



Guidelines of Good Practice on Information Management and Transparency in Electricity Markets

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1 Introduction

These Guidelines seek to establish a consistent approach to the provision of market related information to wholesale market participants - suppliers, generators, energy traders, large customers and demand side participants - across Member States. The Guidelines are focused on information management and transparency at the wholesale market level and do not consider information that shall be made available to retail customers, which is the subject of separate work being undertaken by ERGEG and CEER.

The Guidelines:

- Set out ERGEG's views on the required level of transparency that shall at the minimum be in place across the European market;
- Are intended to give a minimum set of rules required for the organisation of information and its dissemination across the European market;
- Set out general principles governing information release.

ERGEG recognises on the one hand that additional information management and transparency requirements may already exist in individual Member States and on the other hand that in some markets it is not (yet) possible to enforce fully these requirements due to the presently existing legal framework concerning data confidentiality. In the latter case, the Guidelines are intended to be used as the basis for the identification and proposals for any necessary changes to the relevant regulatory or legal framework, in order to fulfil throughout the EU the information management and transparency requirements.

2 General Requirements on Information Management and Transparency in Electricity Markets

2.1 General Principles of Transparency

In view of the importance of market information to the operation of a competitive wholesale market, ERGEG considers that information shall generally be made available to market participants unless there is a strong reason against it (e.g. in a case of legitimate commercial concerns or system security issues), or a proven fact that the cost of providing the information is significantly higher than the expected benefit. In any case, the reason for not making information available (including here the latter aspect of costs), shall be presented to all interested parties in a detailed and explanatory way and shall be approved by the responsible regulatory authority. Furthermore, the information shall be made available in a timely manner, and shall be released simultaneously to all market participants.

Information that is not to be released must be carefully ringfenced to ensure that it is not given to market parties that may benefit from that. Ringfencing may include commitments by information providers (e.g. TSOs) to separate out data and management functions of those parts of the business that produce data (e.g. transmission network operation) from those parts of the business that may benefit from the data (e.g. any generation affiliates).

Information may be made available in a variety of ways and in a variety of formats. Nevertheless, because of the need for timely and simultaneous release of information to all market participants, the information shall be made available through Internet.

The nature of the publication requirements may depend on the national market and legal arrangements in place within a given Member State. It may also be necessary for access to certain information to be limited, for example for reasons of national security, such that information is only made available to market participants and new entrants on a confidential basis, rather than being made more widely available to the public.

The appropriate format in which information is provided (e.g. whether it is made available on an aggregated or non-aggregated basis, etc.) is likely to vary depending on the nature of the information and also on the prevailing market situation and arrangements within the Member State. Equally the timing of information provision will vary, both in terms of whether it is provided on an ex ante or ex post basis and also whether such information is released immediately or release is subject to some delay.

2.2 Guidance on Minimum Transparency

The Guidelines set out ERGEG's views on the level of transparency that shall be in place in all Member States, the scope of which is often complemented with additional rules and regulations at the level of Member States. The application of the general principles concerning transparency may result in further requirements being identified in particular Member States and/or across all Member States. ERGEG considers in particular that the publication of this information will assist regulators and market participants in providing a reference tool, in particular in Member States where no specific legal framework concerning transparency has been defined to date.

Since the characteristics and details of national electricity markets differ from national market to national market (for example wholesale market rules, fuel/generation mix) there may be some national markets to which some of the transparency requirements outlined by ERGEG do not

apply. For example, in markets where hydro power accounts only for a small portion of generation capacity there may be no need to mandate the publication of reservoir filling rates¹, or in the markets with continuous trade there might be less need for publishing of schedules.

Besides the general benefit provided by a common and comprehensive definition of transparency of information and data, another driving force in the preparation of the annexed detailed specification is the fact that no such specification of required transparency throughout the whole value chain (from the primary energy sources, generation, transmission & distribution, supply and demand) within wholesale electricity markets has been produced in a comprehensive scope so far.

The ERGEG Guidelines on Good Practice on Information Management and Transparency will therefore help not only in achieving a harmonized approach throughout the IEM, but shall also contribute to increasing efficiency and practical usability of the future regulations, activities and projects aimed at fostering the development of a more efficient and competitive IEM.

