



Impact Assessment and Action Plan for the request for derogation on the implementation of the Intraday Cross-Zonal Gate Closure Time 30 minutes ahead of real time

1. Introduction

In light of increasing energy prices, price volatility and energy security concerns, the European Commission proposed a reform of the existing Electricity Market design in March 2023, aimed to support the adoption and integration of renewables, to improve protection of the consumers and to enhance industrial competitiveness. The new electricity market design rules (Regulation (EU) 2024/1747) were adopted as of 21 May 2024 and came into force on 16 July 2024.

The new reforms lays the framework to develop and improve the wholesale electricity markets which are regarded as the pathway for a robust and efficient electricity markets in Europe, offering consumers protection from the price spikes and ensuring flexibility in the electricity grid in a cost-effective manner. This further sparks the improvement or rather better utilization of intraday markets, which are important for the market parties to balance their portfolios close to the real time in view of increasing renewable energy sources and their corresponding intermittent nature. As a natural consequence, the shortening of intraday cross-zonal gate closure time (ID CZ GCT) is a significant step for unlocking the potential of intraday market, allowing market parties to trade closer to the real time allowing them to incorporate the most up-to-date forecasts for renewable generation, demand and system conditions. This improved responsiveness enhances market efficiency and helps participants better balance their portfolios, reducing exposure to imbalance costs. It allows Dutch participants to access the liquidity of neighboring markets later in the trading timeline, improving price convergence and trading opportunities.

For avoidance of doubt, the ID CZ GCT refers to the gate closure time of the continuous trading allocation (IDCT) of the Single Intraday Coupling (SIDC). The SIDC Intraday Auctions (IDAs) are out of scope as the gate closure time of the auctions are fixed at D-1 15:00, D-1 22:00 and D 10:00 as per Intraday Cross-zonal Capacity Pricing Methodology.

TenneT TSO B.V. (hereafter: "TenneT") supports moving the intraday cross-zonal gate closure time from 60 minutes – as current practice – to a maximum of 30 minutes from real time in order to achieve the benefits outlined above. There is, however, more time needed than provided for in the EMDR to do this in a way that does not endanger system security. TenneT therefore requests a derogation from this provision until this can be done in a way that system security is not endangered.

1.1. Legal basis

With the entry into force of the Electricity Market Design Reform (Regulation (EU) 2024/1747) Article 8 of Regulation 2019/943 has been amended, and the intraday gate closure time to trade energy across bidding zones has been set at not more than 30 minutes ahead of real time as of 1 January 2026.

Article 8 (1a) provides that a transmission system operator may request with its regulatory authority a derogation from the requirement of an intraday cross-zonal gate closure time maximum 30 minutes ahead of real time until 1 January 2029¹.

The derogation request shall include:

- a) an impact assessment, taking into account feedback from NEMOs and market participants concerned, demonstrating the negative impact of such a measure on the security of supply in the national electricity system, cost-efficiency, including in relation to existing balancing platforms in accordance with Regulation (EU) 2017/2195, on the integration of renewable energy and on greenhouse gas emissions; and
- b) an action plan aiming to shorten the intraday cross-zonal gate closure time to 30 minutes ahead of real time by 1 January 2029.

This request for derogation is a request of TenneT to derogate from the implementation deadline of the provisions on the maximum intraday cross-zonal gate closure time in Article 8 (1) of Regulation (EU) 2019/943 (recast) after the amendments of Regulation (EU) 2024/1747, in accordance with Article 8(1a).

This request contains a justification of the need for the derogation, an impact assessment of the requested derogation and an action plan aiming to shorten the intraday cross-zonal gate closure time to 30 minutes ahead of real time (latest) by 1 January 2027 in line with Article 8 (1a)(a) and Article (1a)(b) of Regulation (EU) 2019/943.

TenneT's request is made to ACM in accordance with Article 8(1a) of Regulation (EU) 2019/943

¹ Known derogation request from other TSOs in bidding zones adjacent to the Netherlands: Elia for BE-NL, Energinet for DK-NL and Statnett for NO-NL.

1.2. Justification for derogation

As the Dutch TSO, TenneT recognizes the need and benefits for shortening of the ID CZ GCT closer to real time. From the market perspective, the incentive for trading closer to real time allows for more interconnected European markets and better integration of the renewables sources. Furthermore, there can be some positive effects on the operations as market will close with more balanced portfolios assuming market parties can leverage from the reduced gate closure time, which would potentially result in less balancing actions needed from the system operators.

