

Transparency of system operators on cross-border exchange capacities: a survey paper

A Eurelectric position paper

February 2020

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We stand for

The vision of the European power sector is to enable and sustain:

- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

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KEY MESSAGES

- Eurelectric members feel that extensive transparency approaches by system operators should be promoted to support efficient power systems operation by fostering the capability of market parties to improve price forecast accuracy and make thereby informed investment decisions. This is an essential condition for economic efficiency of the European integrated markets.
- Eurelectric conducted therefore a survey of transparency practices by European TSOs, with respect to different time frames (long term, day-ahead, and intraday) and dimensions (inputs and outputs) of the calculation of cross-zonal capacities.
- The survey identified advances by some European TSOs in terms of transparency, in particular with respect to DA capacity calculation and forecasted redispatching volumes. However, the transparency level remains a major concern in all capacity calculation regions before the DA time frame.
- This finding motivates three main recommendations towards European TSOs:
 - **Key recommendation 1**
Disclose all details related to DA and ID capacity calculation: for every CNEC, publication of forecasted flows, f_{max} , PTDF, forecasted setting of remedial actions, forecasted margins on allocation constraints, and the GSK of each bidding zone of every capacity calculation region.
 - **Key recommendation 2**
Publish forecasted cross-zonal exchange capacities ahead of day ahead, at least week ahead, month ahead, season ahead, and year ahead. Timely information on lines and transformers' outages is also crucial.
 - **Key recommendation 3**
Advance towards input based approaches of transparency, with the publication of the Common Grid Models used by Regional Coordination Centres in the various processes before day ahead.
- These data should be published consistently by all TSOs, ideally on one platform, to ensure every market participant have non-discriminatory and easy access to needed data.
- Eurelectric considers that transparency on cross-zonal capacities should be one of the roles of the Regional Coordination Centres. Eurelectric acknowledges (and regrets) that such a role is not mandated by the Electricity Regulation 2019/943, but believes that TSOs and regulators should voluntarily increase the range of coordinated operations to include this strategic task and dedicate the means corresponding to the related gain in economic efficiency. Until RCC assume this role, TSOs should publish above mentioned data themselves in a transparent and open manner.

Introduction

The Electricity Regulation (No 2019/943) defines a *market participant* as a natural or legal person who buys, sells or generates electricity, who is engaged in aggregation or who is an operator of demand response or energy storage services, including through the placing of orders to trade, in one or more electricity markets, including in balancing energy markets.

The Electricity Directive (No 2019/944) defines a *transmission system operator* as a natural or legal person who is responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity;

Although definitions describe different roles, there might be overlaps (highlighted in REMIT Regulation 1227/2011), when a transmission system operator (TSO) places orders in one or more electricity markets to fulfil its responsibilities. In this respect, every TSO should be considered as a market participant that must be subject to the same level of information as its counterparts.

Also, transmission system operators are frequently presented as a market facilitator (in the sense of organizing the availability of the infrastructure, calculating cross-border exchange capacities and paving the way for market operators to select the most efficient bids). To fulfil this task effectively, TSOs must deliver complete and timely information on cross-zonal exchanges allowing market participants to take the most efficient decisions.

In particular, market participants entail risks that take different forms (volume, price, counterparty, regulatory,...). Hedging those risks to secure future revenues/expenses can be achieved by developing price forecasting tools. Forecasting capabilities cannot be developed without understanding how the prices are formed. Therefore, market parties need extended transparency from the TSOs on the parameters impacting the price of capacity and energy along the different timeframes.

Evolutions of cross-zonal exchange capacities and potential restrictions on generation/demand output due to internal bottlenecks have significant influence on market price formation. Ensuring transparency on these dimensions is therefore of paramount importance to allow for an efficient functioning of electricity markets across the Union.

The REMIT Regulation (No 1227/2011) mandates transparency by system operators, which should ensure “equal access to information on the physical status and efficiency of the system is necessary to enable all market participants to assess the overall demand and supply situation and identify the reasons for fluctuations in the wholesale price”. In particular, TSOs have to publish inside information, defined as “information of a precise nature which has not been made public, which relates, directly or indirectly, to one or more wholesale energy products and which, if it were made public, would be likely to significantly affect the prices of those wholesale energy products”.

