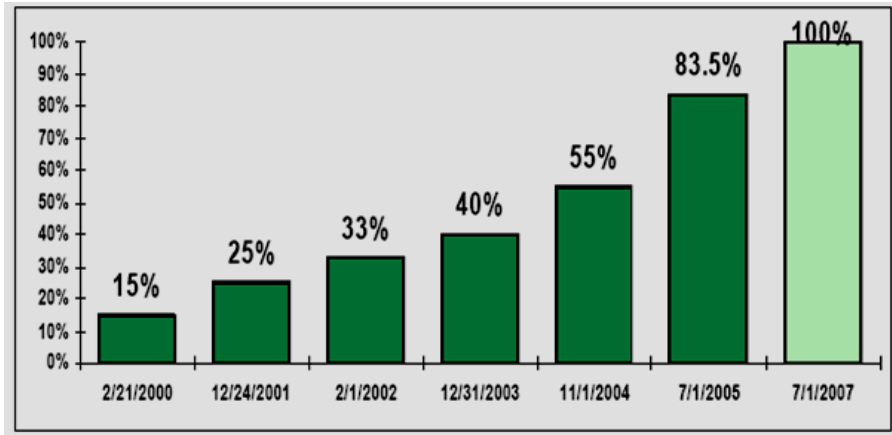
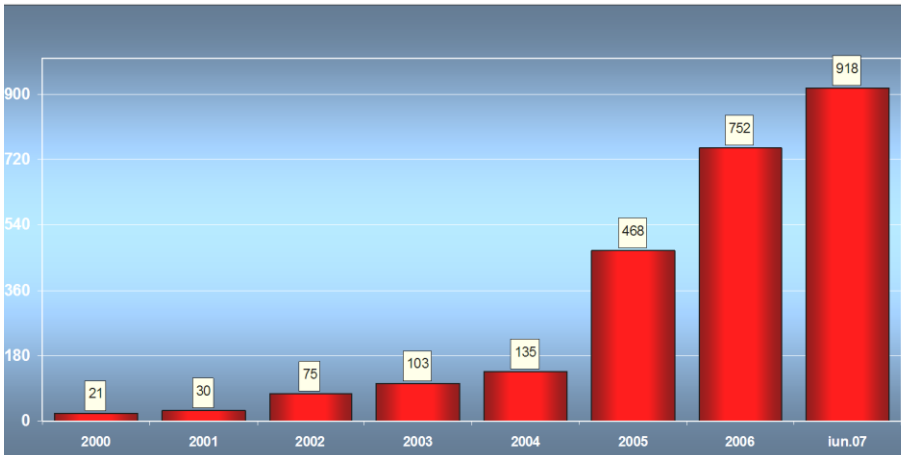




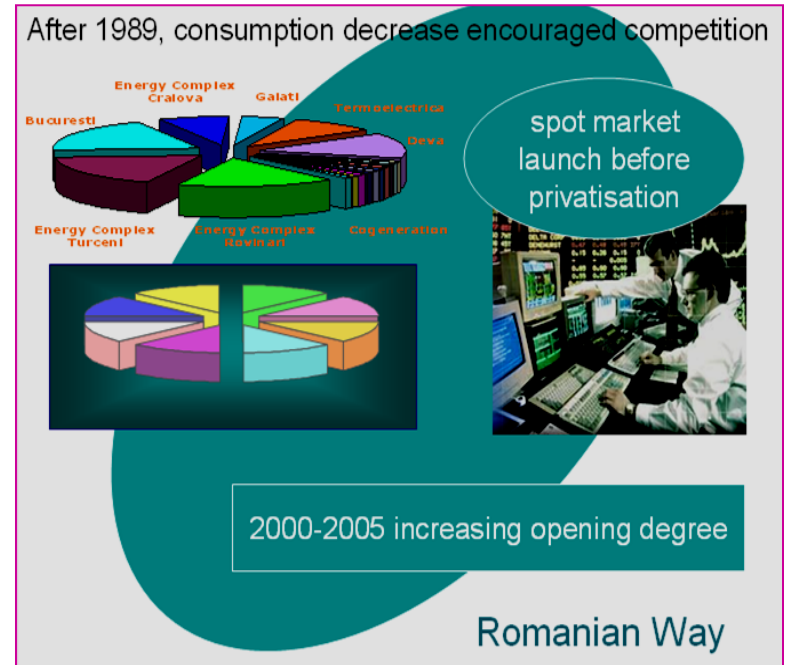
The Romanian Electricity Market liberalisation towards EU access and best practices undertaking



Theoretical opening



Participants' number



Generation & Distribution restructuring

In 2005 a new trading platform including rules, procedures and trading systems introduced the multi-market concept in Romanian electricity market

Market restructuring



The Multi – Market Concept: Romanian Electricity Market

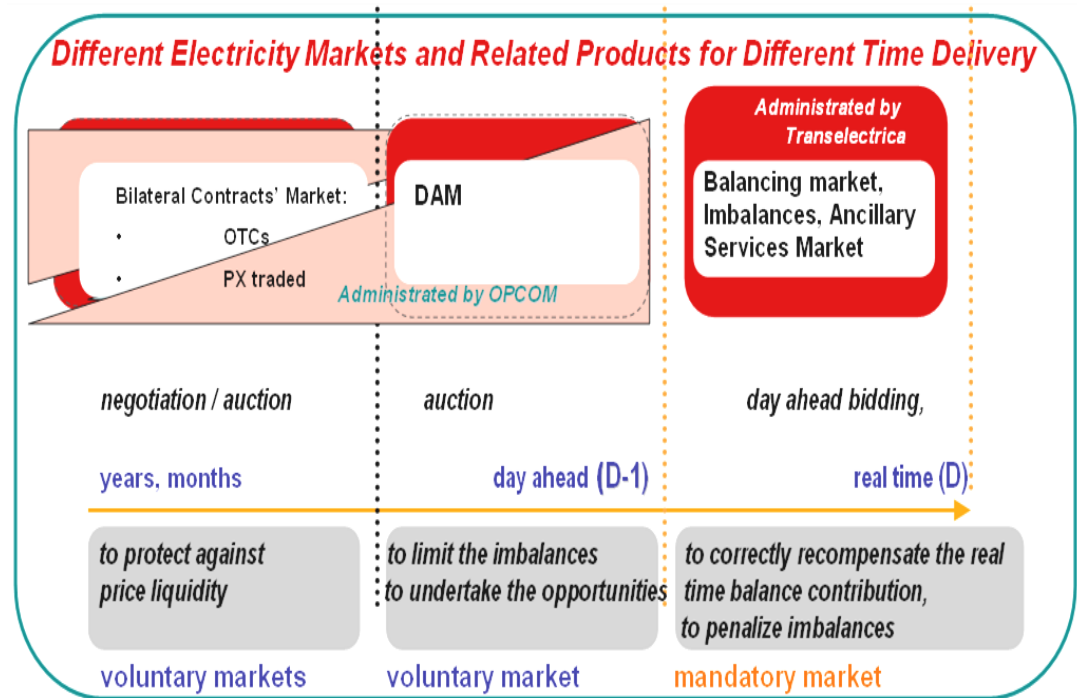
Since the beginning of the liberalisation process (2000 – separation of the monopolistic activities from the commercial ones), Opcom, the Romanian electricity market operator has administered inter alia a daily market. The market operator is perceived and utilised by the ministry and energy regulator as a key tool to ensure competition, transparency, non discriminatory access to energy and reference price.

In 2005 new spot trading mechanisms (day-ahead market) were launched at Opcom allowing two-side bidding which will further ensure the best liquidity in Eastern Europe. A trading platform was created in 2005 at Opcom to provide public auctions (CMBC) for physical forward contracts.

Since 2008 Opcom is providing Day Ahead counterpart service. With its two days healthy payment procedure this contribution is even more valuable during the financial crisis.

There are four important aspects which positively impacts market transparency and fairness:

- Due to Electricity Act provisions Opcom publishes daily all established market prices;
- Through forward trading mechanism the traded contracts become public;
- 1 MW standard products' granularity provides access to the energy for all players including the low market share participants;
- Mandatory auctioning on Opcom markets for state owned producers (Order 2009/445) permits the newcomers entry.





The Multi – Market Concept: Romanian Electricity Market

**Bilateral
Contracts
Market**

**Day
Ahead
Market**

**Balancing
Market**

**Ancillary
Services
Market**

**Alocation of
ATC
Market**

Voluntary

Mandatory

Mandatory

Regulated contracts	Producers	Dispatchable producers	Qualified suppliers for ancillary services	Producers and suppliers
Negotiated contracts	Suppliers	Dispatchable consumers		
PCCB PCCB-NC	Network operators			

Weeks, Months, Years

One day ahead

Several hours before real time operation

Based on acquisition periods

Alocation periods



SUBJECT OF TRADING

is sale-purchase of :



- Electricity
- Ancillary services
- System services
- Transmission services
- Distribution services
- ATC

LICENSED PARTICIPANTS

1
Transmission
Operator

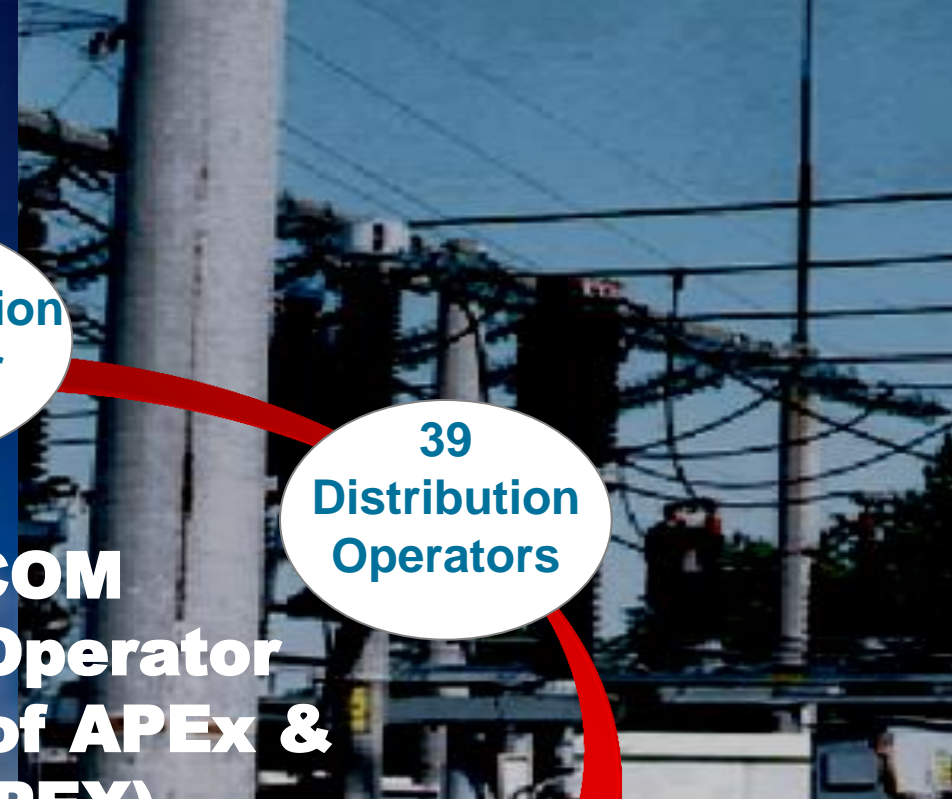
39
Distribution
Operators

1
System
Operator

OPCOM
Market Operator
(Member of APEX &
EuroPEX)

171
Producers

181
Suppliers



Electricity Market
100 % Competitional



MARKET PARTICIPANTS

Legal entities, holders of a
valid License

- Participants on Bilateral Contracts Market
- Participants on DAM
- Participants on Balancing Market
- Balancing Responsible Parties
- Participants on Ancillary Services Market
- Participants on auctions for ATC allocation



WHOLESALE ELECTRICITY MARKET



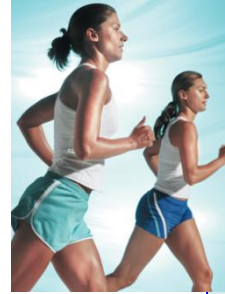
Regulated Market

Portfolio contracts with firm quantities and regulated prices

Ancillary Services

Transmission and distribution services

Competitional Market



- Bilateral contracts between producers and suppliers
- Import contracts
- Export contracts
- Supply contracts, other than for captive consumers at regulated prices

- Trading on DAM
- Trading on BM



Bilateral contracts

- regulated;
- traded on centralized market of bilateral contracts;
- freely negotiated;

Day Ahead Market

- operated by SC Opcom SA;
- voluntary;
- based on participants offers;
- close auction in anonymous environment;



Balancing Market

- operated by TSO;
- mandatory for dispatchable producers;
- producers must offer all available capacity;
- may participate dispatchable consumers;
- tendering process starts after DAM closing in D-1 day.

The imbalances of BRP

- supported by BRPs for which:

$0 < \text{Measured Net Position} - \text{Contracted Net Position} > 0$

- values based on costs/incomes of Balancing Market;
- are paid separately the imbalances of Dispatchable Units notifications.