2.3 Confidentiality Requirements

It is essential that the TSOs and DSOs offer third party information access on a non-discriminatory and transparent basis. The TSOs and DSOs shall meet the confidentiality provisions of Article 12 of the Electricity Directive, by guaranteeing that:

- 1) Commercially sensitive information obtained in the course of carrying out their business shall remain confidential;
- 2) Information disclosed regarding their own activities, which may be commercially advantageous, shall be made available in a non-discriminatory manner;
- 3) In case of vertically integrated companies operating supply and/or generation and grid, when there are no separate database systems, specific information management measures and confidentiality duties must be clearly defined; the relevant national regulatory authorities shall be equipped with the adequate powers to require sufficient evidence from the companies concerned, so as to prove an effective establishment of ringfencing and “firewalls” between supply and/or generation and transmission/distribution branch of the vertically integrated companies.

Some information held by generators may be considered confidential. Thus generators may be reluctant to disclose this information as they may be concerned that they lose a competitive advantage. Moreover, the willingness of generators to disclose information is also dependent on whether the information is to be disclosed ex ante or ex post. While generators' legitimate rights must be respected, the importance of effective information transparency is to be strongly supported.

2.4 Information Management

Another important issue besides transparency of information is the management of information, concerning its release or where release is not possible or desirable, its ringfencing. Market information may be held by a range of parties, for example by TSOs or DSOs, who will hold a range of technical information as a result of their system operation responsibilities, including

¹ No other primary energy sources are considered here in detail, as it is assumed that in a normal supply situation, they will be available to the generators / market that needs them.

e.g.: demand forecast data, generation availability (both planned and unplanned), network and interconnection availability, load and future investment.

Information may also be held by market participants, for example by suppliers, large customers and generators, regarding their own market activities.

Where a TSO or DSO is also affiliated to supply or generation companies this will raise particular concerns regarding the management of information within the affiliated businesses. Issues may also arise regarding information held independently by suppliers/generators.

As a general principle for information management and transparency, the EREG takes as a starting presumption that more information shall be available than less, and that the onus shall be on holders of information to justify any withholding of information on a cost/benefit to market basis. Furthermore, as a general principle, agents holding information that is released to the market shall release it simultaneously to all market parties, in a user-friendly manner in the national language and in English on the internet. Information shall be disclosed in a meaningful, quantitatively clear and easily accessible way and on a non-discriminatory basis.

Information that is not released by an agent to the market shall be ringfenced from all other entities in order to avoid any possibility of discriminatory access to data. Methods of ringfencing may include appointment of information separation compliance officers, separate data and information management systems and appropriate separation of corporate management.

2.5 Governance

Market participants will have a legitimate interest in influencing decisions on how and when certain data is released. The governance of information management is an important and strongly related issue. Developed markets generally contain mechanisms where market participants and other stakeholders can propose modifications to the type, volume and method of dissemination of information by information holders. Such mechanisms ideally contain criteria, including cost benefit considerations, by which any proposals can be judged and implemented. Such mechanisms are also ideally open and transparent in themselves. Bearing in mind the need to retain independent oversight of the proper functioning of the market, regulators will generally have a final right of review and veto of any such proposals.

Such governance issues are likely to require more detailed consideration in the light of cross border trade. Information that arises in one market for example is likely to impact on neighbouring markets. Market players in one market therefore have a legitimate interest in the information management processes in neighbouring markets and hence require an input to any governance processes. Regulators and other relevant authorities will need to consider how governance processes in relevant neighbouring markets can take account of interested parties, and how final review and veto is sanctioned by the responsible regulators. Transparency issues can therefore be further facilitated when neighbouring regulatory authorities coordinate their work, e.g. by common monitoring activities, consultations and publications.

EREG recommends therefore that requirements regarding transparency are also accompanied and underpinned by governance mechanisms. Such mechanisms shall allow market participants to seek relevant modifications to the set of information provided to them, and allow regulatory oversight of any such modifications.

Finally, to ensure the compliance with the requirements of the Guidelines and the compliance with the principles of governance a monitoring programme will be established and carried out by the regulatory authorities.