In Eurelectric’s view, events leading to evolutions of cross-zonal capacities are likely to affect wholesale market prices. They should thus be subject to the same approach in terms of transparency, as what would be expected from generation, storage, or demand assets.

In addition, the Transparency Regulation (No 543/2013) mandates that TSOs must publish any unavailability of transmission assets with an impact on cross-zonal capacities greater than 100 MW, and details the expected impact of the event in terms of cross-zonal capacities.

Furthermore, transparency requirements are also referred in the electricity guidelines and network codes, e.g. CACM guideline (No 2015/1222) or electricity balancing guideline (No 2017/219), as a set of requirements to be included in methodologies. However, the methodologies developed so far have not detailed any principle on how the transparency requirements could be addressed by TSOs in a coordinated manner. Eurelectric advocates therefore for stronger transparency requirements to be included in future CACM and FCA recasts.

Despite efforts by some TSOs to cope with these sets of obligations, the transparency level, when put into practice, varies significantly. Market participants remain sometimes uninformed, or incompletely informed (e.g. on network outages and their expected impacts) and are therefore unable to develop relevant price forecasts.

Eurelectric members feel that extensive transparency approaches by system operators should be promoted. Not only to comply with the requirements from European regulations, but also to support efficient power systems operation by fostering the capability of market parties to improve price forecast accuracy, and to make informed investment decisions. This will ensure overall system security and customers' satisfaction at lowest cost. In this respect, Eurelectric encourages TSOs to commit themselves to a proactive and ambitious transparency approach on price sensitive data and methodologies, so that the TSOs fulfil their role of market facilitators, beyond the mere legal requirements they have to comply with.

This paper focuses on the specific transparency requirements which we believe are necessary for well-functioning electricity markets, providing correct investment signals. The second part of the document contains an analysis of the level of transparency achieved by the European TSOs according to different dimensions. Based on a survey of the current status of transparency of each TSO, we identify best practices, and promising directions for further development of transparency practices by the European TSOs.

1. Why transparency is needed

According to the Electricity Regulation 2019/943, market participants are balance responsible parties themselves, or delegate this responsibility to third party. In this regard, many market participants are in charge of taking operational decisions for generation, storage, or demand response assets, or hedging actions in the market, based on price signals. To make efficient decisions, BRPs need markets to set electricity prices that accurately reflect the physical capabilities of the available infrastructure, in particular the cross-zonal exchange capacities. In this regard, it is key that parties contributing to price formation at any time before delivery can rely on accurate forecasts of the expected situation for every market time unit.

Cross-border exchange capacities are a major driver for the price formation in electricity markets. Network codes mandated by Regulation 2009/714 have led to the development, and ongoing implementation, of more advanced coordinated capacity calculation methodologies. Those will allow for the maximization of the cross-zonal capacities, which may become more variable, as they should be suited to changing operation conditions.

It is therefore of paramount importance that transparency approaches evolve to fulfil the needs of market participants and allow them to make efficient decisions.

a. Transparency favours efficient market functioning for all

Transparency related to cross-zonal exchange capacities aims at allowing market participants to develop more accurate price forecasts.

Price forecasting is a competitive activity that can be performed by market participants themselves, or by service providers working for entities that do not have sufficient know-how to process with forecasting themselves. Increasing transparency will improve the service of price forecasting companies as much as it will help utilities to develop forecasts on their own.

More accurate forecasts will also be useful to drive (forward) price formation towards values that reflect with more confidence the expected real time value of energy.

b. Increasing transparency has little cost

Publishing sufficient information for market participants to build price forecast does not require massive IT investments from TSOs. Actually, most of the needed information exists and is already used by TSOs to manage the grid and perform security assessment and capacity calculation.

Eurelectric believes that publishing this information for professional use will not require major costs to upload and maintain records of past forecasts for the necessary period of time. Those costs are collectively covered when they allow for an efficient management of resources when the system is close to scarcity and make it possible to avoid entering an emergency.

2. Which transparency do market participants need?

As mentioned earlier, market participants foremost need transparency related to cross-zonal exchange capacities. In line with the requirements on generation units, Eurelectric considers that full transparency on cross-zonal exchange capacities is needed with a 3-year time horizon.

