



SYSTEM OPERATOR DATA INFORMATION SCHEMES FOR MONITORING AND PLANNING PURPOSES

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Electricity
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ABSTRACT

This report is developed for the Egyptian Electric Utility and Consumer Protection Regulatory Agency (EgyptERA).

The separation of the activities potentially subject to competition (such as production and supply of energy) from those where competition is not possible or allowed (such as transmission and distribution), also known as unbundling, requires a new and different role of the main players and stakeholders in the electricity industry. The present reports describe and analyse the role that EgyptERA will have to play in defining and implementing the new monitoring and data collection activities and provides details of the implementation strategy from the short run to the long run.

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EXECUTIVE SUMMARY

This a report developed for the Egyptian electricity regulator EgyptERA.

The separation of the activities potentially subject to competition (such as production and supply of energy) from those where competition is not possible or allowed (such as transmission and distribution, also known as unbundling, requires a new and different role of the main players and stakeholders in the electricity industry. The present report describes and analyses the role that EgyptERA will have to play in defining and implementing the new monitoring and data collection activities and provides details of the implementation strategy from the short run to the long run.

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1

WHAT IS UNBUNDLING?

1

WHAT IS UNBUNDLING?

In the regulation of network industries, such as electricity or gas, unbundling refers to the separation of the activities potentially subject to competition (such as production and supply of energy) from those where competition is not possible or allowed (such as transmission and distribution). The introduction of unbundling implies that an actor performing a competitive activity is constrained and eventually prevented from also performing a monopolistic activity or bundling these two different types of activities. Determining the adequate level of unbundling of the monopolistic network companies from the companies performing competitive activities is of major importance when discussing regulatory models.

In the electricity and gas sectors, the physical network that connects generators of electricity or producers of gas to consumers represents an essential facility. Access to the network is fundamental for anyone willing to sell or buy energy at reasonable costs; at the same time, the duplication of the existing infrastructure is either impossible or extremely expensive.

A firm controlling the network and also involved in the competitive segments of the supply chain then has an obvious interest in limiting or deny access to the other firms active upstream or downstream. Therefore, ensuring access on a just, transparent and non-discriminatory basis to any market player is a first and necessary step to achieving effective competition in the sector.

However, this first step is usually not enough to guarantee fair competition. Even if obliged to grant third party access (TPA), possibly on a regulated rather than a negotiated basis, the firm controlling the network can still benefit from a non-level playing

field. In particular, it may delay the expansion of the grid in the presence of congestion that then segments the market and keeps one of its competitors at bay. Alternatively, it may cross-subsidise one of its businesses subject to competition, such as supply to final customers, with resources coming from one of its other activities that are not. The introduction of unbundling, especially in its more radical form, represents a structural remedy that removes not only the possibility, but eventually also the primary interest of the firm controlling the network in discriminating against other market players. The removal of such interests has another important, yet often overseen, advantage that other non-structural measures that aim at establishing a level playing field do not always present: it facilitates regulatory oversight.

However, the application of unbundling rules also presents a downside: it may reduce or eliminate some of the economies of scope previously available to the vertically integrated firm. Therefore, the implementation of unbundling calls for the development of new coordination mechanisms within the restructured sector to limit resulting inefficiencies

1.1 Types of unbundling

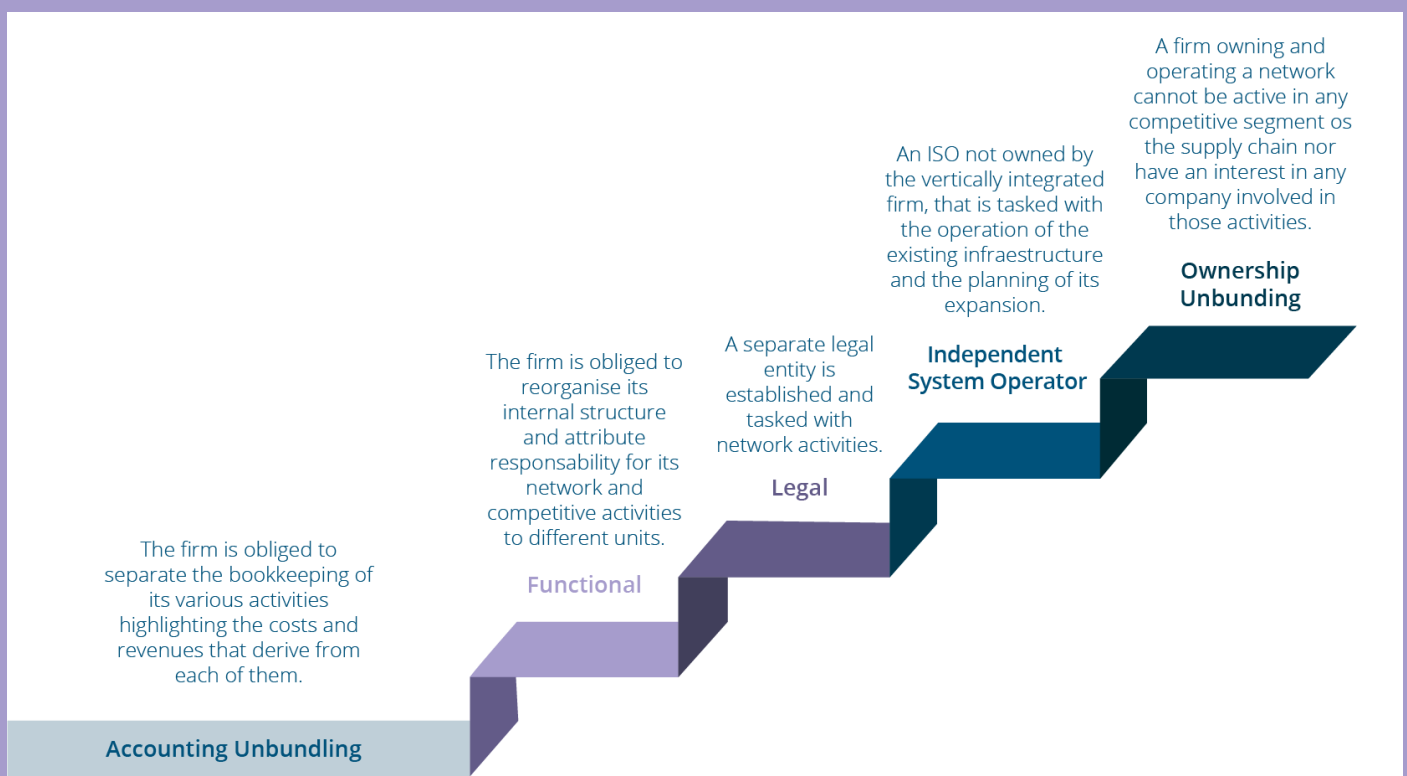
Different degrees of unbundling are possible with different levels of effectiveness:

- *The first and most basic one is account unbundling.* In this case, the firm is obliged to separate the bookkeeping of its various activities, highlighting the costs and revenues that derive from each of them. The information made available increases transparency and allows the regulatory authority to better assess the adequacy of the tariffs proposed for the

regulated activities and to detect possible instances of cross-subsidisation.

- *Functional unbundling is the subsequent step.* In this case, the firm is obliged to re-organise its internal structure and attribute responsibility for its network and competitive activities, assigning them to different units that can take decisions independent of one another. The introduction of a “Chinese wall” between such units can be part of the obligations foreseen by this type of unbundling.
- *Legal unbundling* can be introduced in order to further prevent the implementation of discriminatory practices. In this case, a separate legal entity is established and tasked with network activities. Due to this higher degree of separation, its management is supposed to operate more independently. However, the legally unbundled entity may still be owned by the previously vertically integrated firm through a holding company. As a result, an interest in discriminating against other market players and favouring the parent firm cannot be totally excluded.
- *The ultimate form of unbundling is ownership unbundling.* In this case, a firm owning and operating a network cannot be active in any competitive segment of the supply chain, nor have an interest in any company involved in those activities. The opposite is also true: an electricity generator or a gas supplier cannot have any stake in the fully unbundled network company. This extreme form of separation reasonably solves the issue of discriminatory access to the network.

Figure 1 . The different type of unbundling



1.2 Rules and obligations for unbundling in the EU and selected countries

In the EU, rules on unbundling changed over time and became gradually stricter. In particular, this was the case as far as transmission is concerned. The Third Energy Package, adopted in 2009, foresees ownership unbundling as a default option for electricity and gas transmission, while for electricity and gas distribution, legal unbundling is required. Distribution system operators (DSOs) with less than 100,000 customers are exempted from this requirement: account and functional unbundling are considered sufficient in this case.

In 2019, the recast of the Electricity Directive contained in the Clean Energy Package did not significantly change the legal framework, but provides some additional specifications on the possibility for system operators to own, develop, manage or operate storage facilities and recharging points of electric vehicles. It also provides that electricity DSOs involved in data management have to adopt specific measures to exclude discriminatory access to customer data sought by eligible parties and to ensure that vertically integrated firms do not get privileged access for the conduct of their supply activities.

1.3 The importance of sufficient and effective unbundling

The risks and negative effects of insufficient unbundling of network and commercial activities, which are numerous and can seriously hamper competition and liberalisation, show that effective unbundling is a necessity and of crucial importance. Vertical integration of different economic activities leads to (commercial) incentives for the network operators involved to give preferential treatment to their own upstream or downstream commercial branches instead of third parties.

A vertically integrated company may have an economic interest in using its monopoly position as network operator to prevent or hinder competition in other areas of the value chain. This can happen in many ways and distorts a level playing field. It also contributes to market foreclosure and gives rise to market entry barriers

which hamper competition. Hence, incomplete unbundling lays the ground for discriminatory behaviour of vertically integrated network operators in favour of related companies, to the detriment of third parties. Consequently, insufficient unbundling can impede liberalisation and reduce its benefits.

Insufficient unbundling of network and commercial activities in vertically integrated companies entails many risks. These are related to the distortions that the lack of separation of vertically integrated activities might determine in different stages of the supply chain. After a general overview, we will focus on the risks associated with unequal access to information and strategies to overcome this problem. The main risks are the following:

1. Discrimination through unequal access to information. Vertically integrated firms have access to information which allows them to make strategic decision in ways that their rivals cannot.
2. Higher grid charges due to cross-subsidisation of the competitive business in vertically integrated companies.
3. Increasing costs for rivals. Vertically integrated companies may, for instance, increase the cost of bringing new generation capacity online or make this de facto impossible by charging huge amounts for network extensions and reinforcements.
4. Higher grid charges due to cross-subsidisation of the competitive business in vertically integrated companies.
5. Discrimination relating to the outsourcing of activities by the network operator to related companies ("shared services"). This involves the risk that "shared services" are not provided at market-based costs.

1.4 Access to information

The discrimination through unequal access to information will be specifically explored in this report. We will describe the potential negative implications deriving from scarce or unequal availability of data and market information, in particular, on the System Operator (SO) operations

and activities. The danger of discrimination related to access to information and market data are typically due to the following:

- A lack of transparency of information that should be publicly available in the market.
- Privileged access of the commercial branch of the vertically integrated company (by reason of shared physical locations, shared IT systems, inefficiency of Chinese walls, etc.), including the risk of access of the top management to strategic business information of the network operator (directly or through representation in boards).
- Selective disclosure of information because of the commercial incentive for the network operator to provide certain information only to affiliated companies, while withholding it from third parties.