However, due to the operational risks outlined in the following sections, TenneT will not be able to support the shift to a 30-minute ID CZGCT by January 1, 2026, and therefore requests a derogation until January 1, 2027, for approval by the ACM.

In the impact assessment section, TenneT presents a rationale explaining why the implementation of a 30-minute ID CZ GCT cannot be achieved by the deadline set in the regulation. This is followed by the action plan section, which outlines the prerequisites for grid security, details the timeline for implementation and underscores the commitment to limiting the derogation period to one year.

Finally, the last section highlights dependencies on other TSOs and central systems, followed by conclusion, summarizing the key points.

2. Impact assessment

This section aims to assess the impact of shortening the ID CZ GCT to 30 minutes through a qualitative evaluation, considering existing operational risks and ongoing system developments. Given the limited data availability and the lack of operational experience with the proposed change, a quantitative assessment is not feasible, as it would require numerous assumptions due to uncertainties in market participants trading behavior.

Therefore, based on the best available information and internal expertise, the objective is to provide all relevant considerations for both market and operational impacts.

2.1. Status quo - Market dynamics with the 60 min ID CZ GCT

The Single Intraday Coupling (SIDC) Intraday Continuous Trading (IDCT) allows electricity to be traded continuously across countries in near real-time using the pan-European matching algorithm known as XBID). It helps market participants to adjust their positions closer to delivery based on updated supply, demand or grid conditions information. This XBID system supports intraday continuous trading, where buyers and sellers can match trades across borders continuously up to a certain time before delivery — the Gate Closure Time (GCT). It is important to note that IDCT does not use welfare maximization principle similar to SDAC but rather the capacity is allocated on a first come first serve basis where each trade has its own price.

Currently, the GCT for IDCT the Bidding Zone borders is set at T-60 for each 15' MTU and it's been observed that the trading behavior peaks for intraday continuous trading an hour before the delivery in SIDC IDCT as seen in Figure 1. The increase in activity an hour before ID CZ GCT indicates heightened volatility and volume, as participants try to adjust their portfolios or take advantage of last-minute opportunities with the latest available information. The trend is expected to continue with a shortened ID CZ GCT as it will provide more time for traders to balance their portfolios to account for forecast errors. However, the resulting exchange would depend on the available cross-zonal capacity T-30 before the delivery and the ability of market participants to leverage the cross-border liquidity with extended trading time.

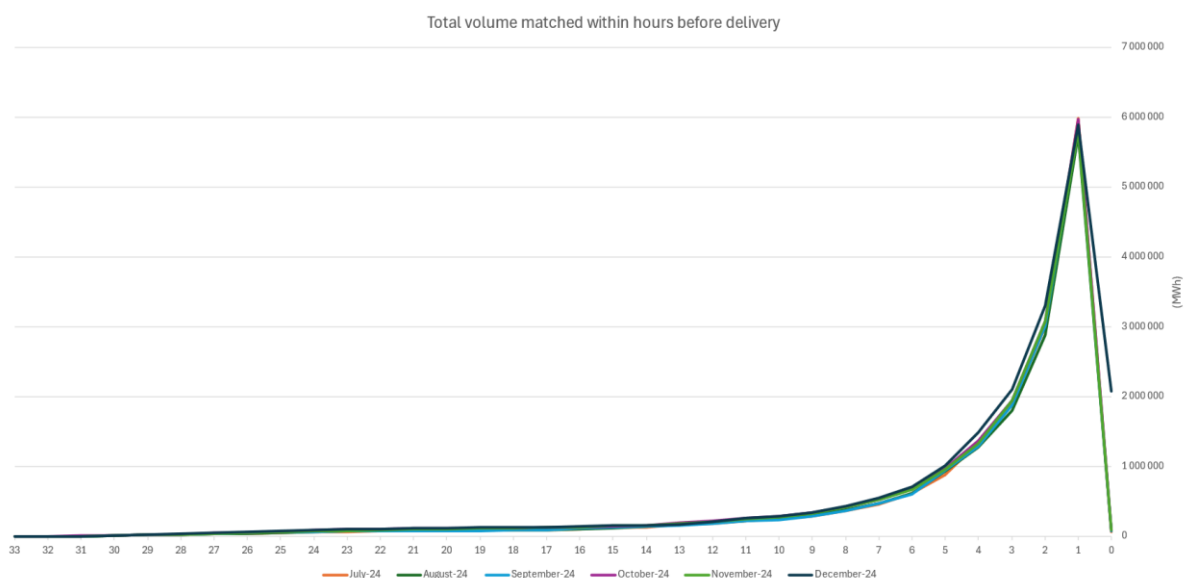


Figure 1: Total volume matched within hours before delivery in the entire SIDC, which is representative behavior for the Dutch borders.