The main factors driving changes in cross-zonal exchange capacities – which in turn are very important factors for price determination – are:

- Shifts in geographical distribution of forecasted generation and demand in every bidding zone (e.g. leading to changes in the reference flows, and Generation/Load Shift Key). TSOs are responsible for the quality of their forecasts, to be included in their individual grid model (then merged into a common grid model) that serves for the calculation of cross-zonal capacities;
- Availability of transmission assets (outage planning).
- Operational decisions in terms of non-costly remedial actions (e.g. network topology, setting of HVDC links, tap changers of transformers, setting of phase shifter transformers,...) and costly remedial actions (e.g. redispatching & countertrading).
- Operational decisions in terms of handling strained situations – predictability (e.g. case when TSOs can take emergency-related decisions affecting cross-zonal exchanges such as the activation of resources that are usually not dispatched based on market signals).

To fulfil the needs of market participants in terms of forecasting cross-zonal capacities for delivery between present and 3 years ahead, TSOs can apply one of the following approaches:

- **Systematic input-based transparency** on cross-zonal capacities: TSOs publish all forecasted inputs for the calculation of cross-zonal exchange capacities (NTCs or flow-based domain). The set of all inputs is complete if it allows stakeholders to perform load flow calculations and assess whether critical network elements might be congested. Transparency of operational decisions, especially if leading to decrease of cross-zonal capacities during validation process, should also be included. This systematic publication is crucial in order for market participants to understand where the determined level of cross-zonal capacities comes from. They should be able to identify why in a specific situation the calculated capacities were at this or that level. This will allow them to make their own forecast for the future situations and hence, make the best decisions for their assets and for their hedging actions.
- **Output-based transparency** on cross-zonal capacities: TSOs publish forecasted values of cross-zonal exchange capacities (NTCs or flow-based domain).

In both cases, TSOs should also publish the cross-zonal capacities effectively applied (after all final calculation and validation processes) in each capacity allocation process. Those are then reported in the ENTSOE transparency platform.

Eurelectric notes that the transparency approach implemented by each TSO for each bidding zone border has been subject to little discussion in terms of strategy, neither at European, nor at regional or national level.

Eurelectric has a strong preference for the systematic input-based approach that opens a wide range of opportunities for innovation and business development in the area of price and cross-zonal exchange capacity forecasting.

Eurelectric acknowledges that different approaches might be applied depending on the forecasting horizon. For example, some TSOs might provide output-based transparency between day ahead and real time (i.e. during this period, the forecasted capacity is equal to the day-ahead forecasted NTC), and prefer input-based transparency from year-3 through day -2.

3. Transparency by European TSOs

Eurelectric acknowledges that many developments have been implemented by European TSOs to address the needs of investors, utilities, and market participants. However, these developments have resulted in a patchwork of data, format, and platforms with significant differences across borders.

Market participants would certainly welcome an alignment of these approaches towards the best practices in the place, keeping in mind that more transparency than the minimum legal requirement reinforces stakeholders' trust, and can only be seen as positive.

Eurelectric has therefore initiated a survey, collecting feedbacks from European utilities and traders on the level of transparency achieved in various regions, with the aim to select best practices. The survey is reported in Annex I of this report, and the learnings from feedbacks are detailed hereafter.

To ease the reading, and because approaches by European TSOs can be radically different, we performed distinct assessments of i) "short-term forecast" for data communicated in the last 48 hours before the related imbalance settlement period, and ii) "long-term forecast" for data communicated ahead of the short-term.

a. Short-term forecast of cross-zonal capacities

All European TSOs apply the output-based approach to disclose information on short-term forecasts of cross-zonal capacities. TSOs must indeed calculate (generally during the night between D-2 and D-1) and allocate capacities at least through single day-ahead and intraday market couplings. They tend to communicate those commercial capacities as such, somewhere with complementary details on the inputs of a capacity calculation.

Those cross-zonal exchange capacities can reasonably be considered as the best available forecast of cross-zonal capacity as seen from the late D-2 (as from the DA Firmness Deadline, cross-zonal exchange capacities become firm), except when they are set at an administratively-high level that may require corrections closer to delivery (e.g. the 70% rule in the Regulation 2019/943). Such a practice may indeed lead to massive volumes of cross-border redispatching & countertrading, which will ultimately reduce the amount of energy that can be transferred between bidding zones.