2.6 Methodology

While developing these Guidelines, ERGEG has performed an analysis of requirements on the availability of and the access to the different data and information throughout the whole value chain of the electric power supply in the liberalized wholesale electricity market. The results of this analysis form the core of the tables that follow in the Annex, being comprehended in terms of the five key characteristics:

- **Required Information:** description of the information/data required including also level of aggregation;
- **Timing of publication:** timescale in which the information needs to be made available; presently the required keeping of history information is specified only for some information items where certainty exists. This may be extended and supplemented with additional requirements depending on the specific needs and on the specific information management provisions;
- **Timeframe:** period of time per market unit to which the required information refers;
- **Key benefits :** background information on why the information is needed and for whom;
- **Information provider:** identifies the organisation likely to be responsible for providing the information to the market;
- **Information source:** identifies the organisation likely to be the source (originator) for that specific information, or a “natural” information owner;

The identification of the party responsible for providing the information to the market is a key to efficient and successful implementation of these Guidelines. The “natural” information owners and their related responsibilities (e.g. to provide the information to other market participants or stakeholders) are summarized below. Nevertheless, other organisations may fulfil these roles too, depending on the specific setup in a given market.

- *Competent authorities*, e.g. regulators or ministries who will compile information on primary energy sources, their availability and in some cases short/mid/long term forecasts; these authorities will also compile information on system load and their mid/long term forecasts.
- *Generators* own and use the real-time information on their generation facilities, i.e. planning and operation, including here the data on generation availability, feed-in to the grid, their new/planned generation projects, etc.
- *Suppliers, energy traders and large customers* hold information regarding their own energy portfolios and forecasts of energy use
- *Transmission System Operators, TSOs* are responsible for all information on transmission infrastructure availability, capacities, interconnection capacity allocation, etc. Furthermore, TSOs are often either responsible or appear to be the best suited party to be responsible for aggregating and providing other relevant information to the market (e.g. information on

generation). TSOs will be in possession of large quantities of such information as a result of their operation of the transmission system, i.e. possession of actual measured data and short term forecasts. For that purpose, it is important that there is national legal framework that enables the TSOs to fulfil the task of publication both with ex-post operational information and ex-ante short term forecasts.

- *Distribution System Operators, DSOs* have the information on load, load profiles as well as the information on distribution infrastructure situation and planned future developments.
- *Power Exchanges, PEXs* own, use and provide to the market the information on the results of the trading at the PEX, including prices, liquidity related information, products information, etc.
- *Clearing & settlement agents (which could also be TSOs or power exchanges)* are primarily responsible for balancing prices and their publishing in a transparent way. They prepare merit order list for the TSOs to use balancing power bids and might also be involved in other activities like e.g. maintenance of the metering point identification databases or similar.

It is within the scope of these roles and responsibilities that the requirements on transparency comprehended in the annexed tables refer to responsibility. It is nevertheless only a recommendation for the finally aggregated relevant data, as the key issue is here to make the information available.

3 Specific Requirements on Information Management and Transparency in Electricity Markets

3.1 System Load - Load per Control Area

The required information on load relates both to ex-ante and ex-post values, made available over different timeframes. Generally the users of such load information are considered to be suppliers, traders, large customers, demand response customers and the balance responsible parties. It is important that the load data are calculated in the same way throughout the countries and regions in EU. The methodology for load data calculation shall be defined by the TSOs and DSOs (e.g. to account for cases where significant portion of generation is connected to the distribution network and hence not “visible” to the TSO) and approved by the relevant regulatory authorities.

The detailed requirements on transparency of information related to system load (load per control area) are contained in the Table 1 of the Annex.

3.2 Transmission and Access to Interconnections

The required information on transmission and access to interconnections – related to both infrastructure and operation – is governed by the actual and future needs of the national and cross-border trading and capacity allocation but also related to distribution. In general the information related to the following activities needs to be made transparently available:

- 1) Network investment and planning - covering expansion proposals, planned works and outages
- 2) Capacity allocation and management - forecasts of interconnection capacity etc, capacity requested, actual interconnector utilisation, congestion income
- 3) Network operation – this will cover ex post information on actual outages, realised physical flows and average hourly physical flows vs. thermal ratings, etc.

According to the Regulation (EC) 1228/2003 the operational and planning security standards shall be made public. The information published on interconnection capacity shall include a general scheme for the calculation of the total transfer capacity and the transmission reliability margin based upon the electrical and physical features of the network. Estimates of available transfer capacity published for each day, indicating any available transfer capacity already reserved shall include week-ahead, month-ahead and year-ahead estimates, as well as a quantitative indication of the expected reliability of the available capacity.

The draft Congestion Management Guidelines according to the Article 8 of the Regulation (EC) 1228/2003 (<http://europa.eu.int/comm/energy/electricity/legislation>) state also that details concerning capacity allocation procedures shall be made publicly available.

