Agenda

I. 4M MC – Common parts

II. Further Information on Romanian Market

1. Regulation for DAM organization and functioning with respect to price market coupling mechanism
2. Market Coupling Concept
3. Romanian DAM Rules in 4M MC Framework
4. Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism

Regulation for DAM organization and functioning with respect to price market coupling mechanism (1)

Dam Participants

Current Rules	Rules in Coupled Market
1. NRA license holder	1. NRA license holder
2. Producers with Pinst < 100 kW	2. Producers with Pinst < 100 kW
3. Holders of licenses for establish energy capacity during the tests running period	3. TSO as Implicit Participant to assume the shipping role, responsible for physical and commercial exchange on cross-border interconnection with other markets within the coupled area

Regulation for DAM organization and functioning with respect to price market coupling mechanism (2)

Offering Rules

	Current Rules	Rules in Coupled Market
1. Buy / Sell hourly orders	Maximum 25 pairs Quantity - Price	Maximum 32 pairs Quantity - Price
2. Simple Buy / Sell hourly orders (only one pair Quantity - Price)	YES	YES
3. Block Order	NO	Combined simple buy/sell hourly orders for more hourly intervals, which execution is interdependent, meaning all executed or none do
4. Sell orders for participants having priority production according to regulations	YES	NO

Regulation for DAM organization and functioning with respect to price market coupling mechanism (3)

Offering Rules (contd.)

	Current Rules	Rules in Coupled Market
5. Price scale - minimum - maximum	 0,01 lei/MWh 4800 lei/MWh	Equivalent in RON for: -500 euro/MWh +3000 euro/MWh
6. Sell orders with negative prices	NO	YES
7. Thick size - quantity - price	 3 decimals 2 decimals	 1 decimal 2 decimals
8. Hourly trading intervals which orders are reffering to	Hours in EET	Hours in CET
9. Orders submitted in advance	With 6 days before trading day	For days which exchange rate is published for
10. Gate Closure Time for DAM	11:15 (RO)	11:00 (CET) 12:00 (RO)

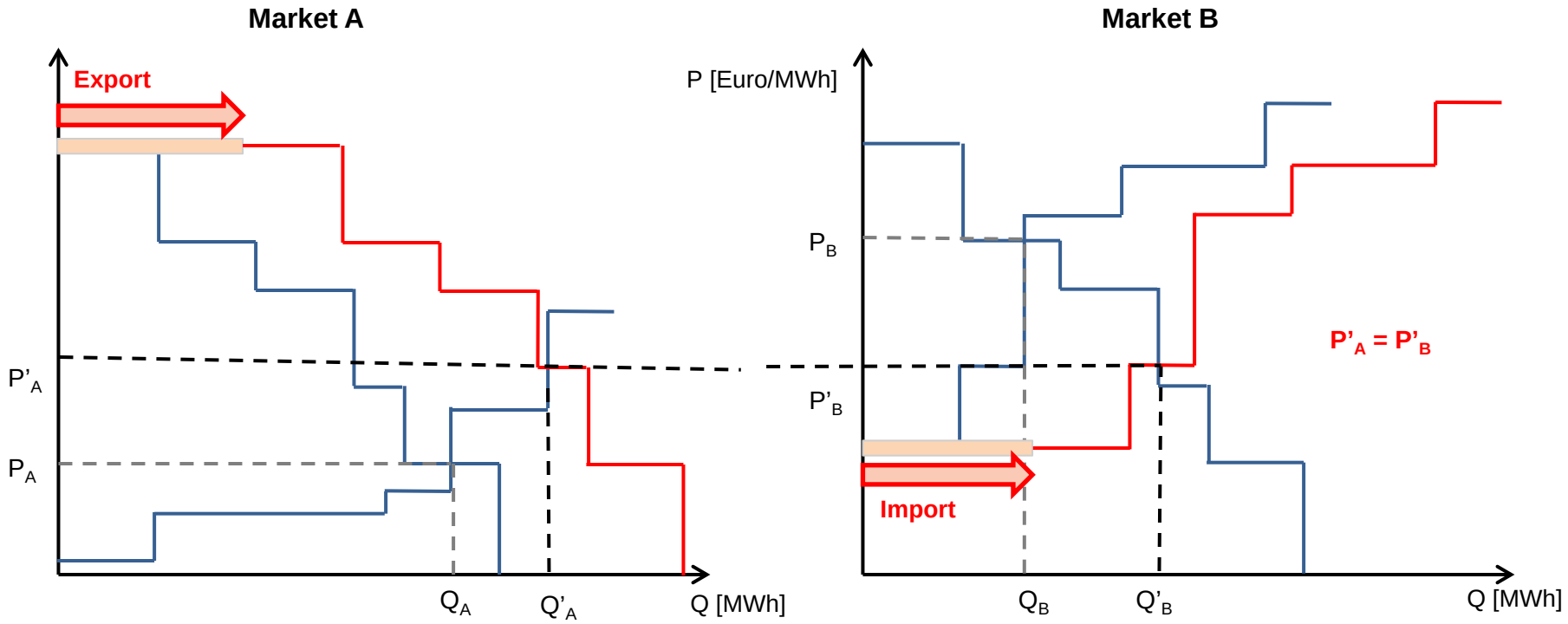
Regulation for DAM organization and functioning with respect to price market coupling mechanism (4)

Trading Mechanism

Current Rules	Rules in Coupled Market
OPCOM calculates for each trading interval MCP at the intersection point of the sell and buy curves.	**OPCOM aggregates the hourly orders in sell and buy curves and adds the block offers and all of them send them anonimyzed to coordinator.** - DAM trades are concluded by means of matching algorithm within the PCR market coupling mechanism. - DAM MCPs are given by matching all sell and buy curves and block orders, by respecting the interconnections capacity constraint, in all coupled area.

