BRIEF GUIDE
to the Market Rules

1. INTRODUCTION AND DEFINITIONS

This Guide is a stand-alone document and intended to help Trading Participants in their reading of the Market Rules. It follows the contents of the Market Rules by explaining briefly the key components, concepts and principles of the market such as market model and role of the Trading Participants, balancing mechanism operation, settlement of trades in balancing energy and the associated credit posting. This Guide is not a legally binding document. In the event of any discrepancies between this Guide and the Market Rules, the Rules shall prevail.

Glossary of Terms

Term	Definition / Explanation
Balancing Energy	The energy used by the TSO to match system-wide imbalances between electricity production and consumption;
Balancing	The making up for the difference between the quantities of energy consumed/produced by Plants of a Trading Participant and the its contractual quantities under delivery schedules;
Grid Code	The widely known name of the Rules under Art. 1, paragraph 1, Item 4 of the Energy Act;
Dynamic Parameters	Technical data and characteristics of a Trading Participant's Plant relating to its ability to change its operational levels;
SERC	The State Energy Regulatory Commission;
EPS	The Electric Power System;
Bid	Information provided by a Trading Participant to the TSO indicating the willingness to reduce the generation or increase the demand of its relevant plant or an aggregate of plants to a level other than the Physical Nomination levels in exchange for payment;
Maximum Delivery Volume	A Dynamic Parameter giving information relating to the maximum amount of energy that an HPP or a Cascade is capable of generating with the hydro-resources available at the time;
Plant	A generation plant or demand plant of a Trading Participant and the associated metering equipment. For generation, a Plant is typically a single generating unit, power plant or cascade. For demand, a Plant is typically a factory, works or installation operated by an eligible customer;
TSO/EPSO	Transmission System Operator/Operator of the Electric Power System
Balancing Market	Organized trade in balancing energy to maintain the balance between production and consumption within the Electric Power System;
Offer	Information provided by a Trading Participant to the TSO

	indicating the willingness to increase the generation or decrease the demand of its relevant plant or an aggregate of plants to a level other than the Physical Nomination levels in exchange for payment;
Run-Up Rate	A Dynamic Parameter giving information relating to the rates for increasing output levels of a relevant plant or an aggregate of plants;
Run-Down Rate	A Dynamic Parameter giving information relating to the rates for decreasing output levels of a relevant plant or an aggregate of plants;
Physical Nomination	Information relating to the expected level of production/consumption of a plant or an aggregate of plants. Such information is provided by Trading Participants submitting Offers and Bids to the Balancing Market.

2. MARKET MODEL. PARTIES AND PARTICIPANTS

2.1. Market Model

The electricity market is organized on the basis of Power Supply Contracts and a Balancing Market – see Fig.1.

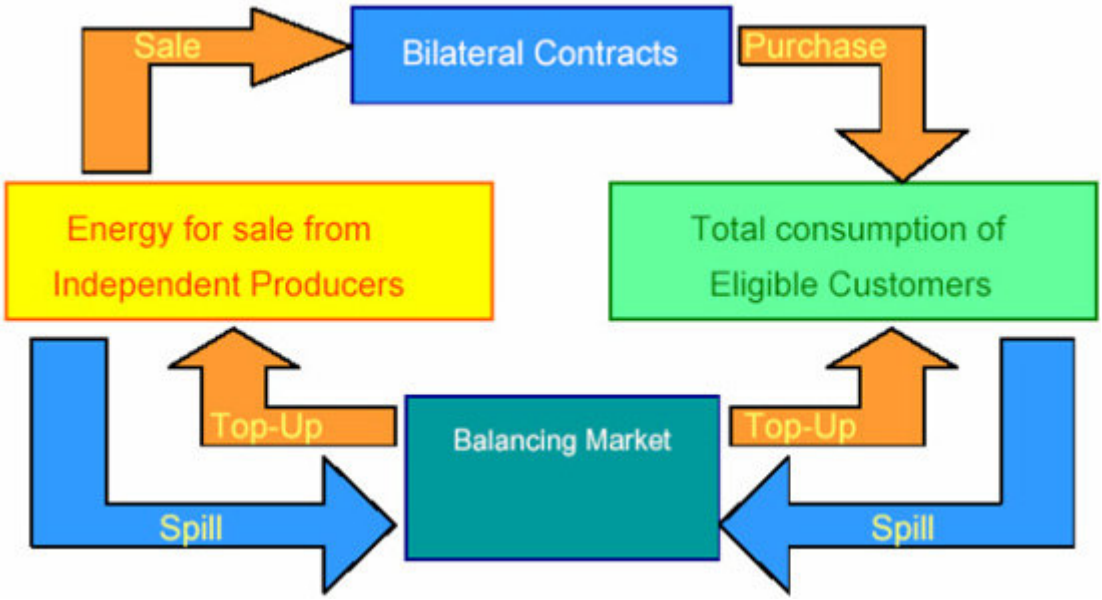


Figure 1

A central feature of this market model is the fact that producers are dispatched according to their contractual quantities of electricity. Energy imbalances resulting from failure on the part of a producer or a consumer to meet its contractual delivery schedules are redressed by providing balancing energy that is purchased from or sold to the TSO. Producers who over a certain settlement period have generated less energy than the contract amount and demand-takers who have consumed more energy than the contract amount, they will be in negative energy imbalance and buy energy from the TSO at a top-up price. Generators who over a certain settlement period have generated more energy than the contract amount and demand-takers who have consumed less energy than the contract amount, they will be in positive net imbalance and sell energy to the TSO at a spill price. Since usually the top-up

price is higher than the contract price and the spill price is lower than the contract price, Trading Participants have incentives to meet as closely as possible their contractual delivery schedules that result in lower levels of imbalances between generation and demand in the system.

2.2. Market Structure

The electricity market consists of two segments – market based on regulated prices and market based on freely negotiated prices– see Fig.2.

