Allegato A

REPORT ON THE IMPLEMENTATION OF THE MINIMUM LEVEL OF AVAILABLE CAPACITY FOR CROSS-ZONAL TRADE (70%) ON THE ITALIAN BORDERS FOR YEAR 2021

2 November 2022

SUMMARY

1 Premise

1.1 According to Article 16(8) of Regulation (EU) 2019/943[1], starting from 1st January 2020 Transmission System Operators (in the following: TSOs) are requested to make available a minimum level of capacity for cross-zonal trade (so called 70% rule).

1.2 Upon request of the TSOs, the National Regulatory Authorities (in the following: NRAs) may grant a derogation from the provision of the minimum level of capacity, on foreseeable grounds where necessary for maintaining operational security. Moreover, Member States may adopt action plan to cope with structural congestions: when an action plan is in place, the minimum level of capacity (70%) shall be reached by 31 December 2025, in the meanwhile a linear trajectory shall be matched.

1.3 On the verge of the entry into force of the 70% rule, in July 2019 ACER issued the Recommendation 01/2019[2] (in the following: ACER Recommendation) giving some criteria on how to compute the level of cross-zonal capacity to make available for cross-zonal trade. The proposal is self-standing for the regions implementing a flow based capacity calculation, while for the regions implementing a coordinated net transmission capacity (in the following: cNTC), ACER proposed an explicit calculation for the limiting elements[3] only, mandating the TSOs to develop a proper methodology to compute the level of cross-zonal capacity on all the other network elements.

1.4 Based on criteria reported in the Recommendation, ACER publishes a yearly report presenting the level of cross-zonal capacity offered on each border and pointing out whether this level is consistent with the 70% requirement. ACER reports have nonetheless only a monitoring scope: assessing the effective compliance of each TSO against the 70% rule is, in fact, a task reserved to the competent national regulatory authority.

1.5 With Decision 420/2021/R/eel[4] ARERA approved the assessment of the status of the 70% rule in 2020 on the borders with France, Switzerland, Austria, Slovenia and Greece, along with some preliminary findings on the Italian internal bidding zone borders.

1.6 The current document presents the assessment for year 2021. Chapter 2 describes how the 70% is assessed in a cNTC environment, as adopted by Terna for the capacity calculation on all its bidding zone borders. Chapter 3 illustrates the results for the Northern borders (Italy North CCR), while Chapter 4 is focused on the Greek border. Chapter 5 gives the status of the Italian internal bidding zone borders, Finally, Chapter 6 reports some conclusions.

[1] Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the Internal Market for Electricity (recast)

[2] Recommendation No 01/2019 of the European Union Agency for the Cooperation of Energy Regulators of 08 August 2019 on the implementation of the minimum margin available for cross-zonal trade pursuant to Article 16(8) of Regulation (EU) 2019/943

[3] A limiting element is a transmission element that effectively limits the cross-zonal capacity.

[4] Deliberazione 12 ottobre 2021 420/2021/R/eel - Valutazione del livello minimo di capacità (70% rule) per i confini italiani con riferimento all'anno 2020

2 70% assessment in a cNTC environment

2.a ***ACER recommendation***

2.1 ACER recommends computing the Margin Available for Cross-Zonal Trade ($MACZT_i$) for each critical network element and contingency (CNEC)[5] i based on the following criteria:

$$MACZT_i = MCCC_i + MNCC_i$$

where:

- $MCCC_i$is the Margin from Coordinated Capacity Calculation on CNEC i;
- $MNCC_i$ is the Margin from Non-Coordinated Capacity Calculation on CNEC i.

2.2 $MCCC_i$ is computed for each coordination area, i.e. for each set of borders on which the cross-zonal capacity is computed in a coordinated manner. For flow based areas, it is equal to the Remaining Available Margin RAM_i resulting from the capacity calculation process as increased to take into account previously allocated and nominated capacities. For cNTC areas, instead, the following formula is suggested:

$$MCCC_i = \sum_b pPTDF_i^b \cdot NTC_b$$

where:

- $pPTDF_i^b$ is the positive PTDF[6] of CNEC i in the direction associated to border b
- NTC_b is the net transmission capacity computed in the capacity calculation process for border b;
- the sum is extended to all the borders within the coordination area.

2.3 ACER points out that the formula for $MCCC_i$ in cNTC areas provides a reliable estimation only for the limiting CNECs, while for all the other CNECs the formula underestimates the $MCCC_i$ since it doesn't consider the quota of the capacity that remains unused because of the law of physics in a meshed system.

2.4 In both flow based and cNTC areas, $MNCC_i$ is computed by multiplying the corresponding zone related PTDF with the net position associated to the bidding zones in the common grid model used for the relevant capacity calculation; before the computation the net position is adjusted in order to filter out the exchanges within the coordination area that are taken into account in the MCCC.

2.5 In case of borders consisting only of HVDC, the computation can be simplified: since the flows on HVDC are usually fully controllable, $MNCC_i$is equal to zero (i.e. no flows on the HVDC due to exchange outside the coordination area) and $MCCC_i$ is equal to the NTC_b on the considered border.

[5] A CNEC is the couple of network element and associated contingency that is monitored during the capacity calculation process to take into account the N-1 security. For N security, CNEC are considered without any contingency attached.

[6] PTDF (Power Transfer Distribution Factor) can be border related or zone related; a border related PTDF measures the flow on a given network element induced by 1 MW exchange on the considered border; a zone related PTDF measures the flow on a given network element induced by 1 MW net position on the considered zone (there is an opposite net position in the slack zone).

2.b 70% assessment in cNTC areas

2.6 The analysis is focused on cNTC areas with borders including AC interconnector, since for borders with DC interconnectors only $MCCC_i$ is equal to the NTC_b on the considered border, as in flow based regions.

2.7 In a cNTC area, NTC is usually computed by an iteration process increasing the injections on the exporting bidding zones, reducing the injections in the importing ones[7] and evaluating the exchange across the border on this new situation by the mean of a full AC load flow (i.e., taking into account the transmission losses and the voltage profile): the process ends when a constraint is detected. The maximum exchange without hitting any constraints is assumed as the NTC on the considered border.

2.8 Let F_i^{last} be the flow on the CNEC *i* at the very last step of the cNTC process, i.e. in the iteration when the gross cross-zonal capacity TTC_b is identified on each border *b*. Let $PTDF_i^b$ be the PTDF associated to CNEC *i* because of flows induced by an exchange on a border *b* withing the coordination area.

2.9 Mimicking the linear approximation adopted in a flow based approach, the flow F_i^0 on the CNEC *i* with no exchanges within the coordinated area can be computed as:

$$F_i^0 = F_i^{last} - \sum_b PTDF_i^b \cdot TTC_b$$

2.10 Then, keeping mimicking the flow based approach:

$$MCCC_i = RAM_i = F_i^{max} - F_i^0 - FRM_i = F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot TTC_b - FRM_i$$

where

- FRM_i is the flow reliability margin on the CNEC *i*.

2.11 FRM_i can be deducted from the transmission reliability margin for each border *b* TRM_b as:

$$FRM_i = \sum_b PTDF_i^b \cdot TRM_b$$

hence:

$$MCCC_i = F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot TTC_b - FRM_i =$$

$$= F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot (TTC_b - TRM_b)$$

$$= F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot NTC_b$$

[7] Theoretically it's possible to increase the load in the importing bidding zones and decrease it in the exporting ones as well. This is nonetheless not relevant for the purpose of this report.

2.12 In case of CNECs that are fully loaded at the last step of the iteration process, $F_i^{last} = F_i^{max}$ hence:

$$MCCC_i = F_i^{max} - F_i^{max} + \sum_b PTDF_i^b \cdot NTC_b = \sum_b PTDF_i^b \cdot NTC_b$$

The result is identical to the formula suggested in ACER Recommendation[8].

2.13 For all the other CNECs, instead:

$$MCCC_i = F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot NTC_b \geq \sum_b PTDF_i^b \cdot NTC_b = MCCC_i^{ACER}$$

2.14 Keeping mimicking the flow based approach and neglecting the previously allocated and nominated capacities[9], the Adjusted Margin AMR_i and the final margin RAM_i^{adj} on the CNEC *i* can be computed as:

$$AMR_i = \max(0{,}7 - MACZT_i; 0)$$

$$RAM_i^{adj} = RAM_i + AMR_i = F_i^{max} - F_i^{last} + \sum_b PTDF_i^b \cdot NTC_b + AMR_i$$

2.15 For sake of simplicity, let the coordination area be composed by a single border[10]. The assumption pretty represents the effectiveness of the Italian borders: in Italy North CCR, in fact, the cNTC computation process identifies the overall capacity on the four borders (France, Switzerland, Austria and Slovenia), then the final value is split by the mean of predetermined factors, while the Italian internal bidding zone borders can be considered as independent on each other from the capacity calculation point of view.