Market Coupling Concept (1)

No congestion (enough ATC) – Equal MCPs



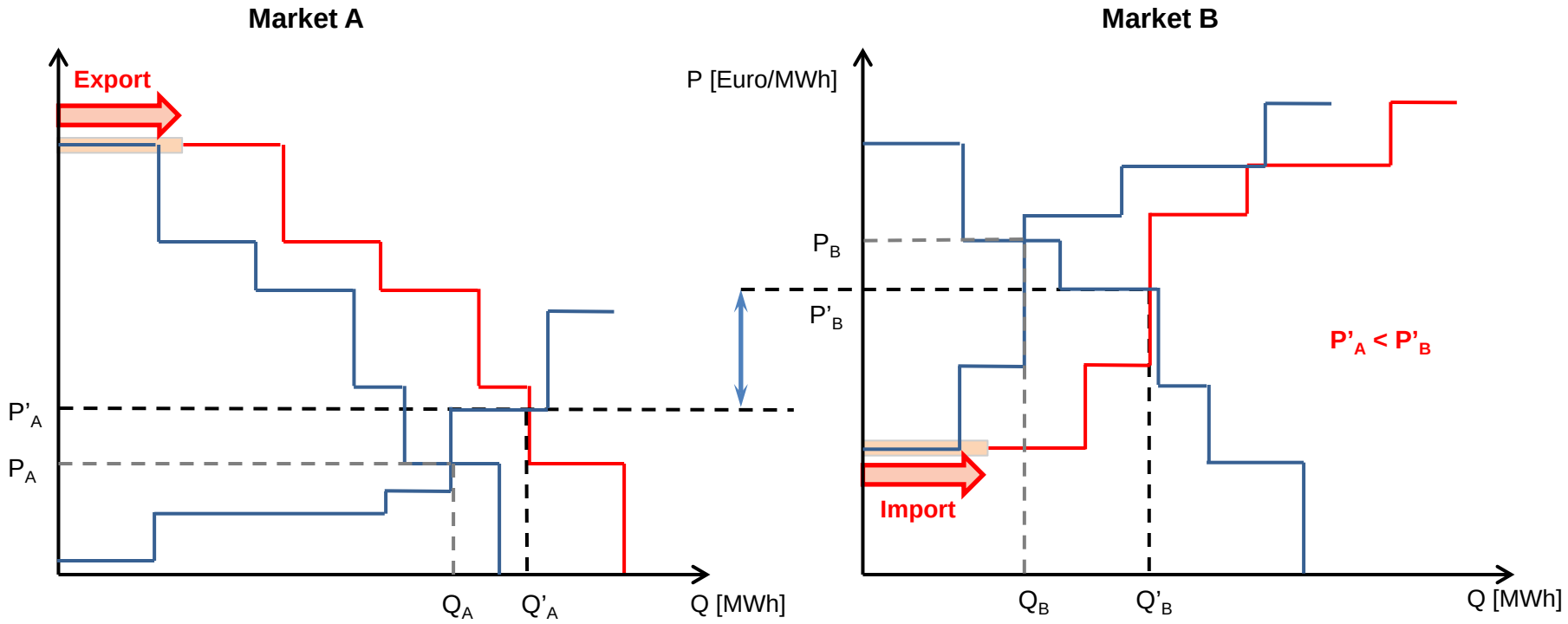
TSO: Efficient capacity allocation

PXs: More competitive prices & Higher welfare

Different prices for isolated markets → Price convergence for coupled markets

Market Coupling Concept (2)

Congestion – Different MCPs



TSO: Efficient capacity allocation

PXs: More competitive prices & Higher welfare

Different prices for isolated markets → Price convergence for coupled markets

Romanian DAM Rules in 4M MC Framework (1)

New market features:

- Threshold prices
  - ⇒ Minimum threshold = -150 €/MWh
  - ⇒ Maximum threshold = 500 €/MWh
- (Implicit) Secondary Auction = Order Book reopened in case of MCP outside the threshold price range (less or equal to minimum threshold or higher or equal to maximum threshold), while functioning in the coupling regime
- Shadow Auction = Explicit auction for capacity allocation for the next delivery day in case of decoupling
- Last resort regime (ANRE ord. 82/2014) = Internal implicit auction for DAM in case of decoupling (isolated DAN performance)

Romanian DAM Rules in 4M MC Framework (2)

The bidding process:

- Stepwise hourly orders as in the current model;

- Block Orders = Orders on more hourly intervals, characterized by:
  - Direction (for sell / buy);
  - The block definition period = the consecutive hourly intervals (minimum 4)
  - Volume = the same volume on each interval within the block definition period;
  - Price = the average price ordered by participant for block energy;
  - The block can only be fully accepted or rejected.

- Linked Block Orders = block order whose acceptance is conditioned by acceptance of other block which it is linked with
  - „Parent" Block Order– block that may be individually accepted in case the block condition is fullfilled;
  - „Child" Block Order – block that may be accepted if the block condition is fullfilled and only if „parent" block order has been accepted.