DAY AHEAD MARKET

(DAM)



● **Participants are legal entities, holders of a valid license issued by ANRE and registered on DAM:**

- **Producers;**
- **Suppliers;**
- **Network operators (purchasing electricity in order to cover losses in network)**
- **TSO (to compensate unscheduled exchanges)**
- **sale offers & buy offers (simple price-quantity offers for each type of trading interval);**

● **Trading interval: 1 hour**

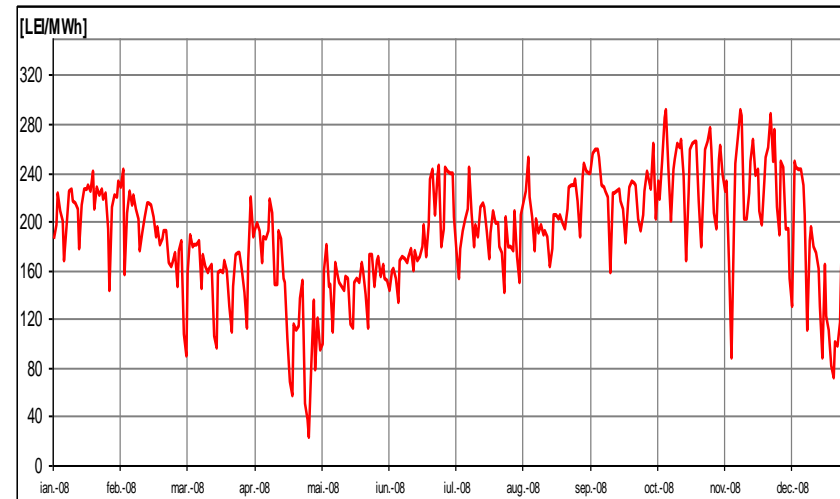
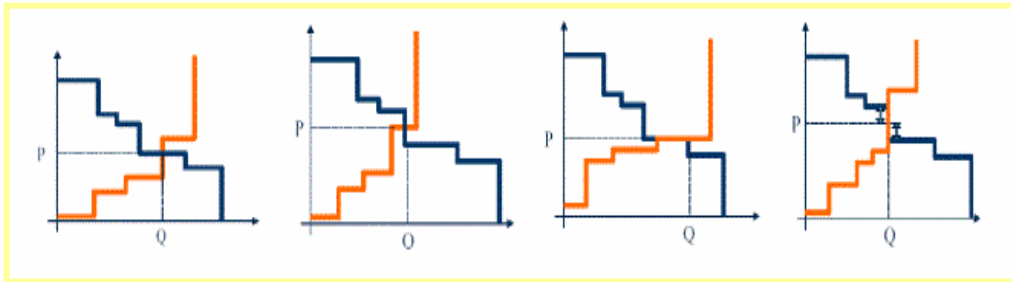
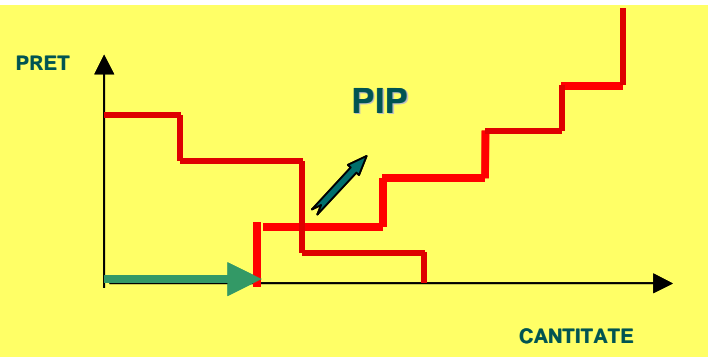
● **Trading zone: Romania**



TRADING MECHANISM

**DAY
AHEAD
MARKET**

1. aggregate bids and are ordered in terms of decreasing-price → aggregate demand curve;
2. aggregate offers and are ordered in terms of increasing price → aggregate supply curve;
3. intersection of aggregate demand curve and aggregate supply curve sets MCP and traded quantities



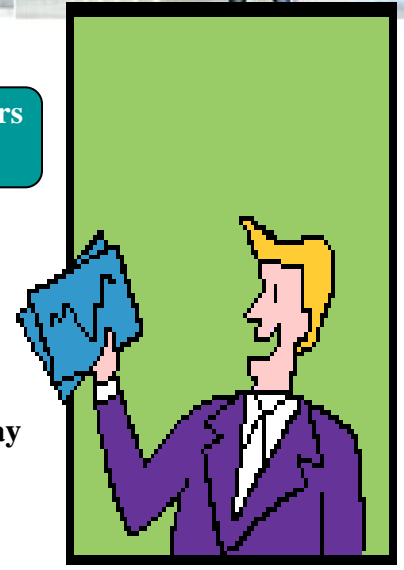
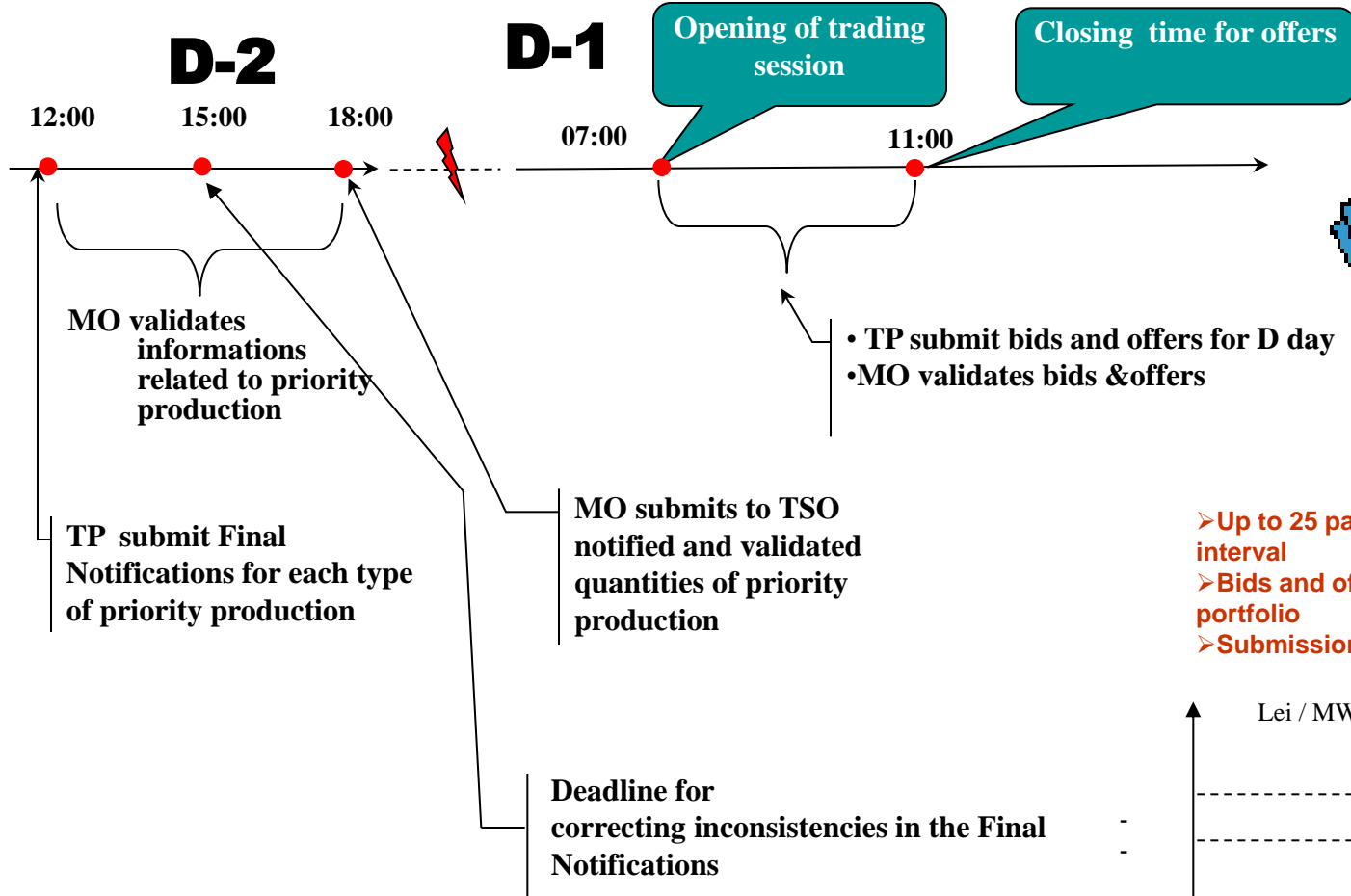


"Earning every Day-Ahead your trust"

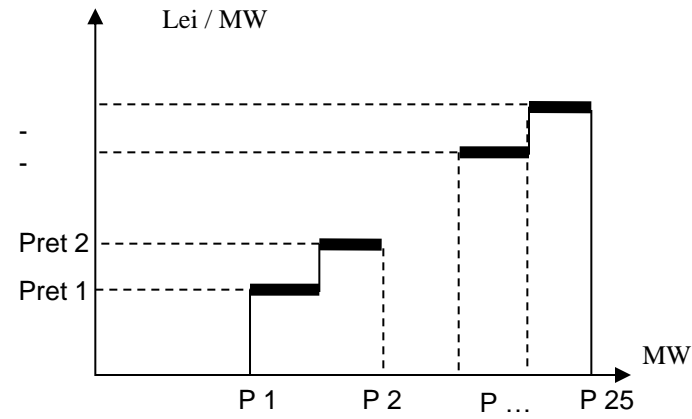


DAY AHEAD MARKET

-TENDERING PROCESS-



- Up to 25 pairs price-quantity for each trading interval
- Bids and offers are for whole participant portfolio
- Submission way: web interface or XML files

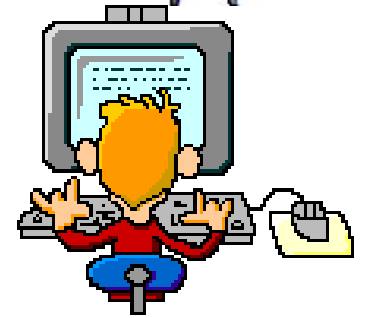


TP- Trading Participant
TSO- Transmission and System Operator
MO- Market Operator
DAM- Day Ahead Market