All of these instances can easily occur in the absence of a clear identification of the data and information that need to be made publicly available to the National Regulatory Authority (NRA). Therefore, we aim to provide a guideline for the definition of a strategy for data gathering and disclosure for EgyptERA by discussing the example and the process that took place in the EU since 2009.

The process of progressive market liberalisation in Europe has placed a great emphasis on the unbundling of information. Unbundling of information is concerned with three main pillars:

- The publication of data,
- Respecting data protection rules and
- Non-discriminatory access to data.

With regard to transparency of information, the European Commission (EC) best practice considers that information shall generally be made available to market participants unless there is a clear reason against it (for example, in cases of legitimate commercial reservations or system security issues), or it is a proven fact that the cost of providing the information is significantly higher than the expected benefit. When concerned with unbundling, the confidentiality and disclosure of information must be specified in a well-defined data management system in order to avoid any discrimination. The following table lists the different kinds of information, their respective handling principles as well as general procedural solutions. We can thus distinguish among third party information and generic network information. In the subsequent sections, we will

Table 1 . General guidelines on information treatment

	Third party information	Generic network information
Definition	Commercially sensitive information	Commercially advantageous information
Treatment	Confidentiality (disclosure upon agreement)	Disclosure
Non-discriminatory implementation	Data access rules	Rules for data disclosure

provide additional details on the treatment for each specific situation.

1.5 Third party information

Third party information (information which does not belong to the network company), obtained by the grid operators while carrying out their business, is very often confidential and classified as commercially sensitive information. As a matter of principle, confidentiality has to be respected, except in the cases where the data owner (third party) agrees to disclosure (general or specific addressees). Data access rules have to be established so that contract partners can obtain access to the data on equal terms, such as time, procedures, cost and quality. Informational unbundling has to respect data protection law, where the person in possession of confidential information is obliged to a specific behaviour. The following list of possibly confidential information is neither exhaustive (it depends on the role of the network company which information it receives) nor mandatory (information can be classified “non-confidential” in the case of the consent of the data owners):

- Financial and technical conditions of grid access (individual grid access contracts)

- Financial and other conditions of energy supply (individual energy supply contracts such as inscriptibility)
- Metering data, load profile and load forecast of the clients (enabling suppliers to set up tailor made products)
- Inactive and planned new connections to the grid (reducing acquisition cost)
- Name, address and bank account details of the client (reducing acquisition cost)
- Billing records (giving information on good/bad customer behaviour)
- Participation in capacity allocation procedures (revealing potential alternative suppliers)

Following a specific consultation process, the European Regulators’ Group for electricity and gas (ERGEG) has defined a set of guidelines for data and information management and disclosure that are specified in the table below:

1.5.1 Generic network information

Some information resulting from operating the network may be commercially advantageous.

Table 2 . Guidelines for third party data management from grid operator – ERGEG

G17	The grid operator shall define commercially sensitive information when third parties are data owners.
G18	If required for the transparency and functioning of the system, the network operator has to seek the agreement of data owners for general data disclosure.
G19	For such data, they will define data collection, data processing as well as data access rules in a “data management system”. This system will make sure that confidentiality is respected, and that equal, well specified and non-discriminatory access of contract partners (or non-discriminatory disclosure) is guaranteed. This involves equal treatment related to time, procedures, updating, cost and data quality.

Therefore, if disclosed, non-discriminatory access must be guaranteed.

The network company shall define commercially advantageous information on network business where the network company is the data owner. For these data the network company shall define whether they are to be disclosed or not (respecting the transparency needs of the market). All commercially advantageous information has to be included in a specific data management system which shall guarantee either non-disclosure or non-discriminatory disclosure of information. This involves equal treatment related to time, procedures, cost and data quality.

Necessary data processes will vary across markets and time as they depend (partly) on the market models in place. However, the NRAs are tasked to clearly define the following:

1. All commercially advantageous and sensitive pieces of information have to be part of well-defined information processes in written form, which have to be sent to regulators along with the compliance programme. These written processes have to be updated whenever a change occurs.
2. The best practice to comply with these requirements would be to separate databases for the network and competitive business. This would allow each market participant to have equal access to information.
3. The processes have to guarantee confidentiality and equal access to information for all market participants. Equal treatment includes the content of information, the timelines of provision, updating and data formats used as well as prices for accessing the information.
4. Information remains confidential (confidentiality has to be ensured by the network operator) until it has been disclosed.

The processes handle the management of information from their creation to data processing, updating, access rules and formats, prices, protocols, monitoring, reporting and training.

2

WHAT COMES AFTER UNBUNDLING? MONITORING FUNCTIONS OF THE NRAS

2

WHAT COMES AFTER UNBUNDLING? MONITORING FUNCTIONS OF THE NRAS

The ongoing process of market liberalisation in the Egypt raises the need for EgyptERA to establish/upgrade a more systematic approach for market transparency and monitoring activities. This must be done with a view to gain accurate and timely data and information aimed at detecting eventual market abuse and/or barriers for well-functioning electricity markets. In addition to customer protection, this must ensure that the system operator runs the network in an efficient and non-discriminatory way.

As defined in the section above, the unbundling process unleashes a series of new activities for the NRAs that concerns the new requirements on information management and transparency related to the well-functioning of the electricity markets. The NRA that faces a new paradigm, characterised by a stricter unbundling regime, should 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.

While this process is relatively new in Egypt, an extensive history of similar experiences in other markets already exists. In particular, the EU has faced a similar process, starting with the introduction of the internal electricity markets and culminating with the third energy package. Therefore, there are well-established guidelines focusing on the information management and transparency that intend to define the following three actions to provide a valid standard for information gathering and disclosure:

- Set out the required level of transparency that shall, at the minimum, be guaranteed in newly liberalised markets.

