.</i>
SK	<i>There is only one TSO.</i>

3.3 Approval of the requirements of general application

- (23) **Q: When was the proposal for the requirements of general application approved by the entity designated by the Member State in accordance with Article 7(1)? Provide the internet link to the published requirements of general application.**

- (24) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (25) 2 NRAs, CREG (BE) and CNMC (ES) reported that the proposals have not been officially approved yet.
- (26) ACM (NL) affirmed that only a partial approval was reached. ACM has not yet decided on the proposals for (i) Rate of Change of Frequency (RoCoF) and (ii) reactive power requirements for type B, C and D PGMs.
- (27) Remaining 19 out of the 27 confirmed the approval of the proposals for the requirements of general application.

Table VIII: Approval of the requirements of general application.

MS	Answer
AT	<i>Draft decree approved on 15th of November 2018 by E-Control for regulatory advisory board: https://www.e-control.at/documents/20903/388512/Entwurf+RfG+Anforderungs-V.PDF/d2c328c0-a83d-c241-e130-1f776f2ef7a2 Final decree by E-Control will shortly be published on https://www.e-control.at/recht/bundesrecht/strom/verordnungen</i>
BE	<i>The formal approval will be made by the government by royal decree. The final version of this decree is submitted to the Minister of Energy and the approval procedure is ongoing. It is expected that the royal decree will be published before 27 April 2019.</i>
BG	<i>no reply</i>
CZ	<i>The proposals were approved by the ERO as following: The proposal from the TSO (ČEPS) was approved on the 26th of October 2018. Link: http://www.ero.cz/documents/10540/5047082/rozhodnut%C3%AD%20%C4%8CEPS.pdf/cbfba49e-eeee-4f03-b24b-17bb402b3d6c (available in the Czech language). The proposal from ČEZ Distribuce was approved on the 1st of November 2018. Link: http://www.ero.cz/documents/10540/5047082/rozhodnut%C3%AD%20%C4%8CEZ+Distribuce.pdf/bc76bbd1-e6c7-4705-aeb1-4682c788f147 (available in the Czech language). The proposal from E.ON Distribuce was approved on the 1st of November 2018. Link: http://www.ero.cz/documents/10540/5047082/rozhodnut%C3%AD%20E.ON+Distribuce.pdf/b11cca71-338e-46c2-82db-0e7571ebb4be (available in the Czech language). The proposal from PREdistribuce was approved on the 1st of November 2018. Link: http://www.ero.cz/documents/10540/5047082/rozhodnut%C3%AD%20PREdistribuce.pdf/b69057c1-65df-49b7-8d1a-599776c0c3c9 (available in the Czech language). However, while already approved, these requirements shall apply from the 27th of April 2019.</i>
DE	<i>In accordance with Article 7(1) sentence 2 of the RfG, the German lawmaker has designated the association "VDE FNN" to approve the requirements of general application established by DSOs/TSOs under the RfG, see Art. 19 Sec. 4 of the German Energy Act</i>

	<p>http://www.gesetze-im-internet.de/enwg_2005/___19.html).</p> <p>The proposals have all been approved by the VDE FNN by 19 October 2018 (https://www.vde.com/de/fnn/themen/europaeische-network-codes/rfg).</p> <p>All the requirements for grid connection of generators are laid down in the renewed "Technical Connection Rules" ("Technische Anschlussregeln (TAR)") of the VDE FNN.</p> <p>https://www.vde.com/de/fnn/themen/tar/tar-hoehchstspannung/tar-hoehchstspannung-vde-ar-n-4130</p> <p>https://www.vde.com/de/fnn/themen/tar/tar-hochspannung/tar-hochspannung-vde-ar-n-4120</p> <p>https://www.vde.com/de/fnn/themen/tar/tar-mittelspannung/tar-mittelspannung-vde-ar-n-4110</p> <p>https://www.vde.com/de/fnn/themen/tar/tar-niederspannung/erzeugungsanlagen-am-niederspannungsnetz-vde-ar-n-4105-2018</p>
DK	<p>i. TSO requirements approved on Monday 19 November 2018: http://forsyningstilsynet.dk/el/afgoerelser/sekretariatsafgoerelser/oevrige-afgoerelser-og-udmeldinger-fra-sekretariatet/afgoerelse-vedroerende-energinetdks-anmeldelse-af-forslag-til-generelle-tilslutningskrav-for-nye-produktionsanlaeg-efter-forordning-2016631-rfg/</p> <p>ii. DSO requirements approved 15 February 2019: http://forsyningstilsynet.dk/index.php?id=10225857</p>
EE	<p>08.11.2018 https://www.konkurentsiamet.ee/index.php?id=28831</p>
ES	<p>The entity responsible for the approval of the requirements is the Spanish Ministry for the Ecological Transition. These requirements have not yet been approved although they are expected to be so within 2019.</p>
FI	<p>Same answer that in 1 d.</p>
FR	<p><i>no reply</i></p>
GB	<p><i>no reply</i></p>
UK-NIR	<p>The Utility Regulator approved the proposal for the requirements of general application on the 16th November 2018. The approval can be viewed here.</p>
GR	<p><i>no reply</i></p>
HR	<p>Approved on 15.11.2018 based on final proposal from 12.11.2018.</p> <p>http://www.hops.hr/wps/wcm/connect/3af1ca45-4975-4073-828c-ad4f18bfd42a/Odluka+HERA.pdf?MOD=AJPERES http://www.hops.hr/wps/wcm/connect/c4a68e06-a42d-43e5-b5a7-852bd2d3c088/RfG+zahtjevi_odobreno.pdf?MOD=AJPERES</p>
HU	<p>HEA (NRA) approved the proposal on 14 November 2018. http://www.mekh.hu/download/c/fa/60000/11184_2018.pdf</p>
IE	<p>26th November 2018</p>

IT	<i>The Italian NRA approved the proposal for requirements of general application by means of resolution 592/2018/R/eel, https://arera.it/it/docs/18/592-18.htm National implementation for MV and LV networks by CEI is on-going.</i>
LT	<i>VERT approved requirements of general application on 2018-10-15 by its resolution No O3E-323 https://www.regula.lt/Docs/nutarimas_2018_323.pdf#search=O3E%2D323 (in Lithuanian)</i>
LU	<i>ILR issued a regulation about these requirements: http://legilux.public.lu/eli/etat/leg/rilr/2018/11/14/a1087/jo</i>
LV	<i>The proposal for the requirements of general application in accordance with Article 7(1) was adopted on 1 November 2018 with the Decision No.1/31 of the Board of the Public Utilities Commission "Amendments to the Public Utilities Commission Decision No 1/4 of 26 June 2013 "Network Code for Electricity Sector" https://www.sprk.gov.lv/index.php/cmaa/type_2?year=2018&sector=26&category=7 The requirements of general application in accordance with Article 7(1) are determined in Annex 7 "Network Connection Requirements of Generators" of the Network Code for Electricity Sector https://likumi.lv/doc.php?id=257943</i>
NL	<i>i. A partial decision on the proposal was established by ACM on December 21, 2018; ii. ACM has not yet decided on the following subjects from the proposal: 1. Rate of Change of Frequency (RoCoF) 2. Reactive power requirements for type B, C and D pgm's and ppm's.</i>
PL	<i>The complex version of the requirements of general application was approved by URE on January 2, 2019. https://www.pse.pl/documents/20182/31216853/Zatwierdzenie_wymogow_RfG_OSP.pdf/5ea79f06-70a0-4623-b170-fd69e906919c https://bip.ure.gov.pl/bip/taryfy-i-inne-decyzje-b/inne-decyzje-informacj/3777,Inne-decyzje-informacje-sprawozdania-opublikowane-w-2019-r.html</i>
PT	<i>The entity that approved the requirements of general application was Direção-Geral de Energia e Geologia (DGEG) at 2018-04-24, accessible at www.dgeg.pt è "Áreas setoriais" è "Energia Elétrica" è "Códigos de Rede Europeus" è "Requisitos Geradores (RfG)". http://www.dgeg.gov.pt/pagina.aspx?back=1&codigono=6363644789338934AAAAAAA A</i>
RO	<i>ANRE approved general requirements by orders No. 72/2.08.2017 modified by order no. 214/19.12.2018 and order no. 208/14.12.2018 . The orders could be consulted at the link, on ANRE website : https://www.anre.ro/ro/energie-electrica/legislatie/coduri-paneuropene1476186098/regulamentul-ue-nr-631-2016-rfg</i>
SE	<i>The Swedish Energy Market Inspectorate approved Article 7(1) together with Article 5(3) on the 17th of November 2018 by announcing a regulation. Internet link to the approval: https://www.ei.se/sv/for-energiforetag/el/Natforeskrifter-och-kommissionsriktlinjer-for-el/natkod-requirements-for-generators-rfg/pagaende-arenden-rfg/Artikel-71-och-53-</i>

