

# **Integration of the Electricity Market with the European Single Intra-Day Coupling and new MI-MSD coordination rules**

Intra-day Coupling: the new market  
model

## ***INTRA-DAY COUPLING : THE NEW MARKET MODEL***

- 1. The design: general aspects**
- 2. The MI-A design (CRIDA)**
- 3. The MI-XBID design**
- 4. The design: the Platform for Scheduling (PN)**
- 5. More in detail**
  - The processes: from trading to appointment**
  - Interaction between MI-XBID and MI-CRIDA**
  - Viewing offers on *order books* in MI-XBID**

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## Adhesion of the Italian market to the **Single Intra-day Coupling** (SIDC)

Impacts on:

- **Technical bidding limits:**
  - 500 €/MWh; +3.000 €/MWh on MGP
  - ± 9,999 €/MWh on MI
- **Design and structure of the MI market**

# Intra-day Coupling: the new market model

## Intraday Market (MI)



Implicit allocation  
of the capacity via  
**continuous  
trading** (XBID)

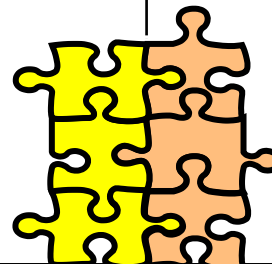
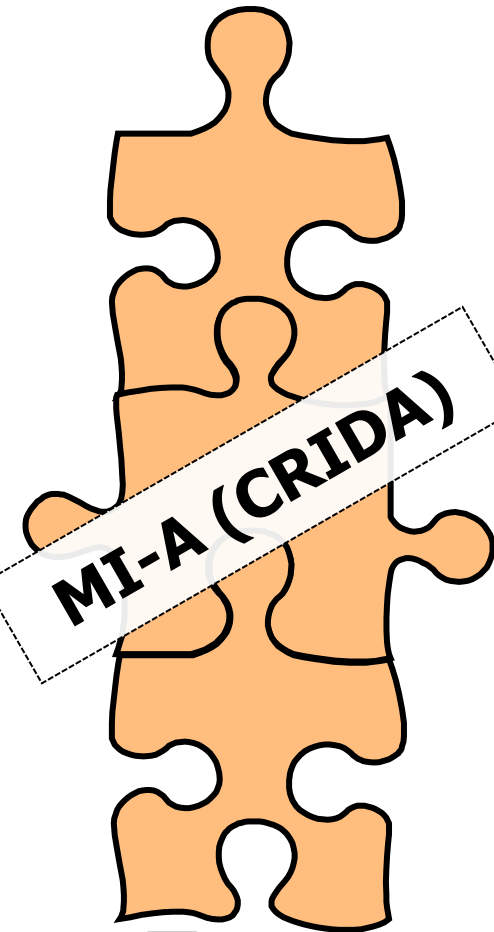
**Matching price**

Offers for  
**Portfolio**  
&  
Offers for **unit**

Implicit allocation  
of the capacity via  
**auction** (IPEX)

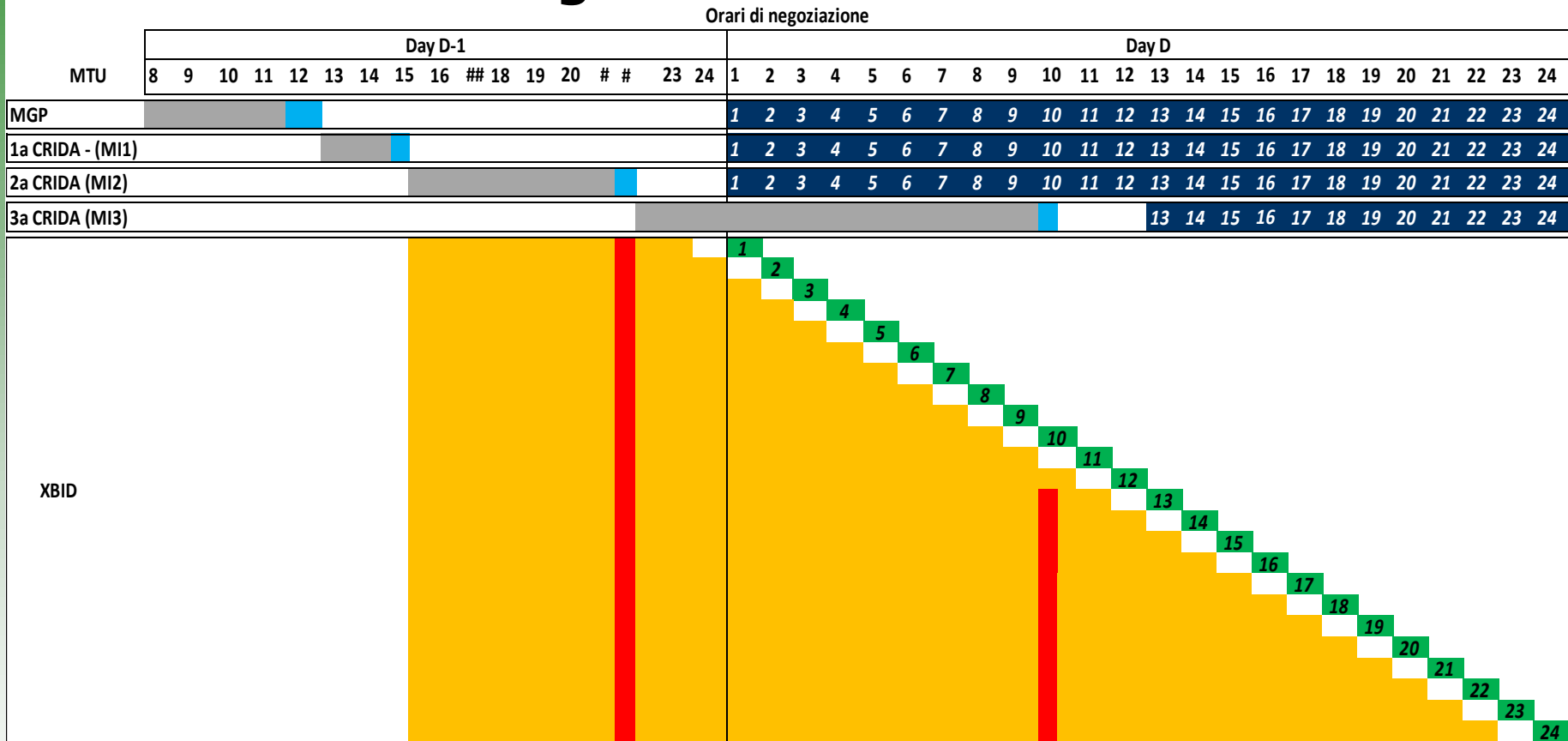
**Marginal price**  
(in continuity with  
current MI)

Offers for **unit**



# Intra-day Coupling: the new market model

## Sessions and trading hours

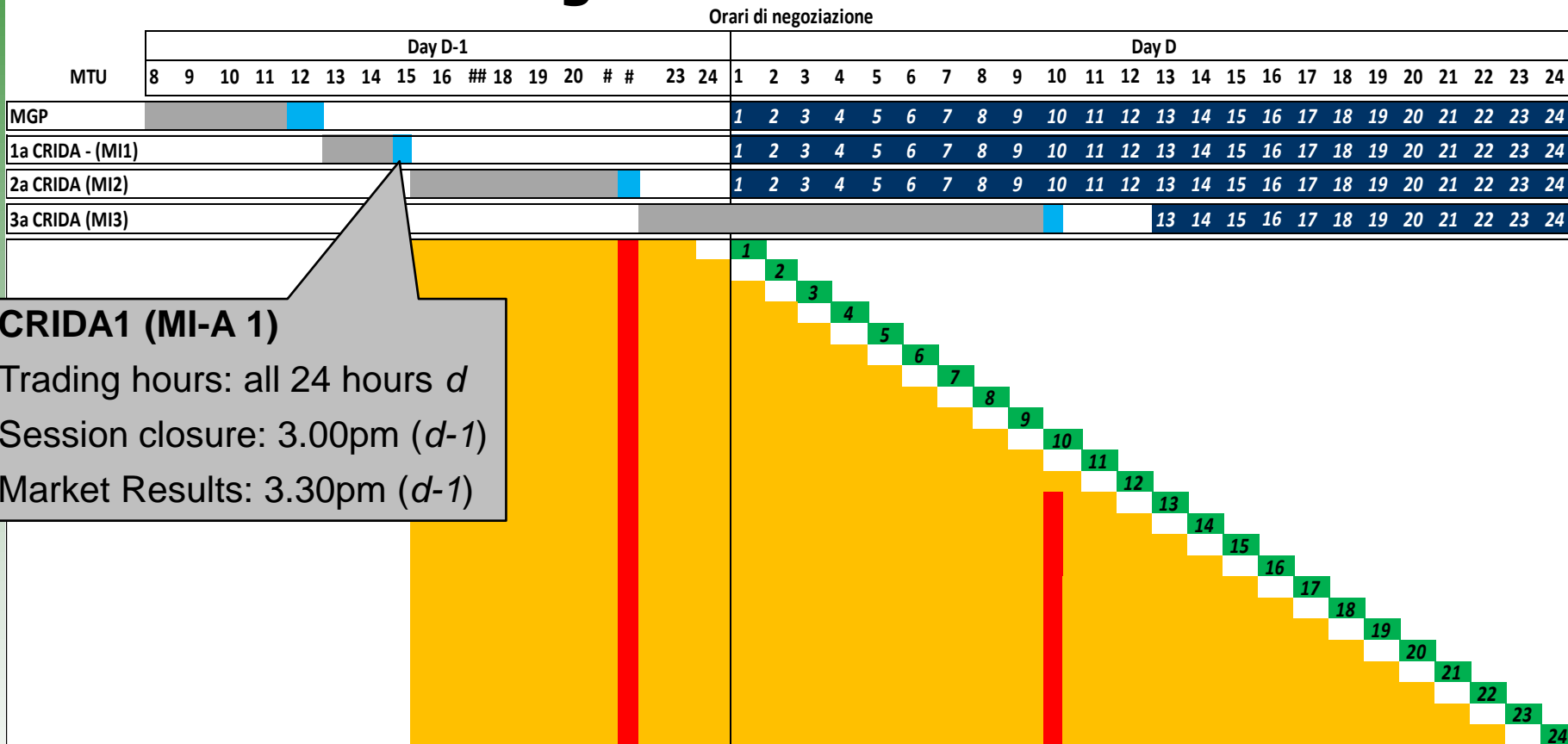


Nota: questa schema è solo una rappresentazione grafica della proposta che fornisce un generico quadro dell'integrazione tra la negoziazione continua in XBID e le CRIDA. Nello schema non sono riportati gli specifici orari di negoziazione