To assess the transparency level, we have reviewed four dimensions:

i. Publication of available cross-zonal exchange capacities at 8.00 (CET) DA

TSOs generally publish the net cross-zonal exchange capacities before 8.00 in day-ahead. They also inform market participants by 10.30 in day-ahead about the available cross-zonal exchange capacities to be allocated with the single day-ahead coupling, taking into account effective nominations of long term rights. We note that this practice is in line with the requirements of the CACM Guideline.

Examples of borders with good practices: CH borders, Channel, CWE, Nordic, SWE, North Italy, Greece Italy

Examples of borders where improvement are expected: CORE region borders with NTC allocation

Best practices to be developed:

- For CWE borders, TSOs publish on jao.eu the flow-based domain and provide details on which critical network element or specific allocation constraint might limit cross-zonal exchanges and to which extent its remaining available margin has been extended based on administrative rules (e.g. 20% minRAM), this extra information is useful and should be delivered on all borders.
- For CWE borders, TSOs publish ex-post full details on the RAM calculation for each CNE, even when the CNE was not constraining the flow-based domain.

Further information needed:

- Eurelectric recommends TSOs to publish as soon as 8.00 (CET) DA the forecasted configuration of non-costly remedial actions (notably the PST tap settings and forecasted flows through HVDC links) and the reason why the configuration goes out of the normal operational range (if any). This might indeed be helpful for market participants to forecast the likelihood of reductions/increases in cross-zonal capacities in the intraday time frame.

Examples of portals delivering day-ahead cross-zonal exchange capacity forecasts:

- www.jao.eu
- www.transparency.entsoe.eu
- www.esios.ree.es
- <http://www.nucs.net/>
- <https://www.swissgrid.ch/de/home/customers/topics/congestion-mgmt/ntc/d-2-ntc.html>
- <https://www.terna.it/it/sistema-elettrico/mercato-elettrico/zome-mercato/stima-domanda-oraria-energia-elettrica-limiti-capacita-trasporto>

ii. Publication of ID evolutions (if any) of available cross-zonal capacities

TSOs generally publish the unallocated cross-zonal exchange capacities (i.e. leftovers of the day-ahead ATC) as a side product of the day-ahead clearing.

Recalculations apply to several borders only as of today, but such practices are likely to be further implemented, with the progressive implementation of the CACM guideline. When recalculations are performed, in the late DA afternoon, updates of the net cross-zonal exchange capacities are published ahead of a local ID auction or ahead of the opening of ID cross-zonal capacity allocation within the continuous market.

Market participants may access information on available transfer capacity (i.e. net transfer capacity minus already allocated transfer capacity) in real time during continuous markets, through NEMOs information platforms. A complementary publication of the latest update of the NTC per border would also be useful.

Examples of borders with good practices: CWE (for transparency matters, concerns remain on the capacity calculation process), SWE

Examples of borders where improvement are expected:

- results of the intraday recalculation of cross-zonal exchange capacities in the Italy North regions are not published yet before the subsequent auction.

- intraday capacity recalculation, leading to evolutions of the available cross-zonal capacities, are not applied yet on the other borders.

Best practices to be developed:

- No best practice, as the TSOs only publish updated ATC values with no further details.

Further information needed:

- Like for the DA capacity calculation, TSOs could publish the updated flow-based (or NTC) domain and provide details on which critical network element or specific allocation constraint might limit cross-zonal exchanges and to which extent its remaining available margin has been extended based on administrative rules (e.g. 20% min RAM) or to include scheduled exchanges, this extra information is useful and should be delivered on all borders.
- Updates of non-costly remedial actions should also be published.

Examples of portals delivering intraday cross-zonal exchange capacity forecasts:

- www.jao.eu
- www.transparency.entsoe.eu (unfortunately this information seems only available ex-post)
- www.esios.ree.es

iii. **Publication of provisional volumes of countertrading:**

We refer here¹ to countertrading to describe the situation where TSOs schedule a cross-zonal exchange from a bidding zone with higher energy price to a bidding zone with lower energy price (hence, in a counter-intuitive direction) and reduce simultaneously the corresponding net cross-zonal capacity. It is applied on several borders as of today (e.g. ES/FR, DkW/DE, GB/FR) and could be more intensively applied with the application of the 70% rule in capacity calculation mandated by the Electricity Regulation 2019/943.