	<i>Generellt-tillampliga-krav-pa-kraftproduktionsmoduler-och-Maximala-troskelvarden-for-kraftproduktionsmoduler/</i>
SI	<i>Proposal for the requirements of general application has been approved on 19. 11. 2018 by NRA (Energy Agency), published at: https://www.agenc-rs.si/izvajalci/elektrika/kodeksi-omrezja/odlocitve-agencije.</i>
SK	<i>The Decision of the Office No. 0015/2018/E-EU of November 12, 2018 http://www.urso.gov.sk:8088/CISRES/Agenda.nsf/0/4C7B7FF8883ECFB4C125834300436743/\$FILE/0015-2018_E-EU%20-%20PP%20final.pdf</i>

3.4 Ensuring transparency

- (28) **Q: How was the transparency in accordance with Article 7(3)(b) ensured in the approval of the proposal for the requirements of general application?**
- (29) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (30) Remaining 22 out of the 27 NRAs provided information concerning the measures adopted in order to ensure transparency in the process of proposing and approving the requirements of general application.

Table IX: Ensuring transparency towards the approval of the requirements of general application.

MS	Answer
AT	<i>The requirements have been consulted with stakeholders by the Association of Austrian Electricity Companies in March/April 2018; the filed requirements have been published by E-Control in May 2018; the draft E-Control decree (Entwurf RfG Anforderungs-V) has been publicly consulted from July to September 2018; the final draft decree has been published on 15th of November 2018</i>
BE	<i>The proposal represents the final position of Elia after discussions with the stakeholders for each of the relevant topics. During the last months, the document was gradually completed and presented to stakeholders, especially during the Federal Grid Code workshops, until all non-exhaustive general requirements were included. Elia has also organized a public consultation on the final proposals for general requirements for NC RfG from 19 March till 23 April 2018: http://www.elia.be/en/about-elia/publications/Public-Consultation/Archives/Formal-public-consultation-regarding-the-proposals-for-a-modified-federal-grid-code</i>
BG	<i>no reply</i>
CZ	<i>All the proposals that were submitted to us were subject to a public consultation procedure in line with our national consultation procedures described in the Czech version of the Energy Act. This allows everyone whose legitimate interests could be directly impacted by the proposal to voice their concerns.</i>
DE	<i>The German TSOs and DSOs are members of the "VDE FNN" along with about 36,000 other persons (1,300 of which are undertakings) from the energy sector.</i>

	<p>The adoption of the “Technical Connection Rules” (“Technische Anschlussregeln (TAR)”) of the VDE FNN follows a firm procedure, which is described in the procedural rules of the VDE FNN, i.e. the rules contained in VDE-AR-N 100. This “rule book” determines the procedure from the proposal, through consultation and adoption of new connection rules and finally their publication.</p> <p>Under these procedural rules anyone, i.e. not only VDE FNN members, but also non-members, may propose the adoption of a “Technical Connection Rule” (“Technische Anschlussregeln (TAR)”). The proposal will be assessed by the competent body of the VDE FNN. If the body confirms the proposal, it will establish a project group, which is comprised of representatives of different stakeholders (e.g. generators, DSOs, TSOs, equipment producers). This project group will do the actual work of drafting a TAR. The proposition will be published and consulted upon publicly.</p> <p>Hence, there is a procedural guarantee for all stakeholders to have the opportunity to be involved in the drafting and adoption of a new connection rule or the reform of an existing connection rule.</p> <p>The members of the project group are obliged to try to find a compromise and to decide in consensus. However, there is an internal legal and technical remedy procedure that may be followed, if consensus is not achieved. Of course, these internal remedies do not hamper the possibility to seek legal review by the Bundesnetzagentur under Art. 7(5) and (8) RfG.</p> <p>https://www.vde.com/de/fnn/themen/regelsetzung/erarbeitung-vde-anwendungsregeln-fnn-vde-ar-n-100</p>
DK	<p>i. Public Consultations initiated by DUR with regards to both the proposals submitted and the draft decisions regarding approval of general requirements.</p> <p>ii. Both Energinet and Danish Energy facilitated several open stakeholder seminars/workshops that worked with developing the general requirements in Denmark.</p>
EE	<p>There was three consultations and public hearings, leaded by Elering AS and Ministry of Economic Affairs and Communications.</p>
ES	<p>There was a dedicated working group and a public consultation process, in which TSO, DSOs and other agents shared their view on this issue. Additionally, all legal regulation needed to implement NC must be submitted to a public consultation according to Spanish regulation before being approved.</p>
FI	<p>Regulator has made its own public consultation about the proposal. Regulator has forwarded the statements to the relevant TSO and asked that asked the Relevant TSO to comment and make needed changes to the proposal based on the statements. After that relevant TSO has responded and provided a reasoned reply and made the changes that were necessary. In the end regulator has evaluated the proposal and its reasons and approved it by decision.</p>
FR	<p>no reply</p>
GB	<p>no reply</p>

UK-NIR	<i>In order to ensure transparency in relation to the proposal for the requirements of general application, a joint consultation paper was issued by SONI as TSO and NIE Networks as DNO for industry comment from 20th of December 2017 to 16th of February 2018. The proposals were also presented at an industry workshop “Workshop on RfG Consultation on Parameter Selection Northern Ireland” on the 11th of January 2018 in the SONI offices in Belfast. The presentation from this workshop can be accessed here.</i>
GR	<i>no reply</i>
HR	<i>Transparency was ensured by public consultation which was organized by TSO.</i>
HU	<i>MAVIR held a public consultation from 19 December 2017 till 19 January 2018. http://mavir.hu/web/mavir/lezart-nuksz-konzultaciok In its proposal MAVIR informed HEA that the proposal was strongly and closely coordinated with DSO (even including their electronical preliminary approval) before final submission. In its approval decision HEA obliged the TSO make available the approved requirements in an easy and transparent way (table format) on its website. Furthermore HEA obliged MAVIR to report the approval to the relevant domestic committees (operational, market and distribution committees – including representatives of small-large generators, etc.). http://mavir.hu/web/mavir/magyarazo-dokumentumok</i>
IE	<i>A joint paper was issued by EirGrid as TSO and ESBN as DSO for industry comments from 20/12/2017 to 16/02/2018. The proposals were also presented at an industry workshop "Workshop on RfG Consultation on Parameter Selection" on the 16th of January 2018 in the EirGrid Offices in Dublin. The presentation given at this workshop can be accessed at: http://www.eirgridgroup.com/site-files/library/EirGrid/160118-RfG-Consultation-Workshop-Ireland_Updated-Post-Workshop.pdf</i>
IT	<i>Transparency has been ensured throughout the public consultation carried out by the Italian TSO. http://download.terna.it/terna/0000/1046/69.PDF</i>
LT	<i>On 2018-02-22 and 2018-03-09 TSO hosted round table discussions with market participants. On 2018-04-03 TSO announced public consultation. TSO announced public consultation and the TSOs evaluation of market participants comments table was announced publicly. See more info at: http://www.litgrid.eu/index.php/energetikos-sistema/es-tinklo-kodeksai/prijungimo-kodeksai/3675 (in Lithuanian) Also, NRAs hearings are public where project of resolution is published in advance.</i>
LU	<i>https://www.creos-net.lu/actualites/actualites/article/consultation-publique-du-30-mars-au-30-avril.html</i>