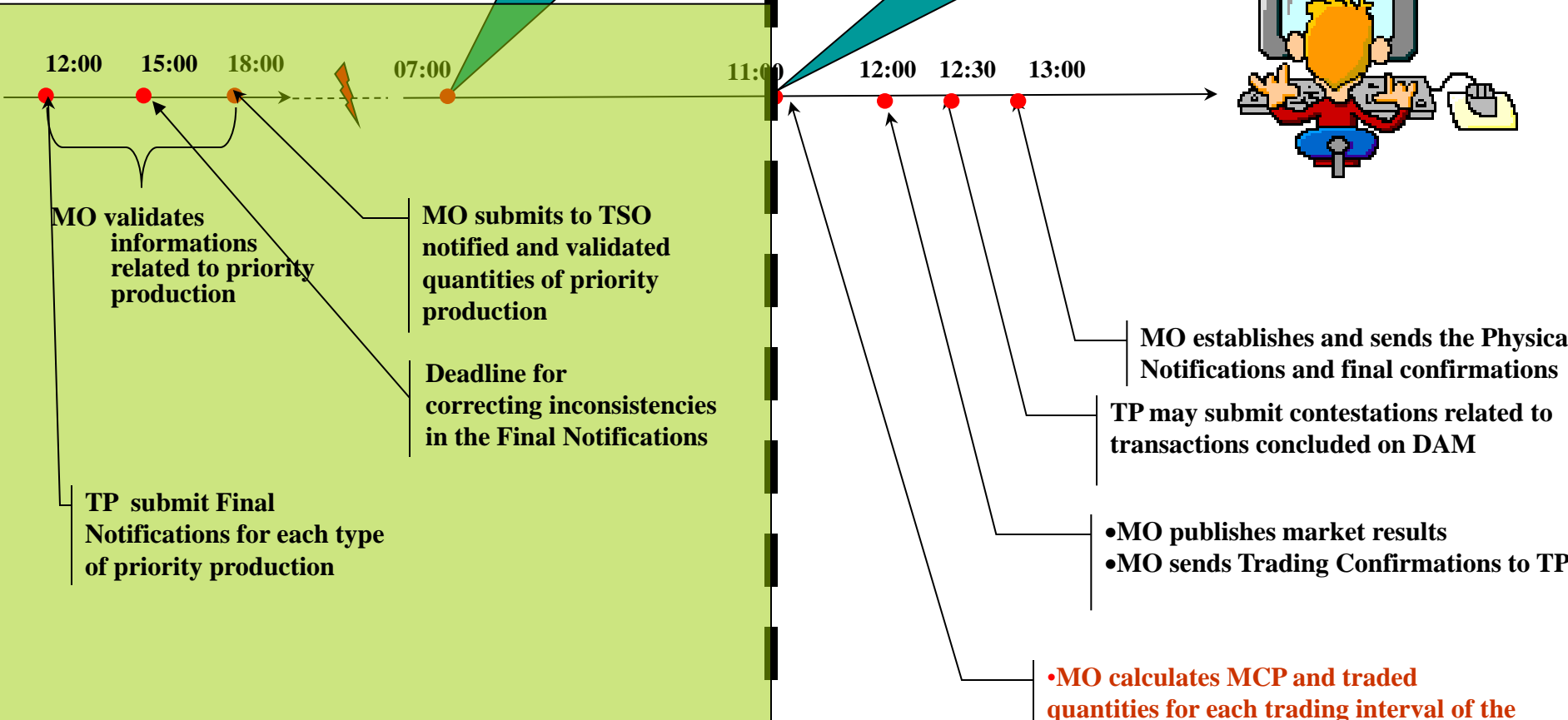
D-2

D-1

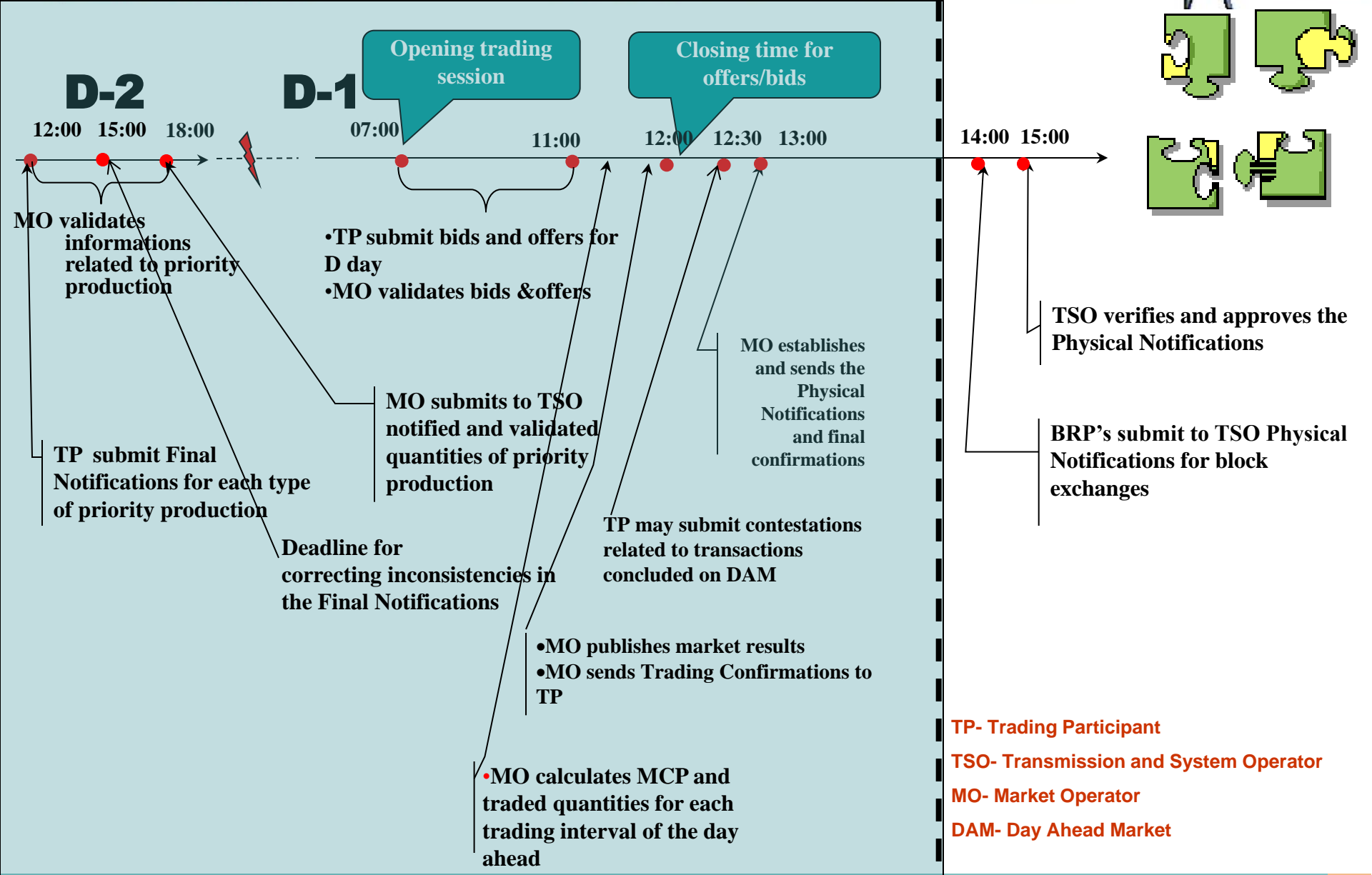
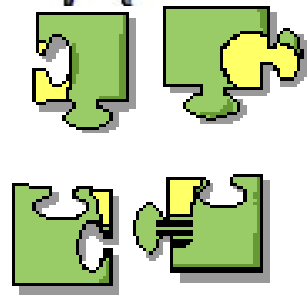


Opening trading session

Closing time for offers

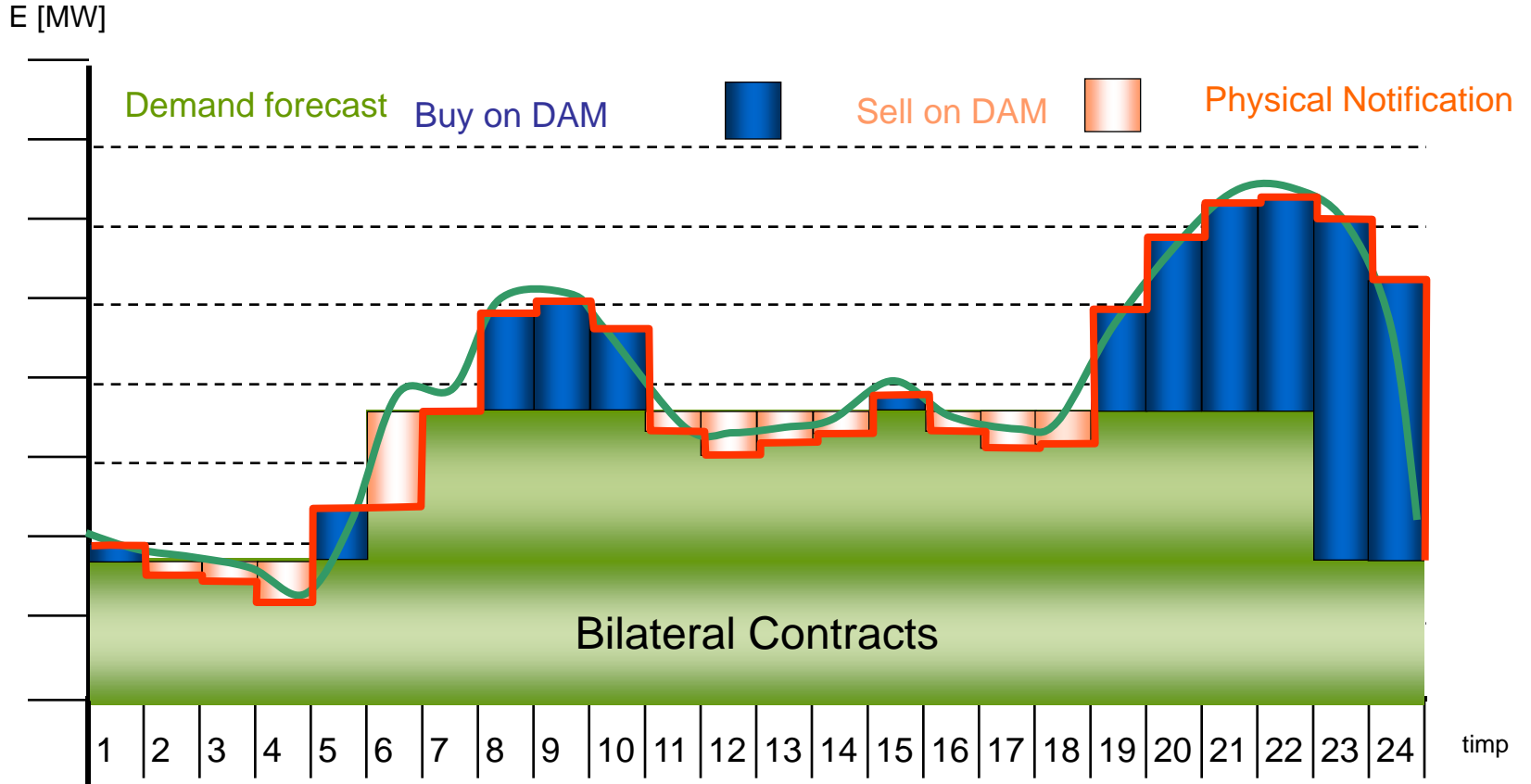


TP- Trading Participant
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MO- Market Operator
DAM- Day Ahead Market