- Provide an essential (parsimonious) set of rules required for the organisation of information and its dissemination across market participants.
- Set out general principles governing information release and management.

1.1 General principle of transparency

In view of the importance of market information to the operation of a competitive wholesale market, the general experience gained so far in terms of transparency considers that, as detailed above, information shall generally be made available to market participants. This is the case unless there is a strong reason against it (for example, 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 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 it. Ringfencing may include commitments by information providers (such as TSOs) to separate out data and management functions of those parts of the business that produce data (for example, transmission network operation) from those parts of the business that may benefit from the data (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 the timely and simultaneous release of information to all market participants, the information shall be made available through the internet.

The nature of the publication requirements may depend on the market structure and on the legal arrangements in place. It may also be necessary limit access to certain information (for example, for reasons of national security). In this case, 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 (for example, whether it is made available on an aggregated or non-aggregated basis) is likely to vary depending on the nature of the information and also on the prevailing situation and arrangements within the considered markets. 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 subject to some delay.

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 exists in the Egyptian market. More specifically, till date, a comprehensive scope of the whole value chain (from the primary energy sources, generation, transmission and distribution, supply and demand) within wholesale electricity markets has not been produced in this country.

It is essential that the TSOs (and DSOs) offer third party information access on a non-discriminatory and transparent basis. The TSOs shall meet the confidentiality provisions discussed above, by guaranteeing the following:

- Commercially sensitive information obtained in the course of carrying out their business shall remain confidential.

- Information disclosed regarding their own activities, which may be commercially advantageous, shall be made available in a non-discriminatory manner.
- In case of vertically integrated companies operating supply and/or generation of the 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. This will 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 will lose a competitive advantage. Moreover, the willingness of generators to disclose information also depends 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.

1.2 Information management

Another important issue besides transparency of information is the management of information. This concerns its release or where its release is not possible or desirable, also known as 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. This includes 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. When a TSO or DSO is also affiliated to supply or generation companies, particular concerns will be raised regarding the management of information within the affiliated

businesses. Issues may also arise regarding information held independently by suppliers/generators.

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

3

PRACTICAL IMPLEMENTATION: WHO DOES WHAT AND WHEN?

3

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The primary goal of regulation in the public interest is to stimulate the regulated firm to efficiently produce output from cost and quality (including reliability) perspectives, to price the associated services efficiently and to achieve these goals consistently. This must also achieve a break-even or budget-balance constraint for the regulated firm that then allows it to cover its costs of providing services, while restraining its ability to exercise its market power to exploit consumers by charging excessive prices. Much of the older theoretical literature on optimal (first and second-best) pricing of services provided by regulated monopolies (for example, Boiteux, Steiner, Turvey) implicitly assumes that regulators are perfectly informed about the regulated firm's cost opportunities and demand patterns and can effectively enforce cost minimisation on the regulated firm.

In reality, regulators care (or at least should care) as well (or more) about the production efficiency and service quality implications of the regulatory mechanisms they choose. Regulators are neither completely informed nor completely uninformed about relevant cost, quality and demand attributes faced by the regulated firm. Regulators have imperfect information about these firms and market attributes, and the regulated firm generally has more information about these attributes than the regulator. Accordingly, the regulated firm may use its information advantage (asymmetric information) strategically to exploit the regulatory process and to increase its profits or to pursue other managerial goals, much to the disadvantage of consumers (Laffont and Tirole, 1993, Chapter 1).

The challenge of making sense of future investment needs and costs for electricity network firms has historically been a rather contentious process, sometimes yielding significant differences

between what the regulated firms claim they need and what the regulator claims they need to meet their legal responsibilities to efficiently provide safe and reliable service. There is clearly a very serious asymmetric information problem here; however, this might be solved by a specific process formulation and approach to cost control activities. In the 2004 review of electricity distribution prices in the UK, the regulator adopted an innovative "menu" of sliding scale mechanisms approach to resolve the asymmetric information problem they faced as they tried to deal with differences between the firms' claims and their own claims (Ofgem, 2004) about future capital investment requirements to meet reliability targets. Besides the principle and the theoretical approach to provide high powered incentives to reveal correct information about the "true" costs structure, Ofgem has also put in place a specific process to partially reverse the asymmetry information problem. We will illustrate the main aspects of this process and suggest how this might be adapted to the current situation in Egypt.

The proposed approach is based on two principles:

1. **Graduality:** The new practices and innovative approach should be gradually introduced in the cost revision process, with a 10-year horizon.
2. **Simplicity:** The data collection, management and storage process shall be simplified to avoid any excessive complexity, striking the right balance between completeness and efficiency.

The end point of the process must be dictated by the closure of the financial year for the Egyptian Electricity Transmission Company (EETC), that is now an independent company incorporated as a part of the Egyptian Electricity Holding Company

(EEHC). EEHC is a joint-stock company subject to the provisions of Law no. 159 of 1981 and is, therefore, subject to a series of obligation in terms of fiscal bookkeeping and budget disclosure guidelines. As such, the provision of the data from and to the SO should follow the financial calendar to the best of its ability to avoid data collection activities interfering with the normal yearly revision process. A scheme for the sequence of market monitoring and SO monitoring activities is provided in Figure 2.

The proposal illustrates a scheme with one optional activity (the public consultation) that should be performed three to four times a month before the data of the SO is finalised for the financial closure for each year.

The market and SO monitoring activities can be divided into two parts:

1. Part of the data collected and published by the NRA will be also required for the annual price control activities, and will form the basis for the definition (and/or revision) of the transmission and distribution tariffs.
2. Another part of the data collected will be made available to market participants for transparency purposes.