<p>LV</p>	<p>The public consultation of the proposal for the requirements of general application in accordance with Article 7(1) was conducted by the TSO. The websites to the call for public consultation: in Latvian http://www.ast.lv/lv/events/priekslikuma-tikla-piesleguma-prasibas-generatoriem-sabiedriska-apsprisanas in English http://www.ast.lv/en/events/public-consultation-proposal-network-connection-requirements-generators Before the approval (from 5 October until 19 October 2018) the public consultation of the proposal for the requirements of general application in accordance with Article 7(1) was conducted by NRA - the Public Utilities Commission. https://www.sprk.gov.lv/content/publiskas-konsultacijas</p>
<p>NL</p>	<p>i. Transparency is one of the criteria within the National Regulatory Framework on which the proposal has been assessed.</p>
<p>PL</p>	<p>The TSO has conducted a consultation process from September 15, 2017 r. to December 31, 2017 r. - more information about this process is available here https://www.pse.pl/rfg</p>
<p>PT</p>	<p>The proposal was discussed between TSO and relevant DSO, then within high level group. After that, there were two meetings with stakeholders representative of the various areas of the sector affected by RfG, including associations. In the end it was made a public consultation, even not being mandatory.</p>
<p>RO</p>	<p>CNTEE Transelectrica organised workshops before send general requirements to ANRE and received observations. After this process OTS send ANRE general requirements and these was posted on ANRE site for public consultations. See :</p> <p>for order 72/2017 (SPGM): -https://www.anre.ro/ro/energie-electrica/legislatie/documente-de-discutie-ee1/coduri-paneuropene/regulamentul-ue-nr-631-2016-nc-rfg/proiect-de-norma-tehnica-privind-cerintele-specifice-necesare-racordarii-fiecarui-tip-de-generatoare-sincrone-conditii-tehnice-de-racordare-la-retelele-electrice-de-interes-public-pentru-generatoarele-sincrone&page=2</p> <p>for order 208/2018 (PPM, it was 2 public consultations managed by ANRE, phase I and phase II): - https://www.anre.ro/ro/energie-electrica/legislatie/documente-de-discutie-ee1/coduri-paneuropene/regulamentul-ue-nr-631-2016-nc-rfg/proiect-de-norma-tehnica-privind-cerintele-tehnice-de-racordare-la-retelele-electrice-de-interes-public-pentru-module-generatoare-centrale-cu-module-generatoare-si-centrale-formate-din-module-generatoare-situate-in-larg-offshore&page=1 https://www.anre.ro/ro/energie-electrica/legislatie/documente-de-discutie-ee1/coduri-paneuropene/regulamentul-ue-nr-631-2016-nc-rfg/proiect-de-norma-tehnica-privind-cerintele-tehnice-de-racordare-la-retelele-electrice-de-interes-public-pentru-module-generatoare-centrale-cu-module-generatoare-si-centrale-formate-din-module-generatoare-offshore-situate-in-larg-faza-ii&page=1</p> <p>for order 214/2018 (order no. 72 modified according to the IGD approved in 2018): https://www.anre.ro/ro/energie-electrica/legislatie/documente-de-discutie-ee1/coduri-paneuropene/regulamentul-ue-nr-631-2016-nc-rfg/proiect-de-ordin-privind-modificarea-ordinului-anre-nr-72-2017-pentru-aprobarea-normei-tehnice-privind-cerintele-tehnice-de</p>

	<i>racordare-la-retelele-electrice-de-interes-public-pentru-grupurile-generatoare-sincrone&page=1</i>
SE	<i>The Swedish Energy Market Inspectorate conducted a public consultation between the 12th of July 2018 and the 23th of August 2018. Reference to the call for public consultation: https://www.ei.se/sv/nyhetsrum/nyheter/nyheter-2018/15-augusti-samrad-om-foreskrifter-enligt-eu-forordningen-rfg/</i>
SI	<i>Public consultation of the proposal has been conducted at NC portal: https://www.agencija.si/izvajalci/elektrika/kodeksi-omrezja/posvetovanja-o-predlogih-odlocitev. After public consultation final proposal has been submitted to NRA.</i>
SK	<i>RONI assessed impact on others stakeholders and did not find any impact on the stakeholders and any inconsistency with network code.</i>

3.5 Connection in absence of establishment of requirements of general application

- (31) **Q: In case the requirements of general application haven't been established yet, explain which rules are currently considered to connect new power generating modules (PGMs) to the network. In particular, do the old rules (before the NC RfG entry into force) apply or do the new PGMs have to wait for the establishment of new requirements? Has a derogation been considered to deal with this issue? If relevant, provide any information as to the implementation of the last paragraph of Article 4(2). Last but not least, provide an indication of the timescales for the adoption of the requirements of general application.**
- (32) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (33) E-control (AT), (BNetzA) DE, (ECA) EE, (EV) FI, (HEA) HU, (ILR) LU, (PUC) LV, (URE) PL, (ERSE) PT, (EI) SE deemed the issue not applicable or simply did not provide any answer.
- (34) CRU (IE) confirmed that it would be expecting derogations requests from EirGrid (the Irish TSO) with respect to frequency sensitive mode active power range and voltage withstand capability and associated reactive power maximum voltage.
- (35) Remaining NRAs confirmed that the deadline for the application of new rules is April 27th, 2019 and derogations would not be considered.

Table X: Set of rules applying to PGM connection in case requirements of general applications have not been established yet.

MS	Answer
AT	/
BE	<i>Compliant with last paragraph of Article 4(2) of the NC RfG, the final version of the royal decree specifies the circumstances the regulatory authority may determine whether a PGM is to be considered existing or new:</i> <ul style="list-style-type: none"> <i>• the power-generating facility owner has concluded a final and binding contract for the</i>

	<p><i>purchase of the main component of the generating plant by 27 April 2019 and;</i></p> <ul style="list-style-type: none"> • <i>the power-generating facility owner must notify the relevant system operator and relevant TSO of conclusion of the contract within 3 months after 27 April 2019; and</i> • <i>the application for approval, accompanied by supporting documents, shall be submitted to the regulatory authority no later than six months after 27 April 2019.</i>
BG	
CZ	<p><i>Until the 27th of April 2019 the old rules apply. After the 27th of April 2019 the requirements of general application in accordance with article 7(1) of NC RfG, approved by ERO, will apply.</i></p> <p><i>Article 4(2) is not relevant as the regulatory authority (ERO) was not given such a competence.</i></p>
DE	/
DK	<p><i>i. The general requirements are already established in DK.</i></p> <p><i>ii. DUR considers the application of RfG general requirements to “existing” PGMs, to be limited to PGMs already connected on/before 27 April 2019.</i></p> <p><i>iii. Furthermore, any PGM not connected on this date, for which a final purchase contract has been concluded no later than 17 May 2018, on the condition that this contract has been notified to the RTSO and RSO no later than 17 November 2018, will be considered as existing.</i></p> <p><i>iv. In DURs interpretation, it is considered that RfG, mainly applies to PGMs connected after 27 April 2019.</i></p> <p><i>v. Both Energinet and Danish Energy expect the RfG requirements to apply from 27 April 2019.</i></p>
EE	N/A
ES	<i>National legislation currently in force is applied so far and it will until new regulation concerning NC RfG is approved.</i>
FI	/
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	<p><i>The proposed parameters for the requirements of general application have been approved by the Utility Regulator and are already in force. These requirements are currently in the process of being integrated into the SONI Grid Code.</i></p> <p><i>However, as noted in the joint SONI and NIE Networks’ proposal for the general application, SONI will be submitting a number of derogation requests to the Utility Regulator. These derogation requests are related to:</i></p> <ul style="list-style-type: none"> • <i>Frequency Sensitive Mode active power range, which the ENTSO-E Frequency expert group confirmed was included as an error.</i> • <i>Frequency Sensitive Mode PPM Frequency Response Capability, as the RfG requirements would reduce the capability of a fleet of generation connected to the transmission system.</i>
GR	<i>no reply</i>
HR	<i>Old rules are applied. No derogation at the moment. No prescribed process for Art. 4(2). Although HERA has already approved requirements of general application in specific</i>