It represents de facto a reduction of the net cross-zonal capacity between the bidding zones. Therefore, the identification of constraints likely to be addressed with countertrading actions is a price sensitive information.

Eurelectric would thus expect that such information should be published on transparency platforms ex-ante, as soon as a (coordinated) security analysis identifies a potential issue on a network element sensitive to cross-zonal exchanges. Those principles should apply to security analysis performed both before the day-ahead market coupling and in the intraday time frame.

This information should be published before TSOs implement countertrading by buying/selling energy in each bidding zone, as a market participant.

Examples of borders with good practices:

- We could not identify any TSO that publishes the information ex-ante, before procuring the countertrading energy, and even before delivery.

¹ We note that this definition of countertrading may differ from the definition developed by TSOs in the recent consultations on the Article 76 of the System Operation Guideline.

Examples of borders where improvement are expected:

- BE/FR, BE/GB, BE/NL, CH/AT, CH/DE, CH/FR, DE/DK, ES/FR, SI/SE, FR/GB, IE/GB

Best practices to be developed:

- Some TSOs (e.g. RTE, German TSOs under netztransparenz.de, PSE) publish ex-post detailed activated volumes of countertrading during each imbalance settlement period.

Further information needed:

- Eurelectric expects TSOs to publish forecasted volumes of countertrading well ahead of delivery, as soon as a potential congestion on a network element sensitive to cross-zonal exchanges is identified, and not only ex-post.
- TSOs should also inform the markets about the cause of these activations, i.e. what is the type and location of the related congestion.
- Potential countertrading activations could also be published as a side product of day-ahead and intraday capacity calculations.
- Realized volumes and costs of countertrading should be published ex-post for every imbalance settlement period.

Examples of portals delivering figures on countertrading:

- www.netztransparenz.de
- <https://www.fingrid.fi/en/electricity-market/market-integration/countertrade/>
www.transparency.entsoe.eu
- <https://www.pse.pl/dane-systemowe>

iv. Publication of provisional volumes of redispatching:

We refer here to redispatching to describe the situation where TSOs request a change in the dispatch of a specific unit to address a congestion, based on its respective location.

This change requires generally that a complementary action is taken to restore the balance. The complementary action can be either a second symmetrical redispatching action, or along the merit order (e.g. the TSO relies on a request for quotes to transfer the position to a trading entity, takes a position directly in the ID or DA markets, or updates the demand for balancing energy activations). In the latter case, the complementary action may impact the energy prices and cross-zonal exchanges.

Therefore, the identification of constraints likely to be addressed with a significant volume of redispatching actions might be a price sensitive information. Eurelectric would thus expect that network operators should publish ex-ante a forecast of the aggregated volume of redispatching actions at bidding zone level, as soon as a security analysis identifies a situation where potential congestion may require an aggregated volume of redispatching above 100 MW. This information should also be published before TSOs implement the redispatching actions.

Examples of control areas with good practices:

- German TSOs publish, under netztransparenz.de, the provisional volumes of RES curtailment as soon as during the DA afternoon, with frequent updates before delivery. There might remain

some concerns about the accuracy of the information, but it should be noted that the approach is positive.

- The GB TSO publishes, under the Elexon platform, the forecasted and realized volumes of redispatching, as well as the price paid for each redispatching action.

Examples of control areas where improvement are expected:

- In the other control areas under review, TSOs publish ex-post activated volumes only (with no information on the congested network element).
- Also, cost figures to address the congestions could be disclosed with a very broad granularity.

Best practices to be developed:

- Eurelectric believes that TSOs should uncover information about likely constraints identified with the regional security analysis, and the potential volumes of redispatching as soon as they are forecasted.

Further information needed:

- Eurelectric expects TSOs to publish forecasted volumes of redispatching volumes at bidding-zone level well ahead of delivery, as soon as a potential congestion is identified, and not only ex post;
- TSOs should also inform the markets about the cause of these activations, i.e. what is the type and location of the related congestions.
- Potential redispatching activations could also be published as a side product of day-ahead and intraday capacity calculations, taking into account to which extend the administrative constraints on capacity calculations (i.e. the 70% rule) and/or the principle of maintaining already allocated cross-zonal capacities will require a later activation of costly remedial actions.
- Realized volumes and costs of redispatching should be published ex-post for every imbalance settlement period.