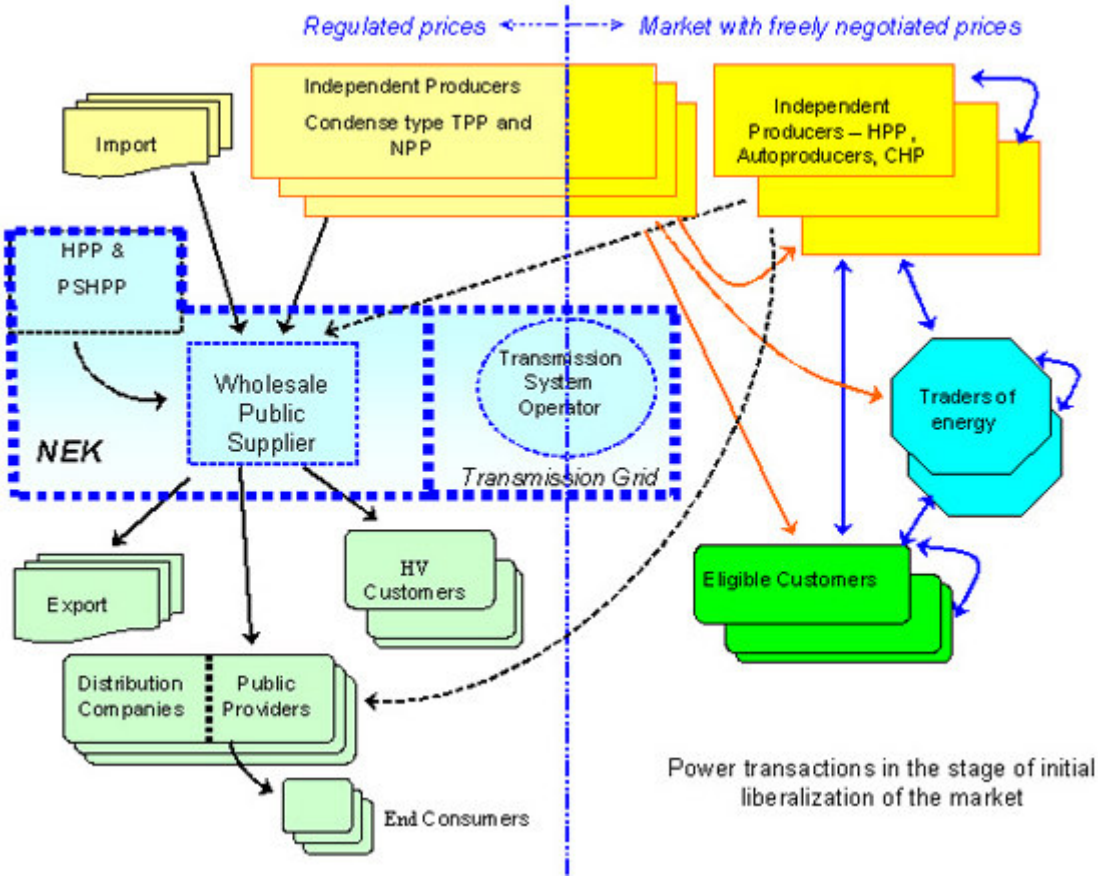


Figure 2

Electric power transactions at regulated prices should be concluded with the Wholesale Public Supplier and/or Public Providers in accordance with the procedure provided under Section VI of the Energy Act, and the parties to such transactions will not be subject to balancing, i.e. they do not enter into deals for balancing energy with the TSO.

Electric power transactions at freely negotiated prices should be concluded between Trading Participants as defined under Section VII of the Energy Act, and parties to such transactions will be subject to balancing in accordance with the rules prescribed by the Market Rules.

2.3. Parties and Participants

The Transmission Company through the TSO concludes deals for balancing energy with Trading Participants and the Public Supplier.

A Trading Participants are:

- Power Producers;
- Eligible Customers granted that status in accordance with the Open Access Ordinance promulgated in SG39/16.4.2002;

- Electric Power Traders, all registered as prescribed by the Market Rules.

The Public Supplier is the main provider of balancing energy through the availability purchased from power plants and internal capacities – HPP and PSHPP. The Public Supplier is subject to balancing in cases where the net energy imbalance of Trading Participants is less than the accepted offers and bids.

TSO is responsible for the secure and reliable operation of the entire electric power system. In the event of emergency, TSO may stay the operation of the market and revise power delivery schedules.

The function of the TSO relating to the organization of the electricity market, include:

- Registration of Trading Participants, weekly delivery schedules under contracts, offers and bids for balancing energy, contracts of the Public Supplier and Public Providers;
- Preparation of merit orders of balancing energy sources;
- Settlement of Trading Participants and the Public Supplier;
- Determination of imbalance prices;
- Settlement statements, issuance and receipt of invoices;
- Management of a separate balancing energy account;
- Management of a market operation database.

3. CONTRACTS

3.1. Contracts at freely negotiated prices

These contracts should be concluded between Trading Participants for supply of electricity at freely negotiated prices, and the quantities of delivery broken down on an hour-by-hour basis in a weekly schedule of delivery should be notified to the TSO – see Fig. 3.

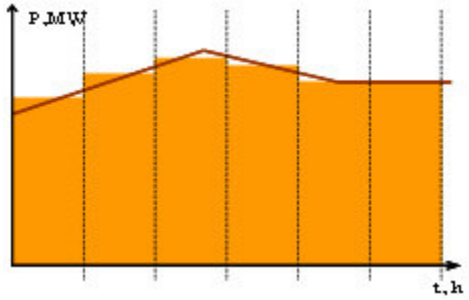


Figure 3

Contracts at freely negotiated prices have the following features:

- The Buyer pays the Seller for the whole contractual amount at a freely negotiated price irrespective of the actual (metered) consumption;
- A Buyer to a Contract is not allowed to buy at the same time energy from the Public Supplier/Provider except for the cases of a substitutionary contract as defined below;
- Trading Participants may enter into unlimited number of contracts at freely negotiated prices within each Settlement Period – see Fig.4;