	<i>act, final and complete approval will be via the amendment process for national grid codes. HERA assumes to approve it in the middle of April.</i>
HU	<i>Not relevant.</i>
IE	<i>The proposed parameters for the requirements of general application have been approved by the CRU and are already in force. These requirements are currently in the process of being integrated into the EirGrid Grid Code. However, as noted in the joint EirGrid and ESBN's proposal for the general application, EirGrid will be submitting a number of derogation requests to the CRU. These derogation requests are related to:</i> <ul style="list-style-type: none"> <i>. Frequency Sensitive Mode Active Power Range</i> <i>. Voltage withstand capability and associated reactive power maximum voltage</i>
IT	<i>The Italian TSO is already applying the requirements of general application, as they have been approved by means of resolution 592/2018/R/eel that also approved the relevant implementation for HV and HHV networks. As far as connection at low and medium voltage level are concerned, DSOs are applying the previous national rules. The Italian Electrotechnical Committee is adjusting the national connection rules to incorporate the requirements of general application: the adjusted rules will be available by 27th April 2019, subject to a formal approval by the NRA.</i>
LT	<i>/</i>
LU	<i>Not applicable</i>
LV	<i>No answer</i>
NL	<i>i. ACM is planning to decide on the subjects of RocoF and the reactive power requirements in the second quarter of 2019.</i>
PL	<i>Not applicable</i>
PT	<i>Already established.</i>
RO	<i>The old rules (national rules) apply before the general requirements from NC RfG to entry into force (27.04.2019)</i>
SE	<i>See question 2.c</i>
SI	<i>By approval of the requirements of general application, both TSO and DSO have been instructed to adapt their rules (national grid code for transmission system and national grid code for distribution system) for connection of generators until date in line with Article 72 of the RfG regulation, in order that requirements shall apply three years after publication of the RfG regulation. Until then existing rules apply for connection of generators.</i>
SK	<i>The requirements of general application have been established. Any derogation had not been considered to deal with this issue. RONI did not determine whether the PGM is existing or new. All requirements are valid from date of the Decision (November 12, 2018)</i>

4 Certification and Validation

4.1 Authorised certifiers issuing equipment certificates

- (36) **Q: Is there an authorised certifier issuing equipment certificates and power-generating module documents present in your Member State? Provide any relevant details.**
- (37) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (38) BNetzA (DE), EV (FI) and ARERA (IT) demonstrated an advanced status towards the establishment of an authorised certifier.
- (39) Two NRAs, ERO (CZ) and CNMC (ES) showed an intermediate status towards the establishment of an authorised certifier.
- (40) The remaining NRAs indicated that there are no authorised certifiers in their MS (or, at least, they are not aware of).

Table XI: Presence of an Authorised Certifier issuing equipment certificates.

MS	Answer
AT	/
BE	<i>There are authorised certifiers for issuing equipment certificates. However, I don't know if they are recognised to certify PGMs.</i>
BG	<i>no reply</i>
CZ	<i>General remark about certification and validation in the Czech Republic: The only formally acknowledged national accreditation body in the Czech Republic on the basis of REGULATION (EC) No 765/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL is the Český institut pro akreditaci, o.p.s. http://www.cia.cz/. Currently the expert group consisting of the TSO and DSOs is in contact with the abovementioned body, discussing whether this body is capable of issuing equipment certificates and documents in accordance with RfG. We should have more information on the topic in the upcoming months.</i>
DE	<i>Yes, there are several authorised certifiers. In Germany the authorized certifiers are private entities, which are authorized via the accreditation of the national accreditation entity, the "Deutsche Akkreditierungsstelle" (abbreviation: DAkks) (https://www.dakks.de/content/profil). DAkks is an entity created by German federal law (i.e. the Akkreditierungsstellengesetz (AkkStelleG)) in accordance with European Union law (i.e. Art. 4(1) of the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products). DAkks is a public law entity applying German and European public law. DAkks has accredited and thereby authorized a whole range of certifiers in Germany in the past years. You may find an oversight of all of the authorized certifiers here: https://www.dakks.de/content/akkreditierte-stellen-dakks. A list with most of the currently authorized certifiers for Renewable Energies you may find here: <a 775="" 879="" 882="" 900"="" data-label="Page-Footer" href="https://wind-fgw.de/wp-con-</i></td> </tr> </tbody> </table> </div> <div data-bbox="> <p>50 Page</p> </i>

	<p>tent/uploads/2019/02/190201_BDEW_Zulassung_von_Zertifizierungsstellenmitarbeitern_fuer_EZE_und_EZA_Zertifizierung.pdf</p> <p>Currently several German authorized certifiers are in the process of enhancing their accreditation with the aim of being allowed to test and certify compliance with the abovementioned new grid connection rules adopted by the VDE FNN as the legally designated entity under Art. 7(1) RfG (see above).</p> <p>Most of the currently authorized certifiers for power-generating modules, which are listed with the Fördergesellschaft Windenergie e.V. (abbreviation: FGW), have enhanced their accreditation for the new grid connection rules.</p>
DK	<p>i. Not as far as we know. We are still in contact with the Danish accreditation Fund (DANAK), which is the national accreditation body in Denmark. This far, we have been informed that there is no authorized certifier for PGMs in Denmark.</p> <p>ii. We are still checking up in this issue.</p>
EE	At the moment no authorised certifying company exists in Estonia.
ES	This point is under the competences of the Spanish Ministry of Industry, Trade and Tourism. There are working groups currently defining these aspects.
FI	Type A: Joining customer can use the EY(765/2008) Certificates of Approval for authentication. If you want to know more, you should contact directly FINAS (Finnish accreditation Service) or Fingrid Oyj (the relevant TSO in Finland). Regulator has no specific information about this.
FR	no reply
GB	no reply
UK-NIR	Not at present. NIE Networks along with GB DNO's and the ENA (Energy Networks Association) is holding discussions with potential providers of equipment certificates, but these have not yet progressed to any concrete proposals.
GR	no reply
HR	We are not aware of it.
HU	As a general feedback to (whole) Question 3. work is still in progress on certification and validation processes. Detailed information we can send only later on this year.
IE	DSO A project is underway within ESB Networks, to give effect to the Operational Notification requirements stipulated in RfG. The scope of this work includes a review of existing practices to determine whether any components therein are recognisable as authorised certifiers or PGMD's. TSO: At the moment, an authorised certifier for the issuing equipment certification and power-generating modules has not be identified.
IT	In Italy there are some entities authorised to certificate power-generating modules and components that, when the NC RfG will be fully enforced, will be also able to certificate all the requirements of general application
LT	Regarding data from the TSO currently there are no certifiers.
LU	/
LV	NO

NL	<i>i. No authorised certification body is currently active in the Netherlands.</i>
PL	<i>No. At present, there is no entity that certifies PGM technical capabilities within the scope defined in the NC RfG.</i>
PT	<i>NO.</i>
RO	<i>We have not any authorised equipment certifier, only for PPM and SPMG testing authorised certifiers.</i>
SE	<i>There is no authorised certifier issuing equipment certificates and power-generating module documents.</i>
SI	<i>No, none.</i>
SK	<i>There is not any authorised certifier.</i>

4.2 Certification and validation processes

- (41) **Q: Are certification and validation processes adopted in your Member State? If yes, provide any relevant details. If no, provide an indication of the timescales for their adoption.**
- (42) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (43) ERO (CZ), DERA (DK), HERA (HR), PUC (LV), ACM (NL), URE (PL), EI (SE), AGEN-RS (SI) and RONI (SK) explained that certification and validation processes have not been set yet in their MS.
- (44) In BE, the certification and validation processes are part of the connection process that is specified in the new grid code (royal decree). ARERA (IT) explained relevant processes are currently under implementation and they will be defined before the full NC RfG entry into force.
- (45) UR (UK-NIR) opened up to UK DNOs accepting manufacturers' self-certification of generation equipment capabilities in lieu of a formal Equipment Certificate regime. Relevant system operators, in collaboration with the TSO, are in charge of the certification and validation processes in RO. A similar approach is in place in IE.
- (46) ERSE (PT) affirmed that there are two ways to certify and validate PGMs, based on their determination of significance.
- (47) More advanced demonstrations of certification and validation processes are claimed by NRAs in DE and FI.