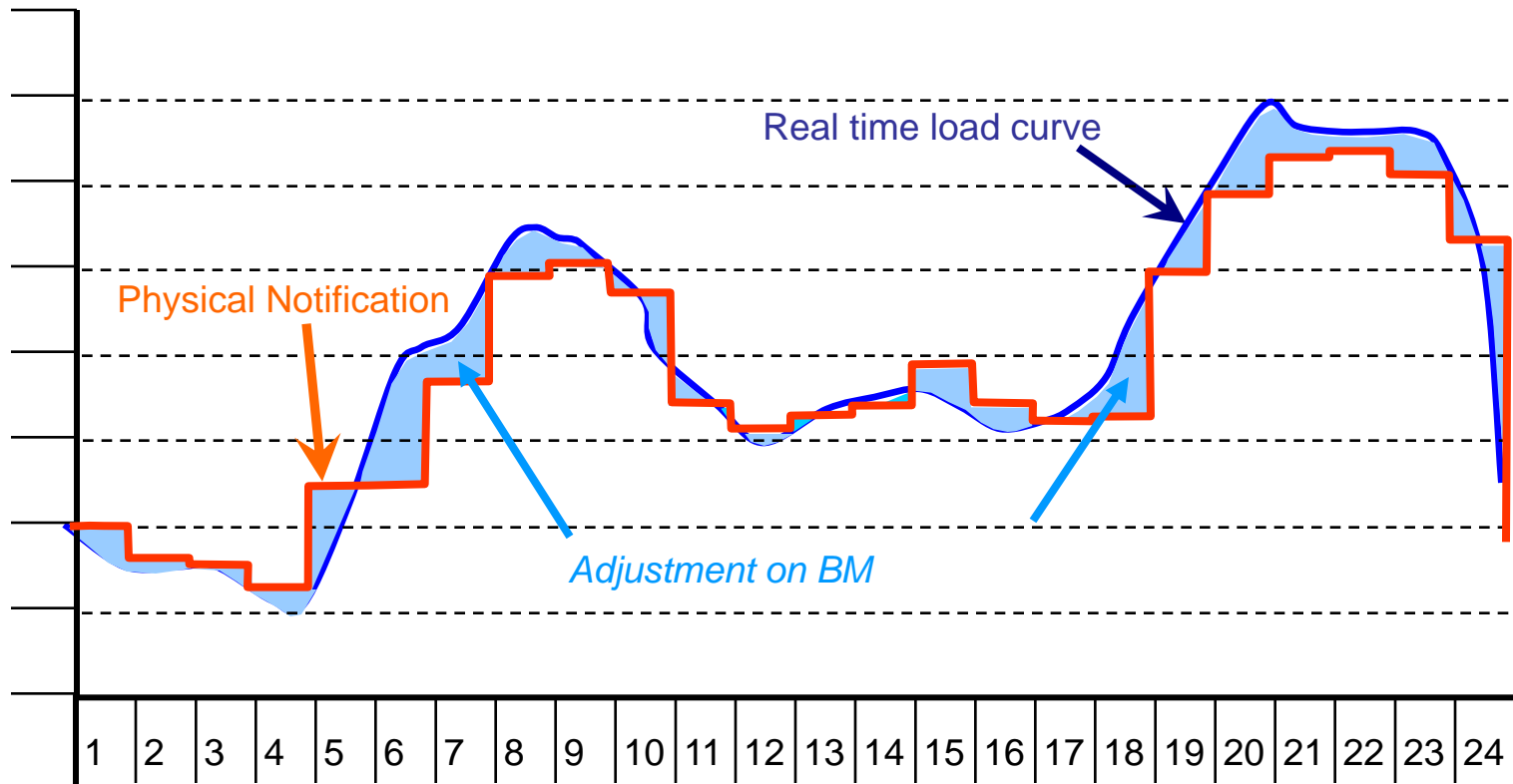


ENERGY CONTRACTING





ADJUSTMENTS ON BALANCING MARKET





PERFORMANCE OF DAY AHEAD MARKET

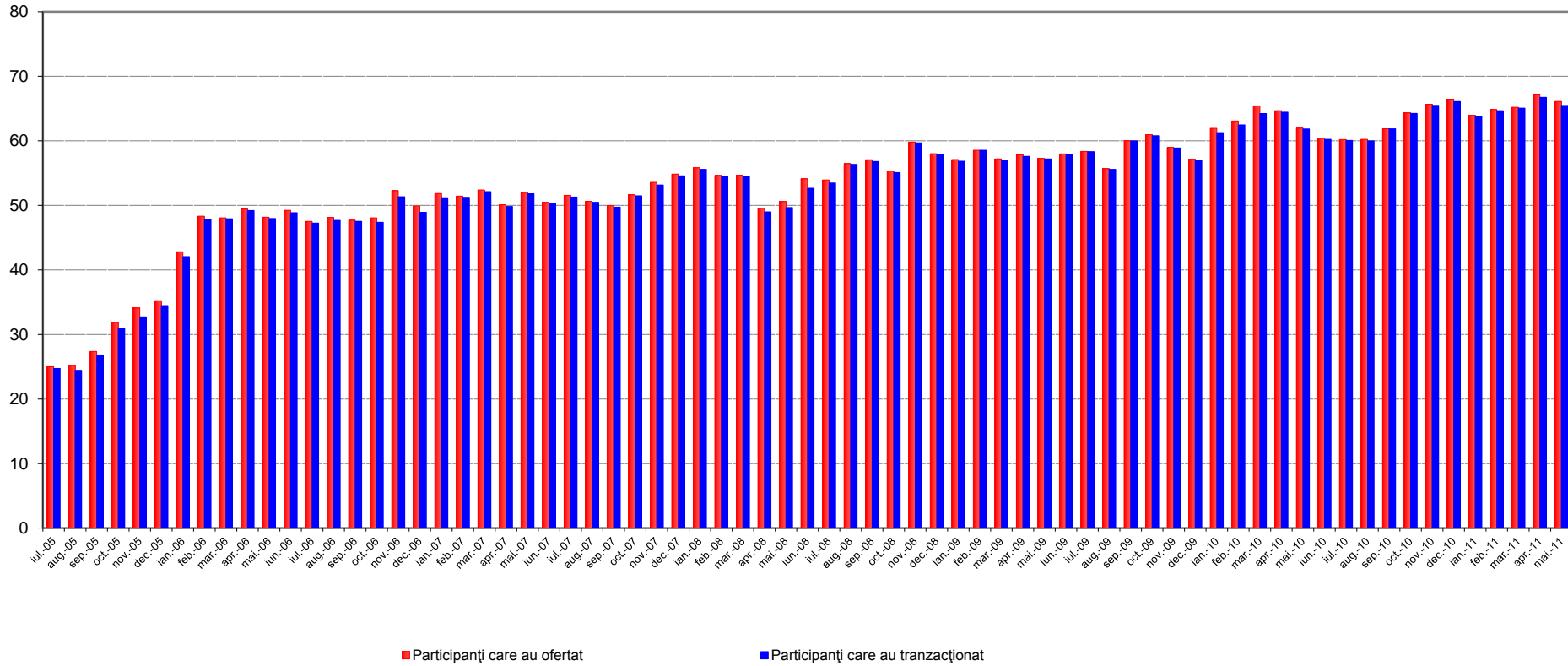


"Earning every Day-Ahead your trust"



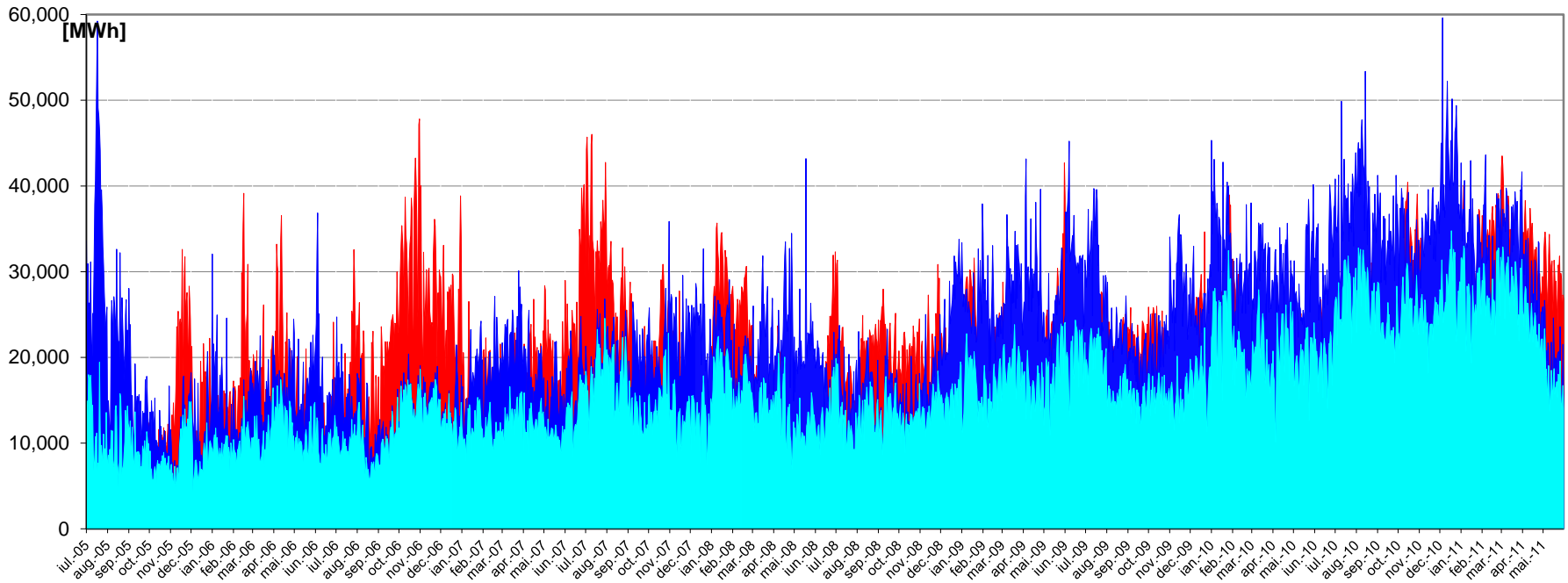
Average number of participants on DAM 2005 July- 2011 May

nr de participanti

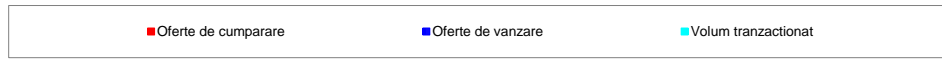




The quantities offered and traded daily 2005 July –2011 May

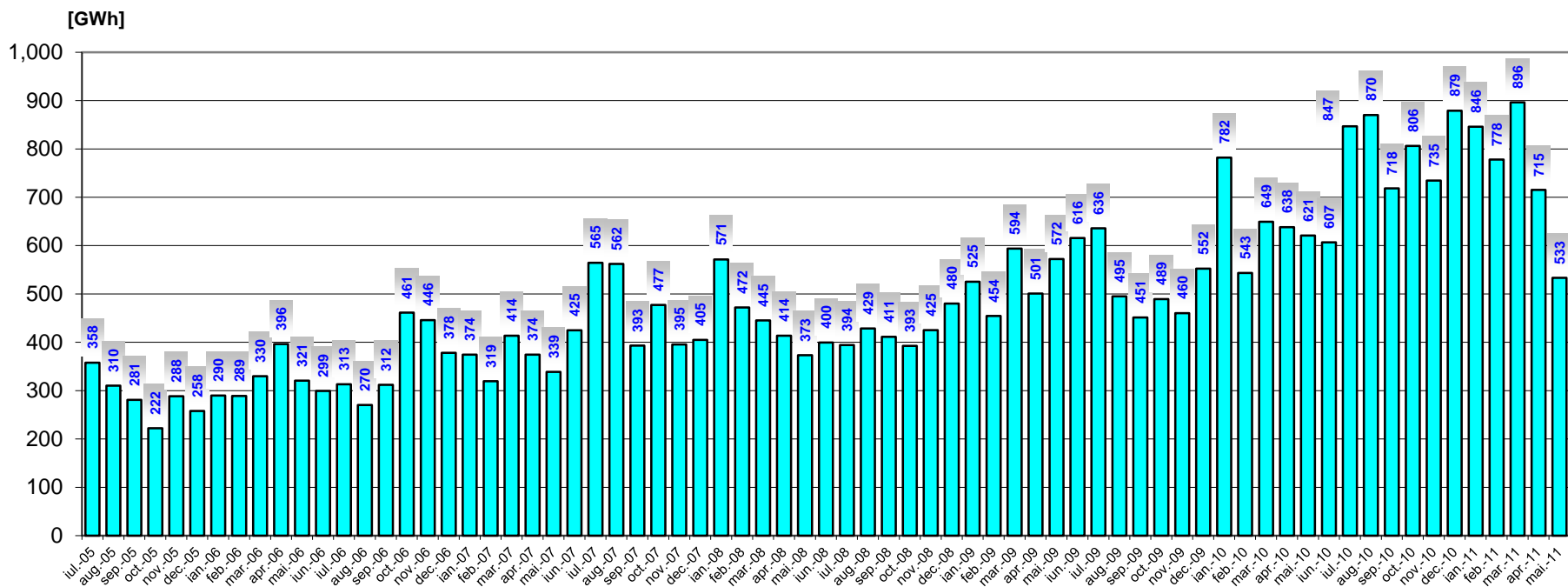


Bids= 46,3 TWh
Offers= 49,6 TWh
Cleared = 34,9 TWh





Traded monthly volumes on DAM during 2005 July – 2011 May



Total volume traded: 34,9TWh

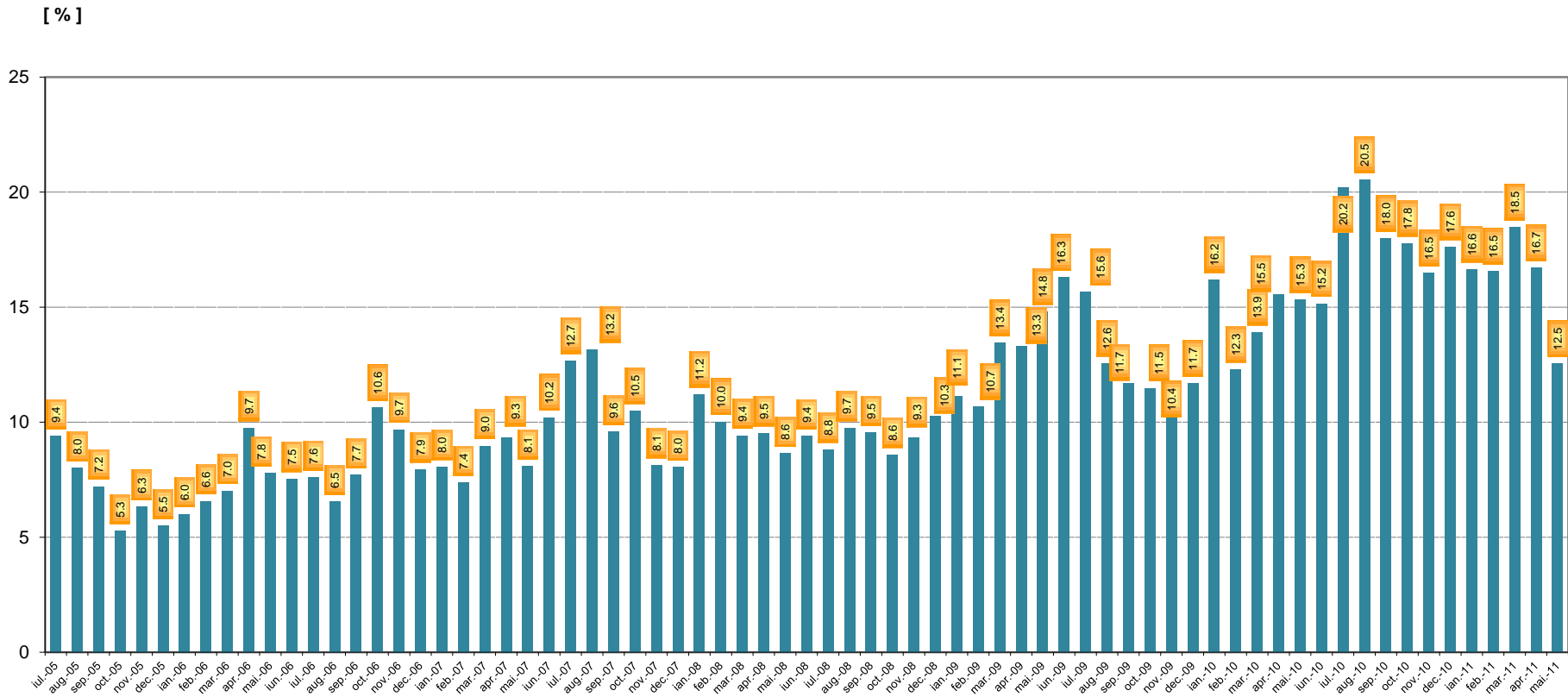
Monthly average volume traded: 491 GWh

Highest monthly volume traded : 896 GWh (2011March)