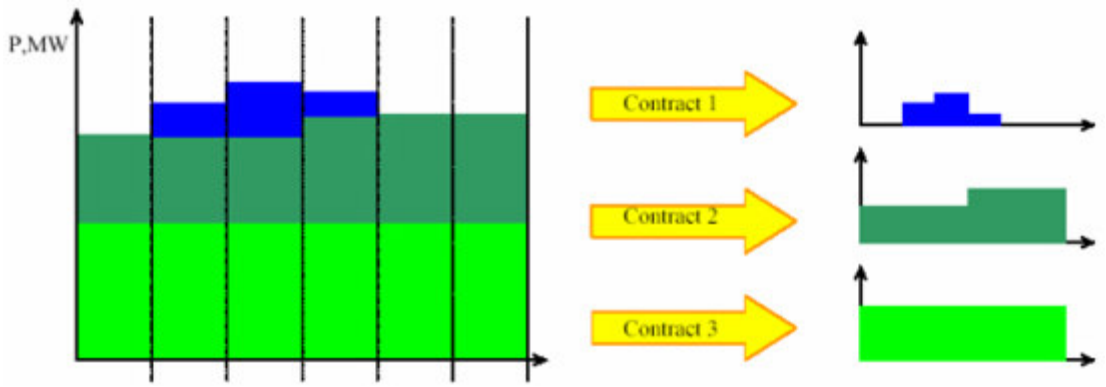


Figure 4

- Producers, who have contracts with the Public Supplier/Provider, may sell energy at freely negotiated prices only from the bargaining quotas authorized by the SERC in accordance with Art 4 of the Open Access Ordinance, SG39/16.4.2002.

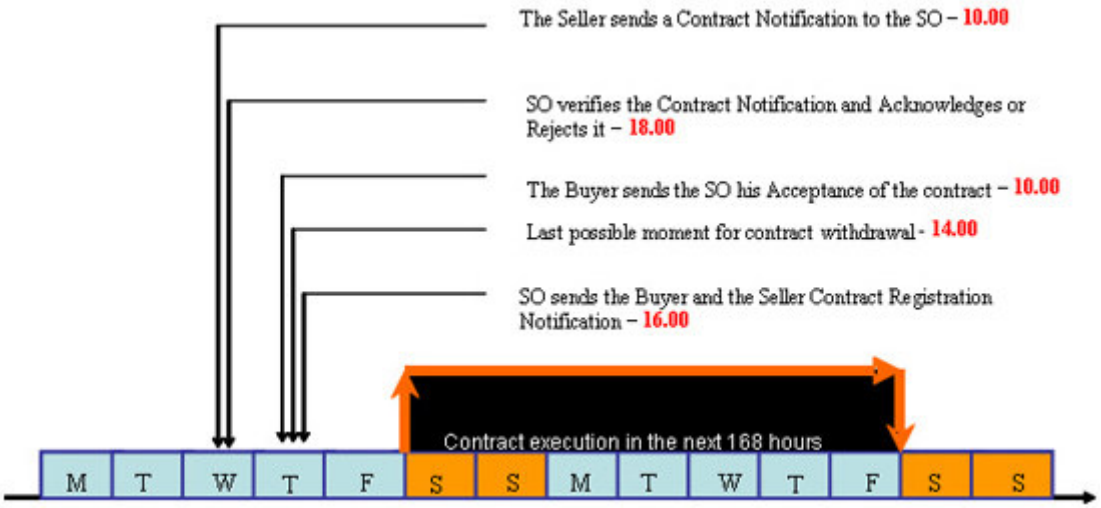
- The hourly quantities of electrical energy contained in the weekly schedules of delivery should be notified to the TSO.

3.2. Weekly Delivery Schedule Notification Procedure

The notification process has the following steps:

Figure 5

The time limits by which weekly delivery schedules need to be notified are shown in Fig. 6:



3.3. Conditional Contracts

Eligible Customers registered in the Balancing Market will conclude one-year conditional contracts for supply of electricity with the Public Supplier and/or Public Providers. Such contracts are implemented when a customer:

- does not have any registered weekly delivery schedule;
- has a cancelled weekly schedule owing to its removal from the market;
- has sustained a breach of a weekly schedule because of a declared stay of the market due to emergency.

In cases where an Eligible Customer has a registered weekly schedule of delivery under contract at freely negotiated prices, for a period of 168 hours it is not allowed to be supplied by the Public Supplier and/or Public Providers except through a substitutionary contract.

Producers registered in the Balancing Market will conclude annual conditional contracts for supply of electricity with the Public Supplier and/or Public Providers that are executable in case of violated weekly delivery schedule due to declared suspension for emergency.

3.4. Substitutionary Contracts

In the event of a withdrawn or cancelled weekly delivery schedule and the non-defaulting party being a Buyer to the contract is an Eligible Customer who has at least one registered weekly schedule other than the cancelled schedule that is valid for the same period of time, the latter has the right to execute a substitutionary contract with the Public Supplier/Provider.

In cases where an Eligible Customer buys electricity based on a substitutionary contract, it is subject to balancing in accordance with the general terms of balancing.

An Eligible Customer has the right to buy electricity through substitutionary contracts for the duration of as many as two successive weekly delivery schedules, and pays the Public Supplier/Provider for the electricity delivered under the substitutionary contract delivery schedule at regulated prices set by the SERC.

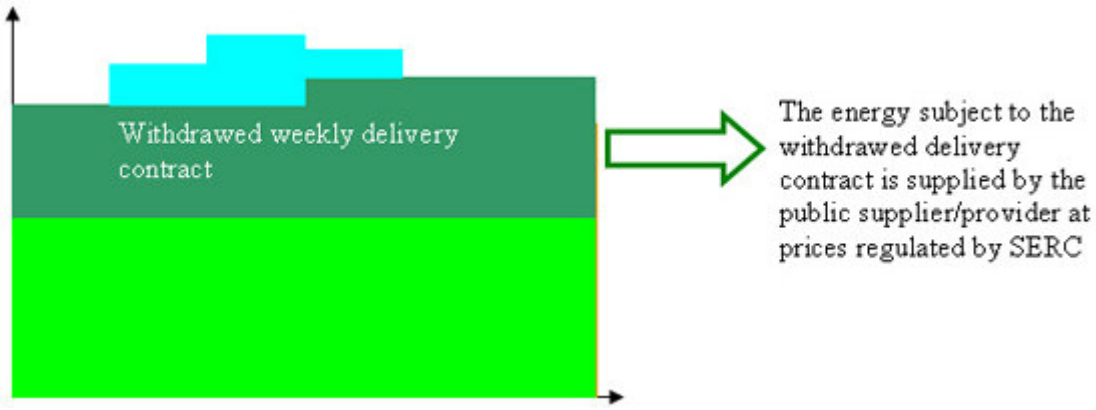


Figure 7

In the event of a cancelled weekly delivery schedule, the TSO will, no later than 10 o'clock in day of notification of a substitutionary contract schedule given by the affected eligible customer, notify the Public Supplier/Provider of the implementation of a substitutionary contract.