2.16 Given what above, the computation of the final margin is simplified as follows:

$$RAM_i^{adj} = RAM_i + AMR_i = F_i^{max} - F_i^{last} + PTDF_i^b \cdot NTC_b + AMR_i$$

2.17 For each CNEC *i* it's then possible to compute the equivalent $NTC_{b,i}^{eq}$ that would allow to match the 70% rule:

$$NTC_{b,i}^{eq} = \frac{RAM_i^{adj}}{PTDF_i^b} = \frac{F_i^{max} - F_i^{last} + PTDF_i^b \cdot NTC_b + AMR_i}{PTDF_i^b}$$
$$= NTC_b + \frac{F_i^{max} - F_i^{last} + AMR_i}{PTDF_i^b} = NTC_b + \Delta NTC_{b,i}^{nused} + \Delta NTC_{b,i}^{AMR}$$

where:

- $\Delta NTC_{b,i}^{nused} = \frac{F_i^{max} - F_i^{last}}{PTDF_i^b}$ is the increase of the cross-zonal capacity associated to the exploitation of the entire thermal capacity on the CNEC *i*;

[8] For fully loaded CNECs $PTDF_i^b$ is positive, otherwise the element would not result fully loaded.

[9] In a cNTC environment, the NTC can be computed neglecting the previously allocated capacities: this means that the NTC represents the whole capacity available on the considered border. The effective capacity offered to the market is then computed deducting the previously allocated one.

[10] It can be either an effective single border or a set of interdependent borders on which the overall capacity is first computed as a whole and then split on all the borders.

- $\Delta NTC_{b,i}^{AMR} = \frac{AMR_i}{PTDF_i^b}$ is the increase of the cross-zonal capacity associated to the adjusted margin on the CNEC *i*.

2.18 Eventually, the adjusted cross-zonal capacity NTC_b^{adj} can be computed as:

$$NTC_b^{fin} = \min\left(NTC_{b,i}^{eq}\right) = NTC_b + \Delta NTC_b$$

2.19 The network element *i* having $NTC_{b,i}^{eq} = NTC_b^{fin}$ is considered as the limiting CNEC.

2.20 For each CNEC *i* the flow F_i^{fin} and the associated RAM_i^{finadj} should be calculated by the mean of an AC load flow assuming an exchange equal to $TTC_b^{fin} = NTC_b^{fin} + TRM_b$. Anyhow for sake of simplicity the linear approximation can be kept, since the overall error is negligible. This means:

$$RAM_i^{finadj} = RAM_i^{adj} = PTDF_i^b \cdot NTC_{b,i}^{eq}$$

2.21 Hence, for each CNEC:

$$MCCC_i^{finadj} = RAM_i^{finadj} = RAM_i + AMR_i$$

$$\begin{aligned} MACZT_i^{finadj} &= MCCI_i^{finadj} + MNCC_i = RAM_i + AMR_i + MNCC_i \\ &= MACZT_i + AMR_i \geq 0{,}7 \end{aligned}$$

2.22 NTC_b^{fin} represents thus the NTC value for which the 70% rule is matched on all CNECs. In particular $MACZT_i^{finadj} = 0{,}7$ in case the original $MACZT_i < 0{,}7$ ($AMR_i = 0{,}7 - MACZT_i > 0$) while $MACZT_i^{finadj} = MACZT_i \geq 0{,}7$ in all the other cases ($AMR_i = 0$). Obviously with this value only some CNECs are fully exploited (or slightly overloaded to comply with the 70% rule, provided that enough remedial actions are available to solve the overload in the subsequent timeframes), while many others remain not fully used, but this happens also in the flow based environment when the allocation phase optimizes the social welfare by identifying the most efficient solution (i.e., the CNECs to fully exploit) within the flow based domain.

2.23 Moreover, for the limiting CNEC:

$$RAM_i^{finadj} = PTDF_i^b \cdot NTC_{b,i}^{eq} = PTDF_i^b \cdot NTC_b^{fin} = MCCC_i^{ACERfin}$$

while for the other CNECs:

$$RAM_i^{finadj} = PTDF_i^b \cdot NTC_{b,i}^{eq} > PTDF_i^b \cdot NTC_b^{fin} = MCCC_i^{ACERfin}$$

2.24 It's clear that the ACER formula is consistent with the effective margin only for the limiting CNEC, while for all the other CNECs it underestimates the margin, as already clarified in ACER Recommendation.

2.25 Let's consider the case with $\Delta NTC_b = 0$, meaning $NTC_b = NTC_b^{fin}$: this occurs only in case at least one CNEC *i* has $\Delta NTC_{b,i}^{nused} = \Delta NTC_{b,i}^{AMR} = 0$. It's the case of a fully loaded CNEC (no adjustment associated to full exploitation) already matching the 70% rule (no need to any adjusted margin). In other terms if a fully loaded CNECs matches the 70% rule in the original computation process, the resulting NTC_b already matches the 70% rule on all CNECs.

2.26 In case no fully loaded CNECs match the 70% rule in the original computation, the computation gives $\Delta NTC_b > 0$. Theoretically in order to identify NTC_b^{fin} all CNECs should be monitored, since one cannot exclude a priori that the final NTC value is limited by the full exploitation of

a CNEC not originally limiting the cross-zonal capacity rather than by the adjustment of the margin on a fully loaded CNEC to comply with the 70% or a combination of both

2.27 For sake of simplicity let the attention be focuses only on the fully loaded CNECs. Let $NTC_b^{*fin} = NTC_b + \min \Delta NTC_{b,i}^{AMR} = NTC_b + \Delta NTC_b^*$ be the final NTC value computed looking only at the fully loaded CNECs. This value can either be equal to NTC_b^{fin} (in case $\Delta NTC_b = \Delta NTC_b^* = \min \Delta NTC_{b,i}^{AMR}$) or above NTC_b^{fin} (in case $\Delta NTC_b^* > \Delta NTC_b = \min \Delta NTC_{b,i}^{nused}$): in both cases the value can be considered compliant with the 70% rule.

2.28 Given what above, the following conclusions can be drawn:

i) in order to be consistent within the 70% rule, the cross-zonal capacity in a cNTC environment shall be assumed equal to the NTC_b^{fin}; in a single border coordination area this value is the one leading to the minimum increase of cross-zonal capacity with respect to the original value; with more borders an equivalent set of NTC values shall be identified;

ii) if a fully loaded CNEC at the end of the cNTC computation process already matches the 70% rule, NTC_b^{fin} coincides with the original NTC value and no further elaboration is required;

iii) if no fully loaded CNECs match the 70% rule at the end of the cNTC computation process, it's enough to evaluate the minimum increase of cross-zonal capacity looking at the limiting CNECs only: the resulting value would be compliant with 70% since it would either be equal to NTC_b^{fin} or above it.

iv) for a more precise value of NTC_b^{fin}, all CNECs should be monitored; nonetheless a dedicated approach to compute the margin shall be adopted since the formula suggested in ACER Recommendation underestimates the margin for all non-fully loaded CNECs.

2.29 The cNTC compliance with the 70% rule can thus be assessed by ensuring that **at least one fully loaded CNEC has a margin equal or greater than 70%** in the original computation or by an adjustment of the original value of cross-zonal capacity. **There is thus no need to evaluate the margins on all CNECs!**

3 Assessment for Italy North CCR

3.a ***Capacity calculation process***

3.1 Italy North CCR encompasses the borders with France, Austria and Slovenia; the border with Switzerland is not formally included in the region, nonetheless because a strict interdependency with the other ones, this border has always been considered within the capacity calculation process.

3.2 Italy North TSOs chose to adopt a cNTC approach: the cross-zonal capacity in the import direction is computed on the entire Northern borders (i.e. an equivalent border across all the Alps is considered) by increasing the injections in France, Switzerland, Austria and Slovenia and by decreasing the injections in Italy: the original methodology, developed on a voluntary basis, was modified to make it compliant with the CACM Regulation[11] and it has been into force in the day-ahead timeframe since 2020 and in the intraday timeframe since late 2019.

[11] Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management

Pursuant to the entry into force of Regulation (EU) 2019/943, the TSOs further modified the capacity calculation methodology to incorporate a monitoring of the level of cross-zonal capacity made available to the market and an automatic adjustment of its value to comply with the 70% rule. The proposal was approved by the competent NRAs in July 2020, along with an implementation plan aimed to have the entry into force of the 70% monitoring in S1 2021.

3.3 Only the import capacity is currently computed, while the export capacity is not estimated: TSOs are working at the so called export corner concept that will allow to evaluate the cross-zonal capacity in the export direction on the specific borders on which export are likely to occur[12]. The export corner is expected to entry into force in S2 2023.

3.4 The overall import capacity may be limited by specific allocation constraints introduced by the Italian TSO Terna to take into account the voltage and stability issues of the whole Italian system. Namely the system needs a certain amount of regulating resources to be dispatched to ensure voltage regulation and a proper inertia. In standard conditions, when the sum of these resources with non-dispatchable production and full import capacity is lower than the load, all the regulating resources can be effectively dispatched[13]. On the contrary with low load and significant non-dispatchable production, dispatching all the regulating resources with a full import capacity would lead to an overgeneration: in these situations (typical in spring months) the solution is to limit import capacity in order to leave enough space for the regulating resources to be dispatched. These constraints are modelled as ex-ante reduction of the NTC value: when they are active the overall capacity calculation process stops when the maximum import is hit, without running any 70% monitoring nor identifying a proper limiting CNEC. A shift to deal with them withing the market coupling algorithm is foreseen in the methodology, but unfortunately the final implementation was achieved only on 17 February 2022.