	Sottomissione delle offerte
	Calcolo dei risultati
<b>h</b>	Ore negoziabili del giorno D nelle aste MGP e MI
	Periodo di trading su XBID
<b>h</b>	Ore negoziabili del giorno D in XBID
	Interruzione del trading XBID durante l'esecuzione delle CRIDA

# Intra-day Coupling: the new market model

## Sessions and trading hours

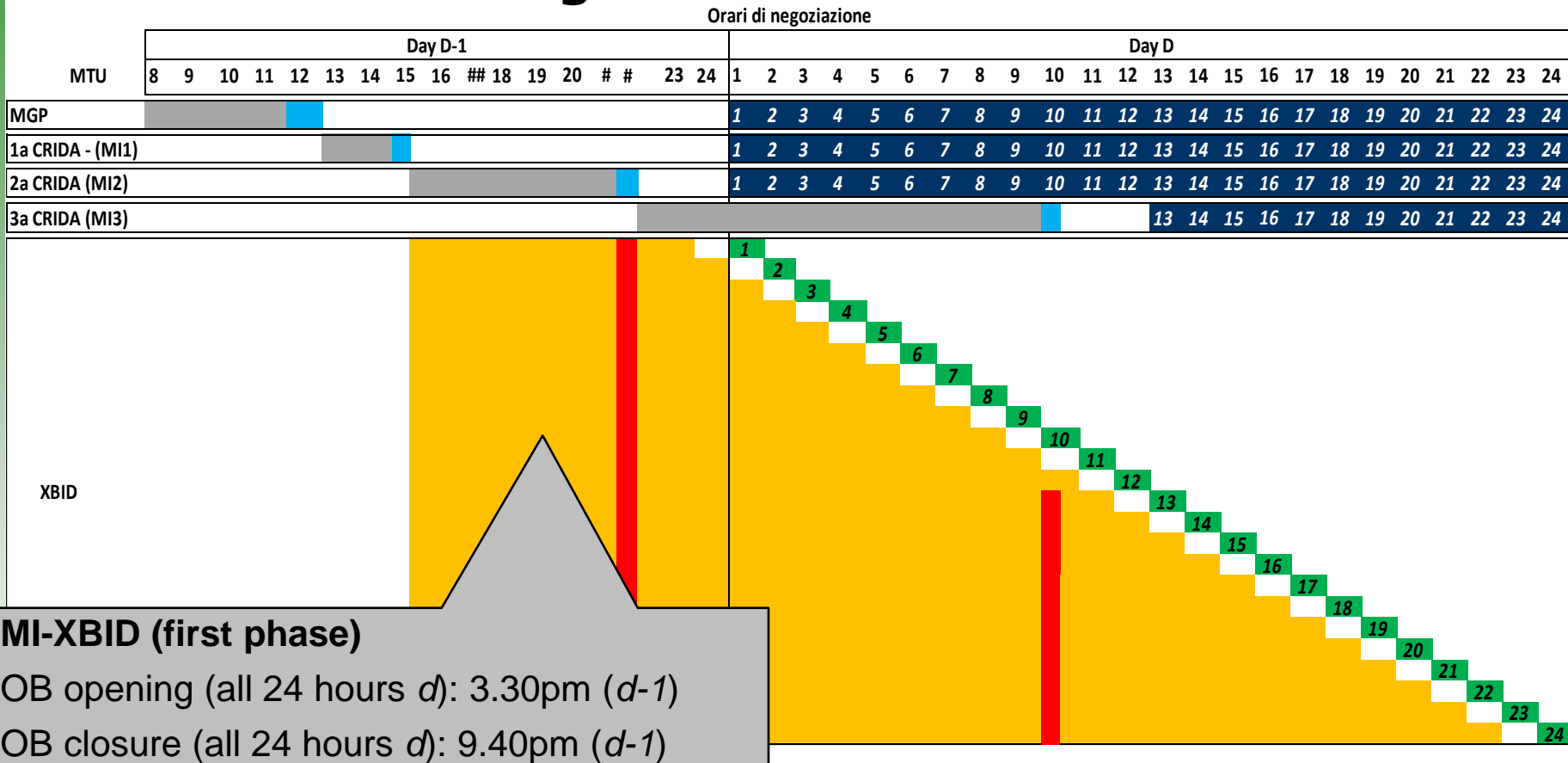


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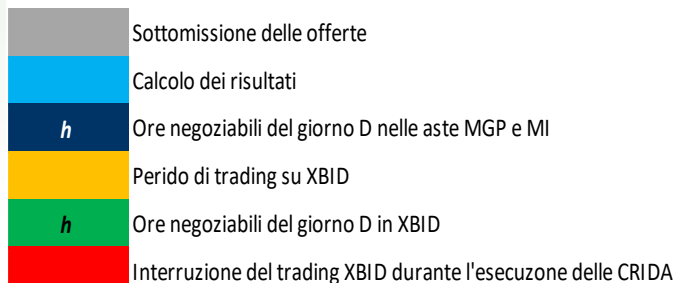
- Sottomissione delle offerte
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# Intra-day Coupling: the new market model

## Sessions and trading hours



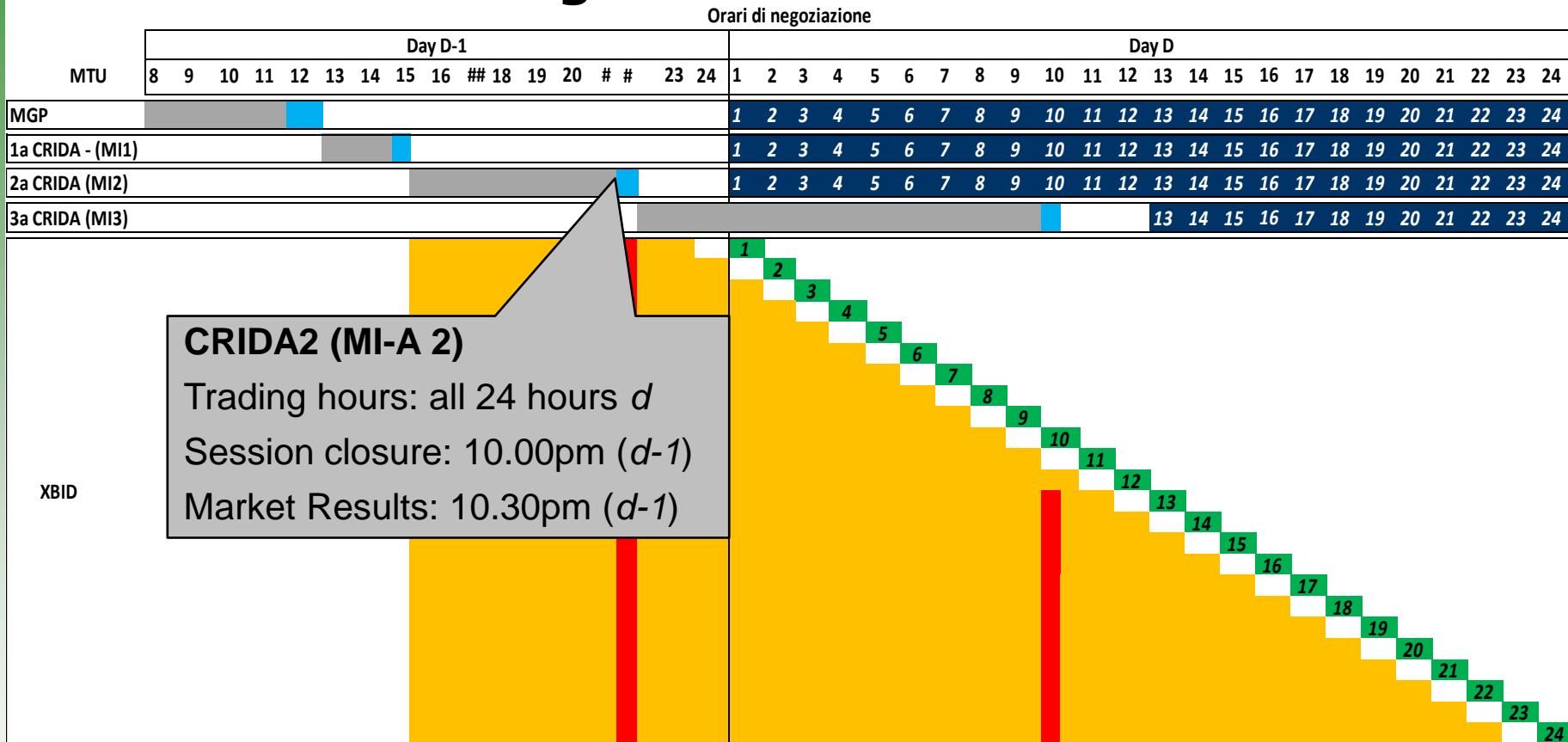
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# Intra-day Coupling: the new market model

## Sessions and trading hours



Nota: questa schema è solo una rappresentazione grafica della proposta che fornisce una generico quadro dell'integrazione tra la negoziazione continua in XBID e le CRIDA. Nello schema non sono riportati gli specifici orari di negoziazione