Romanian DAM Rules in 4M MC Framework (3)

Hourly Orders:

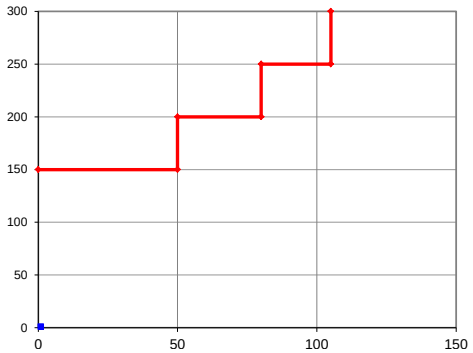
- The price – quantity pairs shall be cumulated
- The price scale limits are convert to RON using the exchange rate

1 Euro = 4,5 RON ⟶ [- 675 RON/MWh, 13.500 RON/MWh]

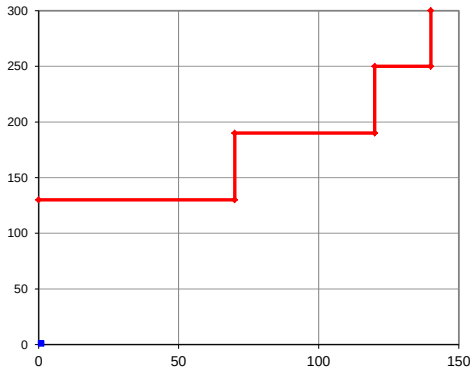
Sell Offer Int.1		
#	Quantity	Price
	[MWh/h]	[RON/MWh]
1	50	150
2	30	200
3	25	250

Sell Offer Int.2		
#	Quantity	Price
	[MWh/h]	[RON/MWh]
1	70	130
2	50	190
3	20	250

Prices	-2250	130	150	190	200	250	13500	
Interval 1			50		30	25		Quantities
Interval 2		70		50		20		
Interval 3								
Interval 4								
Interval 5								



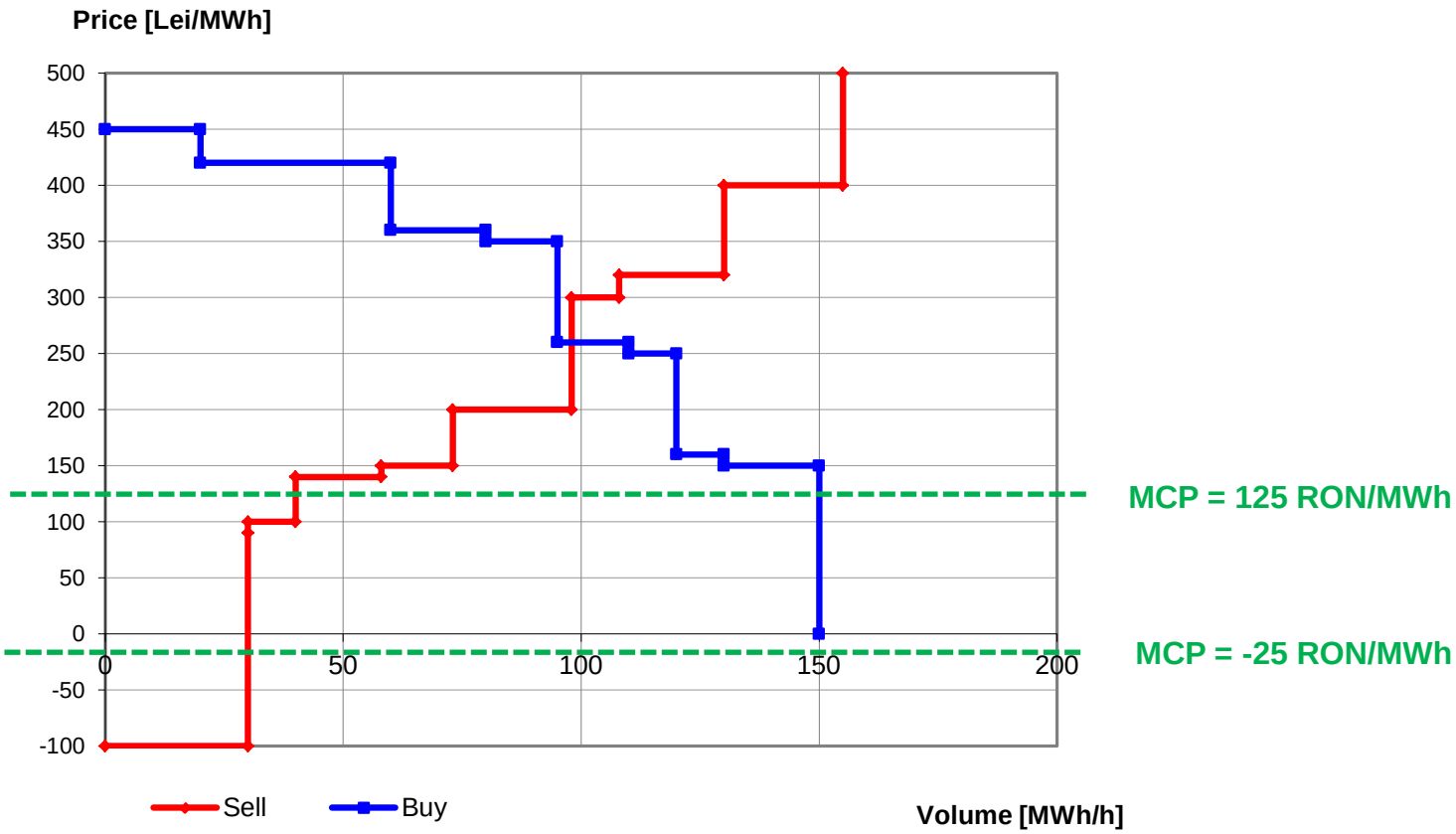
Int.1



Int.2

Romanian DAM Rules in 4M MC Framework (4)