2.2. The current local processes

After the ID CZ GCT, TenneT initiates a series of critical processes to evaluate and maintain grid stability. These processes are conducted within a 60-minute window and are essential for preparing for TenneT's real-time operation. Among several processes carried out after ID CZGCT, two processes have a critical role in operational reliability, which are Grid Security Analysis (GSA), and Congestion Management.

Grid Security Analysis

GSA main objective is to identify potential violations of operational security limits before they occur in real-time. The analysis acts as a final warning mechanism for TenneT's control center and enables system operators to assess and plan remedial actions to maintain TenneT's grid secure in a normal operation state.

GSA runs on hourly basis covering the remaining hours of the business day. The GSA process timeline is critical and is divided into 3 phases after the ID CZGCT. The first 30 minutes are used to collect cross zonal schedules and nodal forecasts. The next phase is used to create the detailed grid models for the execution of load flow analysis and contingency security analysis. This phase usually takes between 10-20 minutes depending on the mathematical complexity and remaining hours of the business day. Finally, the remaining time is used by the operators to assess and analyze the outcome of the analysis and define appropriate remedial actions if any operational security violations are identified.

Congestion Management

If the GSA detects violations of operational limits, congestion management procedures are triggered. This process involves resolving grid bottlenecks using available resources. Congestion management consists of 3 key steps: identifying available remedial actions, analyzing their effect on the congestion, and activating the remedial actions. After the ID CZGCT the available remedial actions TenneT has at its disposal are Phase Shift Transformers and topological measures. Re-dispatching is not considered a viable option, as it cannot be operationally executed within the available 60 minutes. ID CZGCT

TenneT follows a market-based redispatch system which requires time to carry out, thus it cannot be executed instantaneously. There are contractual, technical and operational procedures that limit how late it can be initiated. These limitations include start-up times of power plants and ramp-up time. Because of these constraints, TenneT activates redispatch two hours prior to the real-time hour. Hence, congestion management after the ID CZ GCT fully relies on curative remedial actions (PSTs and topological measures).

2.3. The impact of moving to a 30 min ID CZ GCT

Reducing the ID CZ GCT from 60 minutes to 30 minutes before real-time introduces significant challenges for the current operational grid security analysis and congestion management processes carried out by TenneT.

Impact on grid security analysis

Currently, the GSA for a given T-0 (real-time hour) begins at T-30 (30 minutes before real-time), using input data collected between T-60 and T-30. This input data reflects the system state as of T-60. This is illustrated in the top timeline of Figure 2.

If the gate closure is moved to T-30, and the current processes run as they currently are, then trades executed between T-60 and T-30 will not be captured in the input data used for the GSA, see bottom timeline in Figure 2. This time gap is significant because a large volume of intraday trading activity typically occurs close to the gate closure time. This will impact the GSA for the next operating/real-time hours, since these missing last-minute trades can result in unexpected violations of operational security limits in real-time which were not projected in the outcomes of the security analysis. Minimizing this risk through accurate and timely forecasting is critical to enable the operation of the grid in a normal system state.