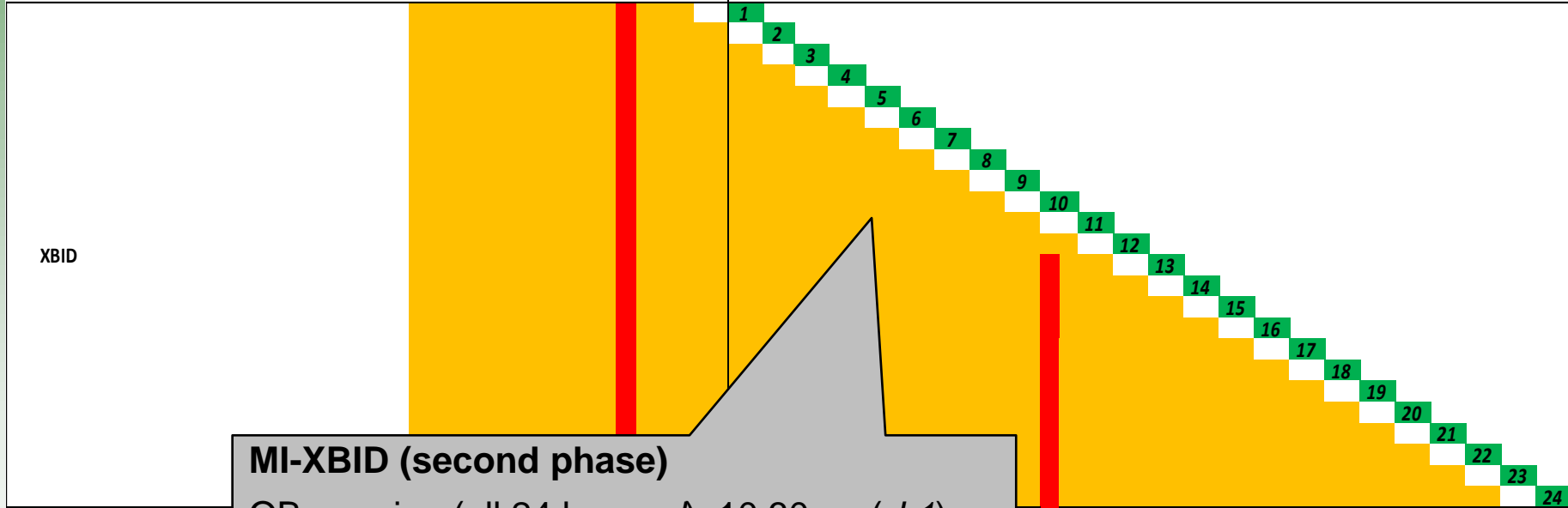
	Sottomissione delle offerte
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$h$	Ore negoziabili del giorno D in XBID
	Interruzione del trading XBID durante l'esecuzione delle CRIDA

# Intra-day Coupling: the new market model

## Sessions and trading hours

Orari di negoziazione

MTU	Day D-1																Day D																							
	8	9	10	11	12	13	14	15	16	##	18	19	20	#	#	23	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MGP																																								
1a CRIDA - (MI1)																																								
2a CRIDA (MI2)																																								
3a CRIDA (MI3)																																								



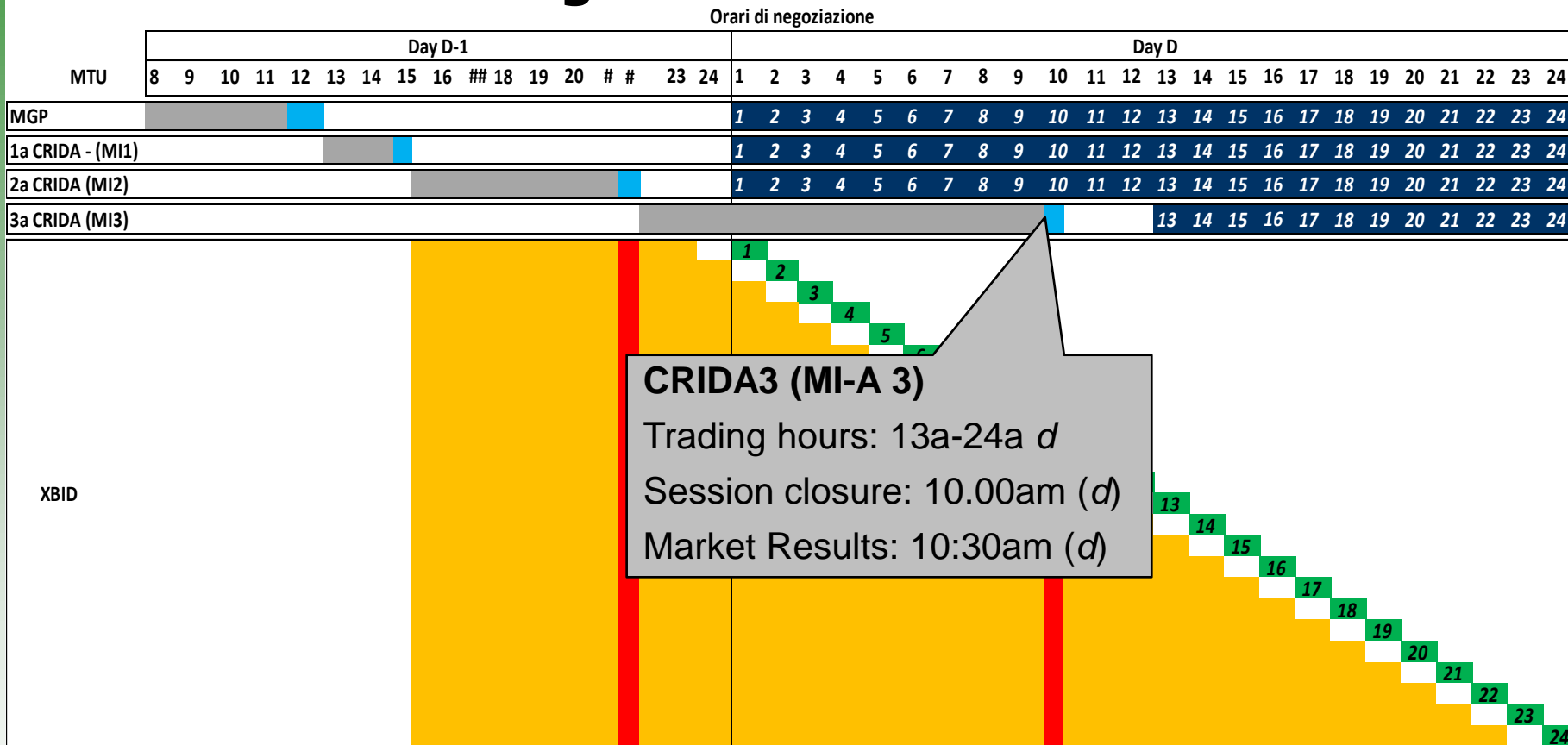
**MI-XBID (second phase)**  
 OB opening (all 24 hours  $d$ ): 10.30pm ( $d-1$ )  
 OB Closure  
 - hours 1a – 12a  $d$ :  $h-1$  ( $d$ )  
 - ore 13a - 24a  $d$ : 09:40am ( $d$ )

- Sottomissione d
- Calcolo dei risult
- $h$  Ore negoziabili
- Periodo di trading
- $h$  Ore negoziabili del giorno D in XBID
- Interruzione del trading XBID durante l'esecuzione delle CRIDA

e le CRIDA. Nello schema non sono riportati gli specifici orari di negoziazione

# Intra-day Coupling: the new market model

## Sessions and trading hours

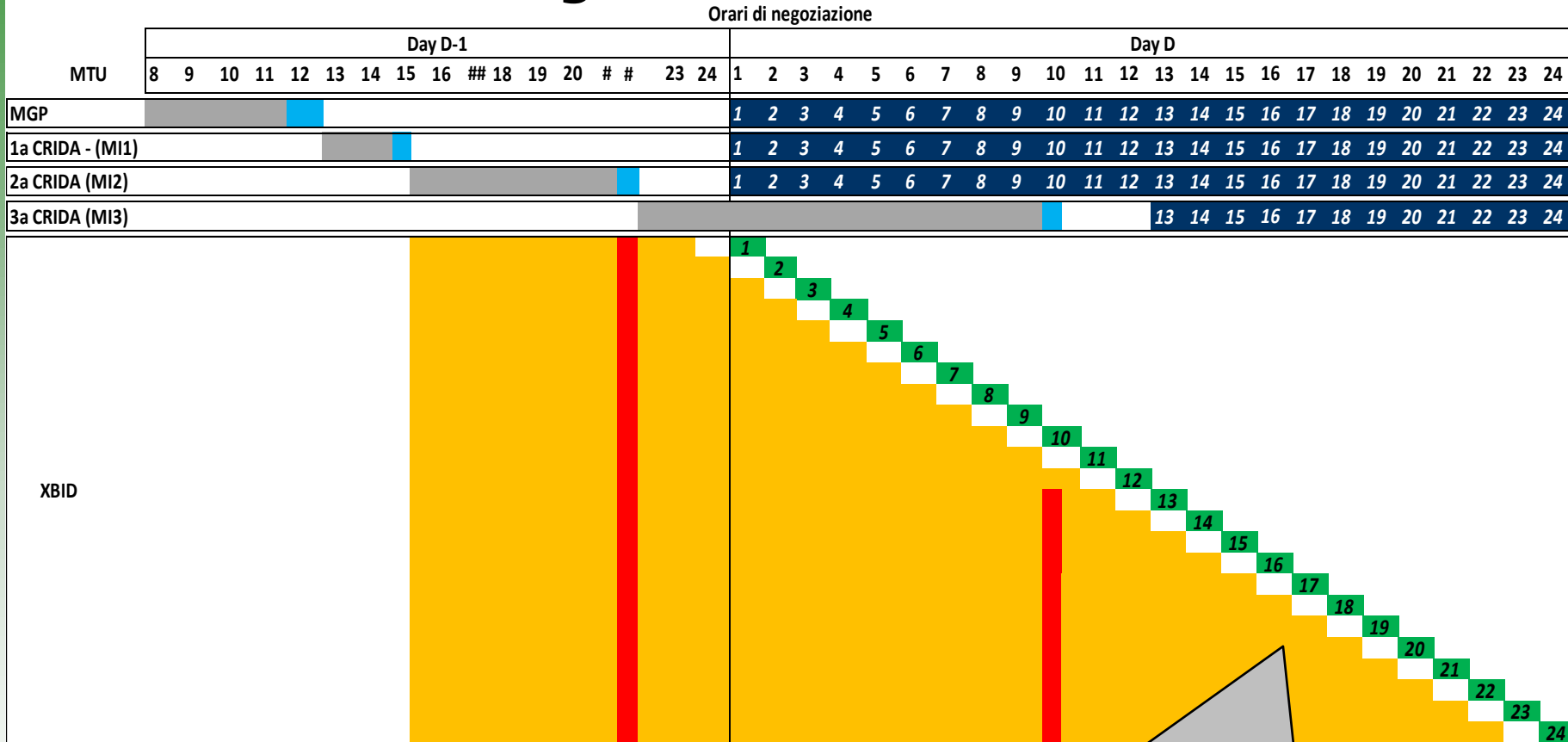


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# Intra-day Coupling: the new market model