Hourly Orders whith negative prices:

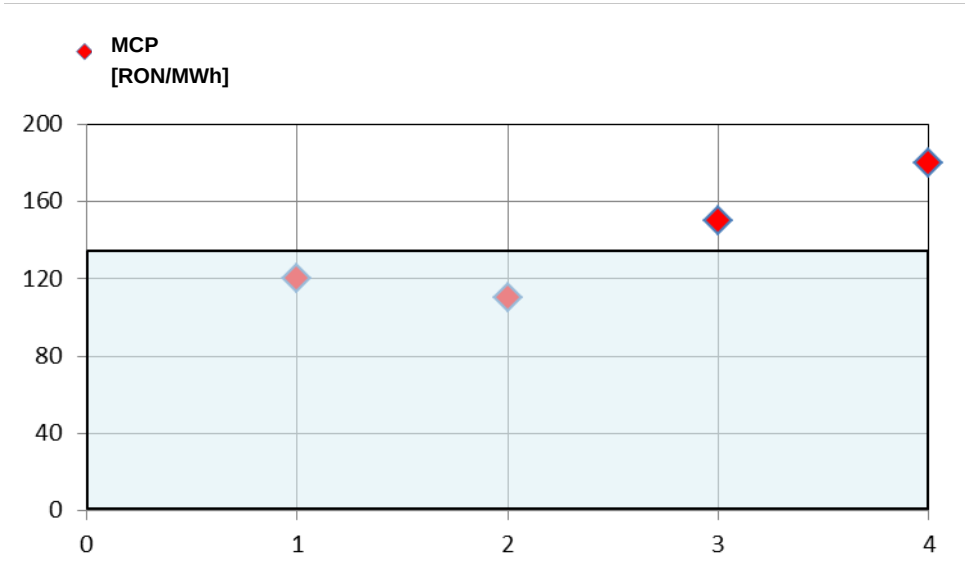


Romanian DAM Rules in 4M MC Framework (5)

Block Orders (1):

- The block order has condition “all or nothing” (same quantity defined for every hourly interval within the block definition period).

The block order **for buying** is accepted if the block order price **is higher** than average MCP for the block definition period.



Int.	MCP [RON/MWh]
int. 1	120
int. 2	110
int. 3	150
int. 4	180
Average	**140**

- **Block Price = 145 RON/MWh**

  = > Block Accepted

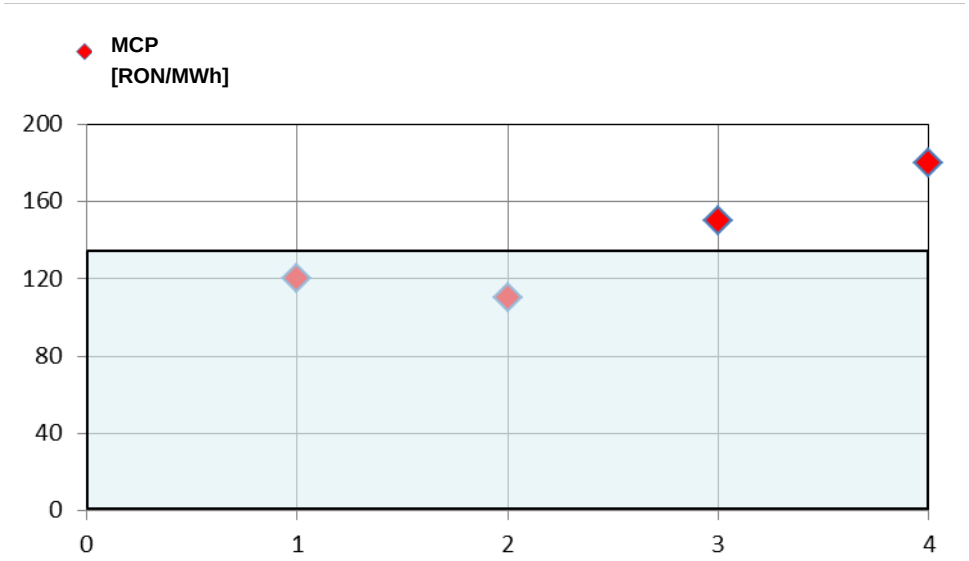
- **Block Price= 130 RON/MWh**

  = > Block Rejected

Romanian DAM Rules in 4M MC Framework (6)

Block Orders (2):

- The block order has condition “all or nothing” (same quantity defined for every hourly interval within the block definition).
- The block order **for selling** is accepted if the block order price **is less** than average MCP for the block definition period.