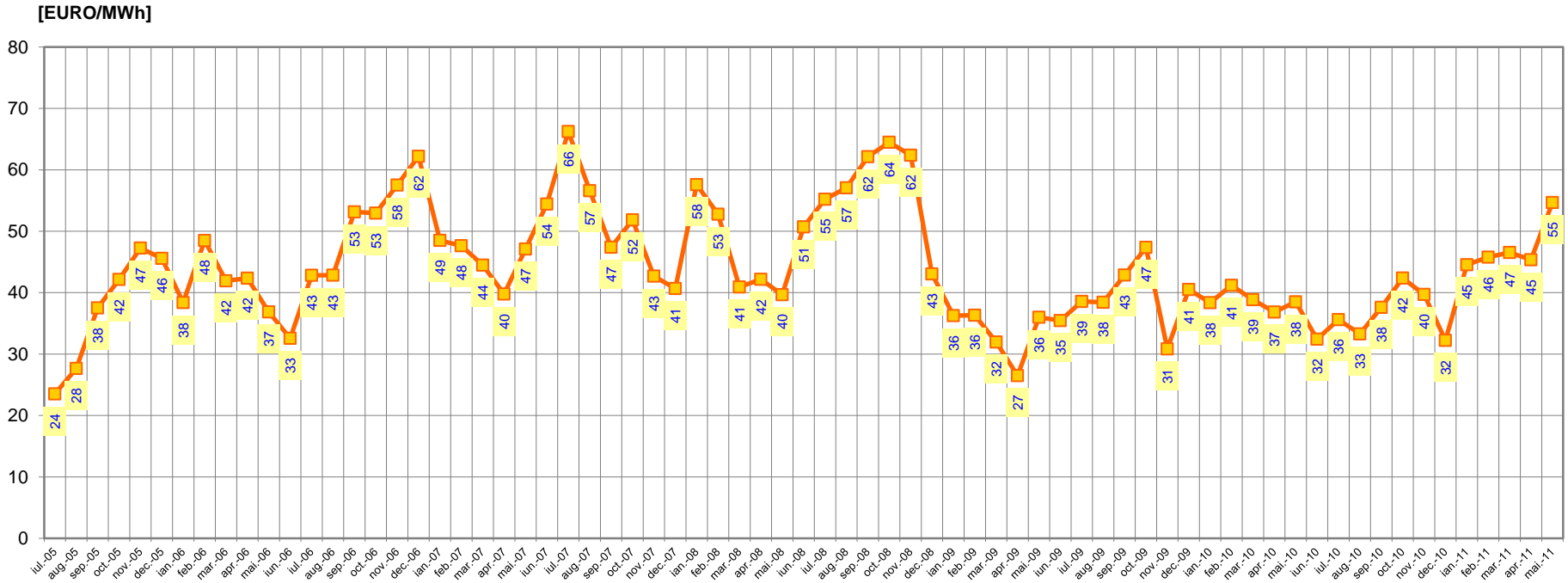
Monthly share of DAM transactions related to internal consumption

11,2%





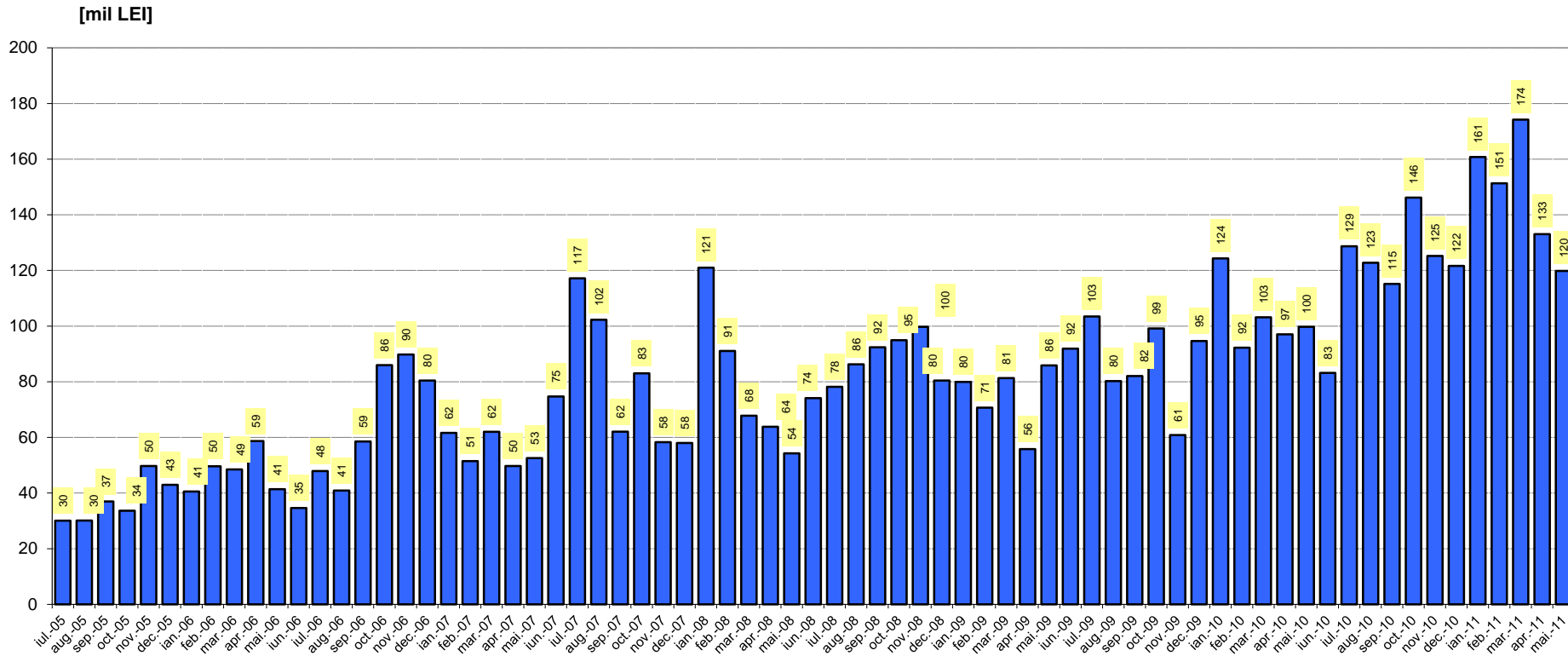
Monthly weighted average of MCP [Euro/MWh] 2005 July –2011 May



MCP weighted: 43,3 Euro/MWh

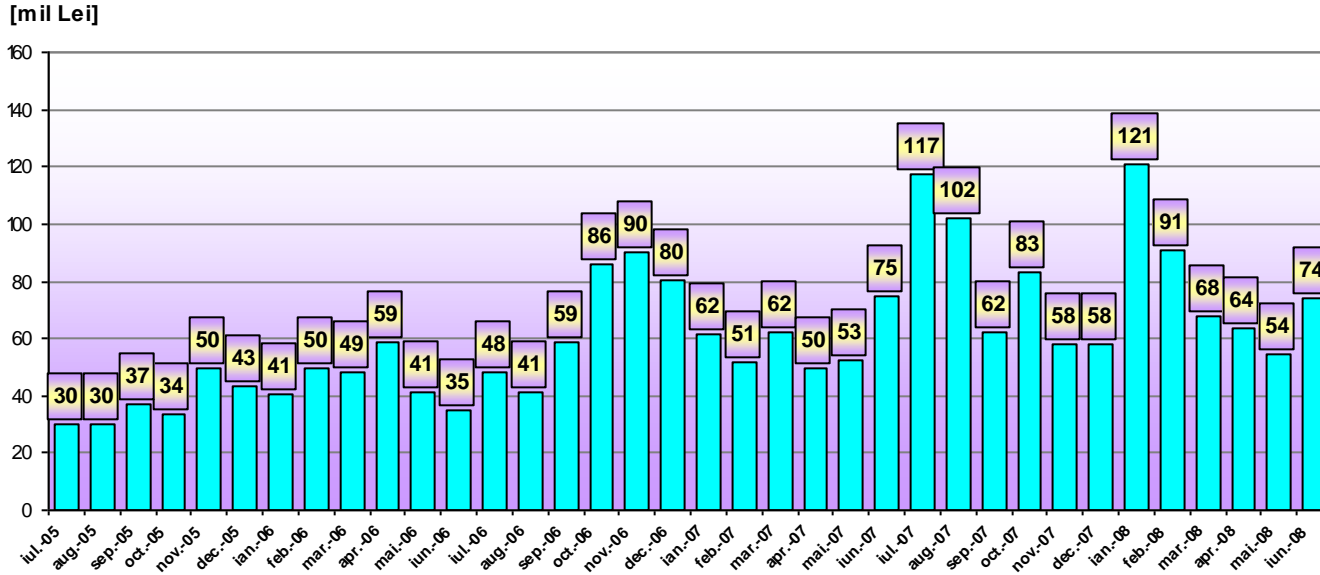


Monthly value of traded volumes on DAM 2005 July –2011 May

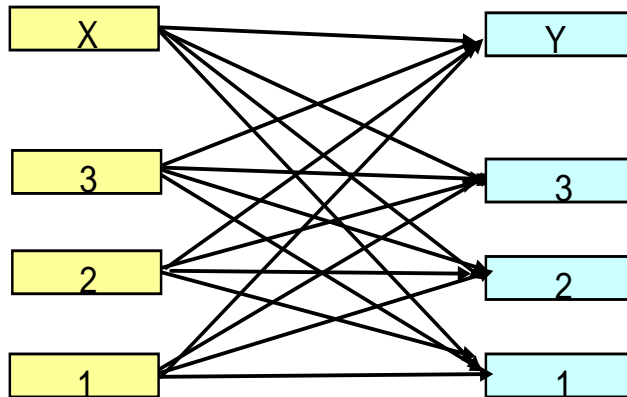




Values of traded volume during July 2005 – June 2008



= 2,205 mld lei
= 635 mil €



**Failure of fulfill
Payment obligations**

Contractual relationships = X * Y



**Failure of fulfill
payment obligations**



Procedure of
suspension..

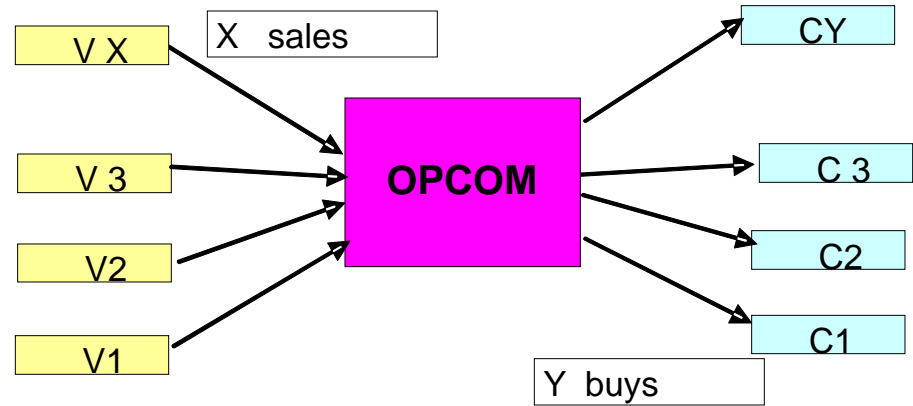
..

Rezultatele aplicării procedurii de suspendare (la data de 01.07.2008):

- 480 complain files
- 100 suspensions were applied
- 69 suspensions were removed (payments)
- 31 suspensions in force
- Value of invoices from files ~ 17 mil. lei



Contractual relationships= X + Y



S.C. OPCOM S.A. provided full design and implementation of central counterparty mechanism through:

- **Designing mechanisms to guarantee compliance with legislation and banking regulations;**
- **Prepared procedures for receipts and payments;**
- **Selected the Central Account Bank;**
- **Purchased IT system in order to provide centralized settlement and a good interface between Areva application and platforma Areva Central Account Bank and ;**
- **Training of participants and own employers.**



Trading on the centralised markets for bilateral contracts managed by OPCOM

The Centralised Market for Bilateral Contracts awarded through public auctions

The Centralised Market for Bilateral Contracts with Continuous Negotiation



Legislative and Administrative Background

The Electricity Law No 13/09.01.2007:

Art. 29 – (1) The electricity competitive market operates according to the regulations issued by the competent authority (the Romanian Energy Regulatory Authority - ANRE)

(2) In a competitive market, electricity trades are run either wholesale or retail.

(3) The competitive wholesale market operates based on:

(a) Bilateral Contracts concluded consequent to auctions organized in the centralized market;

.....

(4) In the competitive retail market, providers sell electricity to eligible clients through bilateral contracts at negotiated prices or through standard offers.