## Sessions and trading hours



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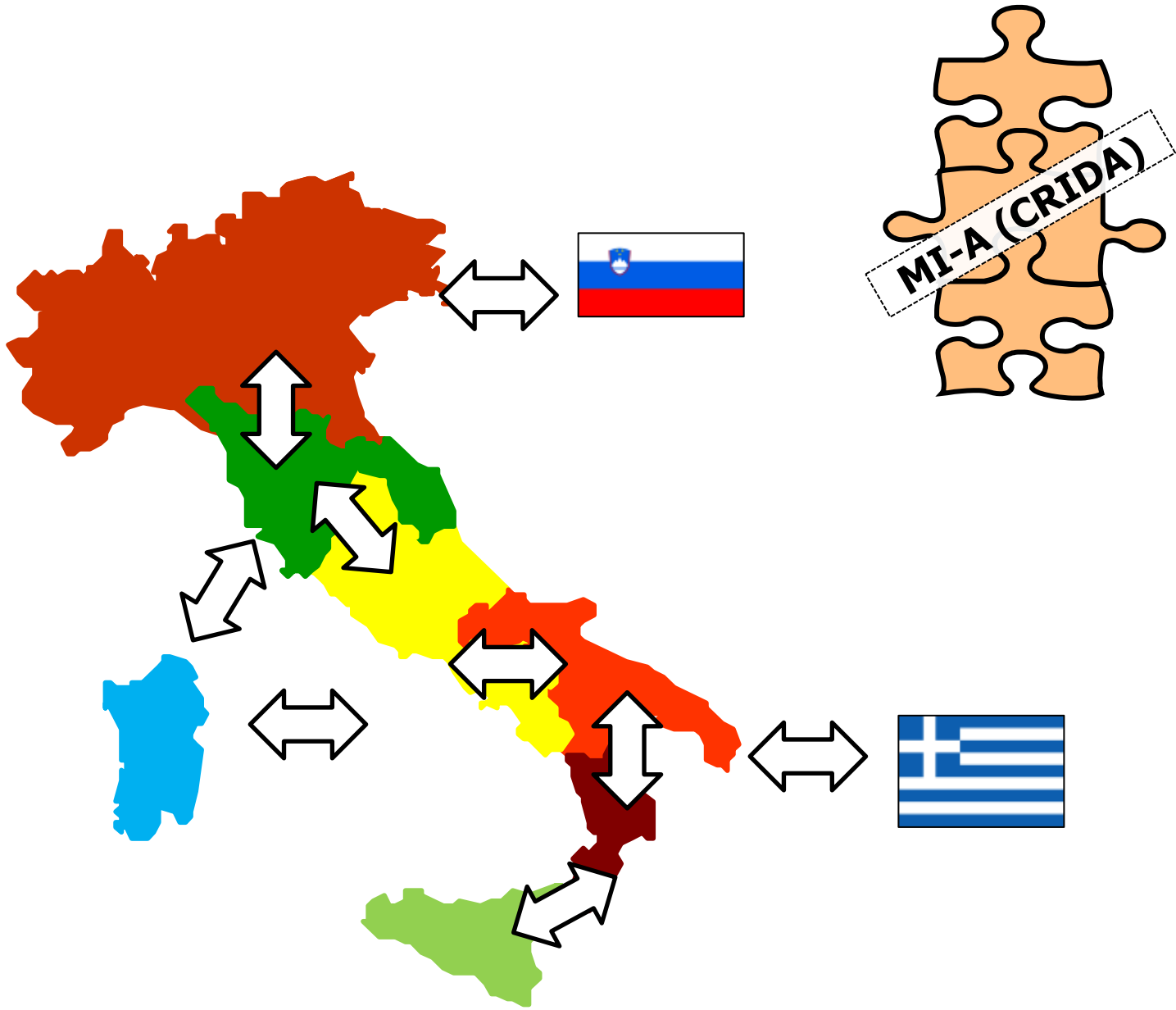
- Sottomissione delle offerte
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- h* Ore negoziabili del giorno D nelle aste MGP e MI
- Periodo di trading su XBID
- h* Ore negoziabili del giorno D in XBID
- Interruzione del trading XBID durante l'esecuzione delle CRIDA

**MI-XBID (third phase)**  
 OB opening (13a-24a d): 10.30am (d)  
 OB Closure(hours 13a-24a d): *h-1* (d)

## ***INTRA-DAY COUPLING : THE NEW MARKET MODEL***

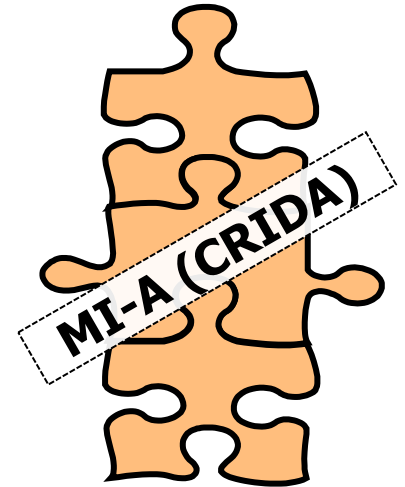
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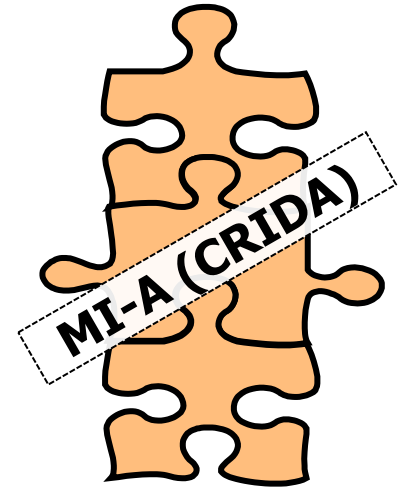
## MI-A (CRIDA): general aspects

- «**Regional**» **price coupling** on *Bidding Zones (BZs)* of Italy, Slovenia and Greece and related *internal Italian borders* and *borders* of IT-SI and IT-GR
- **early implementation** of the **IDAs**
  - Same number of **sessions: 3**
  - **Analogous times** of execution



## MI-A (CRIDA): trading methods

- **Auction** through **IPEX** (same platform as MGP, MSD)
- **Trading per unit only** (as MGP/MSD)
- Sell and buy trading limit = upward and downward **margins** for each unit (as on MGP)

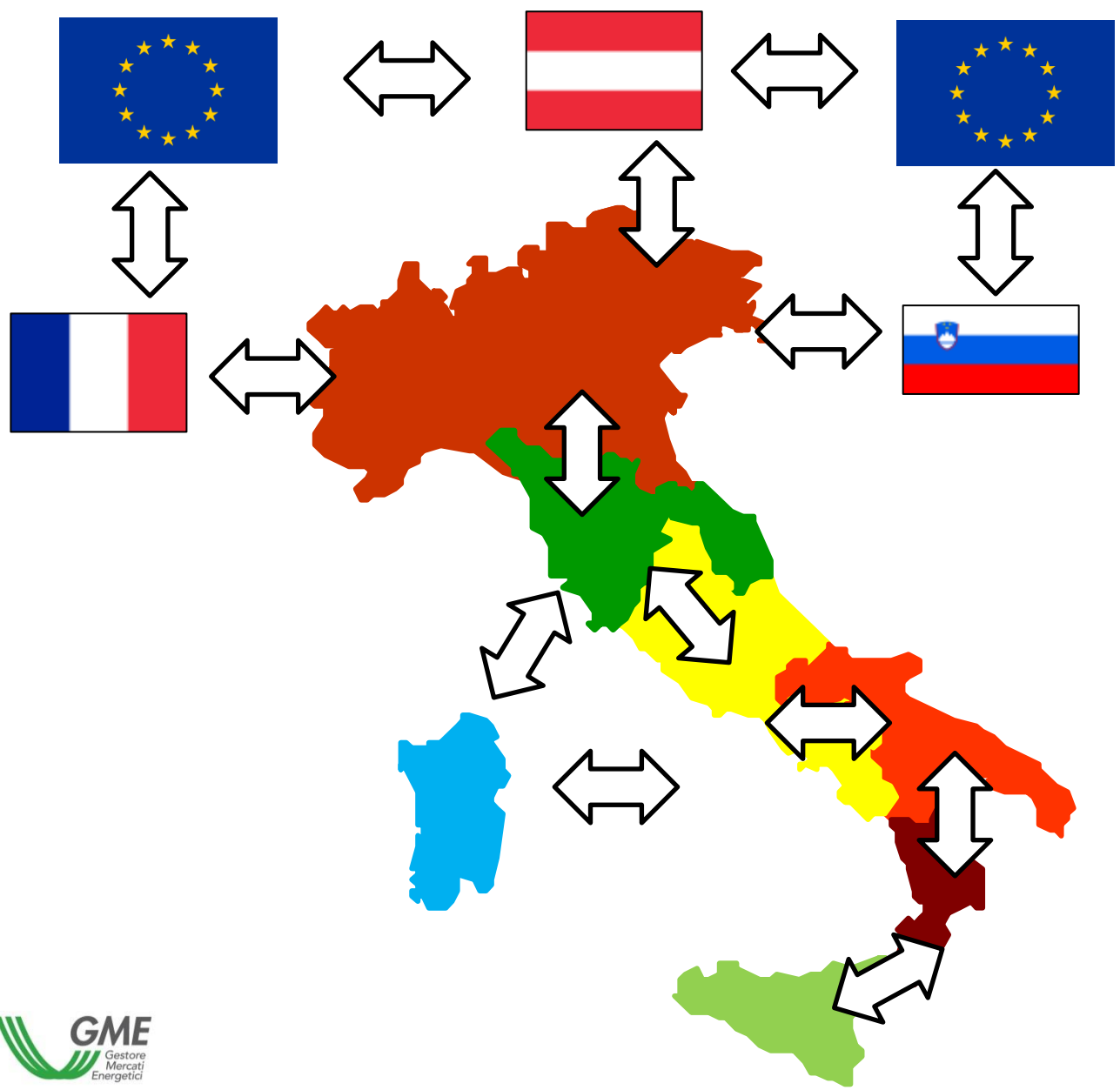




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# Intra-day Coupling: the new market model



## MI-XBID (XBID): general aspects

- **Continuous trading** via Local Trading System - **LTS** GME (new platform)



- Trading up to ***h-1***
- **1 order book (OB)** trading for each **area**  
*(Italian BZs) / hour*
- GME **central counterpart** of the matchings