Int.	MCP [RON/MWh]
int. 1	120
int. 2	110
int. 3	150
int. 4	180
Average	**140**

- **Block Price = 135 RON/MWh**

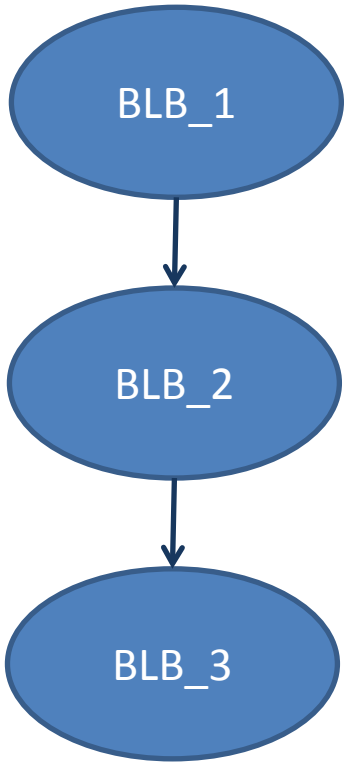
  = > Block Accepted

- **Block Price = 145 RON/MWh**

  = > Block Rejected

Romanian DAM Rules in 4M MC Framework (7)

Linked Block Orders (maximum 3 generations) (1):



- **BLB_1**

BLB_1 may be individually accepted in case of block condition is fulfilled

- **BLB_1 is „parent" for pentru BLB_2**
- **BLB_2 is „child" for BLB_1**

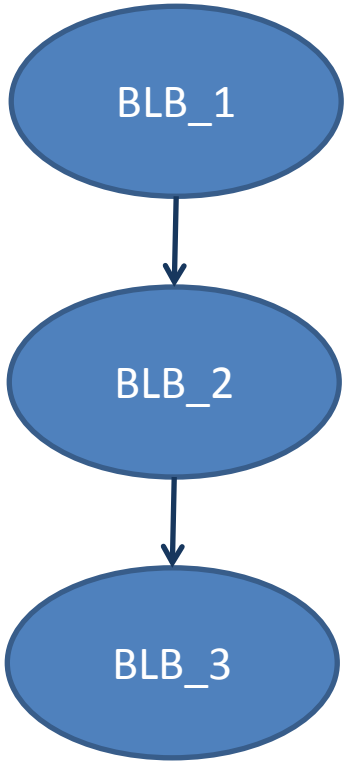
BLB_2 may be individually accepted in case of block condition is fulfilled and only if BLB_1 has been accepted

- **BLB_2 is „parent" for BLB_3**
- **BLB_3 is „child" for BLB_2**

BLB_3 may be individually accepted in case of block condition is fulfilled and only if BLB_2 has been accepted.

Romanian DAM Rules in 4M MC Framework (8)

Linked Block Orders – Possible Scenarios (2):



- **BLB_1** **accepted**
- **BLB_2, BLB_3** **rejected**

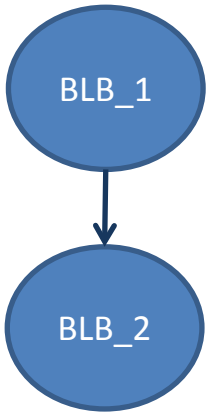
- **BLB_1, BLB_2** **accepted**
- **BLB_3** **rejected**

- **BLB_1, BLB_2, BLB_3** **accepted**

- **BLB_1, BLB_2, BLB_3** **rejected**

Romanian DAM Rules in 4M MC Framework (9)

Linked Block Orders – Total welfare principle for the linked blocks (3):



Int.	MCP [RON/MWh]	Average MCP [RON/MWh]	BLB
int. 1	137,00	105,00	BLB_1
int. 2	102,00		
int. 3	98,00		
int. 4	97,00		
int. 5	88,00		
int. 6	94,00		
int. 7	119,00		
int. 8	139,00	144,76	BLB_2
int. 9	139,00		
int. 10	129,00		
int. 11	119,00		
int. 12	129,00		
int. 13	139,00		
int. 14	139,00		
int. 15	139,00		
int. 16	139,00		
int. 17	139,00		
int. 18	139,00		
int. 19	139,00		
int. 20	177,00		
int. 21	177,00		
int. 22	139,00		
int. 23	140,00		
int. 24	200,00		

- **Acceptance general condition of a block:**

The Block Order is accepted if the block order price is better than average MCP for the block definition period or

The block order is accepted if the welfare generated by order definition is at least equal with welfare resulted for executed block at calculated MCP

- **Linked Sell Orders**

BLB_1 (15 MWh/h, 107 RON/MWh)

=> Expected Welfare = 15*7*107 = 11.235 RON

BLB_2 (25 MWh/h, 137 RON/MWh)

=> Expected Welfare = 25*17*137 = 58.225 RON

Total Expected Welfare = 69.460 RON

- **Results for MCP**

BLB_1 => Expected Welfare = 15*7*105 = 11.025 RON

BLB_2 => Expected Welfare = 25*17*144.76 = 61.523 RON

Total Expected Welfare = 72.548 RON

EUPHEMIA ALGORITHM → **BLB_1 și BLB_2 ACCEPTED**

Romanian DAM Rules in 4M MC Framework (10)

The results of the coupling algorithm:

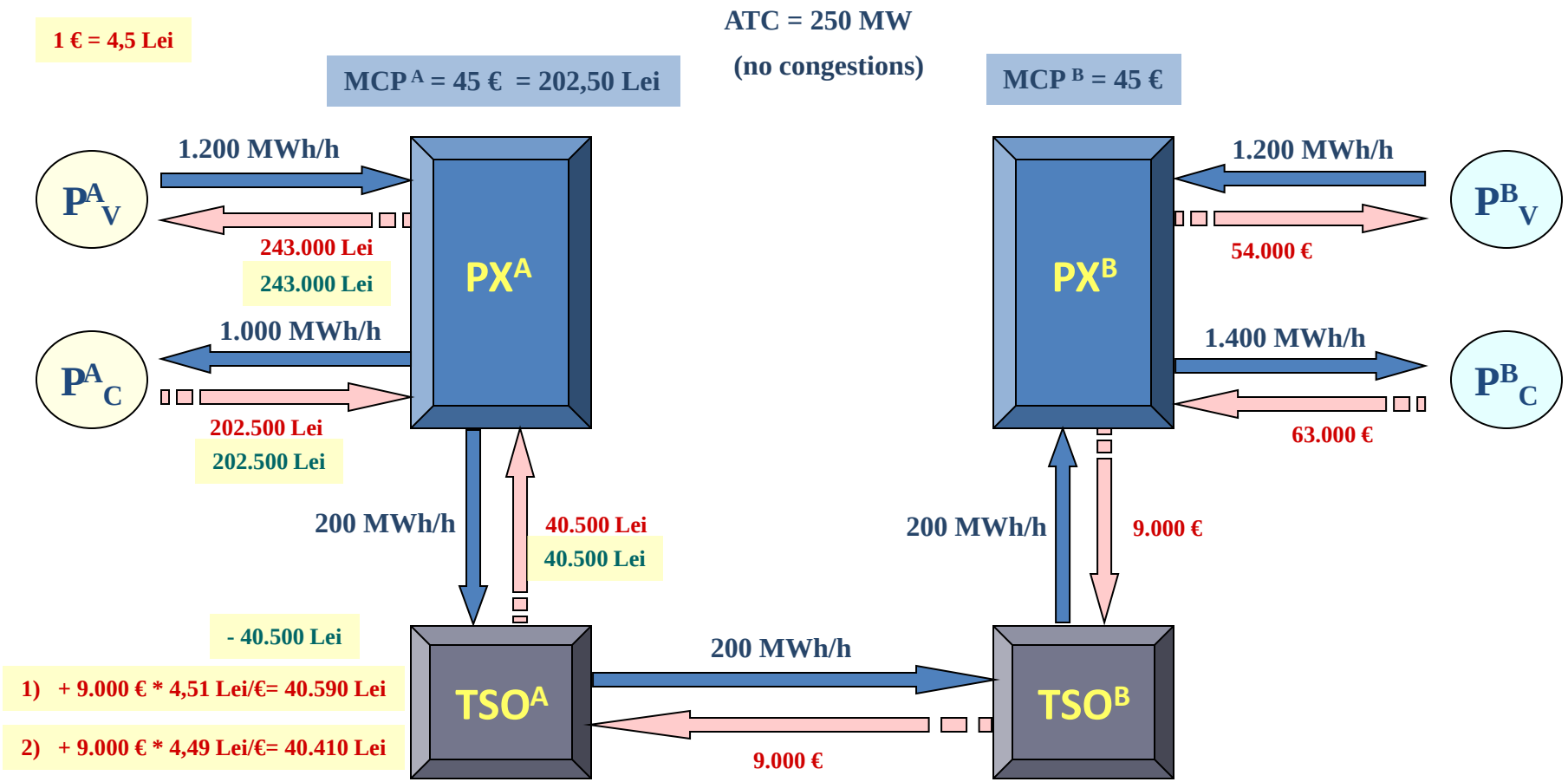
- MCP for each bidding area [€/MWh];
- Net position for each bidding area;
- Energy flow through each interconnection, associated to DAM trades;
- The executed blocks and accepted quantities.

Trade Confirmations:

- MCP for national bidding area [RON/MWh];
- Accepted quantities of hourly orders for sell and buy;
- Executed blocks;
- The energy flows through Romanian – Hungarian interconnection

Romanian DAM Rules in 4M MC Framework (11)

The financial and commercial flows between participants in the markets coupling (1)



Balance between payment obligations & receiving rights for PX.

Balance between payment obligations & receiving rights for TSO depends on the exchange rate at the time of payment (after x days)