The users of the information on transmission and access to interconnections would be generators and traders acting on internal and cross-border markets, but also regulatory authorities. The information needs to be provided by the TSOs.

The detailed requirements on transparency of information related to transmission and access to interconnections, taking into account also the transparency requirements from the Regulation and the draft Congestion Management Guidelines, are contained in the Table 2 of the Annex.

3.3 Generation

The information on generation is particularly important in order to achieve non-discriminatory treatment of all market participants, including also those that do not control generation capacities in given control areas. The availability and the utilization of generation capacities is amongst others (together with e.g. utilization of interconnection capacities) one of the most important influencing factors of the market prices for short term and for long term wholesale products.

Generally this information will be of interest to generators, demand response participants, large customers, suppliers and energy traders.

The detailed requirements on transparency of information related to generation are contained in the Table 3 of the Annex.

Beyond the data in Table 3, it might further be useful to publish some dynamic generators' data like e.g. ramp-up times or others.

3.4 Balancing

ERGEG has performed an in-depth analysis of the balancing markets throughout Europe, extending this analysis with the considerations on the compatibility and integration of balancing markets. The specific issues raised in the scope of balancing are currently being considered by ERGEG who intends to prepare Guidelines for Good Practice on Balancing Markets Integration in due course. The required information on balancing listed below is only that one which is required from the market and market operation perspective.

Reaching a high level of transparency in this field is of utmost importance, in particular as it could contribute to reduce the market power of dominant and well-informed generators, and could indirectly have positive effects on the short-term security of supply.

The users of the information on balancing would be generators, balance responsible parties, demand response parties and traders, as far as they are involved in the intra-day & balancing trade.

The detailed requirements on transparency of information related to balancing are contained in the Table 4 of the Annex.

3.5 Wholesale Markets

Information transparency in the wholesale market is crucial for fostering effective competition in the liberalised electricity market (both nationally and across borders). Information on the wholesale market will be of importance to suppliers, generators, energy traders and (large) customers.

National rules on the operation of financial markets will also be of relevance in considering information transparency requirements with regard to particular national wholesale markets.

The detailed requirements on transparency of information related to wholesale markets are contained in the Table 5 of the Annex.

4 Glossary

Balancing market (*and in that sense balancing area*) is that part of the overall electricity market that provides for meeting the needs for balancing electric power in the electric power system operation by the TSOs, market participants, etc. Balancing market consists generally of two important parts:

- (i) Balancing mechanism defining features of balancing market, e.g. the way of bidding, constraints/requirements on the balancing market participants, way of payment to the bidders, constraints on the TSOs, who/how makes the merit order, etc.
- (ii) Imbalance arrangements and pricing where the cost-reflective and transparent prices (i.e. non-manipulated prices) for the “users” (i.e. balance responsible parties) emerge according to the predefined, transparent and agreed rules and regulatory framework; these rules include also the way how the TSOs determine the imbalance prices for the balance responsible parties. Different ways of calculating the imbalances exist, e.g. only one imbalance for generation and demand or separate imbalances of them.

Balance responsible party: The market participant in charge of imbalance payment of the balance group. The role of a balance responsible party varies depending on country and market design; the balance responsible parties are in general responsible for the submission to the TSO of physical notifications and generation plans (schedules), settling of balancing issues and dealing with any issues concerning balance group members (generators, suppliers, customers). In general, generators, suppliers and traders can have their own balance groups and act as the balance responsible parties, or can pass their roles/responsibilities to a balance group, whose balance responsible party will be responsible for settling imbalance payments for the balance group and all its participants.

Control area is a coherent part of an interconnected power system, operating at the common synchronous frequency, usually coincident with the territory of a company, a country or a geographical area, operated and supervised by a single TSO (control area manager) responsible for load-frequency control, with physical loads and controllable generation units.

EHV grid: Extra high voltage grid including and above 220 kV.

Generator: Market participant that generates electricity, defined by the geographic site independent of the number of producing units at that geographic site.

Interconnector: Transmission interconnection tie-line, a line which crosses or spans a border between the TSOs (control areas).

Interconnector capacity: Net transfer capacity in MW per market time unit of a given interconnector.

Peak load period: Hours / intervals, where peak load appears in a market.

PEX: Power exchange.