## MI-XBID (XBID): general aspects

- **LTS** connected to the platform **XBID**
- In each zonal **OB** the following are displayed (anonymously) and "matched" to each other:

**bid/off** presented in the **same BZ**

+

**bid/off** of **other** (EU) **BZs** in XBID  
compatibly with **available capacity**

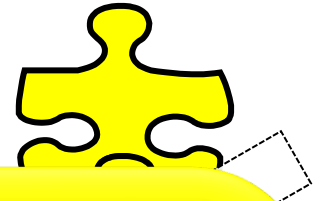


## **MI-XBID (XBID):** trading by portfolio/unit

- Each participant in each zone is assigned **1 portfolio** with all **units @zonal price** (UP/UPV/UCV/UPM) in its **availability (Dispatching User or delegation)**
- The participant can choose whether to refer the offer to the **portfolio** (= indiscriminately to all units) or to the individual **unit @ zonal price**
- The **units @ PUN (UC)** do not enter the portfolio
- On **UC** only offers for **unit** (no portfolio)



## MI-XBID (XBID): trading by portfolio/unit



- Each participant in each zone is assigned a **portfolio** with all **units @ Pz** (UP/UPV/UCV/UPM) in it.
  - **(Dispatching User or delegation)**
    - distinct from that used for MGP and MI-A
    - A unit can be the subject of a single proxy
    - Delegating Dispatching User cannot have the unit on MI-XBID
- The participant can choose whether the offer to **portfolio** (= indiscriminate units) or to the individual **unit @ zone**
- The **units @ PUN (UC)** do not enter portfolio
- On **UC** only offers for **unit** (no portfolio)

**MI-XBID (XBID):** trading by portfolio/unit

- **Trading limit** for sale and purchase
  - **Unit trading:**
    - upward and downward **margins** of **each unit**
  - **Portfolio** trading
    - $\Sigma$  **margins** upward and downward of **all units** of the portfolio
- In defining upward/downward margins, possible **feasibility intervals** are taken into consideration (from MSD)



## The Commercial Position

The **offers matched** by a participant on **MI-XBID** (both unit and portfolio), determine in each hour  $h$  a **commercial position** that is «zonal» for:

- **every** Zonal portfolio (**PZ**)

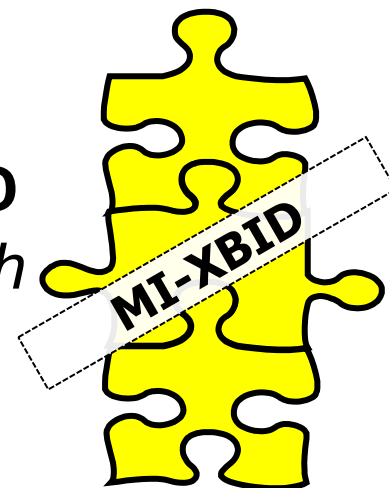
$\Sigma$  buy (+) and sell (-) offers

referring to **PZ** and to **units** from the same zone;

- **every** UC @ PUN (**UC**)

$\Sigma$  buy (+) and sell (-) offers

referring to UC





## The Commercial Position

The **offers matched** by a participant on the PUN (both unit and portfolio), determine in a **commercial positions** «that is zonal

- **every** Zonal portfolio (**PZ**)

$\Sigma$  buy ( ) and sell (-) offers

referring to **PZ** and to **units** from the same zone;

- **every** UC @ PUN (**UC**)

$\Sigma$  buy ( ) and sell (-) offers

referring to UC



Purchases conventionally with sign +

Sales conventionally with sign -

## The Commercial Position

The **offers matched** by a participant on the PUN (both unit and portfolio), determine in a **commercial positions** «that is zonal

- **every** Zonal portfolio (**PZ**)

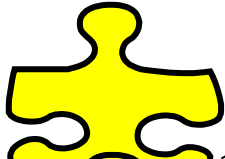
$\Sigma$  buy (+) and sell (-) offers

referring to **PZ** and to **units** from the zone;

- **every** UC @ PUN (**UC**)

$\Sigma$  buy ( ) and sell (-) offers

referring to UC



Both offers on the zonal portfolio and on the corresponding units @ zonal price contribute to determining the **same** Commercial Position

## The Commercial Position

The **offers matched** by a participant on **MI-XBID** (both unit and portfolio), determine in each hour  $h$  a **commercial positions** «that is zonal » for

- **every** Zonal portfolio (**PZ**)

$\Sigma$  buy (+) and sell (-) offers

referring to **PZ** and to **units** from zone;

- **every** UC @ PUN (**UC**)

$\Sigma$  buy (+) and sell (-) offers

referring to UC



Separate commercial position for each UC!

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## From **MI-XBID** to the **Platform for Scheduling (PN)**

- The **Commercial Positions** accrued for each hour  $h$  at the end of *trading period* by MI-XBID ( $h-1$ ) must be «**scheduled**» (Attributed to the corresponding units)
- The scheduling phase of each hour  $h$  closes 57 minutes before  $h$  ( **$h-57$** )



## From **MI-XBID** to the Platform for Scheduling (PN)

- **Trade for unit** on MI-XBID (via LTS) = **«implicit» scheduling** on unit (such as MGP, MI-A MSD) → schedule assigned automatically
- Trade for portfolio on MI-XBID (via LTS) = **«explicit» scheduling** on unit **to be carried out** on the Platform for Scheduling- **PN**



## From **MI-XBID** to the Platform for Scheduling (PN)

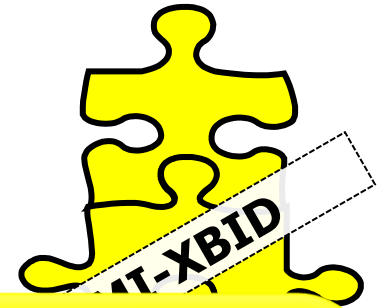
- **Trade for unit** on MI-XBID (via LTS) = **«implicit» scheduling** on unit (such as MGP, MI-A MSD) → schedule assigned automatically



- Trade for portfolio on MI-XBID (via **UC**) = **«explicit» scheduling** on unit **to be carried out** on the Platform for Scheduling- **PN**

For UC there is never an explicit appointment!

## From **MI-XBID** to the **Platform for Scheduling (PN)**



- **Trade for unit** on MI-XBID (via LTS) <<**implicit**>> **scheduling** on unit (such as MI-A MSD) → schedule assigned automatically
- Trade for portfolio on MI-XBID (via LTS), <<**explicit**>> **scheduling** on unit **to be carried out** on the Platform for Scheduling- **PN**

On PN explicit scheduling made by the same participant holding units on MI-XBID (as Dispatching User or by proxy)



## The Platform for Scheduling (PN)

The **schedules** are verified as being **congruous** with respect to:

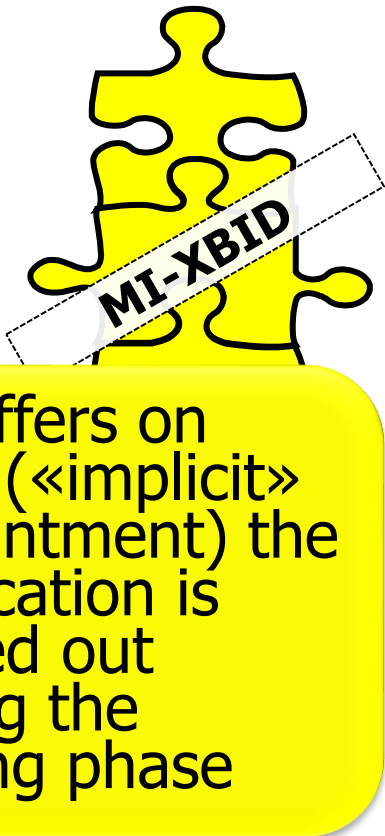


- The relative commercial position of the portfolio to which they refer (unit @ zonal price)
- The margins (feasibility intervals) of the units

## The Platform for Scheduling (PN)

The **schedules** are verified as being **congruous** with respect to:

- The relative commercial position of the portfolio to which they refer (unit @ zone price)
- The margins (feasibility intervals) of the units



For offers on units («implicit» appointment) the verification is carried out during the trading phase

## The Platform for Scheduling (PN)

The **schedules** are verified as being **congruous** with respect to:



- The relative commercial position of the portfolio to which they refer (price)
  - The margins (feasibility inter)
- The balance of appointments must be consistent with the Commercial Position
- The balance of appointments in introduction for commercial positions for sale
  - The balance of appointments in withdrawal for commercial positions in purchase

## The Platform for Scheduling (PN)

The **schedules** are verified as being **congruous** with respect to:



- The relative commercial position of the portfolio to which they refer (unit @ zonal price)
- The margins (fees)

Balance of appointments not exceeding (in absolute value) with respect to the commercial position

## The Platform for Scheduling (PN)

The **schedules** are verified as being **congruous** with respect to:

- The relative commercial position of the portfolio to which they refer (unit @ zonal price)
- The margins (feasibility intervals) of the u



Not congruous  
schedules are  
corrected by the  
PN

## The MI-XBID Program Imbalance

On each Zonal Portfolio (PZ), is determined in each hour  $h$ , an **MI-XBID Program imbalance** equal to:

$\Sigma$  purchase (+) and sale (-) offers

+

$\Sigma$  withdrawal (-) and injection (+) schedules

both implicit and explicit on **unit @ zonal price** of the same zone



## The MI-XBID Program Imbalance

On each Zonal Portfolio (PZ), is defined for each hour  $h$ , an **MI-XBID Program** equal to:

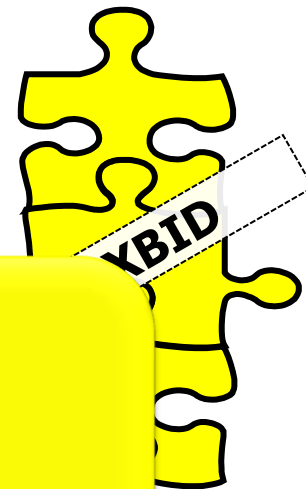
$\Sigma$  purchase (+) and sale (-) offers  
+

$\Sigma$  withdrawal (-) and injection (+) schedules

both implicit and explicit on **unit @ zonal price** of the same zone

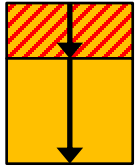
Withdrawal  
conventionally  
with sign -