3.5 Ex ante reduction are also foreseen for the so called ramping constraints aimed to mitigate the differences of the NTC values across the market time units. Also for these constraints a shift into the market coupling algorithm was envisaged, but it was not deemed feasible and thus was put on hold.

3.b 2021 improvements

3.6 The 70% monitoring status aimed to be implemented in S1 2021 was postponed due to some delays in the development and testing phase: it entered into force on 29 October 2021 and since then, NTC_b^{fin} has been computed by the mean of the approach depicted in chapter 2, with the identification of the limiting CNEC.

3.7 Since 1 June 2021, TSOs have been publishing the relevant data for capacity calculation on a daily basis on the JAO website, improving the transparency towards the stakeholders. Until October only few data were published, but with the entry into force of the 70% monitoring all information about PTDFs and margins are provided.

3.8 In Q4 2021 a dedicated agreement between the EU TSOs and Swissgrid was stipulated, stating that Swissgrid is bound by the same duties as the EU TSOs in all the technical processes run for Italy North CCR. This contractual agreement complements the specific technical agreements already developed for the day-ahead and intraday capacity calculation processes, providing the general framework of cooperation for Italy North CCR, in line with what was auspicated by the letter by European Commission to ACER and ENTSO-E dated 16 July 2019

[12] If no export is likely, the export corner is not run and the overall import capacity is computed. In this case the market is provided with a standard export capacity based on yearly estimation.

[13] Either from the energy market or in the ancillary service market.

clarifying that a general agreement is a precondition to consider the exchanges with Switzerland towards the 70%.

3.c 2021 derogations

3.9 For the year 2021 the cross-zonal capacity in the import direction didn't initially foresee the monitoring of the 70% requirement since this functionality was still under implementation at the beginning of the year and entered into force only on 29 October.

3.10 For this reason, Terna asked for a derogation from the 70% requirement for the entire year, claiming that it wouldn't have been possible to comply with the 70% rule without a proper coordinated tool to provide the minimum level of transmission capacity to be offered to the market. Moreover, the TSO pointed out that the regulatory framework didn't allow them to take into account the exchanges with Switzerland towards the 70% rule since the dedicated agreement hadn't been stipulated yet. Terna underlined as well that the application of the allocation constraints may lead to a final cross-zonal capacity lower than the 70% threshold.

3.11 The derogation was in particular requested for all the market time units until the implementation of the 70% monitoring and for all the market time units characterized by allocation constraints since then.

3.12 Moreover Terna asked a derogation for all the market time units for the export capacity, pending the implementation of the export corner.

3.13 ARERA approved Terna's request in December 2020 with Decision 551/2020/R/eel[14]. Terna could thus avoid complying with the 70% requirement in all the 2021 market time units until 28 October 2021 and since 29 October 2021 in all MTUs characterized by allocation constraints and for the export capacity. However the TSO was requested to provide ARERA with a quarterly report monitoring the level of cross-zonal capacity offered on the Italian Northern borders.

3.14 A derogation for absence of proper tools was asked by the Austrian TSO as well, initially for the first semester (since the 70% monitoring was expected to enter into force in S1 2021) and then renewed until the end of the year. These derogations were granted as well.

3.d ACER monitoring

3.15 ACER run its monitoring based on the information provided by the TSOs on the import direction only. No monitoring was run in the export direction.

3.16 ACER requests data about limiting CNECs, NTC values, allocation constraints and, where available, about PTDFs and margin available on each CNEC, computed pursuant to the ACER Recommendation. Where no data on PTDF and margin are provided, ACER estimates the margin by adopting the PTDF computed on some reference common grid models.

3.17 For Italy North CCR all the data including PTDFs and margins has been sent by Coreso starting from 29 October 2021, as part of the 70% monitoring process. Until 28 October the data were transmitted by each TSO, but as in 2020 only NTC values and the indication of the limiting CNECs were provided, since information on PTDF or on possible margin estimation were not available pending the implementation of the 70% requirement.

[14] Deliberazione 15 dicembre 2020, 551/2020/R/eel, "Approvazione della richiesta di deroga per il rispetto del livello minimo di capacità da rendere disponibile per gli scambi tra zone di mercato presentata da Terna S.p.A. con riferimento alla Regione Italy North per l'anno 2021"

3.18 Unfortunately, Terna faced a number of issues in preparing the dataset, in particular not being able to proper identify the limiting CNECs. For this reason, in most market time units Terna sent a list of fully loaded CNECs, filtering only the network elements that, for example being already heavily loaded in the starting common grid model, were judged to be not relevant for cross-border flows. Moreover Terna was not able to provide any information on the CNECs in most of the market time units when the cross-zonal capacity was limited because of an allocation constraints (in these cases the computation does not identify a proper limiting CNEC; nonetheless some further information could be provided in few cases) or because of a validation requested by the TSOs (in these cases the TSOs didn't always reported the exact location of the expected congestions; also, even if reported, this information was not given in a standard network format to be shared with ACER). Hence ACER was able to rely only on a limited set of data, even smaller than the one available for year 2020: this significantly affected the overall results.

3.19 ACER monitors the 70% rule on a country basis: for each market time unit, the limiting CNECs are assigned to their specific country (based on their geographical location) and then the value of MACZT on each of them is computed; the compliance with the 70% rule is deemed reached when the 70% is matched on all the limiting CNECs associated to the country (green area in the figures). ACER also highlights the situation when the margin is within 50-70% (yellow area) or within 20-50% (orange area).

3.20 Figure 1 summarizes the main outcome of the assessment run by ACER for the entire 2021: the left graph doesn't consider the contribution of the third countries exchanges (i.e. flows with Switzerland), while the right one takes it into account.

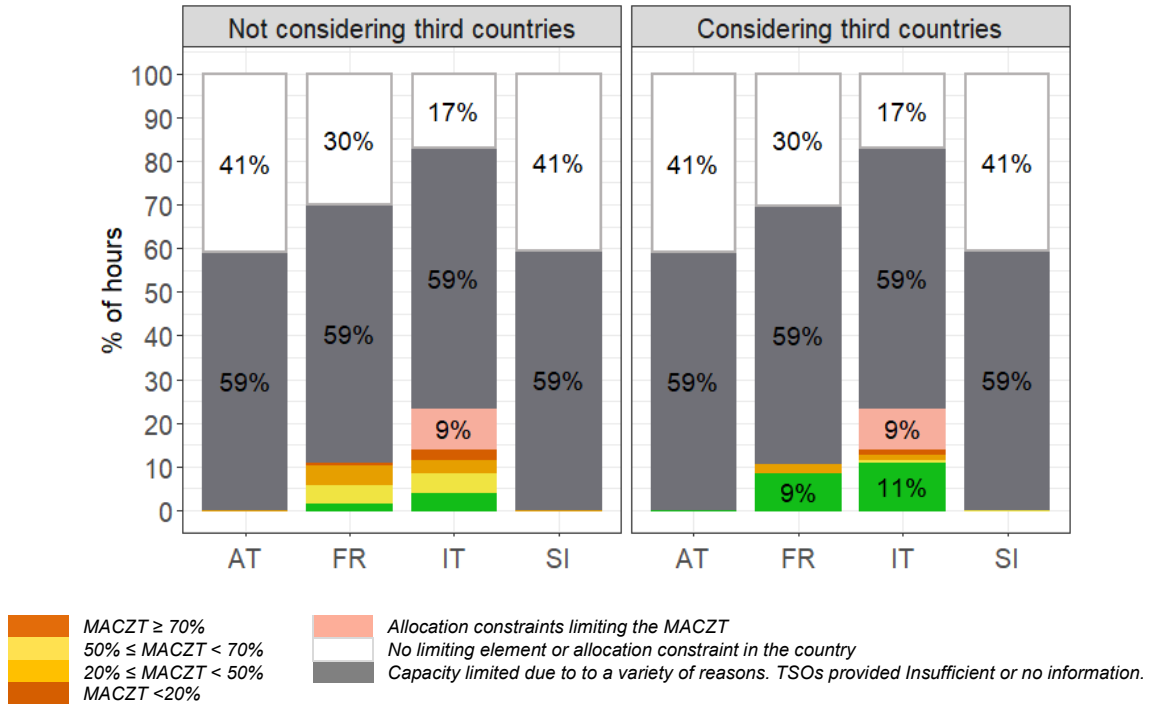

Figure 1 – ACER assessment for Italy North CCR for 2021 – source: Acer report

3.21 For 59% of the market time units (grey area) no monitoring could be done because of lack or insufficient information provided by the TSOs: these are mainly cases where the cross-zonal

capacity was reduced because of a TSO request in the validation phase[15], plus the situations where the capacity calculation processes fail. Unfortunately the percentage is worse than in 2020 (43% of market time units without available data in the first semester and 59% in the second semester) because of the issues faced by Terna in providing its dataset. The difficulties were nonetheless overcome with the implementation of 70% monitoring and the data sent directly by Coreso: for 2022 the grey area is thus expected to be significant reduced and limited to the market time units with failures in the capacity calculation processes.