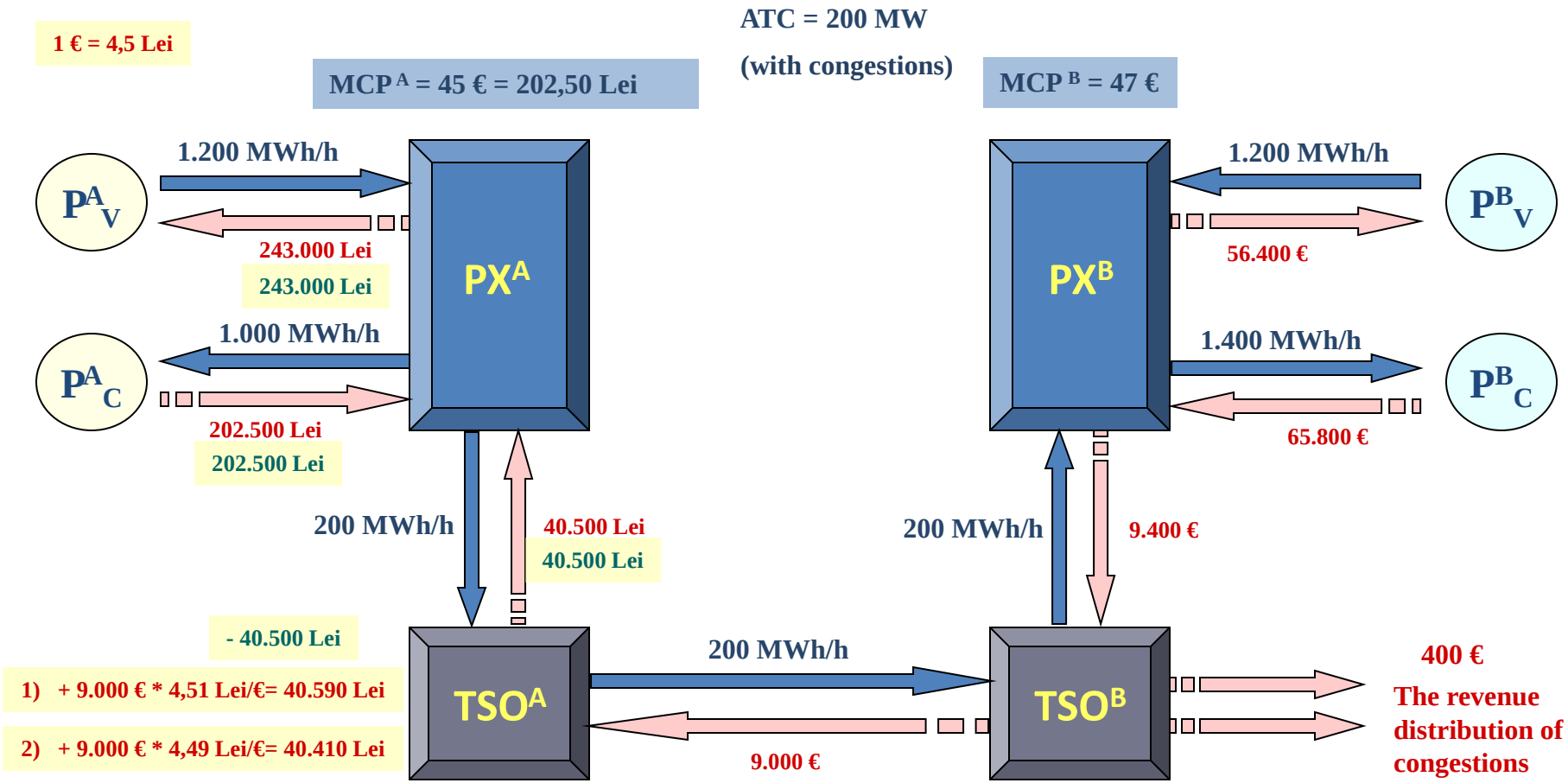
1) Surplus 90 Lei

2) Deficit 90 Lei

Commercial flows | Financial Settlement [Lei] | Payments

Romanian DAM Rules in 4M MC Framework (12)

The financial and commercial flows between participants in the markets coupling (2)



Balance between payment obligations & receiving rights for PX.

Balance between payment obligations & receiving rights for TSO depends on the exchange rate at the time of payment (after x days)

1) Surplus 90 Lei

2) Deficit 90 Lei

Commercial flows | Financial Settlement [Lei] | Payments

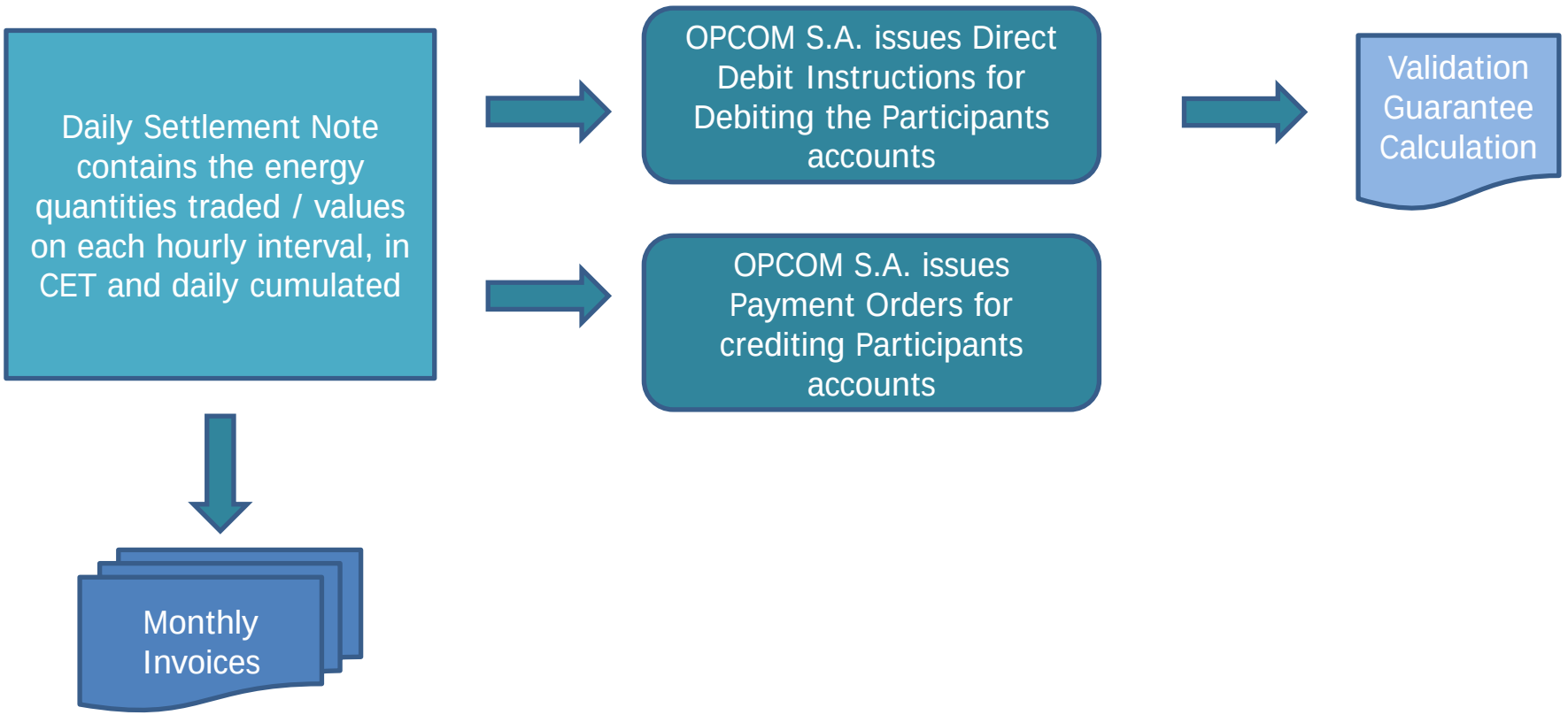
Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism (1)