By the Order No 42/09.11.2005 the Regulation concerning the organized framework for the trading of bilateral contracts for electricity was approved. This regulation applies for producers and suppliers licensed by the Romanian Regulatory Authority as well as for consumers using their eligibility right and for the Romanian Power Market Operator – SC OPCOM SA.

Trading liquidity backed by two successive Minister's Orders: state owned generators, the 5 biggest (ord.408/2006), respectively all (ord.445/2009) obliged to trade further only in OPCOM markets.

Transparency boosted by the Electricity Law requirement: *"Prices cleared on the electricity centralised markets are published on daily basis as related operator responsibility (Art.40, para (4))"*



The Centralised Markets for Bilateral Contracts

Regulatory framework

The Centralised Market for Bilateral Contracts awarded through public auctions – CMBC

- ANRE notice No 32/2008
- Trading: at OPCOM's headquarters
- Published offers: *Selling or buying offers* for **random delivery periods** and for **random daily loads** determined according to the initiator's requirements
- Participation in the auction sessions is conditioned by the posting of **tender guarantees**.



The Centralised Markets for Bilateral Contracts

Regulatory framework

The Centralised Market for Bilateral Contracts with Continuous Negotiation CMBC – CN

- ANRE notice No 33/2008
- Trading: online, from the workstations of the registered market participants
- Published offers: *Standard selling or buying offers*, for **standard** delivery periods and for **standard** daily loads.
- Participation in the auction sessions is conditioned by the posting of **tender guarantees**.



The Centralised Markets for Bilateral Contracts

Administrative measures

Ordinance No 408/12.06.2006

- Addressed to: SN Nuclearelectrica SA, SC Hidroelectrica SA, SC Complexul Energetic Craiova SA, SC Complexul Energetic Rovinari SA and SC Complexul Energetic Turceni SA.
- The selling of all the available wholesale electricity volume must be done on the Centralised Markets for Bilateral Contracts managed by SC OPCOM SA.

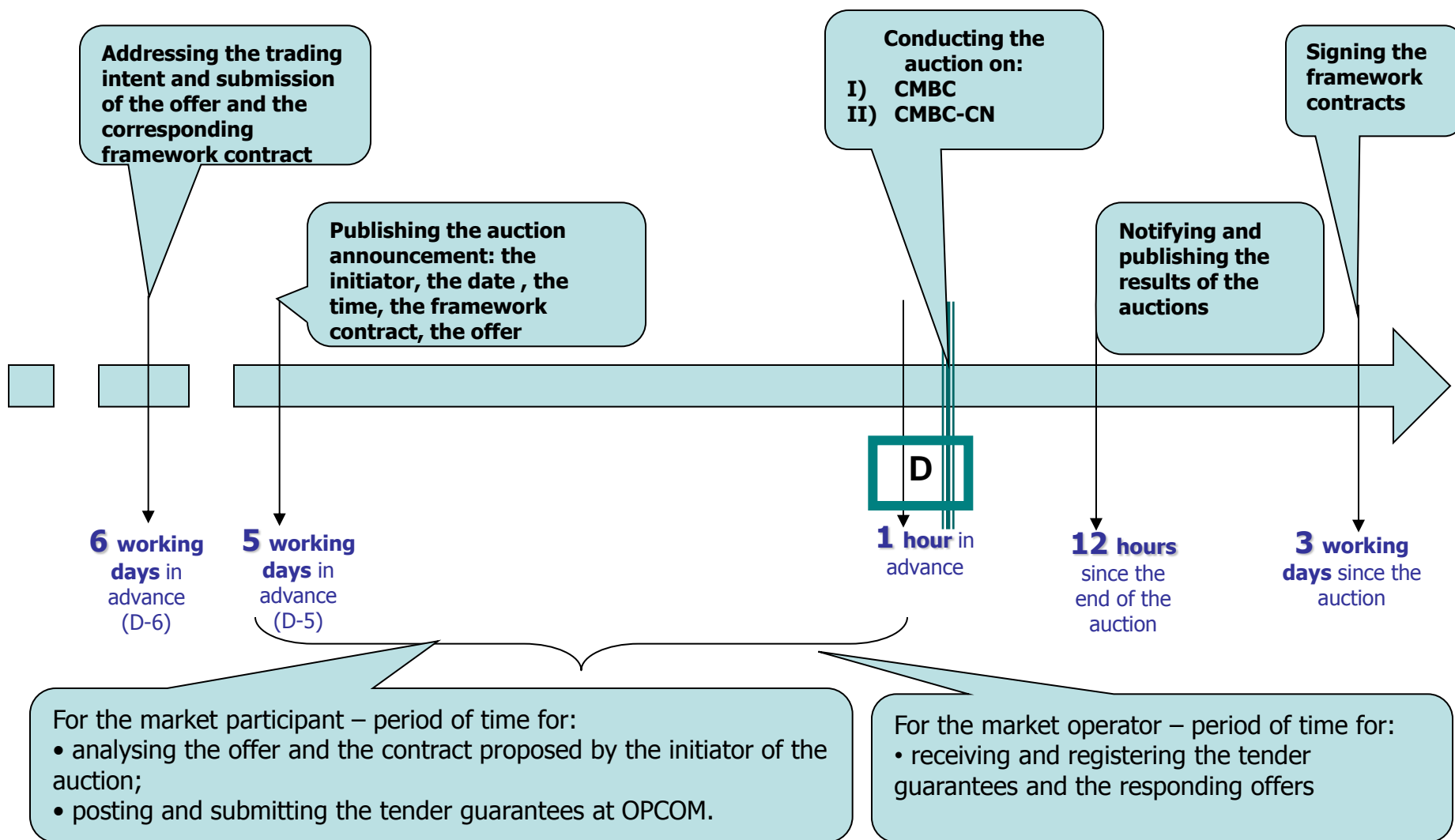
Ordinance No 445/10.03.2009

- Addressed to: Regiei Autonome pentru Activitati Nucleare, electricity generators under the authority of the Ministry of Economy.
- Starting with 31 March 2009, the selling of all the available wholesale electricity volume must be done on the Centralised Markets for Bilateral Contracts managed by SC OPCOM SA.
- Exception: electricity volumes related to the regulated contracts, electricity volumes traded on the Balancing Market and the electricity volumes related to the contracts in delivery.



The Centralised Markets for Bilateral Contracts

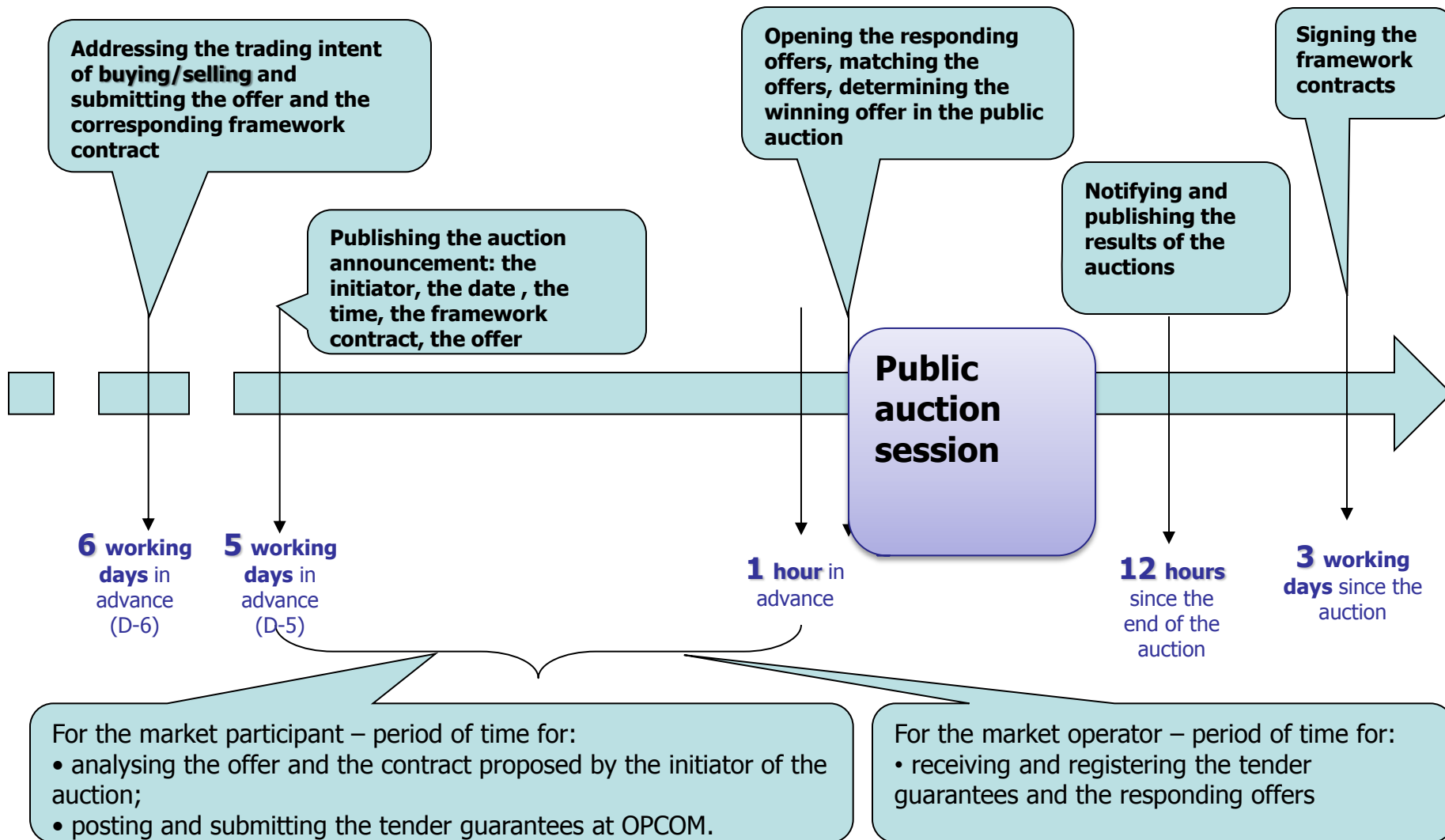
General functioning principles : the calendar of activities





The Centralised Market for Bilateral Contracts awarded through public auctions (CMBC)

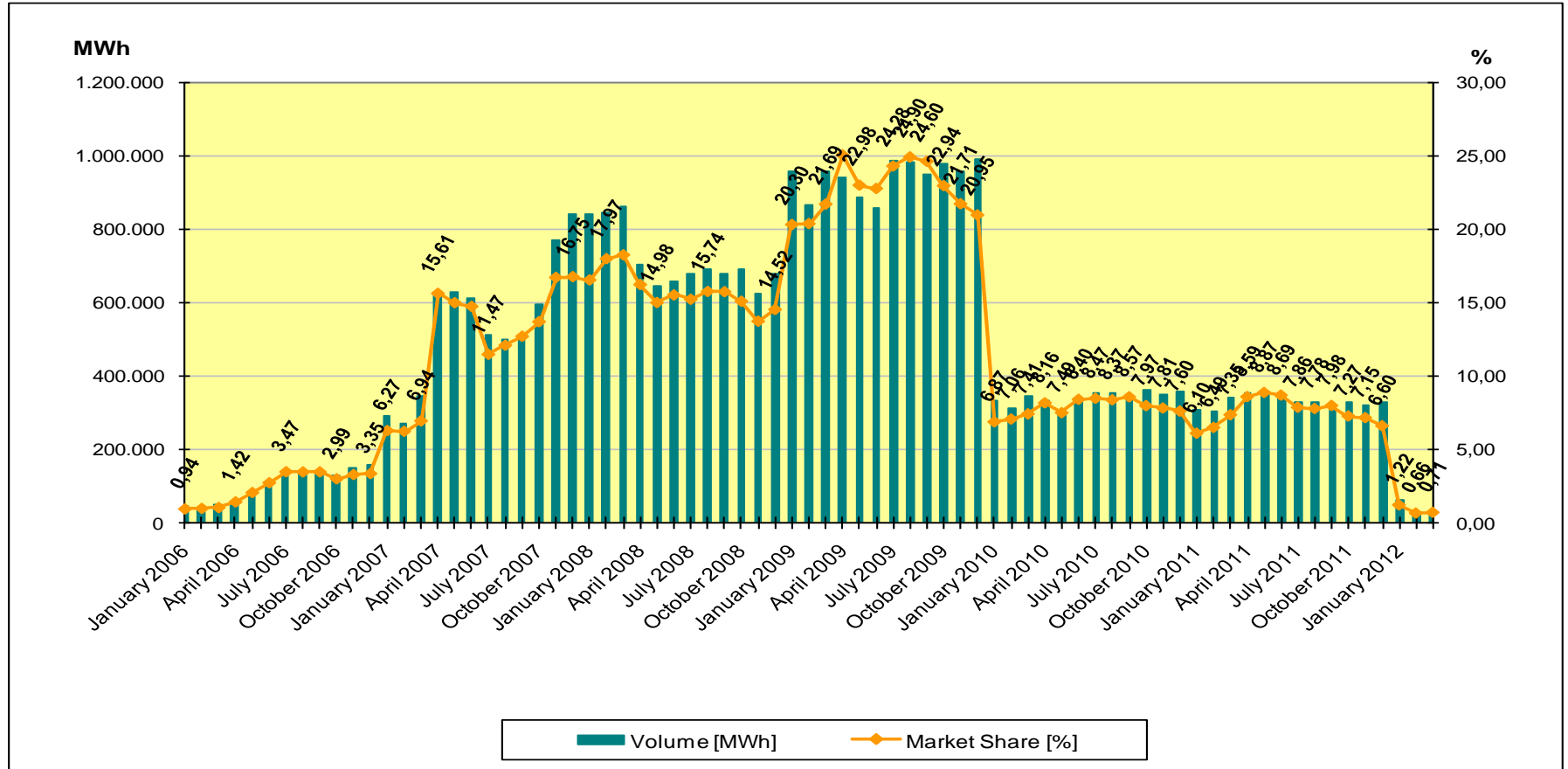
The functioning principle





The Centralised Market for Bilateral Contracts awarded through public auctions (CMBC)