3.22 Allocation constraints limit the cross-zonal capacity only in 9% of the market time units (pink area). This a significant reduction with respect to 2020 (38% of the market time units in the first semester and 3% in the second semester) where allocation constraints usage was increased because of the combination of the low demand due to the Covid 19 lockdown and the high RES productions due to a very favourable weather conditions.

3.23 Focusing the attention on the remaining 32% of market time units, the limiting CNECs was located withing the Italian territory[16] only around in 15% of the cases with a margin higher than 70% in around 11% of the cases, provided that the third country contribution is taken into account.

3.24 Even considering that the usage of PTDFs coming from reference common grid models may lead to underestimate the level of capacity made available for cross-zonal trade, the overall picture emerging from ACER monitoring confirms the gloomy perception already showed in 2020.

3.e ARERA assessment

3.25 In order to allow ARERA assessing the 70% rule on the Norther Italian borders, in 2020 and in 2021, pending the implementation of the 70% monitoring, Terna was requested to provide a quarterly report including an estimation of the level of capacity available for cross-zonal trade and information on PTDFs and MACZT on the CNECs on the import direction. No report was requested for the export direction, since Terna enjoyed a full derogation for that.

3.26 Terna performed a unilateral estimation by the mean of off-line processes, starting from the outcome of the coordinated capacity calculation process and the associated common grid model. Namely:

- Terna provided information for all the CNECs loaded at least at 99% at the end of the capacity calculation process; this set is usually wider than the set of fully loaded CNECs sent to ACER since it also includes, for example, network elements heavily loaded in the original common grid model.
- Terna estimated the margins on the monitored CNECs by evaluating the PTDF at the end of the capacity calculation process; this avoids any potential underestimation due to the employment of reference scenarios, as instead performed by ACER;
- Terna was able to provide information on CNECs also for some of the market time units with an allocation constraint: the information relies on the last step of the capacity calculation process, before hitting the constraint;

[15] When a validation occurs, the CNECs effectively limiting the cross-zonal capacity are the ones marked by the TSOs requesting the validation as critical because congested. Due to a not standard format in the reasons behind the validation, the TSOs were not able to automate the identification of the limiting CNECs in those cases and, thus, decided to not send any data to ACER.

[16] Including the interconnectors that are usually modelled twice, once for each involved TSO.

- Terna was able as well to provide information on limiting CNECs for most of the market time units with a validation request[17].

3.27 Terna could indeed have sent this dataset to ACER as well, but it preferred not doing so since these data were not shared and discussed with the other TSOs. Also for this reason the dataset used by ACER for its own monitoring was quite insufficient.

3.28 Since 29 October 2021, the quarterly reports have been no longer prepared; PTDFs and limiting information have been in fact computed during the capacity calculation process and included in the reports sent by Coreso to Acer. Terna forwards these reports to ARERA without any further elaboration. Since this date, the consistency between ACER and ARERA datasets has been ensured by definition.

3.29 ARERA assessed the 70% rule separately for the period 1 January – 28 October (no 70% monitoring was in place within the capacity calculation process and thus Terna could rely on a derogation for all market time units) and for the period 29 October – 31 December (70% monitoring was in place and Terna's derogation was limited to allocation constraints only).

3.30 For the period 1 January – 28 October, as already performed in 2020, ARERA checked the 70% rule on two different sets of data:

i) the CNECs shared with ACER, but using the unilateral information on margins provided by Terna (in the following: ACER perimeter);

ii) all the CNECs monitored by Terna (in the following: Terna perimeter).

3.31 Moreover, ARERA looked simultaneously at all the Northern borders, without allocating each CNEC to its country: this allows to monitor also the CNECs located within Switzerland (excluded, instead, from ACER reports since Switzerland is not a EU country).

3.32 Figure 2 reports the situation for ACER perimeter: a directly comparison with ACER report is not possible, since ACER provided data for the entire year.

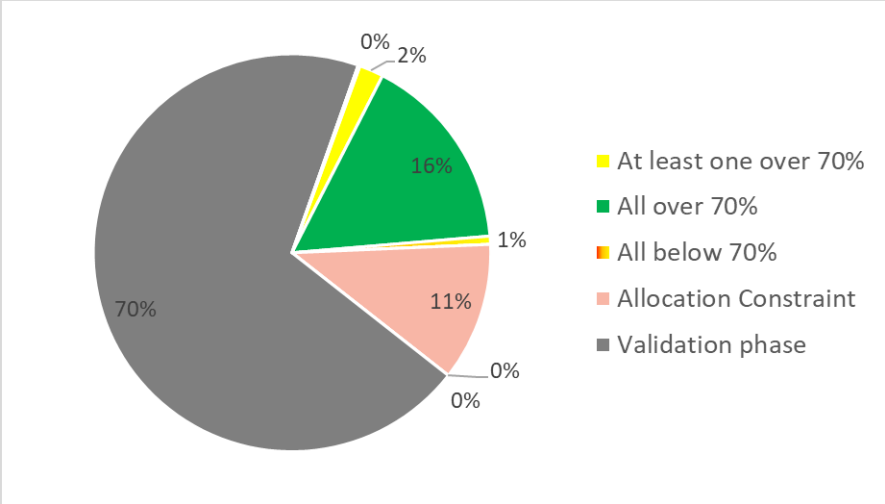

Figure 2 – ARERA assessment until 28 October 2021 ACER perimeter
source: ARERA elaborations on ACER and Terna data

[17]. Terna monitoring looks at all the fully loaded CNECs, thus there is no need to understand which is the critical branch triggering the validation.

3.33 It's immediately evident the significant amount of market time units (70%) for which data are completely missing[18], as already marked by ACER in its report. The effects of the allocation constraints is confirmed quite limited (11% of market time units).

3.34 Figure 3 summarizes the assessment for Terna perimeter: it's immediately evident how almost half of the market time units fall in the yellow area with at least one CNEC over 70%.

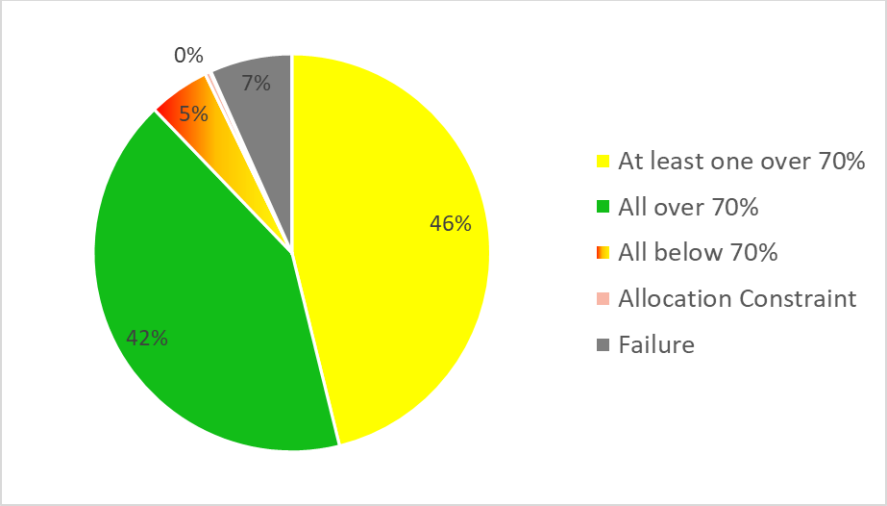

Figure 3 – ARERA assessment until 28 October 2021 Terna perimeter
source: ARERA elaborations on Terna data

3.35 It's worth comparing the cases between the two perimeters in order to understand how the situation may change based on the set of CNECs that is effectively monitored. The results can be found in Table I where the columns refer to the cases in ACER perimeter and the rows to the cases in Terna perimeter: each cell indicates how many market time units fall in the considered combination. The columns includes also the case "Missing input Terna" that highlights the market time units for which ACER got data and Terna was not able to provide any input.

TABLE I – COMPARISON BETWEEN THE PERIMETERS IN THE FIRST SEMESTER

		ACER perimeter					
		Allocation Constraint	All below 70%	All over 70%	At least one over 70%	Validation phase	Missing input Terna
Terna perimeter	All below 70%	126	14	0	0	221	0
	All over 70%	107	11	637	0	2255	0
	At least one over 70%	528	23	528	143	2111	0
	Failure	24	0	0	0	449	10
	Smoothing ramp	1	0	0	0	6	0
	Allocation Constraint	27	0	0	0	2	0

3.36 The differences are sensible:

- most of the market time units falling in the case "All below 70%" in ACER perimeter show a better situation if looking at the wider Terna perimeter; this because in Terna perimeter

[18] ARERA prefers labelling the grey area as validation phase, since the absence of data complained by ACER was mainly due to this situation. In reality the area includes also market time units when the computation process fails, but the frequency of this event is anyhow quite rare.

more CNECs are monitored and it's likely to have at least one them with a margin greater than 70%;

- most of the market time units falling in the case "All over 70%" in ACER perimeter show a worse situation if looking at the wider Terna perimeter; this because in Terna perimeter also CNECs already heavy loaded in the starting common grid model are monitored and they usually show a quite low margin;
- all market time units falling in the case "At least one over 70%" in ACER perimeter are in the same situation in Terna perimeter;
- significant improvements are provided in Terna perimeter for the cases marked in ACER perimeter as "Allocation constraint" and "Validation phase": Terna provided a number of data for these market time units, highlighting as in most cases at least one network element shows a margin higher than 70%.