Injection  
conventionally  
with sign +

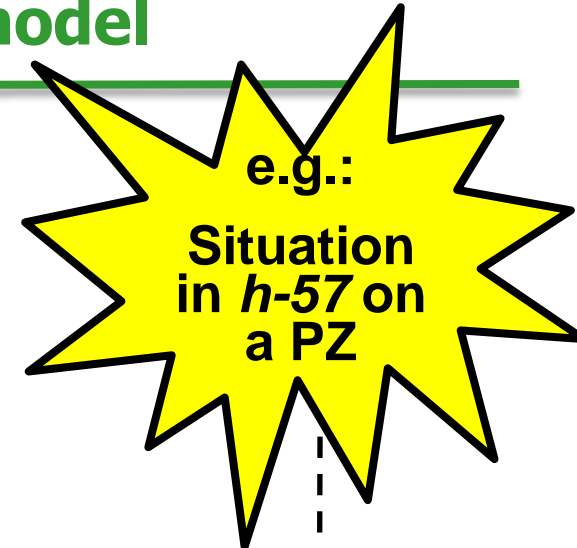


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**MI-XBID  
(LTS)**



**PN**



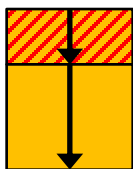
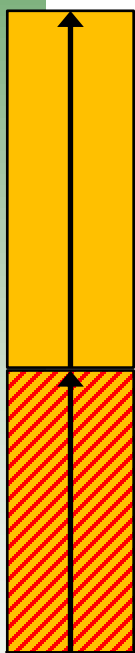
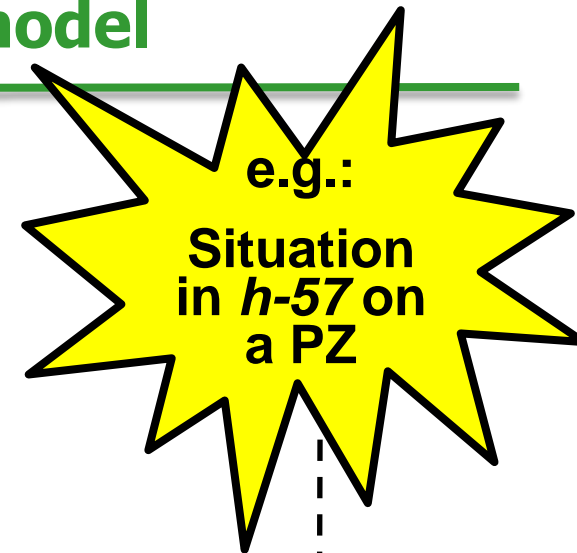
**Purchases (+)**      **Sales (-)**



# Intra-day Coupling: the new market model

MI-XBID  
(LTS)

PN



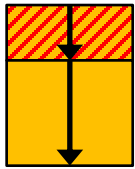
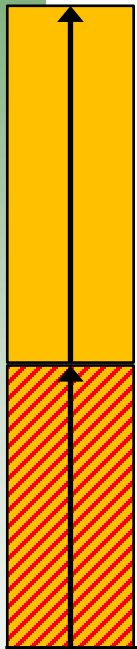
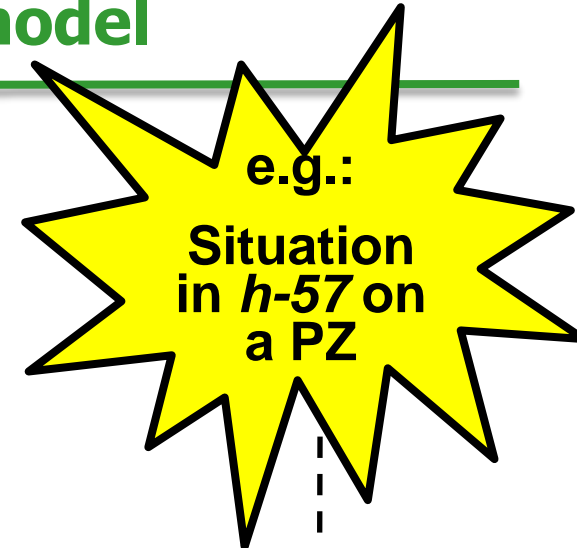
Trade by  
portfolio

**Purchases**   **Sales**  
(+)            (-)

# Intra-day Coupling: the new market model

MI-XBID  
(LTS)

PN

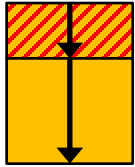


Trade by unit

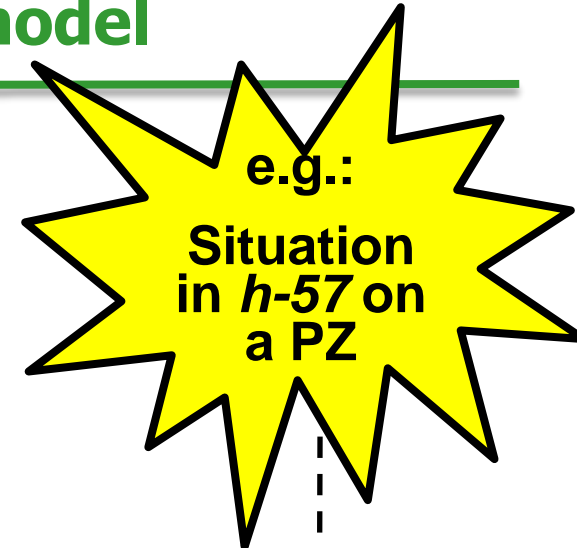
**Purchases**   **Sales**  
(+)            (-)

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**MI-XBID  
(LTS)**



**PN**

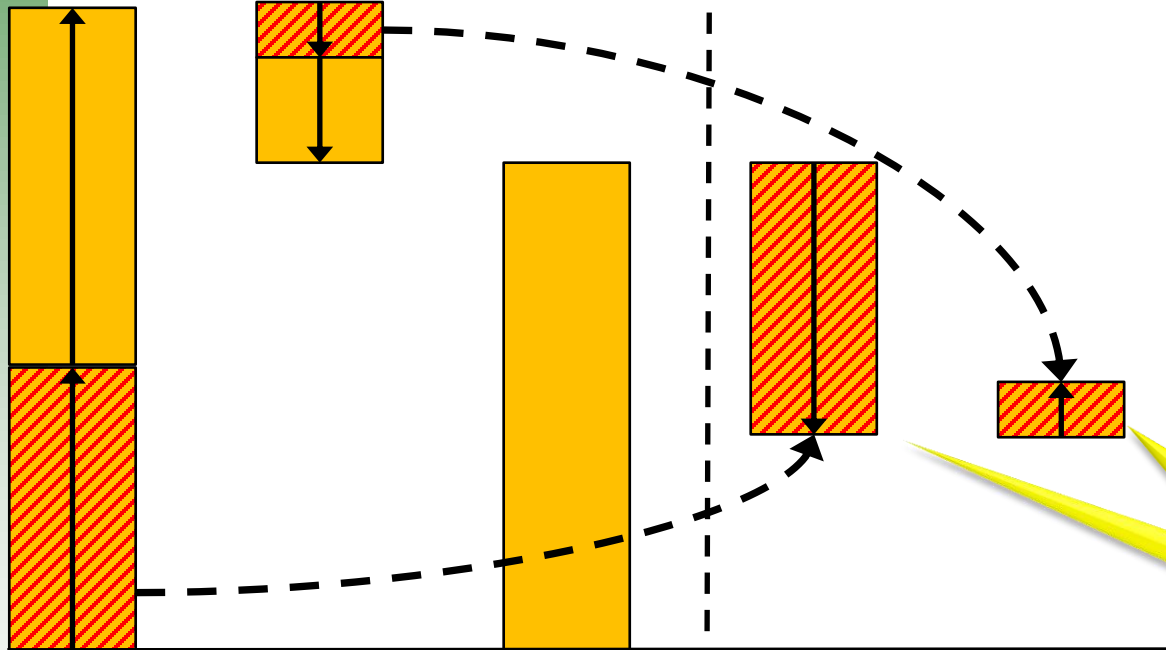
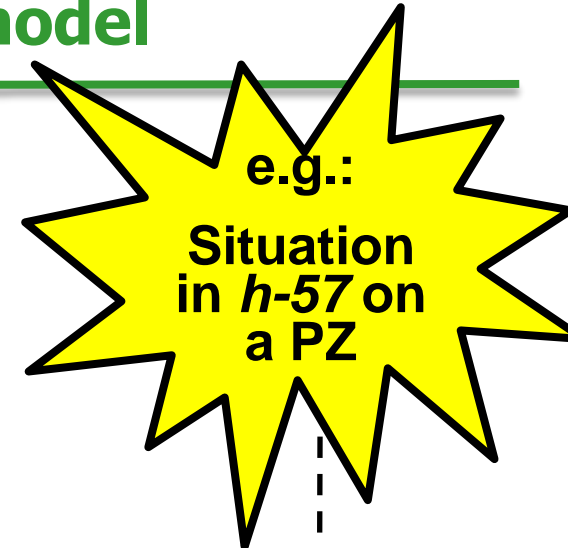


**Purchases (+)**    **Sales (-)**    **Commercial Position**

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MI-XBID  
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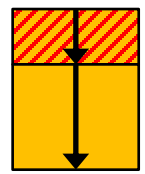


**Purchases (+)**    **Sales (-)**    **Commercial Position**    **Withdraw. schedules (-) implicit**    **Injection schedules (+) implicit**

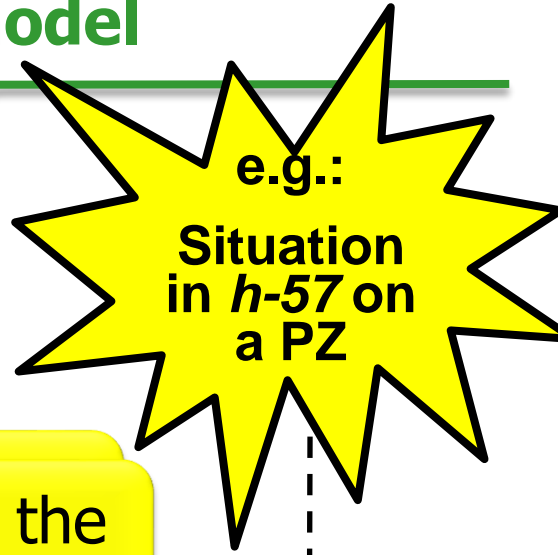
Automatically assigned

# Intra-day Coupling: the new market model

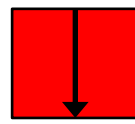
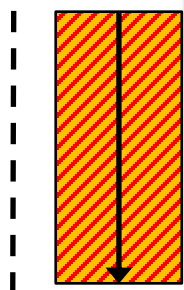
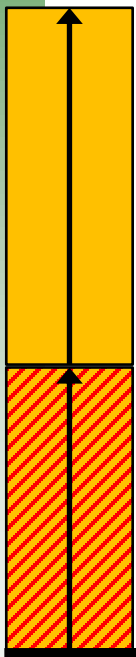
**MI-XBID  
(LTS)**