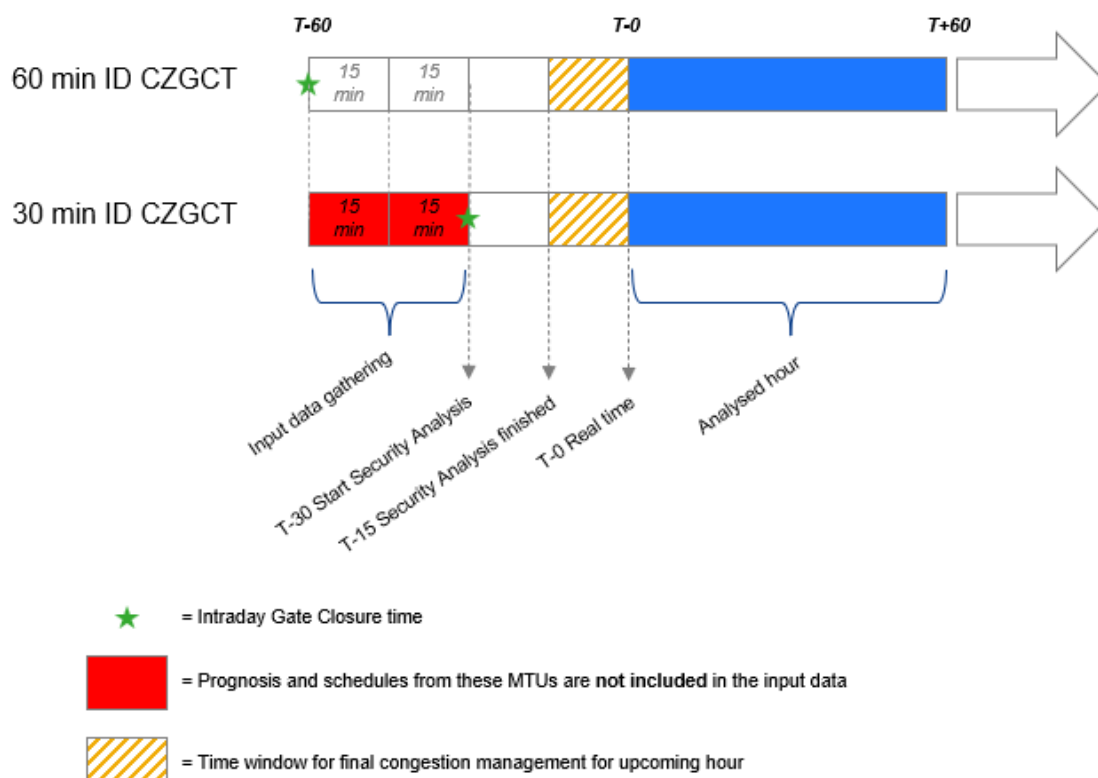


Figure 2: Current Grid security analysis process on TenneT side for both a 60 minutes and 30 minutes ID CZ GCT

Impact on congestion management

If the ID CZ GCT is shortened to 30 minutes, TenneT is forced to resolve any forecasted congestion using curative/near real time remedial actions only. These remedial actions can only be applied during or shortly before real time. This change introduced substantial operational risks, as the effectiveness of the available remedial actions are limited. Additionally, with a projected rise in real time or close to real time grid overloads, the reliance on curative/near real time remedial actions is becoming increasingly challenging.

2.4. Impact assessment

Moving to a 30 minutes ID CZ GCT at the 1st of January 2026 without a derogation will have implications. The next section aims at providing an impact assessment that should describe the risk and benefits in case TenneT NL would not request a derogation. Three indicators are part of this assessment: security of supply, cost-efficiency, and renewable integration and carbon emissions.

Security of supply

Risk

The primary risk is that sudden overloads will occur in real time as a result of the missing prognosis on all ID trades between 60 minutes and the 30 minutes ID gate closure. These overloads might not be resolved, risking a more frequent occurrence of a non-normal system state and ultimately even a partial or whole collapse of the grid. This would strongly reduce the security of supply.

Also, managing congestion that results from ID trading becomes increasingly more time consuming and is putting more pressure on operators to resolve congestions close to real time. Furthermore, the cross-zonal balancing capacities submitted to the balancing platforms (MARI and PICASSO) would be sub-optimal, meaning there could be too much or too less capacity for balancing activities. If too less capacity is offered, and there is a high need for balancing, then we can run into security of supply problems. On the contrary, if too much capacity is offered, then real-time balancing activations can result in additional overloads compounding those coming from the ID trading.

Benefits

On the contrary, TenneT expects that the growth of renewable power generation in the coming years will push the need for last minute adjustments of MPs portfolios. An ID gate closure closer to real time will allow MPs to anticipate for this during ID trading, which in turn might have a relieving effect on the need for adjustments during the balancing timeframe.

Cost efficiency

Risk

If the ID CZ GCT is reduced to 30 minutes, TenneT will face more often volatility in cross-zonal exchanges resulting from intraday trades. Without reliable forecasts and with limited curative remedial actions available in real time, TenneT may be forced to activate redispatch based on incomplete data of the expected grid situation. Hence, activation of redispatch will partly rely on the precautionary principle, compensating for the limited forecasting capabilities of the expected grid situation. Furthermore, if TenneT's grid is in a non-normal system state, intraday trading will be interrupted to restore normal operations. Such interruptions will come at the expense of market efficiency.