Table XII: Certification and Validation processes.

MS	Answer
AT	/

BE	<i>The certification and validation processes are part of the connection process that is specified in the new grid code (royal decree).</i>
BG	<i>no reply</i>
CZ	<i>There aren't any certification and validation processes to validate compliance with connection requirements for connection of power generating modules to our system as of yet. The validation and certification process will be carried out in scope of NC RfG when NC RfG becomes applicable.</i>
DE	<p><i>Yes, there are certification and validation processes adopted in Germany. The "Federal Ordinance on the Verification of Electro Technical Features of Energy Systems" („Verordnung zum Nachweis von elektrotechnischen Eigenschaften von Energieanlagen (abbreviation: NELEV))“ of June 2017 determines the certification and validation of power plants. It explicitly refers to the discretion granted to the Member States under Art. 15 Article 15(6) lit. c subpara. i, Article 16(1) and Article 32(6) RfG which allow the Member States to require that the power-generating module documents shall be issued by an authorized certifier and that the verification of the simulation models against the results of compliance tests be carried out by authorized certifiers. Under this ordinance, power-generating facility owners shall verify to the relevant system operator the compliance of the facility with the minimum technical standards laid down in the RfG-compliant national law.</i></p> <p><i>The ordinance states that the power-generating module documents for Type B und Type C shall be issued by an authorized certifier.</i></p> <p><i>The ordinance further states that the verification of the simulation models for the behaviour of power-generating modules of Type C and Type D shall be carried out by an authorized certifier.</i></p> <p><i>The most important standardized certification program has been established by the FGW. The certifying under the new grid connection rules may take place, because the new certification in the "Technical Directive No 8 of the FGW" ("Technische Richtlinie Nr. 8 der FGW", abbreviation: FGW-TR8) has recently been published (https://wind-fgw.de/produkt/zertifizierung-der-elektrischen-eigenschaften-von-erzeugungseinheiten-und-anlagen-am-nieder-mittel-hoch-und-hoehchstspannungsnetz/).</i></p>
DK	<i>No - N/A</i>
EE	<i>Only DIN EN ISO/IEC 17065 certified body can provide detailed programme proposal for certification scheme.</i>
ES	<i>/</i>
FI	<i>Yes. If you want to know more, you should contact directly FINAS (Finnish accreditation Service). FINAS Finnish Accreditation Service offers accreditation service in Finland and operates as a unit within the Finnish Safety and Chemicals Agency, Tukes. In accordance with European legislation, FINAS has been named the national accreditation body in Finland and its operations are regulated under law (920/2005). Similar to other EU countries, Finland has only one accreditation body.</i>
FR	<i>no reply</i>
GB	<i>no reply</i>

UK-NIR	<i>UK DNOs are accepting manufacturers' self-certification of generation equipment capabilities in lieu of a formal Equipment Certificate regime. Power Generating Facility owners have the responsibility for demonstrating compliance and can undertake most compliance tests on site.</i>
GR	<i>no reply</i>
HR	<i>We are not aware of it.</i>
HU	<i>/</i>
IE	<i>"DSO : For Microgeneration as defined in EN50438, a process of Type-Test certification is in place. For all other generator connections a regime of application for connection and site based testing is in place. TSO No, a certification process is not in place for transmission connected generation. The current validation process is via on-site testing of the respective PGM. The use of a certification process is currently under review as part of the implementation phase of the RfG."</i>
IT	<i>Currently, certification and validation processes are not adopted in Italy, but they are under implementation and they will be fully defined before the NC RfG entry into force.</i>
LT	<i>/</i>
LU	<i>/</i>
LV	<i>No</i>
NL	<i>i. Not yet.</i>
PL	<i>No. The certification process by the device/hardware certification bodies has not been started - the draft document on the rules for the use of certificates has not yet been made public. It is planned to be published until the end of April this year.</i>
PT	<i>YES. Regarding small generation (Type A and B), there is a verification of IEC standard, and its published a list of equipment. Regarding big generation (Type D and C), because of the complexity of the requirements, the generators are checked by TSO, DSO and DGEG, which is the public entity responsible for RfG implementation, and connection to the grid. Usually there is a 2-month verification period.</i>
RO	<i>Yes, the certification and validation processes is provided by relevant network operator with TSO consultation, based on technical data, certificates of equipments, mathematical and functional diagram models, simulations and field tests.</i>
SE	<i>The stakeholders are working on a certification and validation process. The Swedish Energy Market Inspectorate has sent out a request to Swedenenergy (energiföretagen – DSOs' interest organisation) in regard to the above stated question. The Swedish Energy Market Inspectorate will complete this answer when the request has been answered. Swedenenergy (energiföretagen – DSOs' interest organisation) will actively work with the certification and validation processes after receipt of the validation process. The validation process, EN 50549-10, is due late 2020. Swedenenergy expects that it will take a couple of years before the certification is in place with the Swedish requirements.</i>

SI	No, none.
SK	There is no certification body in Slovakia, no entity has currently requested the Slovak National Accreditation Service (SNAS) to obtain accreditation to issue certificates.

4.3 Documents/information in absence of equipment certificates

- (48) **Q: Concerning the operational notification (TITLE III of NC RfG), what documents/information are required by the relevant system operator in the absence of equipment certificates? Elaborate the relevant details concerning different types of power-generating modules.**
- (49) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (50) ERO (CZ), CNMC (ES), UR (UK-NIR), HERA (HR), PUC (LV), ACM (NL), URE (PL) and EI (SE) affirmed that they might be not aware of the mentioned documents.
- (51) In Romania, ANRE specified that no connection agreement was granted to PGMs in absence of equipment certificates.
- (52) PUC (LV) and CRU (IE) pointed out the central role of the TSO in carrying out a number of on-site tests and simulation-based tests in order to ensure the PGMs' compliance to RfG provisions in absence of equipment certificates.
- (53) In Slovenia, AGEN-RS confirmed that the connection of type A PGMs is only possible by presenting an equipment certificate. For other types of PGMs, AGEN-RS envisages the possibility of granting the connection subject to the presentation of studies containing simulations and field test measurements to ensure compliance with all the NC RfG requirements.
- (54) AREA (IT) claimed that, in the absence of equipment certificates, requirements of the NC RfG can be verified by means of self-declaration affidavit.
- (55) ERSE (PT) affirmed that there is a third party entity that certifies the performance of the equipment, namely the FRT, Reactive Power injection, etc.
- (56) In BE, the compliance of the connection installations with regard to all technical requirements is determined by the satisfactory implementation of the conformity tests and the simulations as referred to in the grid code. The procedure to follow, depending on the determination of significance of each PGM is discussed.
- (57) In DK and FI, it is possible to submit installation documents, which list a number of pre-approved information in relation to the relevant technical requirements.