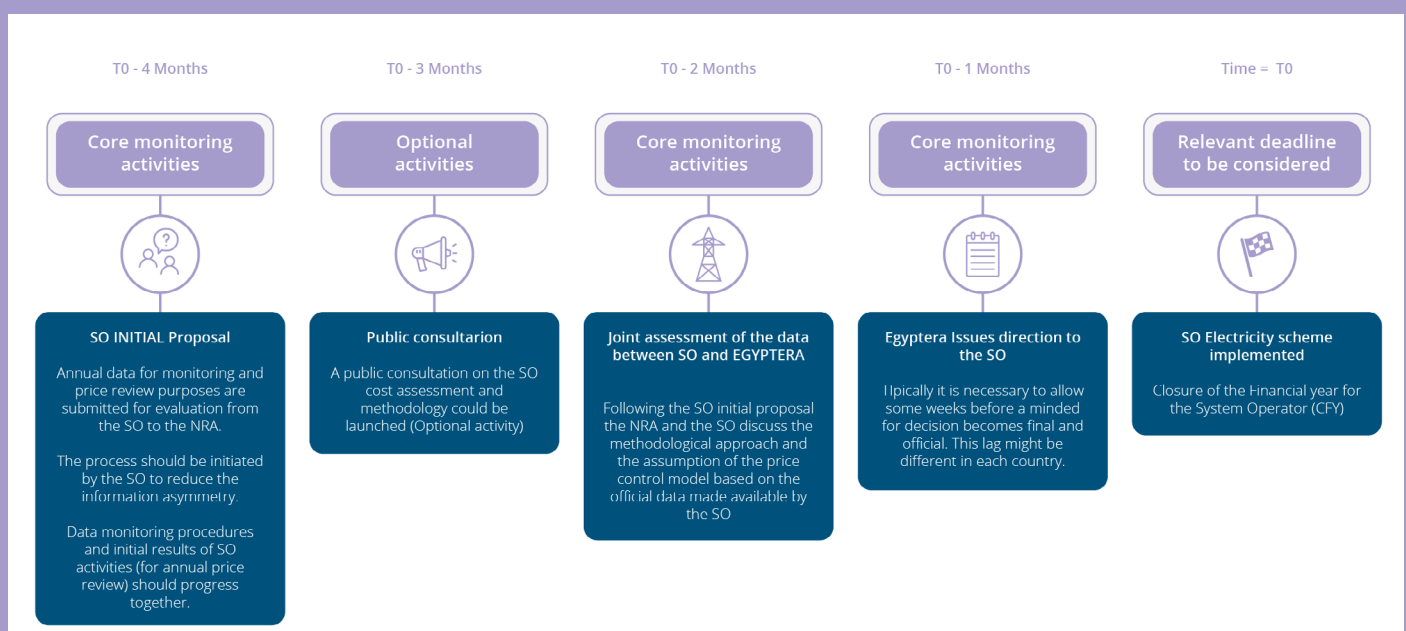
For both data, it is crucial that the details, granularity, format and availability of the data to be provided are specified in a formal regulation (bylaws), with a clear timeline for data provision. Ideally, the penalties and possible fines for failing to comply with market transparency obligations should also be clearly indicated.

Here, we define the process to establish an effective interaction with the SO, specific for annual price control activities (referring to the activity specified above). The annual price control activities need to be conducted bilaterally with the SO, with regular consultations with other relevant stakeholders. The greater the level of involvement of other stakeholder, the greater the transparency of the process. However, at least initially, the transparency of the process can be limited to the benefit of the process's accuracy. The main steps for the same are defined below:

1. *SO initial proposal*: Based on the annual data available for monitoring and transparency purposes, the Transmission System Operator will provide an initial proposal detailing the system costs to be evaluated in the subsequent months by the NRA.

These initial proposals form part of the process to effectively regulate monopolies.

Figure 2 . Ideal structure and sequence of the annual market monitoring activities



It is important for both the electricity and gas markets that the role of the SO is correctly identified and that they have the appropriate tools available to undertake this role. Any interventions in the market made by the SO can lead to costs being incurred, both directly by the SO and more widely by the market. Since consumers ultimately bear these costs, it is important that these interventions are efficient.

The SO also has a wider role than its core balancing activities and it is important that the SO has the appropriate incentives to play a full role in delivering a sustainable energy system. Meeting these challenges will require the SOs to wholly contribute towards delivering a sustainable energy system that is robust to the challenges they face.

Playing a full role will require the SOs to take a proactive approach and take appropriate actions to reduce the impact of these challenges on SO costs. With this view in mind, the initial proposal sets out the SO initial views on the costs incurred during the year and a suggestion of the way the costs will evolve by the end of the year, and in the longer term (1–2 years)

2. *Public consultation (optional activity):* EgyptERA does not operate in a vacuum: regulation affects people and businesses across the country. It is essential that the NRA has clear picture of the implications of each policy before it is implemented. Consulting allows to this to take place transparently and openly.

The consultation process can be open to anyone with an interest in the policy proposals and there is a vast array of stakeholders that should be able to access and respond to consultations if they're directly affected by their implications.

In an initial phase, the consultation process could be open to a selected number of institutional stakeholders (Ministry of Finance, Ministry of Energy, Generation distribution Utilities and representative of final customers). Consultations may last for varying amounts of time depending on the kind of issues they cover.