3.37 Terna cases show also two other peculiar situations:

- failure (around 7% of the market time units) where the capacity calculation process fails and a fallback value is used;
- smoothing ramp (7 market time units, so negligible that is not reported in Figure 3) where the capacity is limited to avoid huge steps between the market time units.

3.38 Figure 4 depicts the assessment for the period 29 October 2021 – 31 December 2021: there is a single graph since ACER and ARERA dataset were the same.

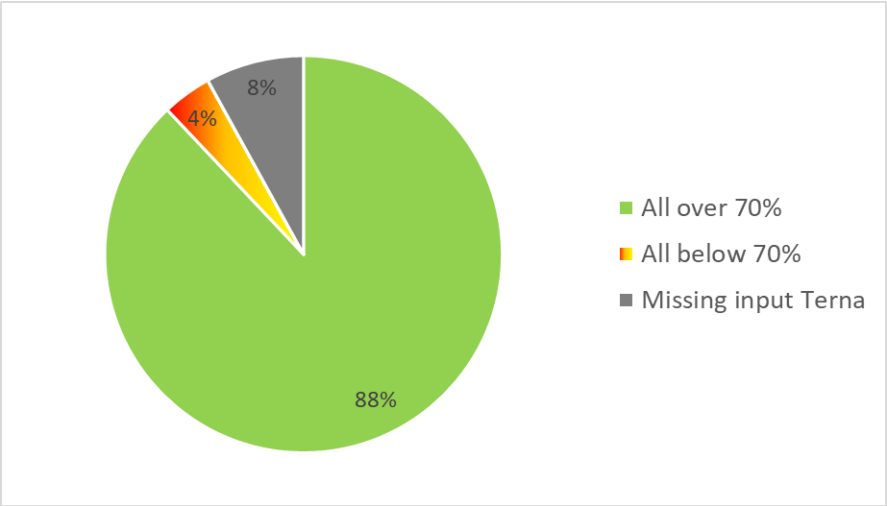

Figure 4 – ARERA assessment since 29 October 2021
source: ARERA elaborations on Coreso data

3.39 The positive effect of the 70% monitoring within the capacity calculation process is dramatically positive: 88% of the market time units show the limiting CNECs with a MACZT over 70%, while only 4% of them market time units are below the threshold. In 8% of the market time units, unfortunately, no data were made available by Coreso. According to the information provided by Terna, these market time units were characterized by some failures either in the capacity calculation process or in the reporting tool.

3.40 In order to compare ARERA assessment and ACER monitoring, Figure 5 provided the situation for the entire year with respect to the ACER perimeter.

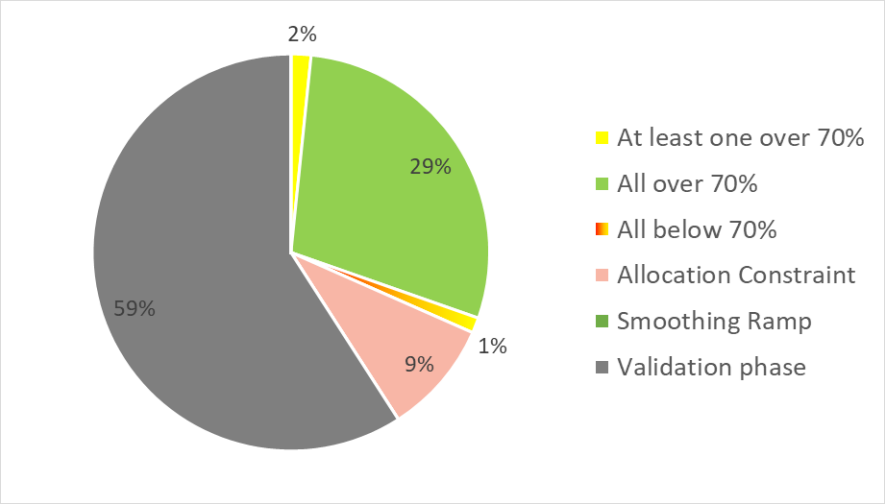

Figure 5 – ARERA assessment for 2021 ACER perimeter
source: ARERA elaborations on, Terna ACER and Coreso data

3.41 The data for ACER perimeter are consistent with the data provided in ACER monitoring (figure 1): 59% of market time units falling in "Validation phase" (that is analogue to the missing data marked by ACER) and 9% falling in "Allocation constraints". As far the remaining market time units, ARERA marks 29% with "All over 70%", while ACER only 11%. Nonetheless it's worth remarking that the green area in ARERA assessment (Figure 5) shall be compared with the green and white areas in ACER monitoring (Figure 1): white area can, in fact, be mainly associated to CNECs located in Switzerland (not explicitly monitored by ACER) that usually shows margin higher than 70%, hence it would have turned green in case an overall monitoring on the entire borders had been performed. With this assumption the two assessments show quite similar results, the only 1% difference associated to the usage by ARERA of PTDFs coming from the proper grid model instead than from a reference scenario as exploited by ACER[19].

3.f ***Final assessment***

3.42 The data provided by Terna, even if derived from unilateral estimations and not complete computations (as in the case of the allocation constraints), allow a more comprehensive assessment of the situation of the Italy North CCR with respect to the 70% rule.

3.43 As illustrated in chapter 2, implementing Italy North CCR a cNTC approach, if at the end of the capacity calculation process at least one fully loaded CNEC shows a margin greater than 70%, the resulting NTC value can be considered compliant with the 70% rule without any further adjustment.

3.44 Given what above, Figure 6 summarizes the final assessment for the year 2021 based on Terna perimeter: the derogation aside, the region performed quite well with positive assessment (i.e. at least one CNEC over 70%) in 88 % of the market time units, while in the remaining 12%, the computation either failed (7%) or showed all CNECs below 70% (5%) or ended up because allocation constraints and smoothing ramp (<0,5%, not highlighted in the figure).

[19] The fact that reference PTDFs may alter the final assessment is explicitly mentioned by ACER in its reports. The findings in this report simply confirm it.

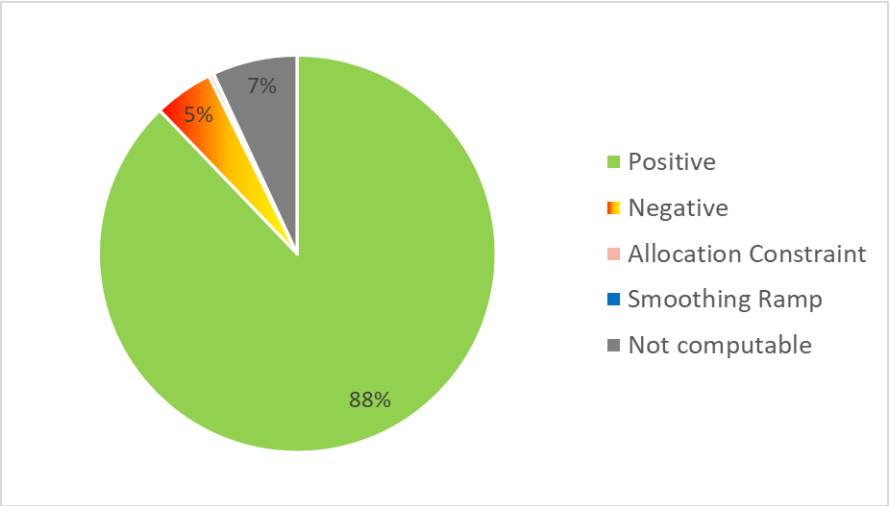

Figure 6 – Overall assessment for Italy North CCR

3.45 It's worth recalling that the assessment looks at the performances of the entire Northern borders section, without pairing each CNEC with the corresponding TSO. ARERA considers that this is the only way to perform the assessment since, being the cross-zonal capacity computed in a coordinated manner, all TSOs shall be deemed responsible for not matching the 70% rule independent of the specific limiting CNECs.

3.46 The only situation when the performances of the TSOs may be assessed differently is when a reduction is requested in the validation phase. In that case, the requesting TSO performance should be assessed based on the reduced NTC, while the remaining TSOs performance should be assessed based on the prevalidated value coming out from the coordinated capacity calculation process. Unfortunately ARERA cannot assess this kind of differentiation since Terna provided an estimation of the margin with respect to the final validated cross-zonal capacity only. Anyhow this differentiation would have led to an improvement in the assessment results for the following reasons:

- Figure 6 encompasses the worst case in each market time unit, since the margins are computed on the reduced NTC value and not on the potentially higher prevalidated ones;
- in case Terna is not the TSO requesting the reduction, its performances should be assessed based on the prevalidated values, resulting in higher level of capacity made available for cross-zonal trade and, thus, in a potentially better assessment;
- the difference would regard only the market time units falling in the negative sector since the application of higher prevalidated NTC values instead than the final reduced ones, might lead to some CNECs turning over 70% and then moving the market time units into the green positive sector;
- in all the other cases no difference would occur since the green area is already compliant and any improvements would only increase the mean margin without changing the overall judgement, while the other areas include market time units where margin cannot be computed (independent of the validation phase).