**PN**



Registered by the participant



**Purchases (+)**   **Sales (-)**   **Commercial Position**

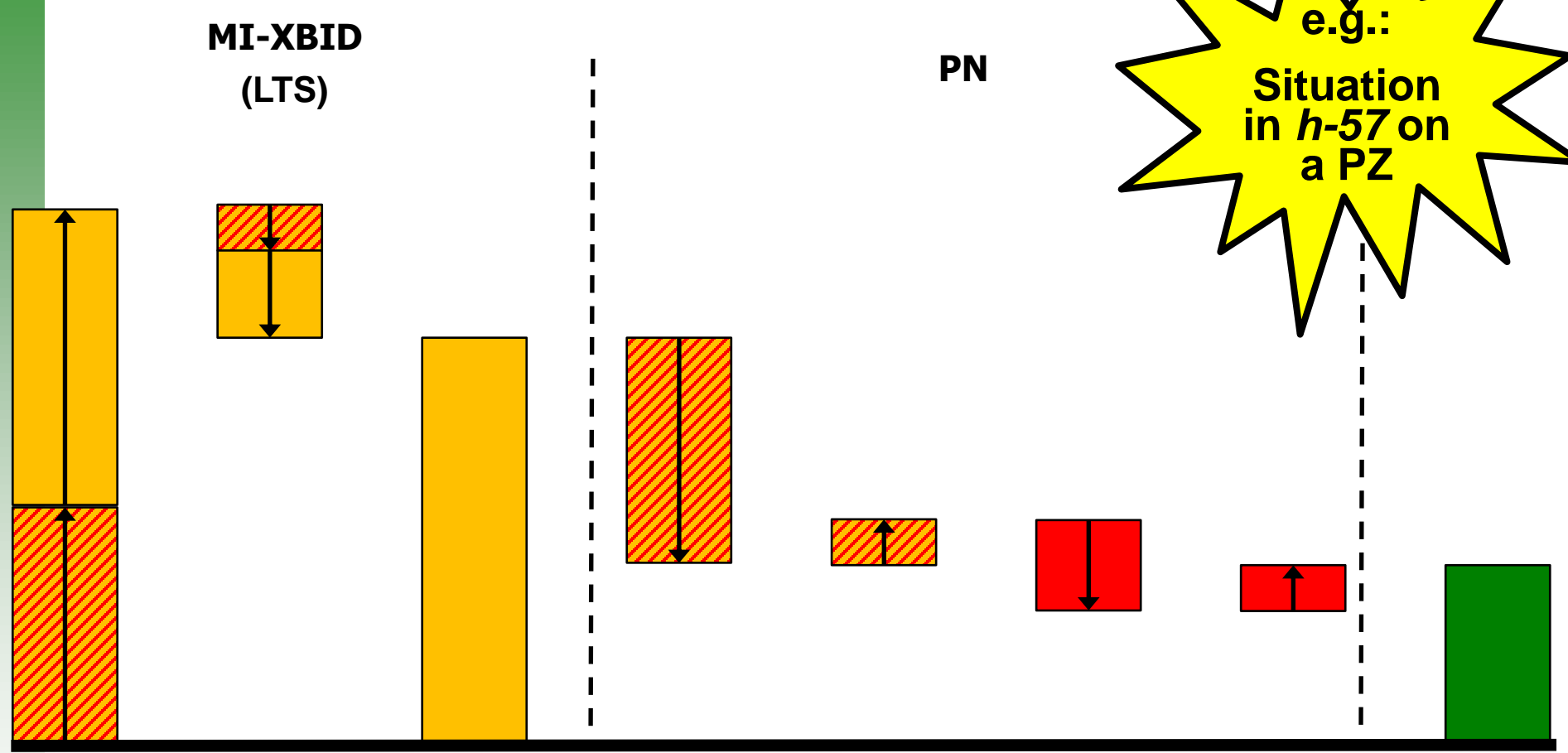
**Withdraw. schedules (-) implicit**

**Injection schedules (+) implicit**

**Withdraw. Schedules (-) explicit**

**Injection schedules (+) explicit**

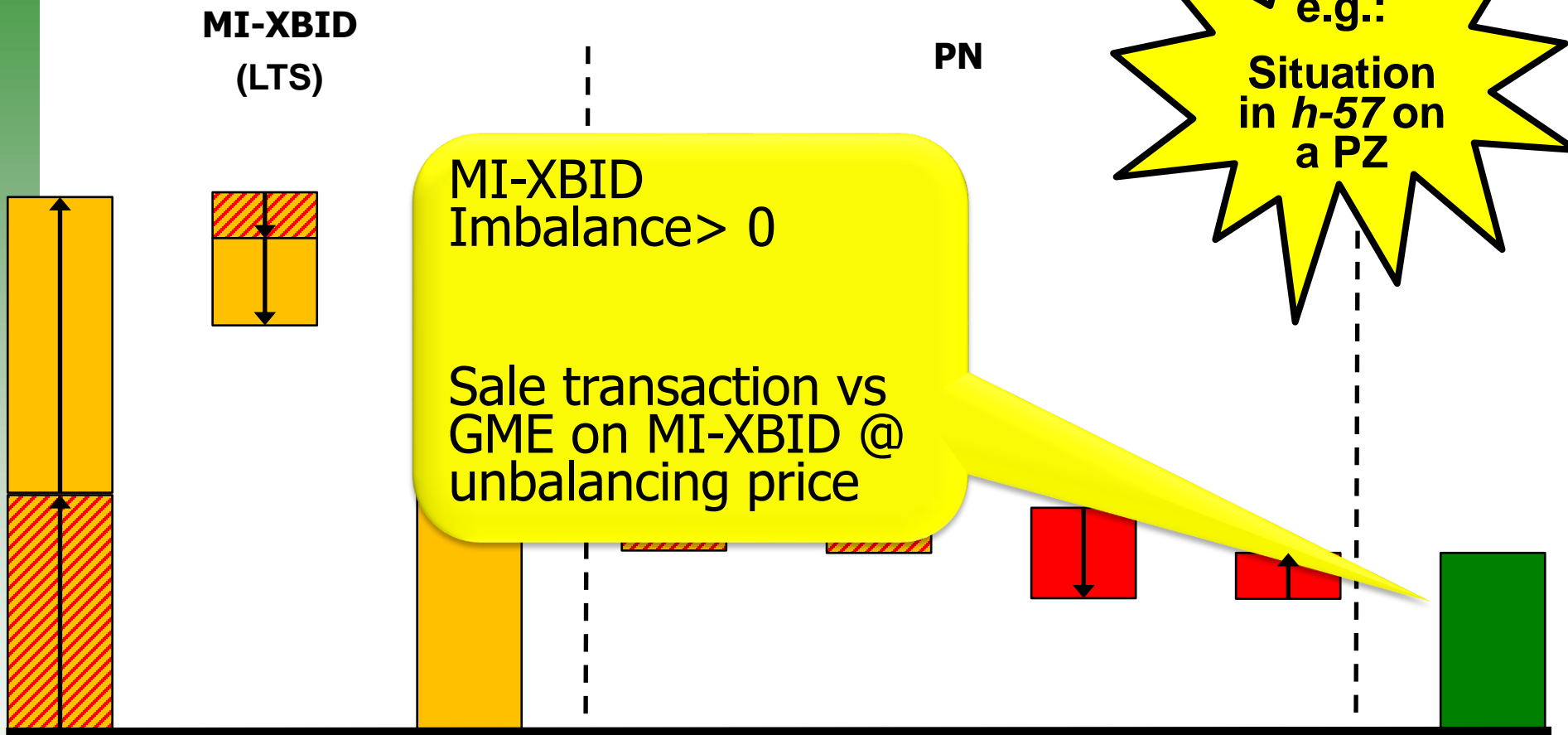
# Intra-day Coupling: the new market model