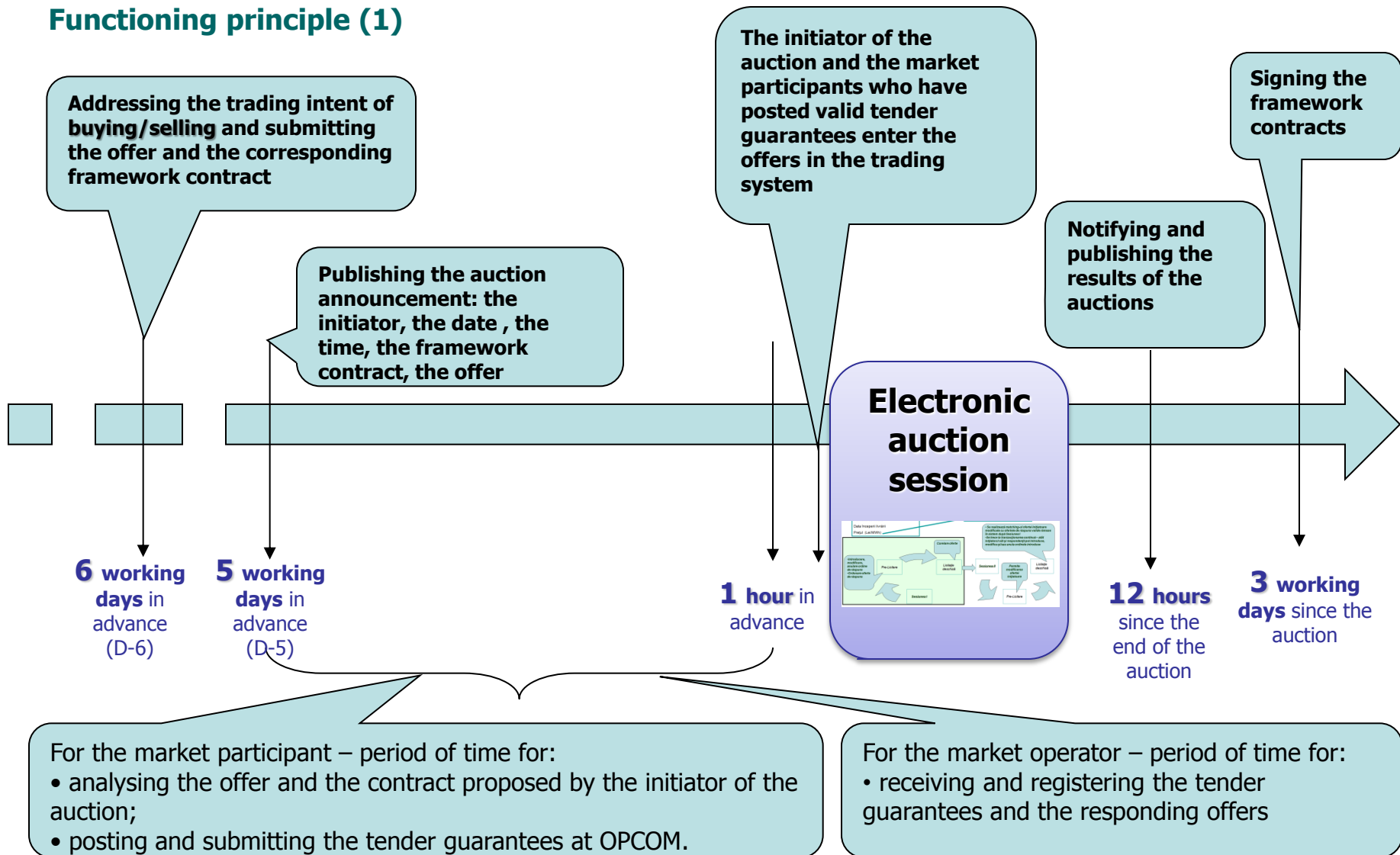
Results: delivered electricity volumes and market share





The Centralised Market for Bilateral Contracts with Continuous Negotiation (CMBC-CN)

Functioning principle (1)





The Centralised Market for Bilateral Contracts with Continuous Negotiation (CMBC-CN)

Results

65 market participants are currently registered to the CMBC-CN

5.559 contracts were offered for trading, representing 1.562.631 MWh;

1.012 contracts were concluded, representing 160.132 MWh.



BALANCING MARKET

GOALS :

Real time system balancing
Congestions Management

MANDATORY PARTICIPATION

ADMINISTRATOR

System and Transmission Operator

PARTICIPANTS

- licensed producers operating dispatching units
- qualified producers to supply ancillary services
- licensed consumers operating dispatching loads



Balancing Market

Main Characteristics

- Operation is done by BMO, within Transelectrica
 - Balancing Market Operator (BMO) is responsible for:
 - ✓ registration of the Participants for BM,
 - ✓ collecting și verification of the Offers,
 - ✓ realization of necessary quantities calculation for the settlement of BM.
 - TSO is the contractual party for every Participant on BM, for all of transactions on this market
- Offers of Dispatchable Units and Consumption
- Mandatory market– all capacities must be offered



Purposes and means

Balancing Market

- **Objectives:**

- Setting in real time, on commercial bases of the balance between consumption and production of electricity
- Commercial Management of network congestions

- On Balancing Market there are **tranzactions** for:

- Secondary regulation
- Fast tertiary regulation
- Slow tertiary regulation



Balancing Market

BM is centralised and mandatory

➤ **On BM, TSO buys and/or sells active electric energy**

- from/to participants to BM which have dispatchable units/consumption, in order to compensate the deviations from the scheduled production and consumption of electric energy

➤ **the Producers are obliged to offer on this market for :**

- Upward regulation, the whole quantity of electricity which is available supplementary of the Notified quantity
- Downward regulation, the whole Notified quantity

➤ **the Offers and Transactions on Balancing Market are done for every dispatchable unit/consumption**

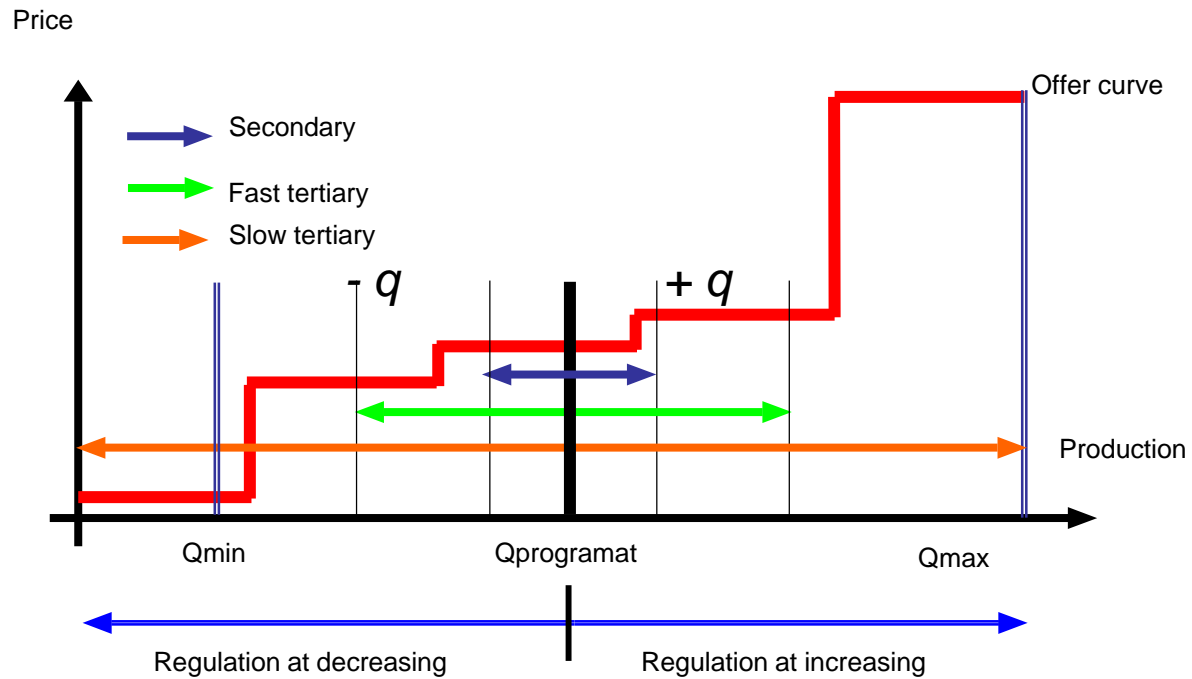


Balancing Market

- centralised mandatory – official operates since 1st of July 2005;
- starts the day before delivery day, after the physical notification were accepted by TSO; transactions are in real time during delivery day;
- operates at dispatchable units level (ETSO code);
- simple hourly offers (price-quantity pairs);
- upward and downward regulation offers;
- unique offer – don't need separate offers by type;
- allocation of capacity offers by type of regulation is automatically done by the informatic system of BM;
- selected offers are paid at the offer price or marginal price.



Balancing Market



BALANCING MARKET

Trading Day

- BRP transmit physical notifications
- OPCOM transmit the physical notification from DAM

- TSO publish aggregate production program, forecast demand, imports and exports
- Closing time of BM

• TSO confirm physical notifications

▪ TSO confirm daily offers

15.00

16.30

17.00

19.00

- Producers make offers on BM
- Check and approve the physical notifications

Check and approve offers on BM

Delivery Day



-01.00

▪ Select slow tertiary regulation

-00.15

▪ select fast tertiary regulation

Real time operation

BALANCING MARKET



Balancing Market

Balancing market Prices

- Fast and slow tertiary regulation:
 - Payment based on the price offered („payment on offer“)
- Secondary regulation:
 - Payment based on marginal cost of supply
- Transaction:
 - Is payed only for actual balancing energy delivered
 - Delivery failure creates imbalance and it is penalized as such