- Major issues of wide interest: 12 weeks (maximum)

- Issues with narrower impact and of more specific interest: eight weeks
 - Urgent issues, or minor changes to existing policy, or other regulatory or statutory requirement: four weeks
3. *Joint assessment of the data between the NRA and the SO:* This is the part of the process when the NRA, based on the initial proposal, will discuss assumptions and analysis of the initial data and the projected costs indicated by the SO. Based on transparent specific analysis, the NRA will hold closed doors workshops and require specific clarification to the SO, in preparation of the final proposal to be issued to the SO. This process is not to be disclosed publicly but entails a series of fundamental steps that remain essential to reduce information asymmetry.
 4. *EgyptERA issues direction to the SO:* Based on the activities described above, the NRA is in a position to provide a decision that sets out a final proposal for the SO allowed costs that will form the basis for the CAPEX and OPEX calculation. This decision, once approved by the relevant ministry, will form the basis for the tariff formulation and any additional costs to be incurred by customers. This direction is based on the data published regularly by the TSO and on the basis of the data specifically acquired by the NRA for the SO cost revision process. This will take several weeks (depending on nation-specific process) before it is made final and implemented.
 5. *SO scheme implemented:* Ideally, the treatment of the allowed costs and the main details of the SO costs should be finalised (pending possible ex-post revision) in preparation of the closure of the financial year. This is vital as these data will provide important information on the financial performance on the SO and can have important repercussions on stakeholders and market participants.

4

PRACTICAL IMPLEMENTATION: WHAT ARE THE DATA, INFORMATION AND DETAILS THAT NEED TO BE PROVIDED TO PERFORM AN EFFICIENT MONITORING ACTIVITY?

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Monitoring activities are connected to the SO price control activities but provide a slightly different (and less specific) type of data to a wider set of interested parties. Also, the purpose of gathering data for monitoring requirements is slightly different as it targets greater transparency for the benefit of all existing and potential stakeholders (including private market players). The market monitoring activities are described below in greater detail, using the best practice developed in the EU markets at the beginning of the liberalisation process as a benchmark.

While developing precise guidelines, most EU member states 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 liberalised wholesale electricity market. The results of this analysis, emerging from this extended benchmarking exercise, forms the core of the tables that follow (in the Annex). These are comprehended in terms of six key characteristics:

1. *Required information:* A description of the information/data required, including level of aggregation.
2. *Timing of publication:* The 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.
3. *Timeframe:* A period of time per market unit to which the required information refers.
4. *Key benefits:* The background information as to why the information is needed and for whom.
5. *Information provider:* This identifies the organisation likely to be responsible for providing the information to the market.
6. *Information source:* This 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 key to the efficient and successful implementation of this process. The “natural” information owners and their related responsibilities (for example, to provide the information to other market participants or stakeholders) are summarised below. Nevertheless, other organisations may fulfil these roles too, depending on the specific setup of the market.

- Competent authorities, for example, 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 in their generation facilities, planning and operation. This includes the data on generation availability, feed-in to the grid and their new/planned generation projects, among others.
- 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 best suited to be responsible for aggregating and providing other relevant information to the market (for example, information on generation). TSOs will be in possession of large quantities of such information as a result of their operation of the transmission system, and in possession of actual measured data and short-term forecasts. Thus, it is important that there is a 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 and the 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 and products information.

Clearing and settlement agents (which could also be TSOs or PEXs) are primarily responsible for balancing prices and publishing them in a transparent way. They prepare merit order lists for the TSOs to use balancing power bids, and might also be involved in other activities such as maintenance of the metering point identification databases or other similar activities.

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

5

IMPLEMENTATION STRATEGY

5

IMPLEMENTATION STRATEGY

EgyptERA will have to face the huge task of implementing the entire set of market and SO monitoring activities from scratch, and additionally introducing an effective process to streamline the great quantity of information that will be required by the relevant operators.

However, this process will be defined in terms of minimum complexity and according to a gradual approach. Following the international best practices, we also believe that at least three timeframe horizons should be identified:

1. *Short run (SR)*: Activities to be introduced from year zero to year three.
2. *Medium run (MR)*: Activities to be implemented between year three to year five.
3. *Long Run (LR)*: Activities to be implemented by year 10.

5.1 Short-run activities

In the SR, EgyptERA should prepare the human and capital infrastructure to be compliant with the significant changes that the monitoring activities will require. A dedicated ITC infrastructure will be required able to accommodate and secure a significant amount of data that will be regularly provided to the NRA. Additionally, this data will be supplied with increasing frequency when fully operational. In the first phase, EgyptERA will decide the basis for the definition of the monitoring activities according to the specific information provided in section 1.4 above.

In terms of process: The first basic step is to distinguish between the handling of information and data protection principle. Therefore, each of the data and variables defined in the annex are to be defined, along with which information and data

represent commercially sensitive information and which remain commercially advantageous information. For both categories, a handling principle should be defined together with an implementation strategy, in order to define who has to provide, collect, store and grant access to each segment of the data required.

In terms of data monitoring: At least the initial wholesale data should be actively collected to guarantee that the potential participation of the private sector in this important segment (see attached Data Annex). In terms of methodology for the monitoring activities, only the core monitoring activities should be introduced. As a general principle, in the SR, it is important that the data already available to market participants are provided in a standardised format and made available to all the interested parties in a non-discriminatory way.

5.2 Medium-run activities

In the MR, the information management activities should be considerably extended to the Generation and Transmission segments. In these segments of the supply chain, the quantity of the data to be collected and the stored increases considerably, as does its granularity and requirements in terms of the duration of availability of the stored data. The monitoring activities will also have to deal with high frequency information whose granularity is also significantly greater.

In terms of process: Once the basic steps of the SR are completed, the handling principle should also be strengthened to define the way in which confidential data are ringfenced with the activities that are now unbundled in the SO. Information ringfencing and oversight mechanisms can help to reduce the possibilities of discrimination

against network users and must be efficiently implemented.

In terms of data monitoring: The NRA should increase the perimeter of the data made available, thus also increasing the level of transparency of the Generation and Transmission data (see the specific list of data identified in Annex 1, 2 and Annex 3).