In the event of a withdrawn delivery schedule, the TSO will notify the Public Supplier/Provider of the implementation of a substitutionary contract no later than 10:00 on the Friday preceding the period of supply.

The Public Supplier or the respective Public Provider is obliged to accept and follow the delivery schedule under the relevant substitutionary contract.

In cases where the supply of electricity takes place based on a second delivery schedule in succession under a substitutionary contract, the Eligible Customer should submit such second delivery schedule under the substitutionary contract to the TSO within the terms set for the weekly delivery programs.

. BALANCING MECHANISM

4.1. General

Pursuant to the energy market principles, customers intend to enter into contracts with delivery schedules that are as close as possible to their expected level of demand and producers intend to generate quantities that are equal to the contractual quantities in accordance with the delivery schedules.

The sum total of the quantities of energy under the delivery programs of all power purchase contracts must be equal to the forecasted total demand for that period.

4.2. Balancing Energy

Balancing energy is used by the TSO to maintain the balance between generation and demand in the electric power system.

Sources of Balancing Energy:

a. Plants of producers the availability of which is released in whole by the SERC for transactions at freely negotiated prices;

b. Plants of Eligible Customers;

c. Power plants of producers the availability of which is in part or in whole purchased by the Public Supplier;

d. Power plants that are property of the Public Supplier.

Trading Participants under a. and b. above provide Balancing Energy through Offers and Bids at prices freely set by them for each period of settlement.

Balancing Energy sourced from power plants under c. and d. above is provided by the Public Supplier.

4.3. Merit Orders

Merit Orders for acceptance of Offers and Bids are prepared by the TSO based on the technological criteria relating to the security of supply.

A Merit Order contains:

- Offers/Bids submitted by Trading Participants under Item 4.2 a. and b.;
- The available tertiary reserve provided by producers under Item 4.2 c. and d.

Power ranges provided for frequency control are not included in a merit order.

In making a Merit Order to make up for the insufficiency of generating capacity in the electric power system, Balancing Energy sources are placed in an ascending order at their delivery price.

In making a Merit Order to make up for the surplus of generating capacity in the electric power system, Balancing Energy sources are placed in a descending order at their price.

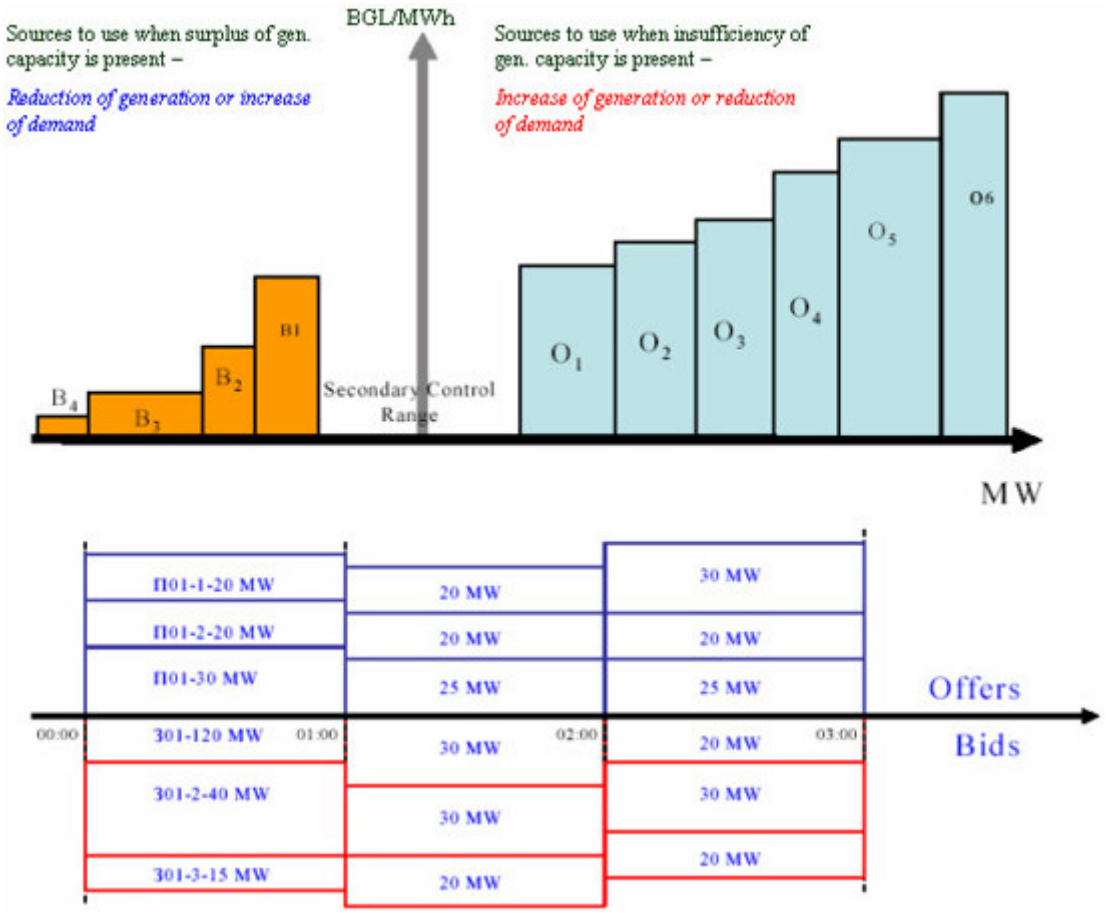


Figure 8

4.4. Offers and Bids

Offers and Bids indicate a participant's willingness to operate at a level other than its Physical Nomination at the relevant price for increasing or decreasing of generation/demand if the TSO has so instructed.