System Load: Load per control area. It is important that the load data are calculated in the same way throughout the countries and regions in EU. The methodology for load data calculation shall be defined by the TSOs and DSOs (e.g. to account for cases where significant portion of generation is connected to the distribution network and hence not “visible” to the TSO) and approved by the relevant regulatory authorities.

5 References

- [1] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC
- [2] Regulation (EC) No 1228/2003 of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity
- [3] Draft Congestion Management Guidelines according to the Article 8 of the Regulation (EC) 1228/2003, <http://europa.eu.int/comm/energy/electricity/legislation>
- [4] Directive 2003/6/EC of 28. January 2003, on Insider Dealing and Market Manipulation

Annex: Specification of the Required Transparency of Information

Table 1. Required Transparency of System Load (consumption)² Information

#	Information	Publication	Timeframe	Key benefits of information	Provider	Source
1.1	Actual load per control area	Just after real time	Per market time unit (e.g. per hour), to be kept for 2 years	<ul style="list-style-type: none"> To monitor and analyze market prices vs. system load & generation To validate forecast load & load forecasting models 	TSO	TSO and DSO
1.2	Day-ahead load forecast ³ per control area	Day D-1 ⁴ for day D and until day D+7 (next week)	Per market time unit	<ul style="list-style-type: none"> To estimate prices To evaluate and adapt requests for interconnection capacities To ensure the adequacy of generation purchases and energy sales with market needs (which improve network security) 	TSO	TSO
1.3	Week-ahead forecast ³ per control area (where week ahead operations take place)	one to eight weeks in advance in a rolling mode	Per market time unit	<ul style="list-style-type: none"> Idem – in case there is significant new load or some load that was out of operation (e.g. damaged) is repaired, it must be included here too 	TSO	TSO
1.4	Year-ahead forecast ³ per control area	Year Y-1 for at least next year (up to a max of 10 years)	Per year	<ul style="list-style-type: none"> To forecast long-term prices evolution To have a better visibility on the profitability of investment projects for generation capacities 	TSO or competent authority (for longer than one year forecasts)	TSO or competent authority (for longer than one year forecasts)

² It is important that the load data are calculated in the same way throughout the countries and regions in the EU. It is important that the load data are calculated in the same way throughout the countries and regions in EU. The methodology for load data calculation shall be defined by the TSOs and DSOs (e.g. to account for cases where significant portion of generation is connected to the distribution network and hence not “visible” to the TSO) and approved by the relevant regulatory authorities.

³ Liquid forward and future markets will provide the market with information on expected market balance, complementing thus to certain extent the forecast information.

⁴ Early on D-1 or D-2.

#	Information	Publication	Timeframe	Key benefits of information	Provider	Source
1.5	Forecast margin, i.e. the difference between scheduled available generation and the forecast withdrawals on the grid (forecast load plus the net exportations scheduled)	Y-1, M-1, D-1	Per relevant market time unit	<ul style="list-style-type: none"> To allow market participants to judge better investment and production decisions 	TSO (or competent authority for longer term forecasts)	TSO (or competent authority for longer term forecasts)

Table 2. Required Transparency of Information on Transmission and Access to Interconnections

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
2.1	Review of the EHV grid expansion projects (investments) per control area and impact of these projects on the transmission capacities within the control area and at the interconnections	Year Y-1 for the next min. three following years (up to a max of 10 years)	Per year	<ul style="list-style-type: none"> To evaluate future development of transmission grids and interconnection capacities and congestions in the years to come (proposed 3- and 10-years period) To evaluate future generation investment opportunity 	TSO	TSO
2.2	Planned outages in the EHV grid and on interconnections with dates and their impact on the capacity of the grid and each interconnection	Year Y-1 for year Y (updated with changes)	Per year ensuring daily update with any new relevant information	<ul style="list-style-type: none"> To guarantee efficient use of transmission networks and interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development 	TSO	TSO
2.3	Year-ahead forecasts of interconnection capacity, taking into account all information available at the time of calculation	Year Y-1 for year Y	Per year	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development 	TSO	TSO
2.4	Month-ahead forecasts of the interconnection capacity, taking into account all information available at the time of calculation	Month M-1 for next 12 months	Per week segregating Peak and Off-peak hours	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development 	TSO	TSO