Benefits

Less cost incurred by TenneT due to less balancing actions needed as market open with more balanced portfolios due to availability of improved forecasts, which would also lead to lower imbalance prices.

Renewable energy integration and carbon emissions

Risk

Intraday trades just before GCT could materialize in congestions that TenneT cannot solve through re-dispatching. Although it is TenneT's intention to avoid curtailment of renewables generation, without other available remedial actions the curtailment of renewables power generation will increase.

Benefits

An inherent property of renewable energy sources is the quality of the power output forecast. Within the last hour before real time this forecasted values can change, especially for solar power. A closer to real time gate closure will allow owners of such renewable generation assets to adjust their market position based on more accurate forecast. As such, this is facilitating the integration of renewable energy in the market. Additionally, optimal usage of renewables generation assets positively impacts CO2 emissions.

3. Action plan

3.1. The need for an action plan

To facilitate the shift from a 60 minutes gate closure time towards a 30 minutes gate closure time in the future, TenneT will define an action plan pursuant to the regulation. The action plan contains two key requirements for TenneT to be fulfilled in order to shift the ID cross-zonal gate closure to 30 minutes before real time. Firstly, a fast grid security analysis process based on the ID trades at GCT. Secondly, TenneT is locally running a project to enhance the role of curative remedial actions in the control room processes.

3.2. Requirements for shifting to a 30 minutes ID CZ GCT

Upgrade of the grid security analysis

It is TenneT's aim to have a faster operational security analysis that fits within the tight margin of 30 minutes. The data gathering as well as the computation time should be performed in period of 20-25 minutes, with 5-10 minutes remaining for operators to act upon the outcomes.

The main characteristics of this upgraded operational security analysis are the following:

- A 15 minutes granularity (today it still is hourly), which is identical to the 15 minutes based MTU.
- The execution frequency of the process will be each 15 minutes, totaling 96 computations per day.
- Input data is based on the final cross zonal schedules and forecasts after ID GCT should be considered as input for the computations,
- Fast creation of the grid models for each remaining MTU of the day.
- Fast computation of the load flows and contingencies

Decision making for curative/near real-time remedial actions

When overloads are detected in real time or when the grid security analysis detects violations of operational security limits the congestion management process will be initiated. In a matter of minutes decisions on the activation of remedial actions have to be made. With the introduction of the 30 min ID CZ GCT, there is increased pressure support operators with a high pace decision making process for remedial actions. The requirements for TenneT are sufficient available curative remedial actions as well as tooling to compute which remedial actions would be most effective in resolving the overload. Operators would be enabled to swiftly respond and resolve sudden overloads.

3.3. Timeline for implementation

Designing a new operational grid security analysis process that meets the above characteristics requires development within the IT landscape and tooling, as well as procedural changes. Hence, TenneT initiated a project to establish this, which started already years ago. The complexity and interdependencies with ongoing developments in other processes are affecting the timeline. Based on the current progress made in the development of the new ID operational security process, TenneT projects the go-live in H2-2026. A more detailed timeline is presented below in Figure 3.

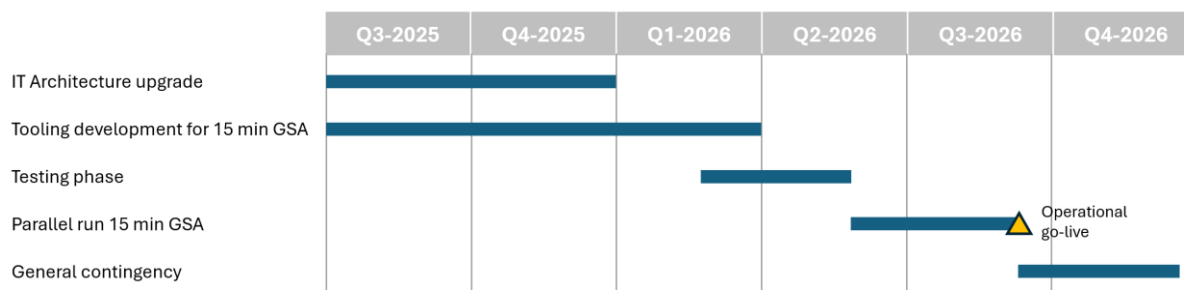


Figure 3: Implementation timelines for the new Intraday Grid Security Analysis process