Table XIII: Documents/information in absence of equipment certificates.

MS	Answer
AT	/

BE	<p>The compliance of the connection installations with regard to all technical requirements is determined by the satisfactory implementation of the conformity tests and the simulations as referred to in the grid code.</p> <p>For type A PGMs the compliance assessment is limited to the submission of a complete installation document to the TSO, in accordance with the procedure applicable to type A power generation units referred to in Article 30 of the NC RfG.</p> <p>For type B and C PGM,s simplified procedure based on a technical file is followed for assessment of the compliancy, in accordance with the procedure applicable to PGM of type B and C referred to in Articles 44 and 45 of the European network code RfG.</p> <p>Based on the results of the compliance tests, the TSO shall, where necessary, provide an interim operational notification (ION) to the transmission system user for a maximum duration of 24 months with regard to type D PMD's. This interim operational notification contains an enumeration of the elements that have to made compliant within a given time.</p>
BG	<p><i>no reply</i></p>
CZ	<p>It is currently under development what documents/information will be required by the relevant system operator in the absence of equipment certificates after the date of NC RfG application (27 April 2019).</p>
DE	<p>A so-called Extended Declaration of Conformity, see below d. More detailed answer will be provided in short.</p>
DK	<p>i. Danish Energy has developed positive lists/approved lists which collects preapproved PGM's in relation to the relevant technical requirements (i.e. National technical requirements and RfG-requirements.)</p> <p>ii. This way PGMs can be preapproved to be compliant with the technical requirements. This saves time and resources.</p> <p>iii. The requirements are the same whether you apply for positive list or simply notify your PGM's compliance with relevant technical requirements.</p> <p>iv. The required compliance documentation is:</p> <ol style="list-style-type: none"> 1. Type A <ol style="list-style-type: none"> a. CE-declaration of conformity b. Protection settings c. Electricity quality d. Filled-in annex B1.1-1.2 with technical documentation. (apart from questions regarding the above mentioned functions this includes basic data regarding the PGM – i.e. Owner address, Generator description, voltage, power, energy source etc.) e. f. 2. Type B: <ol style="list-style-type: none"> a. CE-declaration of conformity b. Protection settings c. Single line diagram d. Electricity quality e. Fault-ride-through f. Filled in annex B2.1-2.2 with technical documentation. (apart from questions regarding the above mentioned functions this includes basic data regarding the PGM – i.e. Owner address, Generator description, voltage, power, energy source etc.) 3. Type C and D:

	<p>a. CE-declaration of conformity b. Protection settings c. Single line diagram d. Electricity quality e. Fault-ride-through f. P/Q-Chart g. Signal-list (data exchange list) h. Simulation-model i. Compliance test plan j. Verification report k. Filled in annex B2.1-2.2 with technical documentation. (apart from questions regarding the above mentioned functions this includes basic data regarding the PGM – i.e. Owner address, Generator description, voltage, power, energy source etc.)</p>
EE	<p>Documents needed are presented in Terms of Connection. Without equipment certificates modelling and live-testing is required for approval of the power generating module.</p>
ES	<p>Regulation that is currently under elaboration is expected to include details about which documents and information will have to be presented by PGM to complete operational notification procedure.</p>
FI	<p>Every power plant shall submit a separate installation document. Type A joining customer can use the Certificates of Approval for authentication (EY(765/2008)). The installation document must contain at least the following information: (a) the place where the physical connection is made; (b) date of accession; (c) the design power of the equipment in kW; (d) the type of primary energy source; (e) the classification of the power plant as an emerging technology by the Energy Agency according to the confirmation; (f) by an authorized verifier used on site equipment references for equipment certificates; (g) in the case of equipment for which no equipment certificate has been obtained, information provided by the network operator of the point of entry; and h) Contact details and signatures of the connecting customer and installer.</p> <p>Type B: For the connection of each new type B power plant for the deployment notification procedure, the connecting customer must provide power plant document (table 7.1 and 7.4), including Declaration of Conformity for DSO of the access point.</p> <p>Type C: Same like type B but connecting customer must provide power plant documents (table 7.2 and 7.3 and 7.4). The connecting customer must verify the performance of the power plant in accordance with the requirements for commissioning tests and provide the compliant information after the commissioning tests to the DSO of the access point. Upon completion of the acceptance verification measures by the connecting customer, the DSO of the connection point shall verify the information provided by the connecting customer and issue a statement on verification of requirements. After accepting the complete and sufficient power plant document the DSO shall provide the subscriber with a final deployment declaration.</p>

	<p>After the final deployment notification is issued, the DSO of the access point will provide the relevant TSO with the information required by the requirements.</p> <p>Type D: The DSO of the access point and the connecting customer must perform a the verification process of the type D power plant and the deployment notification procedure are phased in according to Table 6.1. For the connection of each new type D power plant for the deployment notification procedure, the connecting customer must provide power plant documents (table 7.2 and 7.3 and 7.4). The DSO of the access point will provide the information to the relevant TSO. Information required can be found in the approval: https://www.energiavirasto.fi/documents/10191/0/Fingrid2018_vahvistusp%C3%A4%C3%A4t%C3%B6s_liitteineen.pdf/8de8609d-54c8-4de1-be59-c29e127c03fb</p>
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	Formal documentation covering both installation Documents and Power Generating Module Documents has been included in the drafts of the new Engineering Recommendations G98/NI and G99/NI which are currently out for public consultation which can be viewed here.
GR	<i>no reply</i>
HR	We are not aware of it.
HU	/
IE	DSO: The scope of project referred to above includes a review of existing practices and identification of any gaps needed to ensure compliance with these provisions. This work is continuing. TSO: In the absence of equipment cert, EirGrid currently requires transmission-connected PGMs to carry out a series of tests, including on-site tests and where it is not possible to carry out physical tests, the appropriate simulations must be submitted by the PGM. The testing requirements vary according to the technology type. Details on the testing requirements are available on the EirGrid website - http://www.eirgridgroup.com/customer-and-industry/general-customer-information/grid-code-compliance-test/compliance-testing/index.xml
IT	In the absence of equipment certificates, requirements of the NC RfG can be verified by means of self-declaration affidavit. There is not distinction between different types of power-generating modules.
LT	/
LU	/
LV	An analogue to the operation notification has been defined in the Regulations Regarding System Connection for Electricity Producers adopted 22 February 2012 by Decision No. 1/6 of the Board of the Public Utilities Commission. According the Regulations: - The system operator shall, in a mutually acceptable time but not later than ten working days from receipt of the information regarding completion of construction of the powerplant and its system connection, check the power plant installed by the producer and the conformity of the system connection built with the specifications issued by the