TSO accepts Offers for increase of generation and decrease of demand when there is insufficient generation capacity in the EPS to maintain the positive part of the secondary control range within the limits as prescribed in the Grid Code.

TSO accepts Bids for decrease of generation and increase of demand when there is a surplus of generation capacity in the EPS to maintain the negative part of the secondary control range within the limits as prescribed in the Grid Code.

Trading participants submitting Offers and Bids to the Balancing Market need to notify the TSO of:

a. the dynamic parameters that are an aggregate of data and characteristics of the different plants of the Trading Participants relating to their ability to change output levels;

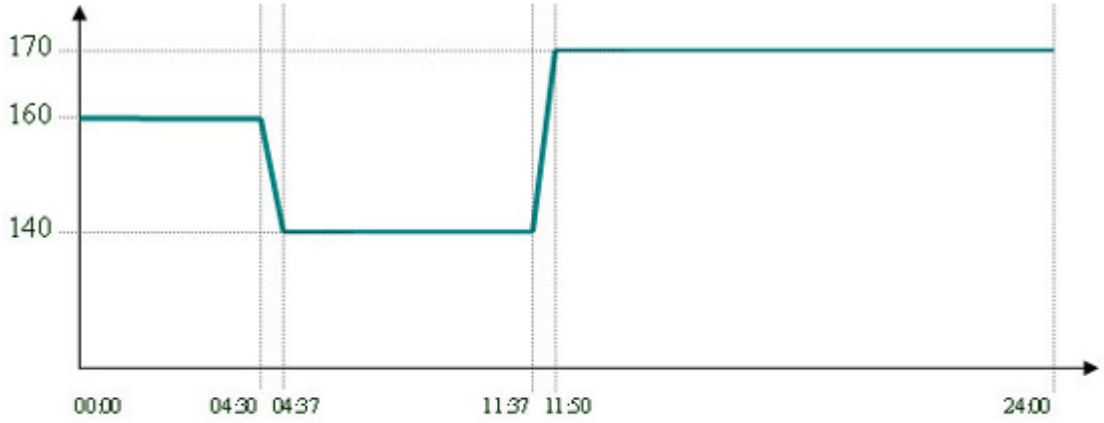
b. Physical Nominations for generation/demand providing information on the expected level of generation/demand of a given plant or an aggregate of plants.

Dynamic Parameters and Physical Nominations are submitted by Trading Participants along with the associated Offers and Bids in a consolidated form after a sample established by the TSO.

Dynamic Parameters:

- Run-Up Rate, MW/min;
- Run-Down Rate, MW/min;
- Maximum Delivery Volume, MWh – for HPP and PSHPP only;
- Maximum Delivery Volume period, hh:mm – for HPP and PSHPP only;
- Bid Acceptance Time, min;
- Offer Acceptance Time, min;
- TSO dispatch order implementation time, i.e. from the moment of receipt till start of a change, min.

Physical Nominations placed by Trading Participants take the form of a minute-by-minute profile of the expected power output or consumption of the relevant generation or demand plants for the following 24 hours – see Fig.9.



T, hh:mm	00:00	04:30	04:37	11:37	11:50	23:59
P, MW	160.0	160.0	140.0	140.0	170.5	170.5

Figure 9

Power exports (energy flows from a participant's plant to the transmission/distribution network) specified in the Physical Nominations are

expressed as positive values, whereas imports (energy flows from the network to a participant's plant) are expressed as negative values.

For the purpose of settlement it is assumed that the active power between two points consecutive in time defined in a Physical Nomination will change by a linear characteristic.

In calculating the quantities of Balancing Energy from accepted Offers and Bids, the TSO will use the generation/demand levels specified in the Physical Nominations.

An Offer/Bid for a generation plant or an aggregate of generation plants may deviate from the relevant Physical Nomination for generation by minimum 20 MW and should be specified to the nearest MW.

An Offer/Bid for a demand plant or an aggregate of demand plants of an Eligible Customer may deviate from the relevant Physical Nomination for demand by minimum10 MW and should be specified to the nearest MW.

Duration of an Offer/Bid should be equal to the Settlement Period and every Trading Participant is required to submit at least two successive Offers and/or Bids.

A Trading Participant may submit one Offer and one Bid for each of its plants or an aggregate of plants for a single Period of Settlement and the price of such Offer/Bid should be valid for the whole Settlement Period.

Where a Participant has an accepted Offer/Bid for period j and it has submitted an Offer/Bid for period j+1 but has not be given an instruction by the TSO to stop the execution of its Offer/Bid, it should be deemed that the TSO has accepted its Offer/Bid for period j+1 as well.

Where a Participant has not submitted an Offer/Bid for period j+1 and it has not received an instruction from the TSO to undo its Offer/Bid accepted during period j, it has the right to undo itself the Offer/Bid two minutes at the earliest before the end of period j by giving an advance notice to the TSO thereof – see Fig.10. In the event that the dynamic parameters of the relevant plant do not allow to effect complete undo of the Offer/Bid within 4 minutes, the Trading Participant has the right to request the TSO to initiate the undo process so much time before the beginning of period j+1 so that 50% of the requested change in power could be achieved by the beginning of period j.