Examples of portals delivering figures on redispatching :

- www.netztransparenz.de

v. Publication of non-costly remedial action

Several TSOs publish useful details on the capacity calculation parameters and outcomes. For instance, they may publish all or part (the most constraining ones) of the critical network elements, with further information on the reference flow through each element, the influence factors of the cross-zonal exchanges within the region, etc. This information is useful for market participant to identify the bottlenecks and build up forecasts for the forthcoming delivery days. However, all this information is highly dependent on the actual setting of the non-costly remedial actions (e.g. network topology, setting of each phase-shifter transformer, setting of each HVDC link) selected by the TSOs while performing the capacity calculation.

To improve transparency further, and allow market participants to make the best use of the information that is published, market participants believe that TSOs should also release information on non-costly remedial actions, and in particular on the setting of phase shifter transformers and HVDC links in the reference situation.

Examples of control areas with good practices:

- As of today, we have not identified any TSO performing such a publication.

Best practices to be developed:

- Eurelectric believes that TSOs should uncover information on scheduled settings for the network operation that will make it possible to take maximum learning out of the other publication. In particular, the setting of HVDC links, tap changers of transformers, setting of phase shifter transformers. This should not require major costs.

b. Long-term forecast of cross-zonal capacities

Eurelectric advocates that transparency is necessary in the three years before delivery. In line with this need, legal transparency requirements apply to all inside information about the availability of assets and cross-border exchange capacities within the next 3 years.

In such a term, TSOs apply different approaches to forecast cross-zonal capacities. The choice of the approach seems to depend on the actual capacity calculation methodology applied to the respective borders:

- Where day-ahead cross-zonal capacities are relatively stable despite variations in context (e.g. availability of the infrastructure, level and location of demand and RES location within the bidding zones), TSOs tend to publish expected cross-zonal capacities on a yearly basis (output-based approach) with possible updates when the context evolves significantly;
- Where day-ahead cross-zonal capacities are more dynamic with respect to variations in context, TSOs may also disclose some information (e.g. network topology, forecasted flows and imitations on critical network elements for a set of realistic scenarios,...) that will make it possible for stakeholders to build their own forecast (input-based approach).

Stakeholders can rely on such forecasted outputs or inputs, and derive their own forecasts, including statistical analysis of past cross-zonal exchanges capacities and parameters (where they are finely published ex-post).

i. Output-based approach:

For most borders, transparency on future cross-zonal capacities is output-based, with TSOs providing information on provisional volumes of cross-zonal capacities.

This information is usually published year ahead, with possible updates month-ahead. As of today, such updates are very rare. However, market participants would need such updates for each event leading to potentially significant evolution of cross-zonal capacities: change in the expected availability of the transmission assets (outage) or shift in the respective locational distribution of generation and demand. In such cases, updated forecasts of the NTCs or flow-based domains for each future market time unit should be published as early as the impact assessment can be performed. Market participants would appreciate, monthly, bi-weekly and weekly updates.

Examples of borders with good practices:

- The Romanian, Slovak, French TSOs publish good forecasts
- CWE has developed the SPAIC approach, which allows for an impact assessment of different types of context changes, a few weeks before their application. We could recommend a more systematic approach of SPAIC with monthly simulations of cross-zonal capacities for a limited

number of benchmark hours for each of the 12 forthcoming months, including all forecasted evolutions in context.

Examples of borders where improvement are expected:

- Some updates of cross-zonal capacities are published for SWE borders, but with no systematic approach, and relatively long delays (e.g. reduction in NTC at the FR/ES border in 2019).
- Likewise, PSE publishes information on planned outages and forecasted NTCs with some delays and lack of clarity
- CH borders: Swissgrid publishes NTC forecasts M-6 (significant uncertainties) and M-1 (good quality), but with no explanation on potential limitations,
- Poor information and quite high volatility of predicted values for several CORE NTC borders.

Best practices to be developed:

- Eurelectric encourages TSOs to develop systematic impact assessment of planned outages, change in operational practices, or any significant change in context likely to impact cross-zonal capacities. Approaches like the SPAIC process in CWE might be promising, but their use would need to be generalized.