	<p>system operator.</p> <ul style="list-style-type: none"> - If the system operator detects that the power plant installed and the system connection built by the producer conform to the specifications issued by the system operator, the system operator and the producer shall enter into a system services contract. - After entering into a system services contract the system operator shall issue a permit of the sample laid down in Annex 3 to these regulations to the producer for connecting the powerplant to the system for a probationary period not less than seventy-two hours. - During the parallel performance check of the power plant and the system the producer, by co-ordinating it with the system operator, shall organise checks of the installed generating device (generator) and measurements of parameters of electricity produced on the border of electrical facility belonging indifferent operating modes of the power plant. The measurements shall be taken by a laboratory accredited in accordance with the procedures provided for in the laws and regulations in the field of conformity assessment. The check costs of the power plants shall be paid by the producer. - If the results of the measurements taken in the check conform to the requirements laid down in the standard LVS EN50160 "Voltage characteristics of electricity supplied by public electricity networks", the system operator shall sign the act regarding recognition of the power plant as valid for parallel work with the system and shall, not later than on the following working day, issue the permit for connecting the power plant to the system, and shall connect the power plant to the system.
NL	none
PL	According to the document on the rules for the use of certificates in the absence of certificates on the market, the basis for verification will be respectively: 1) compliance test or simulation; 2) producer's declaration of conformity.
PT	Usually there is a 3rd party entity studies, that certifies the performance of the equipment, namely the FRT, Reactive Power injection, etc. The Study is presented to DGE, which consults TSO and DSO, regarding the fulfilment of the criteria.
RO	Till 2019, no PGM was put in function without equipment certificate. Anyway, for few cases where the certificate was delivered following other standards, or limited requirements, TSO asked for complete technical data, explanation of modality of guarantee the fulfilment of requirements, results of laboratory tests (the manufacturer laboratory tests), methodology of testing and technical characteristics of recording devices, the complete mathematical model and manufacturer simulations on this model. The tests concern: frequency and ranges, ROCOF, active power response to frequency deviations and setpoints, reactive capabilities, LVRT, reactive power control, voltage control, voltage ranges .
SE	The stakeholders are working on a certification and validation process. The Swedish Energy Market Inspectorate has sent out a request to Swedenenergy (energiföretagen – DSOs' interest organisation) in regard to the above stated question. The Swedish Energy Market Inspectorate will complete this answer when the request has been answered. The stakeholders are working on a certification and validation process. Swedenenergy (energiföretagen – DSOs' interest organisation) will initiate the work to update the handbooks for connection of smaller and bigger power-generating modules in the spring of 2019. The updates will include requirements from RfG regarding new

	<i>power-generating modules. Swedenenergy expects that it will take a couple of years before it is in place.</i>
SI	<p><i>Type A PGM - Equipment certificates must be provided. Without equipment certificates connection is not possible.</i></p> <p><i>Type B PGM - Equipment certificates or equivalent documents should be provided. If they are not provided studies containing simulations and field test measurements should be performed to ensure compliance with all requirements. For compliance with requirements regarding reactive power regulation type test reports which show compliance with requirements can be provided for PGM connected to LV network while on site measurements reports which show compliance with requirements must be provided for PGM connected to MV network.</i></p> <p><i>Type C PGM - Equipment certificates or equivalent documents can be provided. If they are not provided studies containing detailed dynamic simulations and detailed field test measurements of each unit should be performed to ensure compliance with all requirements. For compliance with requirements regarding reactive power regulation on site measurements reports which show compliance with requirements must be provided.</i></p> <p><i>Type D PGM – Detailed rules and procedures for the use of equipment certificates are in the process of development by the TSO.</i></p>
SK	<i>As for the new equipment, SEPS requires a certificate from the equipment manufacturer meeting the requirements according to the RfG (the technology supplier must provide the certificate) or in the absence of such a certificate the equipment manufacturer have to submit a technical report with the measured values that it meets the RfG requirements.</i>

4.4 Compliance testing

- (58) **Q: Concerning the compliance testing, how are the requirements of the NC RfG verified in the absence of equipment certificates? Elaborate the relevant details concerning different types of power-generating modules.**
- (59) EWRC (BG), CRE (FR), Ofgem (GB), RAE (GR) and VERT (LT) did not reply to the question.
- (60) E-Control (AT), ERO (CZ), CNMC (ES), HERA (HR), PUC (LV), ACM (NL), and EI (SE) affirmed that they might be not aware of specific compliance testing procedures, or the process to define the latter is still under development.
- (61) CREG (BE), ARERA (IT), URE (PL) and ERSE (PT) replied by referring to the answers provided to the previous question of the survey.
- (62) DERA (DK) and AGEN-RS specified the list of compliance testing for each type of PGM.
- (63) The TSO is charge of assessing the compliance to the requirements approved by the NRA (or designated entity) in SK. A similar approach is claimed in IE for transmission-connected PGMs. For distribution-connected PGMs, a regime of site based testing is in place. The role of the TSO in the compliance testing appears to be central also in FI.

- (64) In RO, in absence of equipment certificates, the manufacturer is in charge of the compliance testing. Similarly, CA (EE) affirmed that, without equipment certificates, modelling and live-testing is required for approval of the PGM.
- (65) Most requirements can be verified on site according to UR (UK-NIR).
- (66) Finally, BNetzA provided a detailed explanation of the compliance testing procedure in case there is no equipment certificate issued.

Table XIV: Compliance testing.

MS	Answer
AT	<i>The details concerning the operational notification and compliance testing are still being developed by the system operators. We expect them being finished in March 2019; they will be part of the new national grid code "TOR Erzeuger".</i>
BE	See 3c.
BG	<i>no reply</i>
CZ	<i>It is currently under development how the requirements of the NC RfG will be verified in the absence of equipment certificates after the date of NC RfG application (27 April 2019).</i>
DE	<p><i>For power-generating modules with production equipment, for which there is no equipment certificate issued, the "Technical Connection Rules" ("Technische Anschlussregeln (TAR)") of the VDE FNN require the implementation of a so-called "single item proof of compliance method" ("Einzelnachweisverfahren", abbreviation: "ENV").</i></p> <p><i>The procedure consists of three stages:</i></p> <ol style="list-style-type: none"> <i>1. In the planning phase, the electrical properties are simulated on the basis of an EZA model (in which essentially generic or manufacturer EZE models are used) and reported in a preliminary conformity study. This study is then subjected to a conformity assessment by an authorized certifier, on the basis of which the so-called Plant Certificate Type C (power-generating module document Type C) is issued.</i> <i>2. After commissioning of the power module, extensive measurements are carried out on it. The results lead to a fitting of the original EZA model and its validation. With this adapted model, the final conformity study is compiled, which, together with the Declaration of Conformity, leads to the so-called Ex-tended Declaration of Conformity, which in turn must be issued by an authorized certifier.</i> <i>3. Disturbance recorder should be set up during the operating phase and any events should be evaluated by the authorized certifier (which may eventually lead to further adaptation of the EZA model).</i> <p><i>This procedure is defined in the "Technical Connection Rules" ("Technische Anschlussregeln (TAR)") of the VDE FNN VDE-AR N 4110, VDE-AR N 4120 and VDE-AR N 4130) in each case in chapter 11.6.</i></p> <p><i>The corresponding design in the form of the certification regulations, the measuring</i></p>

	<p><i>instructions and the requirements for the simulation model and its validation can be found in the technical guidelines of the FGW (FGW-TR8, TR3 and TR4).</i></p> <p><i>So far, this ENV method has been developed only for synchronous machines. It is currently correspondingly mainly applied to power plant blocks within (industrial) object networks.</i></p>
DK	<p>1. Type A</p> <p>a. No Testing requirements</p> <p>2. Type B compliance testing:</p> <p>a. Frequency response – LFSM-O</p> <p>3. Type C & D compliance testing:</p> <p>a. Frequency response – LFSM-O and U</p> <p>b. Frequency control</p> <p>c. Frequency restoration control (only Synch. PGM)</p> <p>d. Dead start capability (only Synch. PGM)</p> <p>e. Switch to Houseload operation (only Synch. PGM)</p> <p>f. Operational area/limits of reactive power</p> <p>g. Voltage control (only Synch. PGM)</p> <p>h. Power Factor Control (only Synch. PGM)</p> <p>i. Q-control (Reactive power control independent of active power control (only Synch. PGM))</p>
EE	<p><i>Documents needed are presented in Terms of Connection. Without equipment certificates modelling and live-testing is required for approval of the power generating module.</i></p>
ES	/
FI	<p><i>Verifying process is presented in the approval document (look answer c.)</i></p> <p><i>Type B-C: Instead of conducting an appropriate test, affiliates may use the attestation issued by an authorized verifier to prove that the requirement has been met. In such a case, the equipment certificates must be delivered to DSO of the access point. In principle, the certificates cannot be guaranteed power plant complex and all auxiliary equipment. As a result, device certificates are not accepted as the primary verification method, and their use must be agreed upon separately with the DSO of the access point and relevant TSO.</i></p> <p><i>Type D: Always appropriate test required.</i></p> <p><i>If you want more detail, you should contact directly Fingrid Oyj that is the relevant TSO in Finland.</i></p>
FR	<i>no reply</i>
GB	<i>no reply</i>
UK-NIR	<p><i>Most requirements can be verified on site in the traditional way. However it has also been traditional for manufacturers of mass market generation to self-certify. There are a few characteristics that cannot be demonstrated on site, and here manufacturer's assertions will need to be relied on as they have been in the past – although some of these might be within the scope of future Equipment Certificates.</i></p>