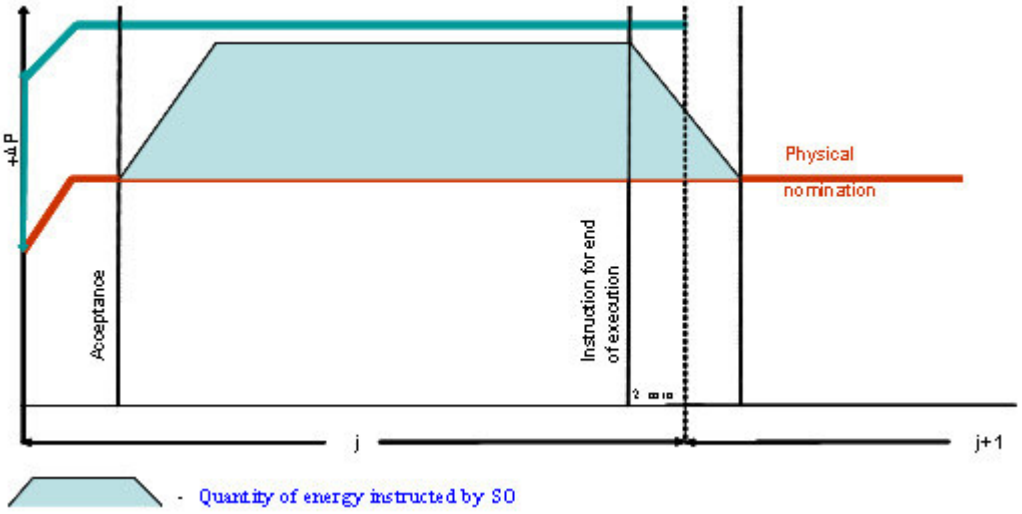


Figure 10

Since between two periods of settlement the TSO needs to undo former Offers/Bids and accept new Offers/Bids, there is a threat of occurrence of serious imbalances in the EPS and considerable narrowing of the secondary control ranges. To mitigate the

negative effect thereof, it is necessary for the TSO to be able to accept Offers/Bids at the end of the preceding period and to this end, the Rules on Electricity Trading stipulates the following rule:

The TSO may accept an Offer/Bid of a Trading Participant for Settlement Period j+1 no earlier than two minutes before the start of Period j+1 and where the Dynamic Parameters of a single plant do not allow to effect complete acceptance of the Offer/Bid within 4 minutes, the TSO may instruct to initiate acceptance so much time before the start of Period j+1 so that 50% of the instructed change in power be achieved by the start of Period j+1 – see Fig.11.

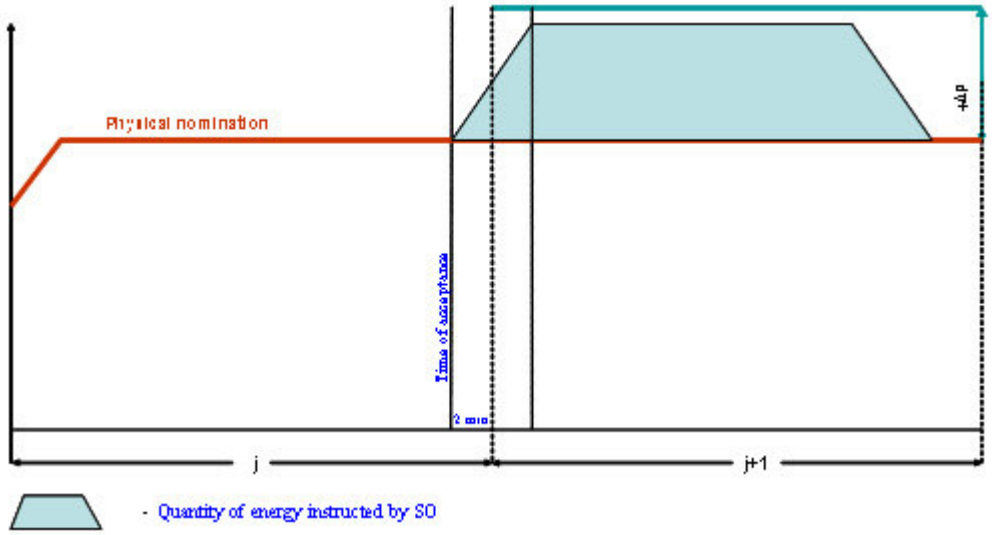


Figure 11

5. SETTLEMENT

5.1. General Principles of Balancing of Trading Participants

Settlement represents a system used by the TSO for calculation of individual deviations of actually consumed or generated electric energy from the contractual quantities over a given period.

Balancing of a Trading Participant is the compensation for the difference between the quantities of consumed/generated energy by its plants and the quantities under delivery programs to the contracts concluded.

The following parties are subject to balancing:

a. Trading Participants that have a registered weekly delivery schedule;

b. Trading Participants that participate with Offers and Bids in the Balancing Market for a given Period of Settlement;

c. The Public Supplier in cases where the energy amount of net imbalances of Trading Participants is less than the amount of energy under accepted Offers and Bids.

The contractual amounts of energy in the weekly delivery schedules are shown in the formulas for Settlement of a Trading Participant with negative values when it acts as seller under the Contract and with positive values when it acts as buyer.

The measured quantities of energy are entered into the formulas for Settlement of a Trading Participant with negative values when their direction is from the transmission/distribution network to a Participant's plant and with positive values– in the opposite direction.

5.2. General Conditions of Balancing

Settlement of Trading Participants that have done only transactions at freely negotiated prices is made in accordance with the General Conditions of Balancing. As for the other Trading Participants, exceptions to the general conditions explained under Item 5.3 are introduced.

For every period of settlement the TSO calculates the following imbalances of Trading Participants:

- *Measured Imbalance* is the difference between the measured quantity of energy and the quantity of energy under weekly delivery schedules;
- *Instructed Imbalance* is the difference between the TSO- instructed quantity of energy under an accepted Offer/Bid and the quantity of energy under Physical Nominations for a Settlement Period. It is calculated only for plants of Trading Participants that have accepted Offers and Bids;
- *Net Imbalance* is the difference between the measured imbalance and the instructed imbalance.

5.3. Exceptions to the General Conditions of Balancing

Producers that deliver energy at regulated and freely negotiated prices over one and the same Settlement Period are balanced in accordance with the General Conditions of Balancing only when the total amount of energy from their weekly delivery programs is greater than their measured quantity of energy and their generating units do not provide secondary frequency and power exchange control services over the relevant Period.

Producers participating in the Balancing Market with Offers and Bids and having no registered weekly delivery programs are balanced in accordance with the General Conditions of Balancing only for Settlement Periods for which they have registered Offers and Bids and their measured imbalance is calculated from the difference between the measured quantity of energy and the quantity of energy under the relevant Physical Nomination.

The net imbalance of energy traders is calculated from the difference between the energy purchased and sold under its weekly delivery programs.