4 Italy – Greece border

4.a Capacity calculation process

4.1 Italy – Greece border belongs to GRIT CCR that implements a capacity calculation process based on a cNTC approach.

4.2 Namely, being the Italy – Greece border a pure DC interconnection[20], the computation is simplified and the full thermal capacity (500 MW) is usually offered to the market, but in case there is the need to reduce the flows because of congestions in the AC networks in Italy and/or in Greece.

4.3 In 2021 the thermal capacity of the cable was always offered to the market whenever the cable was available for operation without any reduction requested by the TSOs. Congestions in the AC network, if any, were solved locally.

4.b ACER monitoring

4.4 ACER run a single monitoring for the entire year. Due to similarities, ACER reports group all the DC borders in the same figure, in order to easily point out the differences. Figure 7 summarizes the main results.

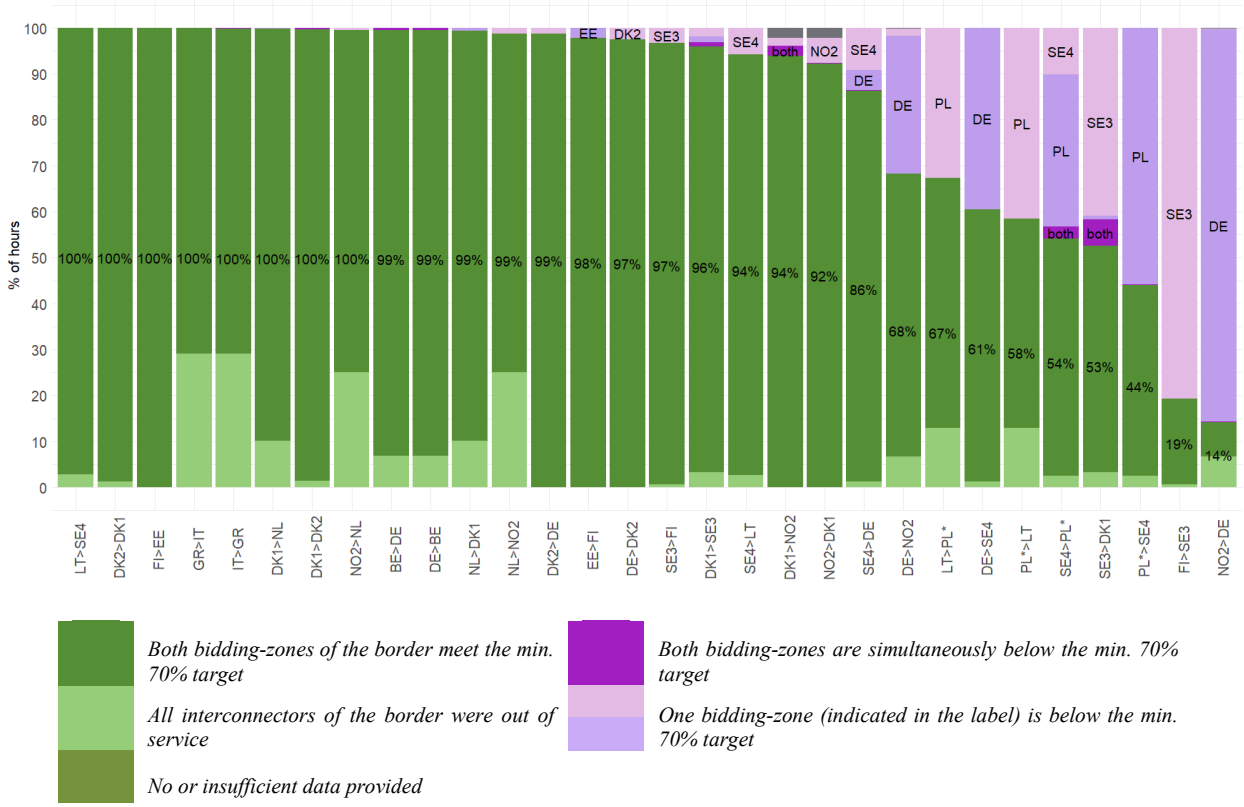

Figure 7 – ACER assessment for DC borders for 2021 – source: Acer report

[20] There is one DC cable from Galatina in Italy to Arachthos in Greece.

4.5 Greece-Italy border resulted unavailable for 30% of the market time units[21], while for the remaining 70% the thermal capacity was offered, matching the 70% target.

4.c ARERA assessment

4.6 ARERA didn't ask for any further information with respect to the Italy – Greece border. In this case the monitoring performed by ACER is already complete, since for a DC border what is important is to compare the NTC offered to the market (equal to the margin available for cross-border trade as per ACER Recommendation) with the thermal rate and the Agency was provided with both set of data.

4.7 ARERA thus fully shares the conclusion reached by ACER on this border that can be deemed compliant with the 70% rule in all the market time units.

4.8 It's also worth noticing that no derogation was requested by Terna on this border, since the positive outcome of the 70% assessment was widely expected, giving the level of cross-zonal capacity usually offered to the market.

5 Italian internal bidding zones

5.a Capacity calculation process and 2021 update

5.1 Italian internal bidding zones belong to GRIT CCR as well. The cross-zonal capacity has been computed since the opening of the electricity market in 2004 by the mean of a cNTC approach, monitoring both the current and the voltage constraints. In specific sections (e.g. borders with Sicily) dynamic stability has been considered as well.

5.2 Before the entry into force of the CACM Regulation, NTC values were estimated on a yearly basis and adjusted on a daily basis in case of significant outages or to take into account the expected load and renewable production levels by the mean of proper sensitivities.

5.3 With the entry into force of the CACM Regulation, the capacity calculation process was adjusted to be compliant with the new regulatory framework foreseeing a daily computation. The first version of the capacity calculation methodology was approved in July 2018. During the implementation phase the methodology was further amended to take into account the 70% rule: the final version of the methodology was approved in December 2020 and its implementation ended on 3 August 2021: the calculation is run by SEleNe CC through its subsidy Esperia. In particular for 2021, in order to allow a smooth and secure transition towards the new methodology, a cap was applied aimed to avoid an extreme difference between the daily calculation outcomes and the yearly estimations. This cap was definitely phased out at the beginning of 2022, after the new tools proved to be reliable.

5.4 Differently from what is applied in Italy North CCR, the 70% rule is indirectly checked, by filtering out at each iteration all the CNECs with a margin lower than 70%. This means that the final capacity can be limited only by CNECs with a proper margin and that no limiting CNECs may show a margin lower than 70%. According to what reported in Chapter 2, the resulting value can thus be considered compliant with the 70% rule, without the need to monitor the margins on all the other CNECs.

[21] The cable is usually out of service for 4 weeks for the ordinary maintenance activities. In 2021 a failure occurred in May just before the start of the ordinary maintenance: unfortunately, the damage was worse than expected and the cable was restored only in early September.

5.5 Foreseeing the implementation of the new methodology with the 70% monitoring in 2021, Terna didn't ask for a derogation. This means that:

- for the market time units and borders for which the cross-zonal capacity is limited by voltage or stability constraints, Terna could nonetheless limit the cross-zonal capacity below the 70% since these constraints are due to the lack of proper remedial actions (i.e. voltage or stability resources) and, in such cases, a specific reduction is allowed by Article 16(3) of the Regulation (EU) 2019/943;
- for the market time units and the borders for which the cross-zonal capacity is limited by current constraints, Terna should comply with the 70% rule.

Terna was requested to monitor the level of capacity made available for cross-zonal trade and to send a dedicated report to ARERA.

5.b Acer monitoring

5.6 In 2021 ACER started monitoring also the level of cross-zonal capacity on the Italian internal bidding zone borders

5.7 Terna was requested the same dataset as for Italy North CCR (limiting CNECs, NTC values, allocation constraints and, where available, PTDFs and margin available on each CNEC); unfortunately these data were available through Esperia with a market time unit granularity only since 3 August 2021 when the daily calculation process entered into force. Until 2 August 2021 no data were thus provided.