GR	<i>no reply</i>
HR	<i>We are not aware of it.</i>
HU	<i>/</i>
IE	<i>DSO: For all generators other than Microgeneration, a regime of site based testing is in place. This would comprise a combination of normal commissioning practices, including specific protection testing, where that protection is on the System Operators network and/or witness testing where relevant protection is located on the Customers side. TSO: In absence of the equipment certificates, EirGrid is currently undertaking a body of work to update the existing suite of test procedures to capture all of the necessary RfG requirements. Once complete, these test procedures will be made available on the EirGrid website.</i>
IT	<i>In the absence of equipment certificates, requirements of the NC RfG can be verified by means of self-declaration affidavit. There is not distinction between different types of power-generating modules.</i>
LT	<i>/</i>
LU	<i>/</i>
LV	<i>TSO performs testing in accordance with the rights and tests specified in the Network Code for Electricity Sector. TSO is working on the amendments to the Network Code for Electricity Sector.</i>
NL	<i>i. No verification is currently taking place. Discussions about this subject are being held between system operators and the relevant stakeholder groups.</i>
PL	<i>As above: according to the document on the rules for the use of certificates in the absence of certificates on the market, the basis for verification will be respectively: 1) compliance test or simulation; 2) producer's declaration of conformity.</i>
PT	<i>In doubt, the procedure is the described above.</i>
RO	<i>In the absence of equipment certificates, a situation which is avoided, the manufacturer must provide the tests mentioned at point c. Some of them are anyway tested in situ, at the put in function: active and reactive power control, voltage control, fast disconnection/reconnection, frequency deviation behaviour, reactive power capability, for each PGM type.</i>
SE	<i>The stakeholders are working on a certification and validation process. The Swedish Energy Market Inspectorate has sent out a request to Swedenenergy (energiföretagen – DSOs' interest organisation) in regard to the above stated question. The Swedish Energy Market Inspectorate will complete this answer when the request has been answered. The stakeholders are working on a certification and validation process. Swedenenergy (energiföretagen – DSOs' interest organisation) will initiate the work to update the handbooks for connection of smaller and bigger power-generating modules in the spring of 2019. The updates will include requirements from RfG regarding new power-generating modules. Swedenenergy expects that it will take a couple of years before it is in place.</i>

	<p><i>Type A, B and C PGM - Compliance testing shall be done according to TITLE III Chapter 2, Chapter 3 and Chapter 4 of NC RfG. Further details are still under consideration and will be published by the Slovenian DSO.</i></p> <p><i>Type D PGM – Compliance tests, which can be replaced by equipment certificates, are:</i></p> <ol style="list-style-type: none"> <i>1. Synchronous PGM</i> <ul style="list-style-type: none"> <i>-LFSM-O (Article 13(2))</i> <i>- LFSM-U (Article 15(2)(c))</i> <i>- FSM (Article 15(2)(d))</i> <i>- Frequency restoration control (Article 15(2)(e))</i> <i>- Black start capability (Article 15(5)(a))</i> <i>- Houseload operation (Article 15(5)(c))</i> <i>- Reactive power capability (Article 17(2)(a) and Article 18(2))</i> <i>- FRT (Article 14(3)(a) and Article 16 (3)(a))</i> <i>- Active power recovery (Article 17(3))</i> <i>- Island operation (Article 15(5)(b))</i> <i>Oscillation damping control (Article 19(2)(b))</i> <i>2. PPM</i> <ul style="list-style-type: none"> <i>- LFSM-O (Article 13(2))</i> <i>- LFSM-U (Article 15(2)(c))</i> <i>- FSM (Article 15(2)(d))</i> <i>- Frequency restoration control (Article 15(2)(e))</i> <i>- Active power control (Article 15(2)(a))</i> <i>- Voltage control (Article 21(3)(d))</i> <i>- Reactive power control (Article 21(3)(d))</i> <i>- Power factor control (Article 21(3)(d))</i> <i>- Fast fault current (Article 20(2)(b) and (c))</i> <i>- FRT (Article 14(3)(a) and Article 16(3)(a))</i> <i>- Active power recovery (Article 20(3)(a))</i> <i>- Island operation (Article 15(5)(b))</i> <i>- Synthetic inertia (Article 21(2))</i> <i>- Reactive power capability (Article 20(2)(a) and Article 21(3))</i> <i>- Oscillation damping (Article 21(3)(f))</i> <p><i>All tests will be included in the document “conditions and procedures for the use of equipment certificates”.</i></p>
<p>SK</p>	<p><i>Concerning the new facilities, the TSO (SEPS) assesses compliance with the requirements approved by RONI.</i></p>

Annex II: List of abbreviations & country codes

Acronym	Definition
ACER	Agency for the Cooperation of Energy Regulators
EC	European Commission
ENTSO-E	European Network of Transmission System Operators for Electricity
EU	European Union
NC	Network Code
NRA	National Regulatory Authority
TSO	Transmission System Operator

ISO code	Country
AT	Austria
BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GB	Great Britain
UK-NIR	Northern Ireland
GR	Greece
HR	Croatia

ISO code	Country
IE	Ireland
LT	Lithuania
LV	Latvia
HU	Hungary
IT	Italy
LU	Luxembourg
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia

Abbreviation	NRA
ACM	Autoriteit Consument & Markt/Authority for Consumers & Markets
ARERA	Autorità di Regolazione per Energia Reti e Ambiente
AGEN-RS	Agencija za Energijo/Energy Agency
ANRE	Autoritatea Națională de Reglementare în Domeniul Energie/Regulatory Authority for Energy
BNetzA	Bundesnetzagentur/Federal Network Agency for Electricity, Gas, Telecommunications, Posts and Railways
CRU	The Commission for Regulation of Utilities

Abbreviation	NRA
CRE	Commission de régulation de l'énergie
CREG	Commission de Régulation de l'Électricité et du Gaz/Commissie voor de Regulering van de Elektriciteit en het Gas
CNMC	La Comisión Nacional de los Mercados y la Competencia/The National Commission on Markets and Competition
DERA	Energistyrelsen/Danish Energy Regulatory Authority
E-Control	Energie-Control Austria
ECA	Konkurentsiamet/Estonian Competition Authority
EI	Energimarknadsinspektionen/Swedish Energy Markets Inspectorate
ERO	Energetický regulační úřad/Energy Regulatory Office
ERSE	Entidade Reguladora dos Serviços Energéticos/Energy Services Regulatory Authority
EWRC	комисия за енергийно и водно регулиране (KEBP)/Energy and Water Regulatory Commission
EV	Energjavisto /Energy Authority
HEA	Magyar Energetikai és Közmű-szabályozási Hivatal/ The Hungarian Energy and Public Utility Regulatory Authority
HERA	Hrvatska energetska regulatorna agencija/Croatian Energy Regulatory Agency
ILR	Institut Luxembourgeois de Régulation
Ofgem	Office of Gas and Electricity Markets
PUC	Sabiedrisko pakalpojumu regulēšanas komisija/Public Utilities Commission
RAE	Ρυθμιστική Αρχή Ενέργειας/The Regulatory Authority for Energy
RONI	Úrad pre reguláciu sieťových odvetví/Regulatory Office For Network Industries
UR	Utility Regulator of Northern Ireland
URE	Urząd Regulacji Energetyki/Energy regulatory Office
VERT	National Energy Regulatory Council



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