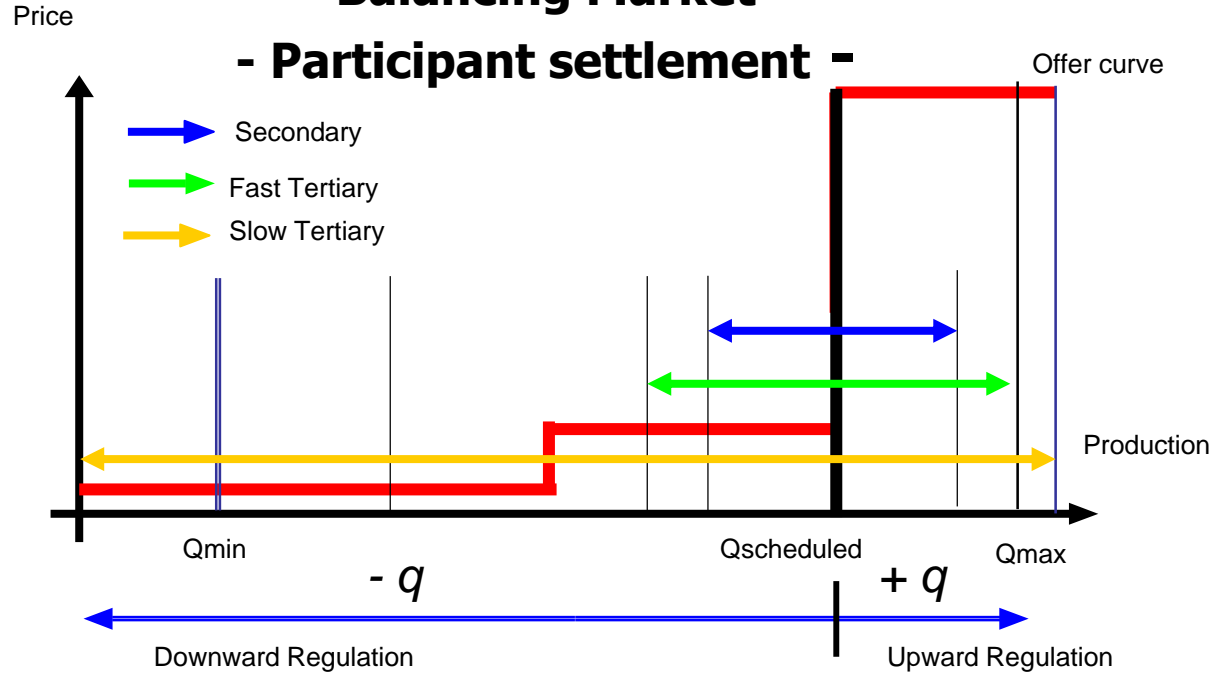
OPCOM ROLE IN BALANCING MARKET

1. The settlement of the transactions concluded on the Balancing Market



Balancing Market

- Participant settlement -



$$VZ = \sum q \times p$$

Participant pays $q \times \text{price}$

Secondary Regulation PM

Fast Tertiary Regulation }
Slow Tertiary Regulation } Offer Price

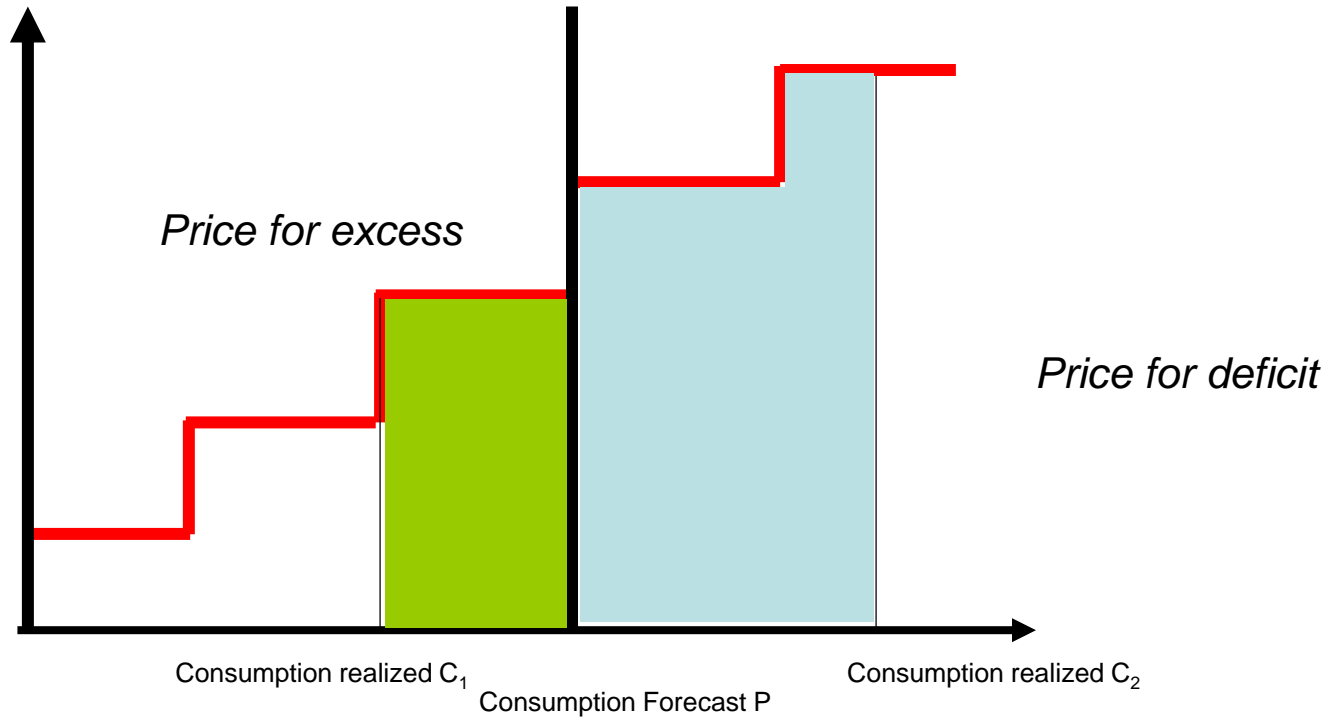
Participant receives $q \times \text{price}$

Secondary Regulation PM

Fast Tertiary Regulation }
Slow Tertiary Regulation } Offer Price
Starting Up



Prices for excess and deficit



$$\text{Price for excess} = \frac{\sum \text{Value of power reductions } (P - C_1)}{\sum \text{Quantities of power reductions } (P - C_1)}$$

$$\text{Price for deficit} = \frac{\sum \text{Value of power increasing } (C_2 - P)}{\sum \text{Quantities of power increasing } (C_2 - P)}$$



Balancing responsibility and BRP



Balancing responsibility and BRP

Obligations regarding the balancing

The balancing responsibility rests upon the Licensed Participants for:



- **Assuring the physical balance** between :
 - Measured production, programmed acquisitions and imports of electricity
 - Measure consumption, programmed sales and exports of electricity
- **Assuming the Financial responsibility at TSO** for all Physical imbalances registered





PROGRAMMING

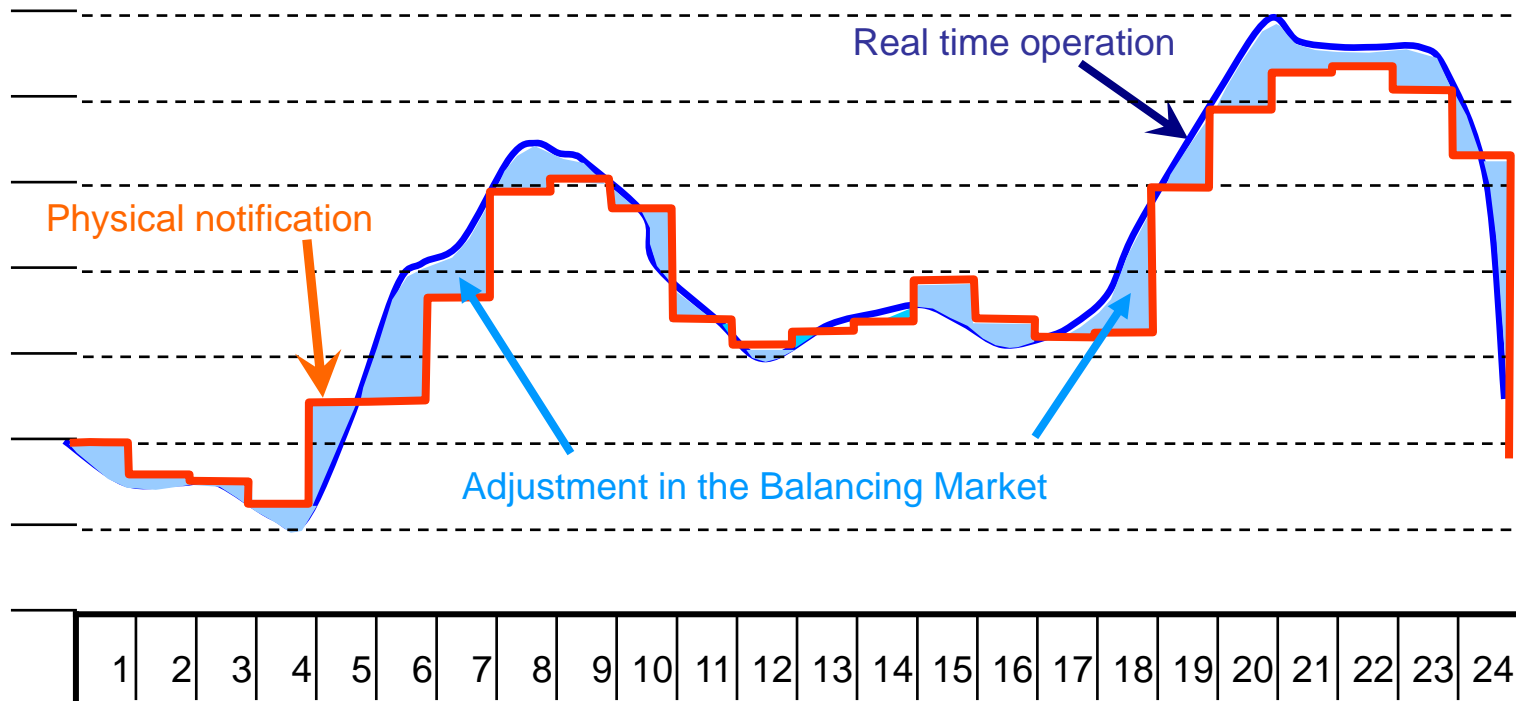
- ✓ Notification energy block exchanges between different parties responsible for balancing
- ✓ Notification international energy trade
- ✓ Notification of production / consumption aggregate
- ✓ Notification of production for each dispatchable unit / consumption dispatchable

Preliminary conditions:

- Bilateral Exchanges are allowed only between BRP recorded to TSO.
- All participants in the DAM should be part of a BRP
- All producers and suppliers (consumers) should be part of a BRP



BALANCING MARKET ADJUSTMENTS





ROLE OF OPCOM IN BALANCING MARKET

2. Settlement of BRP Imbalances



BRP Imbalance - Settlement -

$$NCP = Seles - Purchases + Export - Import + DAM_{sales} - DAM_{purchases} +/- E_{balancing}$$

$$NMP = Production - Consumption$$

$$Imbalance = NMP - NCP$$

Negative Imbalance
(Quant. x Price for deficit)



BRP payes

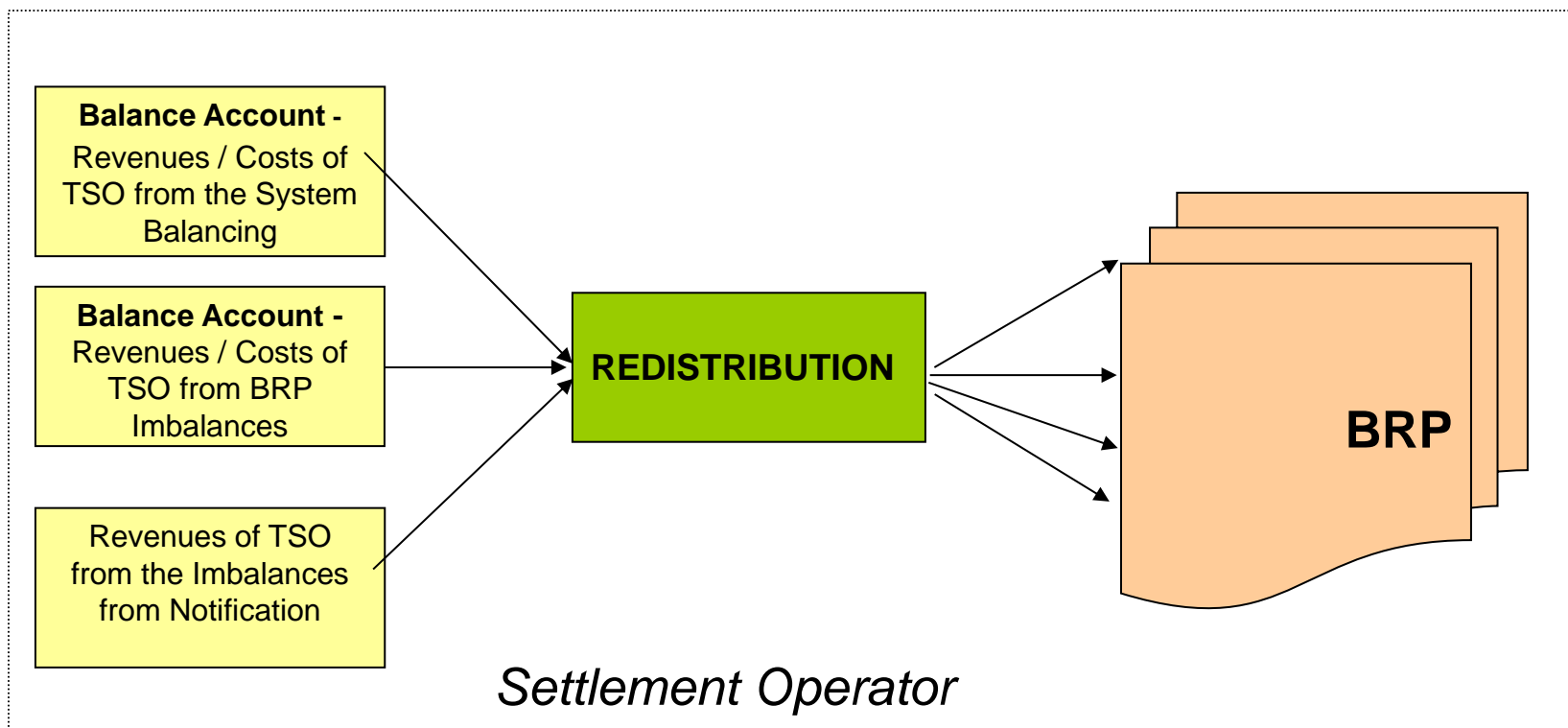
Positive Imbalance
(Quant. x Price for excess)



BRP receives



Redistribution of the Revenues / Costs from the System Balancing



We thank for your attention !

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