- The DAM Participants which intend to introduce buy offers with positive prices and / or sell offers with negative prices have the obligation to send to OPCOM S.A.:
  - Direct Debit Mandatory Agreement
  - Guarantee Letter
- The Implicit DAM Participant (TSO) does not have the obligation for a Gurantee and does not have the right to send offers
- OPCOM S.A. calculates daily the validation guarantee for buy offers with positive prices and / or sell offers with negative prices :

$$G_{validation} = (G_{constituted} - T_{oblig}) \ / \ (1+VAT/100)$$

T_{oblig} represents the net value of the payment obligations of the Participant, unreceived in the DAM Central Account and VAT as in the Fiscal Code

Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism (2)



Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism (3)

Invoices issued by DAM Participants

SELLER

Electricity sold to positive prices

- quantity
- value
- VAT, as Fiscal Code

Electricity sold to negative prices

- quantity

OPCOM S.A.

BUYER

Performing services for acquisition of Electricity at negative prices (get rid of/remove)

- quantity
- value
- VAT, as Fiscal Code

OPCOM S.A.

Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism (4)

Invoices issued by OPCOM S.A.

OPCOM S.A.

Electricity sold to positive prices

- quantity
- value
- VAT, as Fiscal Code

BUYER

Electricity sold to negative prices

- quantity

OPCOM S.A.

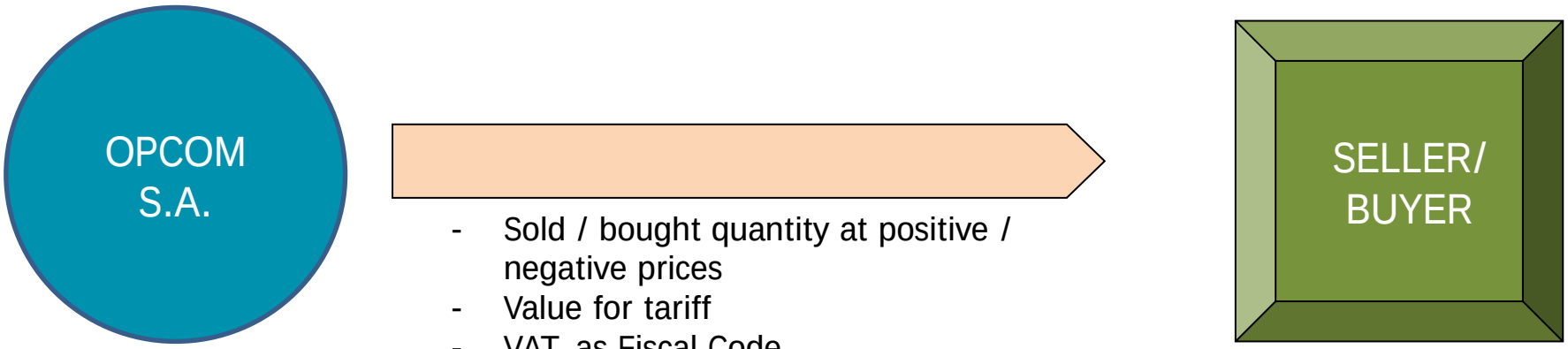
Performing services for acquisition of Electricity at negative prices (get rid of/remove)

- quantity
- value
- VAT, as Fiscal Code

SELLER

Regulations for collateral and settlement mechanism of DAM transactions taking into account the Market Coupling Price Mechanism (5)

Invoicing the regulated tariff transaction component on centralized markets in which OPCOM S.A. is counterapart



- Sold / bought quantity at positive / negative prices
- Value for tariff
- VAT, as Fiscal Code

Thank you for your attention.

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