Further information needed:

- Eurelectric believes that TSOs should provide market participants with more frequent and reliable updates of forecasted NTCs as well as input information on outages of 200 kV and 400 kV lines. It might even be one of the roles of RCCs to prepare and disclose such forecasts in a timely manner.
- Changes in forecasts should always mention which planned outages are considered.

Examples of portals delivering figures on forecasted long-term cross-zonal exchange capacities:

- www.transparency.entsoe.eu

ii. Input-based approach:

Eurelectric notes that hybrid approach has been discussed in the Core Consultative Group and the CWE Consultative Group since 2015. It acknowledges the TSOs' desire not to publish injections/withdrawal forecasts by node, nor detailed operational data such as PST settings or busbar topology. Instead, the aim is to publish a subset of simulated flows and structural data from the TSOs' load flow model which Market Parties could use to build simplified statistical models. Unfortunately, this effort has been hindered by a slow IT implementation; a first stage requested by the NRAs as of 01/06/17 contains a lot of duplicates and imprecise labels; a second stage requested by the NRAs as of 01/06/19 has been delayed.

What does the market need?

Market parties would need TSOs to publish:

- A static grid model setting reference names for grid elements and main static characteristics of the infrastructure for the different forecast horizons. The CGM used in capacity calculation could be the right level of information;

- Every time an event is likely to trigger a significant evolution of cross-zonal capacities. AT triggering event being e.g. a change in the expected availability of the transmission assets (outage), a shift in the respective locational distribution of generation and demand.

5. Conclusion and recommendations

Despite unilateral advances by some European TSOs, Eurelectric is highly concerned with the overall insufficiency in transparency on cross-zonal exchange capacities, as reported in ACER's market monitoring report 2018 (See Figure 1 below). Even in regions with a good score, significant improvements that go beyond legal requirements could be achieved.

Insufficient transparency has dramatic consequences, as it impedes market participants to make good price forecasts, which is necessary to i) trade efficiently before the day-ahead auction, and ii) take the most efficient investment and operational decisions. This has direct impact on electricity prices for consumers.

Table 5: Detailed scoring of the regions per sub-aspect examined as of June 2019

	Sub-aspect	Region									
		Baltic	Channel	Core	GRIT	Hansa	IU	Nordic	SEE	SWE	Average
CACM coverage	General Proceedings	50%	25%	100%	50%	38%	50%	50%	63%	50%	53%
	Input to capacity calculation	52%	0%	0%	0%	0%	0%	0%	0%	0%	6%
	Capacity calculation	46%	62%	96%	60%	84%	85%	96%	88%	73%	77%
	Average CACM coverage	49%	63%	95%	61%	76%	67%	86%	85%	67%	72%
Detail and Harmonisation	GSK	20%	36%	55%	27%	N.A.	36%	45%	45%	36%	38%
	Operational security limits	0%	50%	73%	38%	17%	50%	33%	63%	17%	38%
	Allocation constraints	30%	67%	90%	14%	75%	44%	60%	100%	100%	64%
	Reliability margin	36%	62%	100%	100%	88%	100%	100%	54%	50%	77%
	Remedial actions	0%	25%	100%	25%	13%	25%	38%	71%	25%	36%
	PTDF(1)	N.A.	N.A.	100%	N.A.	N.A.	N.A.	100%	N.A.	N.A.	100%
	DA process(2)	25%	50%	100%	63%	38%	63%	75%	75%	50%	60%
	ID process(3)	25%	50%	88%	63%	38%	63%	88%	86%	50%	61%
	Average Detail and Harmonisation	19%	49%	88%	47%	44%	54%	67%	71%	47%	54%
	Principle 1(4)	67%	67%	50%	0%	100%	33%	50%	67%	67%	56%
Non-Discrimination	Principle 2(5)	25%	100%	100%	25%	33%	33%	25%	25%	25%	44%
	Flows from other CCRs	100%	0%	100%	0%	100%	0%	100%	100%	100%	67%
	Average Non-Discrimination	58%	71%	88%	14%	88%	28%	48%	58%	58%	58%
	Publication of data	40%	20%	100%	0%	0%	0%	20%	100%	20%	32%
Transparency and Enforceability	Enforceability	0%	67%	100%	100%	100%	33%	67%	100%	33%	67%
	Average Transparency and Enforceability	25%	38%	100%	38%	17%	13%	38%	100%	25%	44%
Total		36%	55%	92%	40%	49%	41%	58%	76%	47%	55%

Source: ACER.