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
2.5	Week-ahead forecasts of the interconnection capacity, taking into account all information available (e.g. possible changes in maintenance plans) at the time of calculation	Week W-1 for week W	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development 	TSO	TSO
2.6	Day-ahead values of interconnection capacity	Day D -1 for day D	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO
2.7	Intra-day allocations of available transmission capacity	Day D – 1for day D	Successive after issuing of indicated/ actual day ahead production schedules	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To enable existing players to plan their position To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
2.8	Details on actual outages (planned and unplanned) in the EHV grid Details on when components affected by outage are expected to be in operation	Immediately after occurrence To be kept available for a minimum of 2 years, preferably 10 years	Time of occurrence As soon as possible	<ul style="list-style-type: none"> To guarantee efficient use of interconnection and transmission grids To engender trust in the market To evaluate how security criteria are met To facilitate the access of new players to markets where competition is still under development 	TSO	TSO
2.9	Capacity requested by market participants and capacity offered and assigned by TSOs	After each capacity allocation session	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO/market players
2.10	Capacity requested as priority rights by market participants and offered as priority rights by TSOs	After each capacity allocation session	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO/market players
2.11	Capacity reserved for balancing	After each capacity allocation session	Per market time unit	<ul style="list-style-type: none"> To guarantee an effective use of interconnection To facilitate the access of new players to markets where competition is still under development 	TSO	TSO/market players

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
2.12	Total capacity nominated by market players on interconnections (commercial transactions)	After each session	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO/market players
2.13	Congestion income and volumes and prices in case of auction for regulated assets (hence relevant portion of merchant interconnectors excluded).	After each session	Per market time unit	<ul style="list-style-type: none"> To guarantee an effective use of interconnection To facilitate the access of new players to markets where competition is still under development 	PEX/TSO	PEX/TSO/market operator
2.14	A description of reasons and effects of any actions taken by TSOs that have impact on cross border trade, including reductions of previously allocated transmission capacity rights	Flows and effects just after occurrence, other information D+1	Per market time unit	<ul style="list-style-type: none"> To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster introduction and usage of the flow-based capacity calculation methods in order to raise compatibility between the commercial and actual physical flows between the different control areas 	TSO	TSO
2.15	Hourly average physical flows vs. thermal ratings of the lines and transformers in the EHV grid	Week W+1 for week W	Per hour	<ul style="list-style-type: none"> To evaluate existing congestions on the interconnections and within the control areas To evaluate how security criteria are met To increase the benefit of this information, it would be useful to visualise it in terms of actual line rating (e.g. red=high, green=low) 	TSO	TSO

Table 3. Required Transparency of Information on Generation (for Generation units of 10 MW and beyond)

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
3.1	Total and available installed generation capacity per single generator unit and foreseeable aggregated evolution in the next 3 to 10 years (including information on the type of generation from new projects, planned mothballing or dismantling)	Year Y-1 for the next min 3 following years and up to a max of 10 years	Per year	<ul style="list-style-type: none"> To explain historic and forecast future prices To have a better understanding of historic price developments and possible outlook on the profitability of investment projects for generation capacities 	TSO or another institution or authority	Generator
3.2	<i>Ex ante</i> information on the scheduled unavailabilities of the generation units (start and stop dates of the outages, unavailable capacity)	Year Y-1 for year Y and regular updates	Per year and as soon as possible	<ul style="list-style-type: none"> To be able to forecast future prices better 	TSO/PEX (market place)	Generator
3.3	<i>Ex ante</i> information on the scheduled unavailability of significant consumption units (start and stop dates of the unavailability)	Year Y-1 for year Y and regular updates	Per year and as soon as possible	<ul style="list-style-type: none"> To be able to forecast future prices better 	TSO	Significant consumption units (customers), or suppliers

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
3.4	<i>Ex ante</i> aggregated information on the scheduled generation per control area	Day D-1	Per system time unit	<ul style="list-style-type: none"> To be able to forecast future prices better To be able to consider influence on available transmission capacity 	TSO (based on the day-ahead reported generator schedules)	Generator
3.5	Filling rate of the water reservoirs in an aggregated form, by hydroelectric exploitation zone and per week in terms of percentage of the 100% filling	Week W+1 for the week W	Per week ⁵	<ul style="list-style-type: none"> To be able to forecast future prices better To analyse the impact of past events on prices formation 	Authority, PEX (market place), TSO and Hydro generators	Generator
3.6	Forecast and actual intermittent generation (e.g. wind)	Forecast for day D on D-1 and actual generation close to real time	Daily	<ul style="list-style-type: none"> To be able to forecast future prices better To be able to consider influence on available transmission capacity 	TSO /PEX	Generator
3.7	<i>Ex post</i> information on the planned and unplanned unavailability of actually running generation units (start and stop dates of the outages, unavailable capacity and maintenance).	Close to real time	Per market time unit As soon as possible	<ul style="list-style-type: none"> To analyse the impact of past events on prices formation To give the possibility to react on longer unplanned outages 	TSO/PEX	Generator