5.8 Figure 8 summarizes the main findings by ACER:

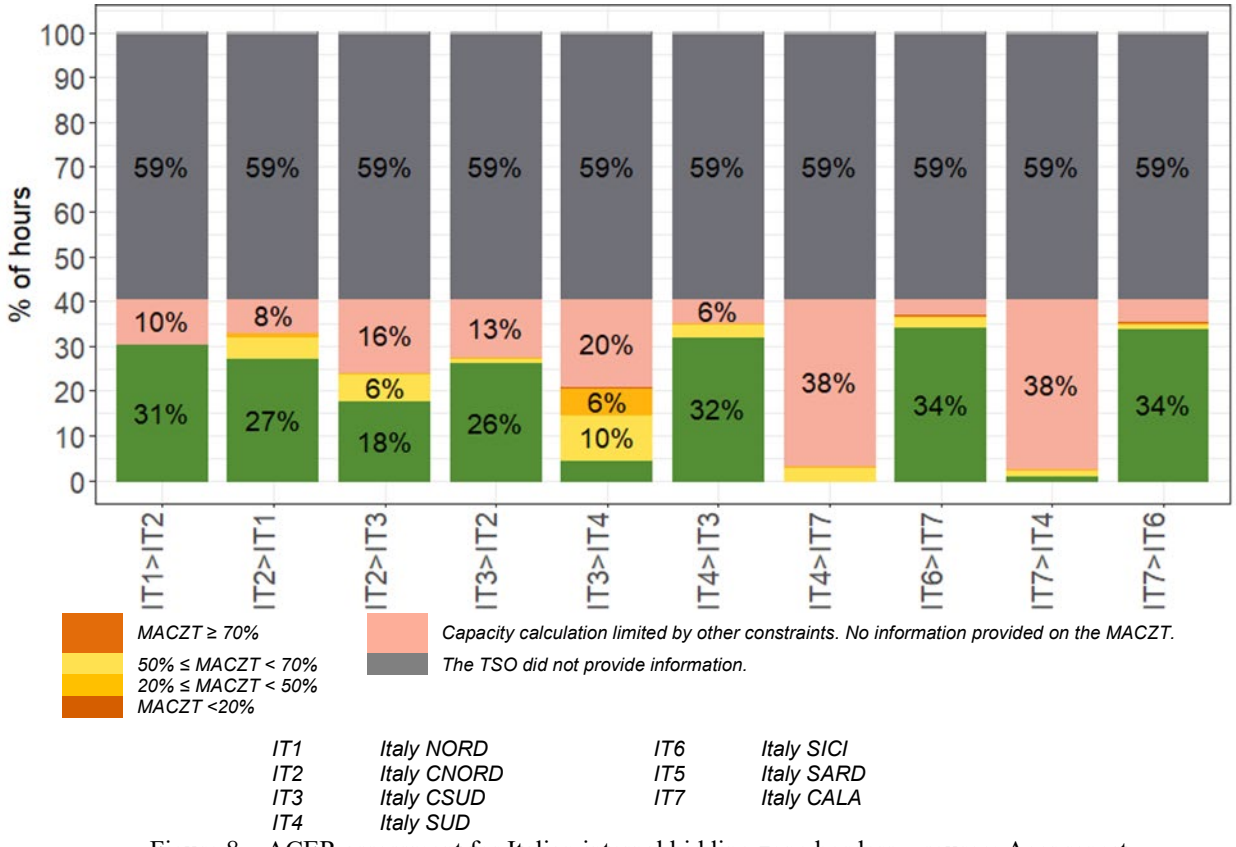

Figure 8 – ACER assessment for Italian internal bidding zone borders – source: Acer report

5.9 The grey area (59% of market time units) refers to the missing data: it encompasses all the market time units until 2 August 2021, plus the market time units (48 in total) for which the capacity calculation process was not executed because of failures in the input data and thus a

fallback value was offered to the market. The pink area (other constraints) include the market time units for which the cross-zonal capacity is limited by non-current constraints and the market time units for which the capacity calculation process failed (even if proper input data were provided) and fallback value were taken into account according to the yearly estimation.

5.10 The outcome of ACER assessment changes depending on the specific border:

- for NORD – CNOR border, CSUD – CNOR border, SUD –CSUD border, SICI – CALA border (both directions) and CALA – SUD border (both directions) either the 70% rule is matched or the capacity is limited by other constraints (triggering a limitation pursuant to Article 16(3) of Regulation 2019/943); on these borders few or even no market time units show a margin lower than 70%;
- for CNOR – NORD e CNOR – CSUD borders the situation is slightly worse with around 6% of market units showing a margin between 50 and 70%
- for CSUD – SUD border the situation is the worst one, with 10% of market time units with margin between 50% and 70% and 6% with margin below 50%.

5.11 It's nonetheless worth remarking that the margins below the 70% threshold were mainly due to the application of the cap that blocked the capacity calculation process before the 70% level is matched. This cap was anyhow phased out in early 2022.

5.c ***ARERA assessment***

5.12 ARERA assessed the 70% rule on Italian internal bidding zone borders separately for the period 1 January – 2 August (no daily computation in place, but yearly value with daily adjustments) and the period 3 August – 31 December (70% monitoring in place).

5.13 For the first period, Terna was requested to identify the limiting CNEC and to estimate the associated MACZT by the mean of off-line elaborations. Pending a dedicated grid model for Greece-Italy CCR[22], Terna employed:

- some reference scenarios adopted for the yearly calculation of the cross-zonal capacity
- the common grid models developed for Italy North CCR processes on a hourly basis

5.14 The analysis is limited to the sections where current constraints played a role (at least in some market time units)[23].

5.15 Table II (reference scenarios) and Figure 9 (Italy North CCR models) summarizes the main findings. In both cases, the margins were estimated for all the market time units where the cross-zonal capacity is limited at least by some current constraints, independent of the fact that these constraints are the only relevant one or there some other constraints (e.g. voltage ones) that matter as well. In case only voltage constraints matter, the margins were not estimated. These situations are labelled with "only voltage" in Table II and with "NA" in Figure 9. In particular in Figure 9 NA includes as well the market time units for which the estimation process failed.

[22] The capacity calculation methodology for Greece-Italy CCR indeed foresees the exploitation of the common grid model developed at European level pursuant to the CACM Regulation. Unfortunately this model become available only in late 2021 and in any case its usage for the CCR processes needs further adjustments that are suntil not in place. Pending these adjustments, each CCR develops a proper grid model for its own processes. For Greece – Italy CCR such a model has been available for each market time unit since 3 August 2021; until then only some reference models used for the yearly estimation of cross-zonal capacity had been prepared.

[23] The borders with Sicily and Sardinia are not considered since limited by stability issues and aFRR regulation issues only.

TABLE II – FINDINGS FOR INTERNAL BIDDING ZONE BORDERS UNTIL 3 AUGUST 2021 – REFERENCE SAMPLES

	NORD→ CNOR	CNOR→ NORD	CNOR→ CSUD	CSUD→ CNOR	CSUD→ SUD	SUD→ CSUD	SUD→ CALA	CALA→ SUD
>70%	3 out 4	1 out 4	2 out 4	5 out 5	6 out 8	5 out 5	2 out 2	20 out 20
<70%	0 out 4	0 out 4	0 out 4	0 out 5	2 out 8	0 out 5	0 out 2	0 out 20
Only voltage	1 out 4	3 out 4	2 out 4	0 out 5	0 out 8	0 out 5	0 out 2	0 out 20

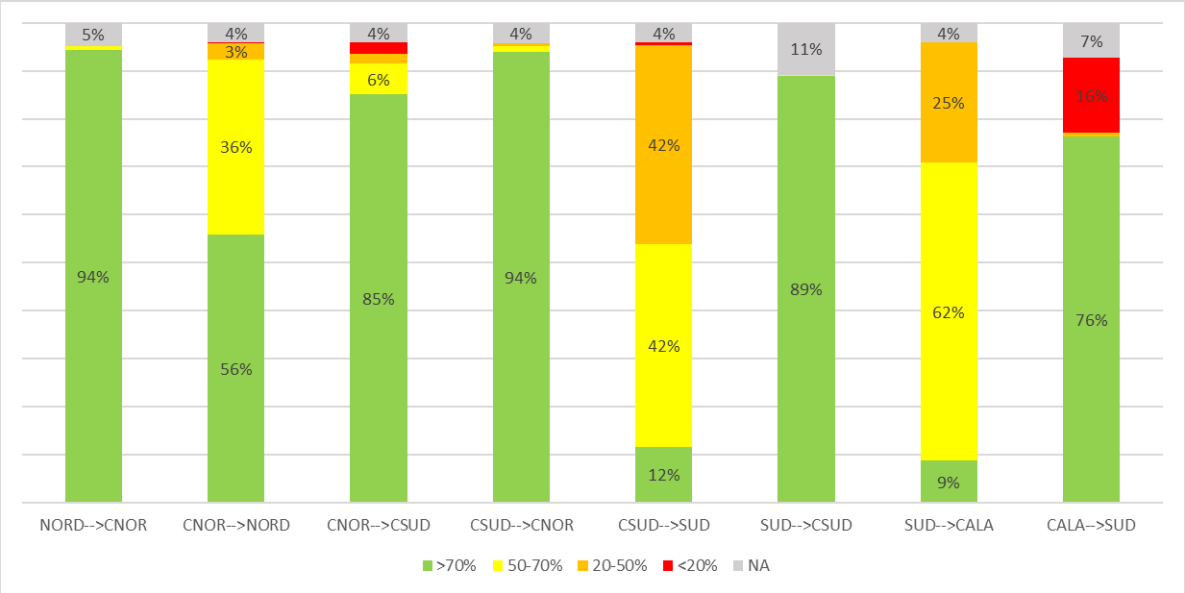

Figure 9 – ARERA assessment for Italian internal bidding zone borders until 2 August 2021 – Italy North models
source: Arera elaboration on Terna data

5.16 Looking at the reference scenarios the level of compliance seems quite high, but for the scenarios with only voltage constraints: only 2 scenarios for CSUD – SUD border (down direction) show a margin lower than 70% (but in both cases greater than 60%).