Figure 1. ACER's assessment of transparency practices in specific capacity calculation regions (as reported in its market monitoring report 2018).

Eurelectric calls therefore for a **fast move by all transmission system operators, regulators, and policy makers in Europe to implement the best practices already applied by the best-in-class transmission system operators.**

From this perspective, Eurelectric highlights the following list of key recommendations.

Key recommendation 1

Disclose all details related to DA and ID capacity calculation: for every CNEC, publication of forecasted flows, Fmax, PTDF, forecasted setting of remedial actions, forecasted margins on allocation constraints, and the GSK of each bidding zone in every capacity calculation region.

Key recommendation 2

Publish forecasted cross-zonal exchange capacities ahead of day-ahead should be a role of Regional Coordination Centres. Eurelectric acknowledges (and regrets) that it is not made mandatory by the Electricity Regulation 2019/943, but believes that TSOs and regulators should voluntarily increase the range of coordinated operations to include this strategic task and dedicate the means corresponding to the related gain in economic efficiency.

Key recommendation 3

Advance towards input-based approaches of transparency. Eurelectric warmly welcomes detailed publications of parameters and outputs of the capacity calculation process, as it is already developed in the most-advanced regions. We highlight that such publication has induced no issue in terms of security or competition. This approach should be further encouraged and developed, with TSOs/RCCs publishing settings of remedial actions considered in the capacity calculation process in ID, DA, and for longer-term forecasts as mentioned under recommendation 2. In particular, Eurelectric believes that the Common Grid Models used as input for regional coordination should be publicly disclosed, as they represent the best available forecast made by TSOs based on publicly available data.

Eurelectric believes that TSOs and Regulators should seize the opportunity to make progress in terms of transparency, as it will be ultimately beneficial in terms of economic efficiency, reducing thereby end consumers' bills. Good practices highlighted in this report should be acknowledged and considered in this respect. Where such an aim is insufficient to motivate a more transparent approach of capacity calculation, Eurelectric would support the introduction of transparency obligations in the CACM methodologies, and in the Terms of Reference of Regional Coordination Centres.

Annex 1 : Survey on actual practices by European TSOs

We would welcome the feedback of stakeholders that make effective use of the information published by TSOs, about their appreciation of the completeness, timeliness, and accuracy of transparency publications by TSOs related to cross-zonal capacities.

Do not hesitate to highlight examples of good practices, and to mention the links towards transparency platforms where the related information is published.

a. Short-term forecast of cross-zonal capacities (from day ahead through real time)

i. Publication of firm cross-zonal exchange capacities at 8.00 am DA.

Which TSO does it in practice? Are you pleased with the level of information provided by the TSOs (please specify the corresponding borders/bidding zones)?

Link to the transparency platform, and what is satisfactory/would deserve further developments?

ii. Publication of ID evolutions of cross-zonal capacities (if any):

Is there any recalculation at the borders you consider (please specify the corresponding borders)? Are you pleased with the level of information? What might be missing?

Link to the transparency platform, and what is satisfactory/would deserve further developments?

iii. Publication of provisional and realised volumes of countertrading:

Is there any countertrading at the borders you consider (please specify the corresponding borders)? Are you pleased with the level of information? What might be missing?

Link to the transparency platform, and what is satisfactory/would deserve further developments?

iv. Publication of provisional and realised volumes of redispatching:

In case of redispatching/curtailment, are you pleased with the level of information (please specify the corresponding bidding zones)? What might be missing?

Link to the transparency platform, and what is satisfactory/would deserve further developments?

b. Long-term forecast of cross-zonal capacities (from 3 years through day ahead)

Do you consider that TSOs provide the necessary information to predict cross-zonal exchange capacities, in the right timing with respect to notifications of transmission asset outage (please specify the corresponding borders)?

Would you consider that TSOs' approaches in your region are input-based or output-based?

Are you pleased with the level of information? What might be missing?

Link to the transparency platform, and what is satisfactory/would deserve further developments?



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