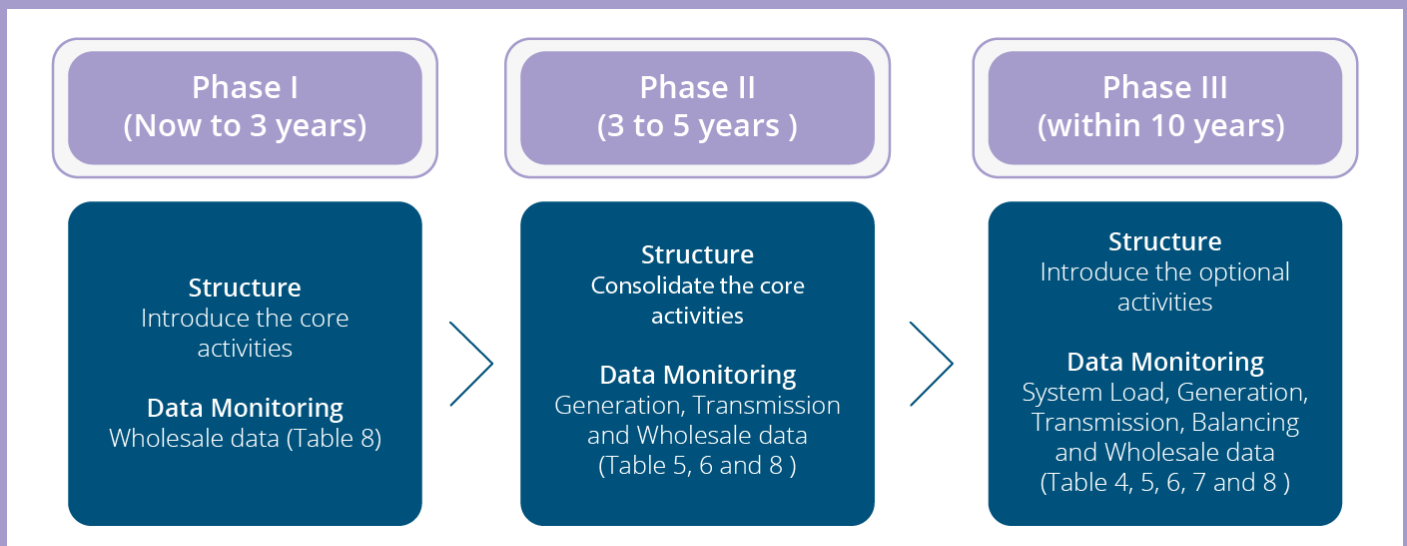
5.3 Long-run activities

In the LR, the monitoring activities to be implemented should be able to ensure that the NRA and every stakeholder involved in the process has adequate visibility of all the main market and system indicators that have been identified in the Annex tables. The ambition of the NRA must be to ensure that the electricity market in Egypt has reached a sufficient level of transparency for the industrial and commercial stakeholders, and so that market conditions and long-term perspectives are provided on an equitable basis to everyone interested. Ideally, market operators should be able to replicate the analysis of the adequacy of the transmission system in the long run. They should also be able to access the network development plan and market conditions using the data made available, to conduct statistical and optimisation analysis and to utilise planning methods and tools.

In terms of process: Following the provisions discussed in the two previous steps, the NRA should ensure that all the optional activities are available and ready to be implemented. In particular, the consultation process should be made available for at least the main issues of wide interest, in order to incorporate the views of interested stakeholders and parties. This will also provide reassurance that the NRA is willing to guarantee an adequate level of transparency with respect to the main dimension or the market functions and will, at the same time, provide an implicit incentive for the interested stakeholders to participate in a more transparent market. Thus, this will attract potential market participants, investors and operators.

In terms of data monitoring: The NRA will introduce market monitoring on System load data and Balancing cost data (Annex 4 and) with the aim to make all the information detailed in the Annex tables below available. The data should be available with the optimal data granularity and for an adequate time period. Whenever data are considered to be made unavailable on a confidentiality basis, the NRA should guarantee that no interested party has access to this type of data, and that there is no risk for this privileged information to be accessed or disclosed. Considering the amount and the relevance of data that will be made available, it is also essential to raise the standard of data security from an ICT point of view.

Figure 3 . Draft implementation strategy in the SR, MR and LR



ANNEX: DATA MONITORING

ANNEX 1: SYSTEM LOAD CONSUMPTION DATA

Information	Publication	Timeframe	Key benefits of information	Provider	Source
Actual load per control area	Just after real time	Per market time unit (for example, per hour), to be kept for two years	To monitor and analyse market prices vs. system load and generation To validate forecast load and load forecasting models	TSO	TSO and DSO
Day ahead load forecast per control area	D-1 for day D and until D+7 (next week)	Per market time unit	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
Week ahead forecast control area (where week ahead operations take place)	One to eight weeks in advance in a rolling mode	Per market time unit	Idem – in case there is significant new load or some load that was out of operation (for example, damaged) is repaired, it must be included here too	TSO	TSO
Year ahead forecast per control area	Y-1 for at least next year (up to a max of 10 years)	Per year	To forecast long-term prices' evolution To have a better visibility on the profitability of investment projects for generation capacities	TSO	TSO
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	To allow market participants to judge better investment and production decisions	TSO	TSO