5.4. Imbalance Settlement Prices

Since Balancing Energy is supplied by the Public Supplier and through Accepted Offers and Bids submitted by Trading Participants, to calculate its price, offer participation coefficients (OPC) and bid participation coefficients (BPC) respectively are introduced**.** The values of OPC and BPC are calculated from the relation between the quantity of energy under accepted Offers/Bids and the net imbalance (energy deficit/surplus) of Trading Participants.

The values of OPC and BPC are calculated for each Settlement Period and their meaning is explained below:

OPC = 0	No accepted Offers and TSO covers the energy deficit of Trading Participants by providing Balancing Energy from the Public Supplier only;
OPC = (0¸ 1)	Energy deficit of Trading Participants is covered with Balancing Energy provided by the Public Supplier and under accepted Offers and Bids;
OPC = 1	The quantity of energy under accepted Offers is equal to the energy deficit of Trading Participants and to cover it the TSO does not use Balancing Energy from the Public Supplier;
OPC > 1	The quantity of energy under accepted Offers is greater than

	the energy deficit of Trading Participants and therefore part of such Balancing Energy is used by the TSO to cover the energy deficit of consumers supplied by the Public Supplier. In this case, the Public Supplier is subject to balancing and it buys energy from the TSO at a top-up price.
BPC = 0	No accepted Bids and to compensate for the energy surplus of Trading Participants, the TSO sells the surplus to the Public Supplier only;
BPC = (0 ¸ 1)	The TSO adjusts the energy surplus of Trading Participants by selling the surplus of the Public Supplier and that under accepted Bids;
BPC = 1	The quantity of energy under accepted bids is equal to the energy surplus of Trading Participants and to adjust it the TSO does not sell Balancing Energy to the Public Supplier;
BPC > 1	The quantity of energy under accepted Bids is greater than the energy surplus of Trading Participants and therefore part of such Balancing Energy is sold by the TSO to adjust the energy surplus of consumers supplied by the Public Supplier. In this case, the Public Supplier is subject to balancing and it sells energy to the TSO at a spill price.

Imbalance Settlement price for deficit for Settlement Period j is calculated depending on the value of OPC_j by the formulas below:

- **OPC_j = [0;1],** $PED_j = (1- OPC_j)PEMj + OPC_jPEOav_j$

Where:

PEMj – the price of Balancing Energy from the Public Supplier formed on the basis of the marginal price of the condense-type thermal units or HPP with daily equalizers that are in operation, expressed in BGL/MWh

$PEOav_j$ – weighted average price calculated from the Accepted Offers for Period j

- **OPC_j > 1,** $PED_j = PEOav_j$

The price for surplus PES_j for Settlement Period j is calculated based on the value of BPC_j as follows:

- BPC_j = [0;1], $PES_j = (1- BPC_j)PEG_j + BPC_jPEBav_j$

Where:

PEG_j – the price of Balancing Energy purchased from the Public Supplier to adjust positive imbalances of Trading Participants for Period j.

$PEBav_j$– weighted average price calculated from the accepted bids for period j.

- BPC_j > 1, $PES_j = PEBav_j$

5.5. Receivables and Liabilities of the TSO for Balancing Energy

For each Settlement Period, the amount of receivables of the TSO from the sale of Balancing Energy is equal to the amount of its liabilities for the purchase of Balancing Energy – see Fig. 12.

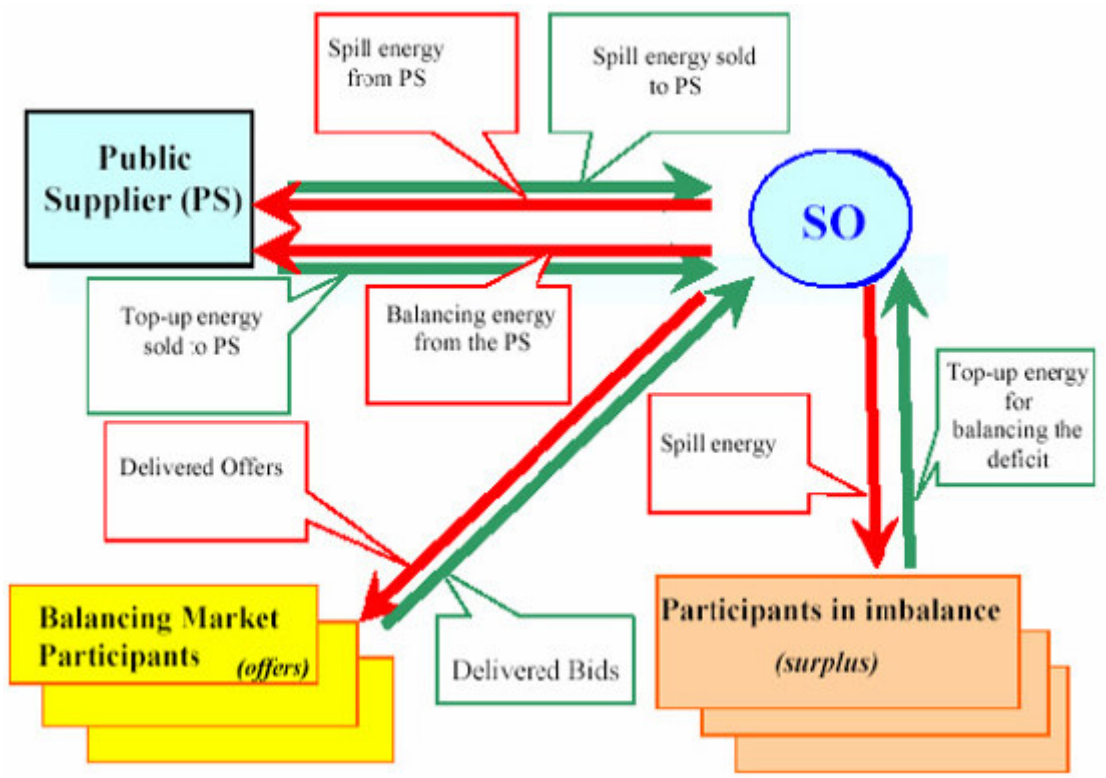

Spill energy from PS
Spill energy sold to PS
Public Supplier (PS)
SO
Top-up energy sold to PS
Balancing energy from the PS
Top-up energy for balancing the deficit
Spill energy
Delivered Offers
Balancing Market Participants (offers)
Delivered Bids
Participants in imbalance (surplus)

Figure 12

6. MARKET OPERATION PROGRAMS – BEFORE AND AFTER THE TIME OF ACTUAL DELIVERY – DAY "D"

Figure 13 sets out the timetable for exchange of information and the operation of the Balancing Market before the day of actual delivery, and Figure 14 – the successive stages of settlement and invoicing.