5.17 The impression is different when looking at the Italy North models. While for NORD – CNOR border, CNOR – CSUD border (both directions), SUD – CSUD border, the positive outcome is confirmed, the situation seems worse for all the other sections.

5.18 There are however specific justifications for each border. Namely:

- CNOR – NORD border is mainly limited by voltage constraints; when current constraints count as well, the associated margin often turns to be lower than 70%;;
- CSUD – SUD border and SUD – CALA border low performances are due to the fact that Italy North CCR grid models were not optimized for Greece – Italy regions[24], thus the provided results cannot be considered fully reliable;
- For CALA – SUD border the 16% of market time units with margin below 20% are associated to unavailability of network elements for maintenance.

5.19 For the period 3 August 2021 – 31 December 2021, ARERA relies on the same data set sent to ACER, complemented with some further information on the other constraints limiting the cross-zonal capacity. Namely voltage constraints are highlighted, while all the other situations (mainly stability and frequency regulation) are labelled under the generic "Additional constraint". Moreover the market time units where the process failed are given as well.

[24] In particular the main issues lie on the adoption of simplified GSK coefficients to locate the injections increase in the exporting bidding zones and the injections decrease in the importing bidding zones. This simplification did not proof consistent with the effective reality provided by the reference scenarios.

5.20 The main results are depicted in Figure 10, where the percentage values refer to the entire year in order to allow a comparison with ACER findings. In particular the pink area in Figure 8 (other constraints) shall be compared with the group of grey (failed calculation), pink (limiting voltage) and light blue (additional Constraint) areas in Figure 10.

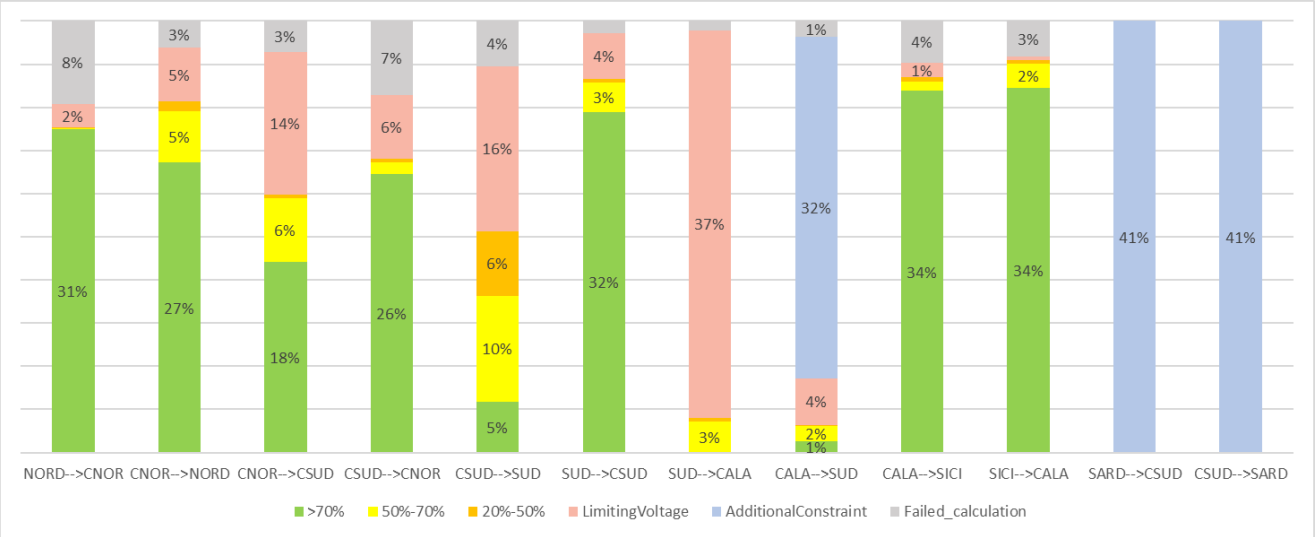

Figure 10 – ARERA assessment for Italian internal bidding zone borders since 3 August 2021 – source: Arera elaboration on Esperia data

5.21 As expected the results are fully consistent with ACER ones.

5.22 Table III reports the overall assessment for all the borders: a positive assessment is given when most of the market time units show margins greater than 70% or are characterized by voltage or additional constraints for which a reduction is allowed pursuant to Article 16(3) of Regulation 2019/943.

TABLE III – OVERALL ASSESSMENT FOR ITALIAN INTERNAL BIDDING ZONE BORDERS

	NORD→ CNOR	**CNOR→ NORD**	**CNOR→ CSUD**	**CSUD→ CNOR**	**CSUD→ SUD**	**SUD→ CSUD**
	Positive	Slightly positive	Slightly positive	Positive	To be improved	Positive

	SUD→ CALA	**CALA→ SUD**	**CALA→ SICI**	**SICI→ CALA**	**CSUD→ SARD**	**SARD→ CSUD**
	Positive with remarks	Positive with remarks	Positive	Positive	Positive	Positive

5.23 CNOR – NORD border and CNOR – CSUD border are characterized by a significant amount of market time units with current constraints below the threshold: the overall assessment is still positive, but better performances are auspicated in the incoming year. CSUD – SUD border (down direction) is by far the worst one in terms of 70% compliance. The situation needs indeed significant improvements. Nonetheless it's worth remarking that all these borders were very seldom congested[25], thus a reduced level of cross-zonal capacity had a negligible impact on the market outcome.

[25] In 2021 in Italy the energy flew from SUD to NORD, with congestions on SUD – CSUD border and on CSUD – CNOR borders. Some congestions occurred on CALA – SICI border (both directions) and on CSUD – SARD border (both directions) as well. NORD and CNOR were frequently in the same price area, with few congestions.

5.24 SUD-CALA border performed well in both directions after the daily calculation with the 70% monitoring was implemented, while the estimations on the Italy North models until 2 August 2021 were a bit disappointing. ARERA assessment is nonetheless positive since the initial estimations cannot be considered fully reliable because Italy North models were not optimized for Greece-Italy CCR. Anyhow also this border was very seldom congested.

6 Conclusions

6.1 From a pure legal perspective the granting of a derogation for Italy North CCR exempted Terna from any obligation stemming from the application of the 70% rule on Northern borders in most of the market time units. Namely Terna was fully exempted until the implementation of the 70% monitoring (i.e. until 28 October 2021) and exempted in the market time units with allocation constraints since then.

6.2 In the above mentioned situations, Terna legal compliance is thus guaranteed by definition, while in all the other cases (Italy – Greece border, Italian internal bidding zone borders and Italy North since 29 October 2021 without allocation constraints) the 70% compliance shall be properly assessed.

6.3 In Italy North CCR Terna performed quite well: after the implementation of the 70% monitoring 88% of the market time units complied with the 70% rule, while the remaining 12% were mainly due to a process failure. For 2022 ARERA auspicate that the extent of the process failures may be mitigated and that even better results are achieved.

6.4 In Greece-Italy CCR, the outstanding performances on Greece-Italy border are confirmed, despite the significant outage affecting this cable in 2021.

6.5 For the Italian bidding zone borders the borders with the lowest performances (CNOR – NORD, CNOR – CSUD and CSUD – SUD) were seldom or never congested in 2021, thus the impact of the low margins was negligible. An improvement is auspicated also in this situation, but there is no urgency since the level of congestions on these borders is expected to remain low in the near future.

6.6 ARERA also regrets that the ACER monitoring for Italy North CCR proved to be even less successful than in 2020, due to the insufficient set of data sent by Terna for the period 1 January – 28 October. ARERA understands that Terna met difficulties in preparing the data set due to internal organizational issues.. Luckily these difficulties were definitely phased out because since 29 October 2021 data have been sent by Coreso within the calculation process.

6.7 When based on consistent datasets ACER and ARERA assessments lead to pretty similar results. This occurred for Italian internal bidding zone borders only since 3 August and for Italy North CCR only since 29 October. Till then ACER were either provided with no data or with insufficient or incomplete information.

6.8 Nonetheless some differences popped up. First ARERA monitored the entire Northern borders, assessing the 70% compliance with respect to the CNECs in the coordinated capacity calculation process independent of their geographical location. ACER, instead, looked at each single border and neglected the Swiss elements.

6.9 Then, for ACER all CNECs sent by the TSOs shall have a margin greater than 70% for a positive evaluation. ARERA demonstrated in this report that in a cNTC environment a NTC valued compliant with the 70% rule is achieved when at least one fully loaded CNECs has a margin higher than 70%: this approach led to a completely different judgement with respect to ACER, especially with reference to the data until 28 October 2021 for Italy North CCR. For

that period, in fact, Terna provided both ARERA and ACER with a list of fully loaded CNECs without identifying the limiting one. Since 29 October 2021 the problem has been no longer existing since Coreso has been providing directly the limiting CNECs.