ANNEX: DATA MONITORING

ANNEX 2: TRANSMISSION ACCESS AND INTERCONNECTION DATA

Required information	Publication	Timeframe	Key benefits of information	Provider	Source
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	Y-1 for a minimum of three following years (up to a max of 10 years)	Per year	To evaluate future development of transmission grids and interconnection capacities and congestions in the years to come (proposed three- and 10-year period) To evaluate future generation investment opportunity	TSO	TSO
Planned outages in the EHV grid and interconnections with dates and their impact on the capacity of the grid and each interconnection	Y-1 for year Y (updated with changes)	Per year, ensuring daily update with any new relevant information	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
Year ahead forecasts of interconnection capacity, taking into account all information available at the time of calculation	Y-1 for year Y	Per year	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
Month ahead forecasts of the interconnection capacity, taking into account all information available at the time of calculation	M-1 for next 12 months	Per week, segregating Peak and Off-peak hours	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
Week ahead forecasts of the interconnection capacity, taking into account all information available (for example, possible changes in maintenance plans) at the time of calculation	W-1 for week W	Per market time unit	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
Day ahead values of interconnection capacity	D-1 for day D	Per market time unit	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 the 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
Intra-day allocations of available transmission capacity	D-1 for day D	Successive after issuing of indicated/ actual day ahead production schedules	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 the 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
Details of 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 two years, preferably 10 years	Time of occurrence As soon as possible	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

Required information	Publication	Timeframe	Key benefits of information	Provider	Source
Capacity requested by market participants and capacity offered and assigned by TSOs	After each capacity allocation session	Per market time unit	To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster the 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
Capacity requested as priority rights by market participants and offered as priority rights by TSOs	After each capacity allocation session	Per market time unit	To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster the 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
Capacity reserved for balancing	After each capacity allocation session	Per market time unit	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
Total capacity nominated by market players on interconnections (commercial transactions)	After each session	Per market time unit	To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster the 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

Required information	Publication	Timeframe	Key benefits of information	Provider	Source
Congestion income, volumes and prices in case of auction for regulated assets; hence, relevant portion of merchant interconnectors excluded	After each session	Per market time unit	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
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	To guarantee efficient use of interconnection To facilitate the access of new players to markets where competition is still under development To foster the 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
Hourly average physical flows vs. thermal ratings of the lines and transformers in the EHV grid	W+1 for week W	Per hour	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 (for example, red = high, green = low)	TSO	TSO

ANNEX: DATA MONITORING

ANNEX 3: GENERATION DATA

Required information	Publication	Timeframe	Key benefits of information	Provider	Source
Total and available installed generation capacity per single generator unit, and foreseeable aggregated evolution in the next three to 10 years (including information on the type of generation from new projects, planned mothballing or dismantling)	Y-1 for a minimum of three following years (up to a max of 10 years)	Per year	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
Ex-ante information on the scheduled unavailability of the generation units (start and stop dates of the outages, unavailable capacity)	Y-1 for year Y and regular updates	Per year and as soon as possible	To be able to forecast future prices better	TSO/PEX (marketplace)	Generator
Ex-ante information on the scheduled unavailability of significant consumption units (start and stop dates of the unavailability)	Y-1 for year Y and regular updates	Per year and as soon as possible	To be able to forecast future prices better	TSO	Significant consumption units (customers) or suppliers
Ex-ante aggregated information on the scheduled generation per control area	D-1	Per system time unit	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

Required information	Publication	Timeframe	Key benefits of information	Provider	Source
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	W+1 for the week W	Per week	To be able to forecast future prices better To analyse the impact of past events on prices formation	Authority, PEX (marketplace), TSO and hydrogenerators	Generator
Forecast and actual intermittent generation (for example, wind)	Forecast for day D on D-1 and actual generation close to real time	Daily	To be able to forecast future prices better To be able to consider influence on available transmission capacity	TSO /PEX	Generator
Ex-post 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 and as soon as possible	To analyse the impact of past events on prices formation To give the possibility to react on longer unplanned outages	TSO/PEX	Generator
Ex-post information on the scheduled unavailability of significant consumption units (start and stop date of the unavailability)	Close to real time	Per market time unit	To analyse the impact of past events on prices formation To give the possibility to react on longer unplanned outages	TSO/PEX	Generator
Ex-post data on the actual generation by unit and control area	Close to real time	Per market time unit	To analyse the impact of past events on prices formation To be able to forecast future prices better	TSO/PEX	Generator

ANNEX: DATA MONITORING

ANNEX 4: BALANCING DATA

Information	Publication	Timeframe	Key benefits of information	Provider	Source
Volumes of bids and offers used	Just after real time, to be kept at least for one month	Per balancing mechanism time unit	To help market players to formulate their balancing offers to increase the level of transparency in the management of TSOs	TSO or parties responsible for clearing and settlement	TSO or parties responsible for clearing and settlement
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	To help market players to formulate their balancing offers To increase the level of transparency in the management of TSOs	TSO or parties responsible for clearing and settlement	TSO or parties responsible for clearing and settlement
Imbalance prices	Just after real time	Per balancing mechanism time unit	To help balance responsible to optimise their imbalance's level	TSO or parties responsible for clearing and settlement	TSO or parties responsible for clearing and settlement
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	To help balance responsible to optimise their imbalance's level To enable monitoring	TSO	TSO
Information on the financial balance of the whole market (expenses on the balancing market / payment of imbalances)	M+1 for month M, to be updated until final reconciliation	Per month	To increase the level of transparency in the management of TSOs	TSO	TSO or parties responsible for clearing and settlement
Market information on the type of balancing bids/offers used	M+1 for month M	Per day	To help market players to formulate their balancing offers To increase the level of transparency in the management of TSOs	TSO	TSO

ANNEX: DATA MONITORING

ANNEX 5: WHOLESALE MARKET INFORMATION DATA

Information	Publication	Timeframe	Key benefits of information	Provider	Source
Aggregated supply and demand curves, prices and volumes for each standard traded product and for all kinds of markets (spot, continuous, futures, etc.)	P-1 for period P, per illustrative product	Per market time unit	To analyse market depth To give a reference for the contract's negotiation To facilitate risk assessment	PEX	PEX
Prices and volumes of the OTC market	M+1 for month M, per illustrative product	Per month	To analyse market depth To give a reference for the contract's negotiation	Brokers, PEX	Brokers, PEX



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