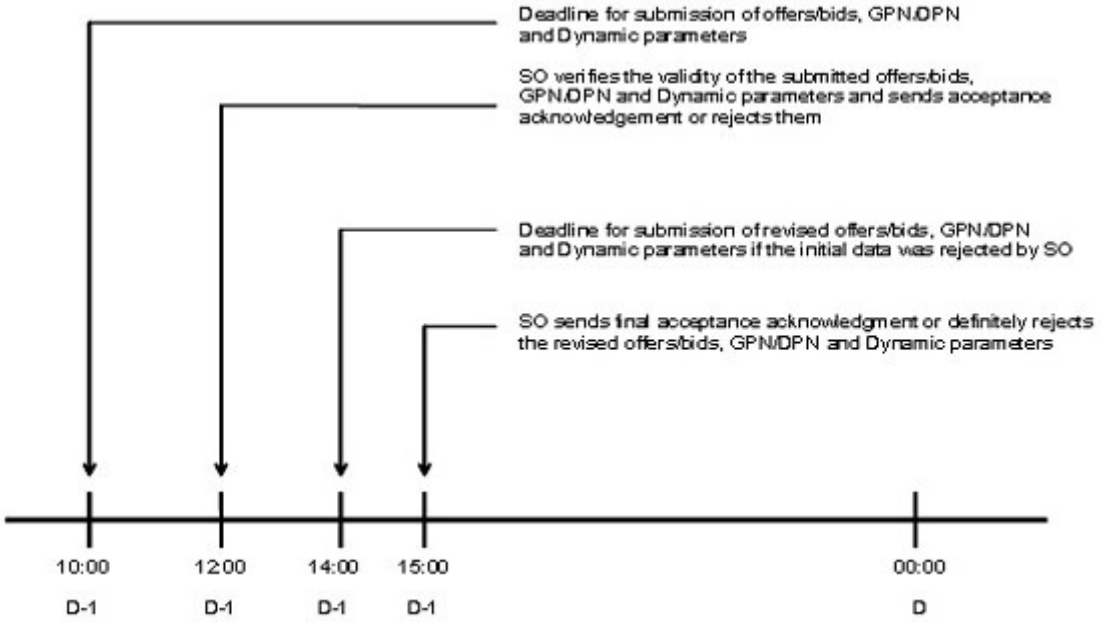


Figure 13

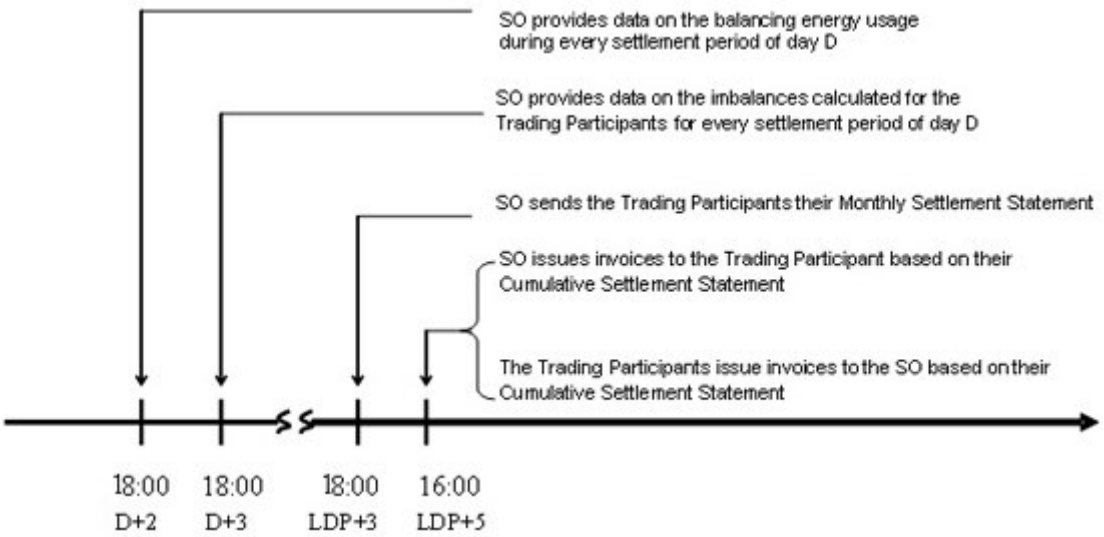


Figure 14

LDP – the last day of the period concerning a respective Cumulative Settlement Statement.

7. CREDIT POSTING TO BACK UP BALANCING ENERGY TRANSACTIONS

Trading Participants registered in the Balancing Market may strike transactions at freely negotiated prices after having lodged with the TSO a guarantee deposit to back up transactions with Balancing Energy. The guarantee is deposited in a special account of a participant with a bank servicing the Balancing Market.

To administer the special accounts, the bank, TSO and the Trading Participant enter into a contract. Provided the Account Holder fails to pay an amount due to the TSO within 5 days from invoice, the TSO will be entitled upon first written demand/order for immediate collection to the bank by stating the amount due from the Trading Participant including interest accumulated to receive payment in its favour from the special account of the Trading Participant.

The amount of the guarantee deposit is determined by a methodology set forth in the Market Rules and is updated by the TSO twice a year – in July for the first six months and in January for the second six months of the preceding year.

8. GOVERNANCE AND REGULATION

Any amendments to the Market Rules may be initiated and discussed by the Permanent Working Group to SERC composed of:

- Two representatives of SERC;
- Two representatives of TSO;
- Two representatives of the Public Supplier;
- One representative of each of:
  - Power producers (condense-type plants);
  - CHP generators;
  - Distribution Network Operators;
  - Eligible Customers;
  - Autoproducers;
  - Producers of electric energy from renewable energy sources.