⁵ It is assumed that availability of information per week is enough and any aggregation is up to the information users. It is expected that the information provider can restore that information for minimum 2 years after publishing.

#	Required Information	Publication	Timeframe	Key benefits of information	Provider	Source
3.8	<i>Ex post</i> information on the scheduled unavailability of significant consumption units (start and stop date of the unavailability)	Close to real time	Per market time unit	<ul style="list-style-type: none"> To analyse the impact of past events on prices formation To give the possibility to react on longer unplanned outages 	TSO/PEX	Generator
3.9	<i>Ex post</i> data on the actual generation by unit and control area	Close to real time	Per market time unit	<ul style="list-style-type: none"> To analyse the impact of past events on prices formation To be able to forecast future prices better 	TSO/PEX	Generator

Table 4. Required Transparency of Information on Balancing⁶

#	Information	Publication	Timeframe	Key benefits of information	Provider	Source
4.1	Volumes of bids and offers used	Just after real time, to be kept at least for one month	Per balancing mechanism time unit	<ul style="list-style-type: none"> To help market players to formulate their balancing offers To increase the level of transparency in the management of TSOs 	TSO or responsible for clearing & settlement	TSO or responsible for clearing & settlement
4.2	Average and marginal prices of bids/offers with prices corresponding to global imbalance	Just after real time, to be kept at least for one month	Per balancing mechanism time unit	<ul style="list-style-type: none"> To help market players to formulate their balancing offers To increase the level of transparency in the management of TSOs 	TSO or responsible for clearing & settlement	TSO or responsible for clearing & settlement
4.3	Imbalance prices	Just after real time	Per balancing mechanism time unit	<ul style="list-style-type: none"> To help balance responsible to optimise their imbalance's level 	TSO or responsible for clearing & settlement	TSO or responsible for clearing & settlement
4.4	Control area imbalance volumes and volume (actual use) of manually activated reserve (balancing power) used and of automatic reserves used.	Just after real time	Per balancing mechanism time unit	<ul style="list-style-type: none"> To help balance responsible to optimise their imbalance's level To enable monitoring 	TSO	TSO
4.5	Information on the financial balance of the whole market (expenses on the balancing market / payment of imbalances)	Month M+1 for month M, to be updated until final reconciliation	Per month	<ul style="list-style-type: none"> To increase the level of transparency in the management of TSOs 	TSO	TSO or responsible for clearing & settlement
#	Information	Publication	Timeframe	Key benefits of information	Provider	Source

⁶ The planned and actual system margin in terms of generation + import/export balance vs. load can be derived from the respective information on load, generation and interconnections.

4.6	Market information on the type of balancing bids/offers used	Month M+1 for month M	Per day	<ul style="list-style-type: none">• To help market players to formulate their balancing offers• To increase the level of transparency in the management of TSOs	TSO	TSO
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Table 5. Required Transparency of Wholesale Market Information (in this context, no mandatory power exchanges role is intended here, i.e. it is referred only to the markets where PEX exists)⁷

#	Information	Publication	Timeframe	Key benefits of information	Provider	Source
5.1	Aggregated supply and demand curves ⁸ , prices and volumes for each standard traded product and for all kinds of markets (spot, continuous, futures, etc.)	Period P-1 for period P, per illustrative product	Per market time unit	<ul style="list-style-type: none"> To analyse market depth To give a reference for the contracts negotiation Facilitate risk assessment 	PEX	PEX
5.2	Prices and volumes of the OTC market	Month M+1 for month M, per illustrative product	Per month	<ul style="list-style-type: none"> To analyse market depth To give a reference for the contracts negotiation 	Brokers, PEX	Brokers, PEX

⁷ The planned and actual system margin in terms of generation + import/export balance vs. load can be derived from the respective information on load, generation and interconnections.

⁸ Or other aggregation/information that may be better suitable for continuous markets.