e.g.:  
 Situation  
 in *h-57* on  
 a PZ

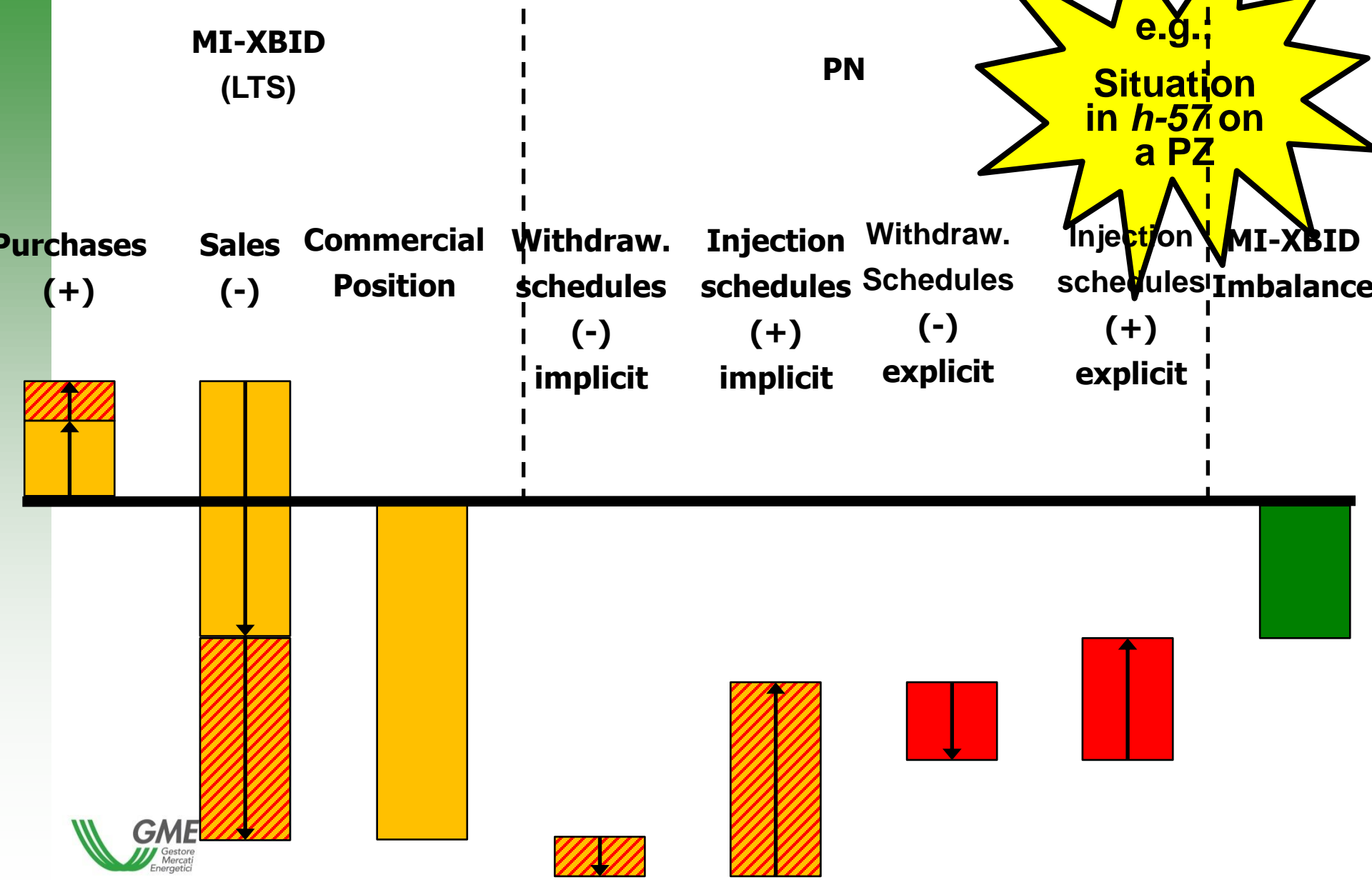
**Purchases (+)**    **Sales (-)**    **Commercial Position**    **Withdraw. schedules (-) implicit**    **Injection schedules (+) implicit**    **Withdraw. Schedules (-) explicit**    **Injection schedules (+) explicit**    **MI-XBID Imbalance**

# Intra-day Coupling: the new market model



<b>Purchases (+)</b>	<b>Sales (-)</b>	<b>Commercial Position</b>	<b>Withdraw. schedules (-) implicit</b>	<b>Injection schedules (+) implicit</b>	<b>Withdraw. Schedules (-) explicit</b>	<b>Injection schedules (+) explicit</b>	<b>MI-XBID Imbalance</b>
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# Intra-day Coupling: the new market model





# Intra-day Coupling: the new market model

MI-XBID  
(LTS)

PN

Purchases  
(+)

Sales  
(-)

Comm  
Posi

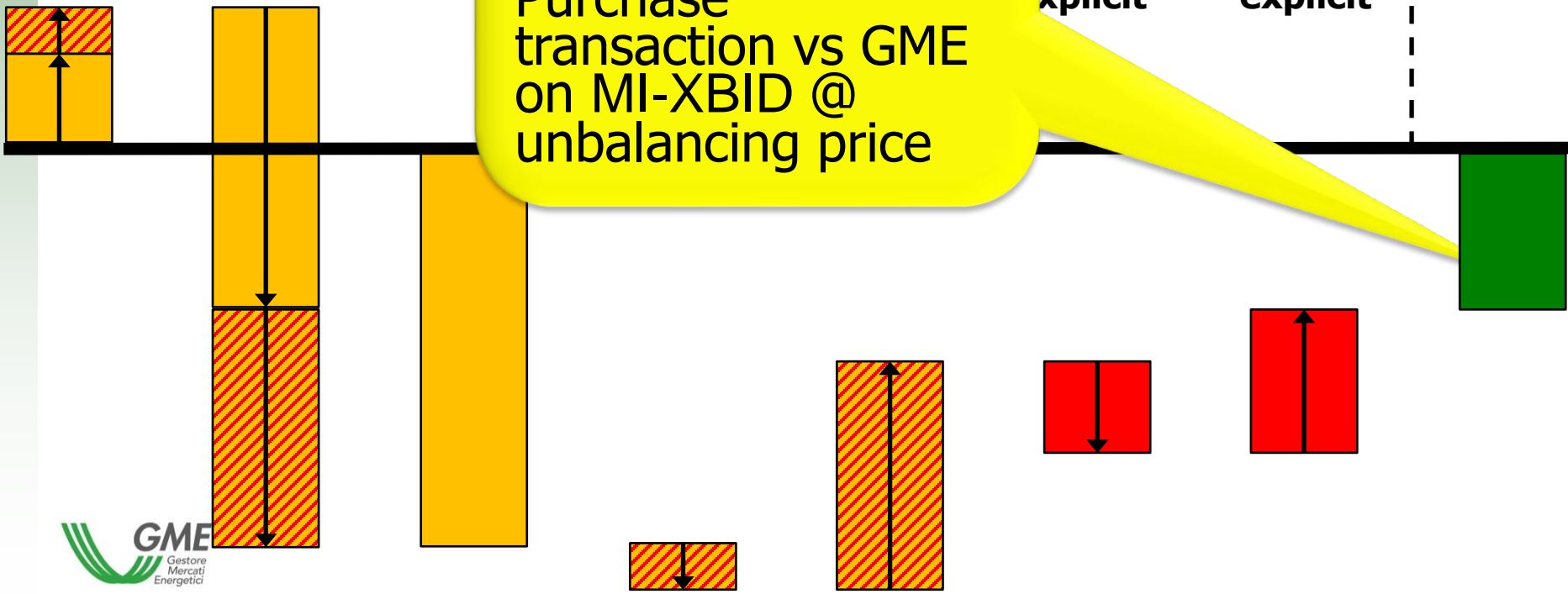
Withdraw.  
schedules  
(-)  
explicit

Injection  
schedules  
(+)  
explicit

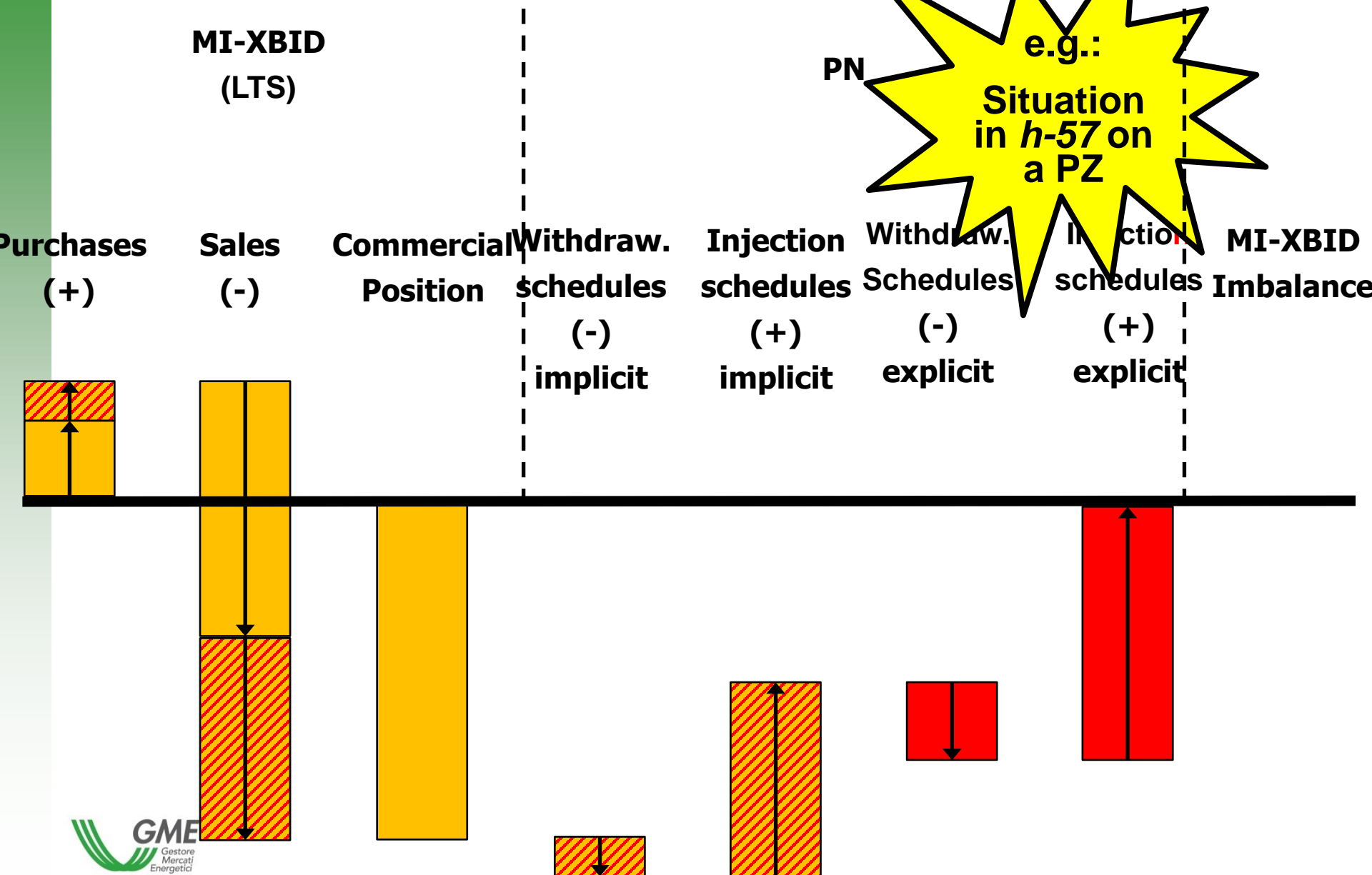
MI-XBID  
Imbalance

e.g.:  
Situation  
in *h-57* on  
a PZ

MI-XBID imbalance < 0  
  
Purchase transaction vs GME on MI-XBID @ unbalancing price



# Intra-day Coupling: the new market model



# Intra-day Coupling: the new market model

MI-XBID  
(LTS)

PN

Purchases  
(+)

Sales  
(-)

Commercial  
Position

MI-XBID  
Imbalance = 0

No Transaction vs  
GME

draw.  
schedules  
(-)  
unit

Injection  
schedules  
(+)  
explicit

MI-XBID  
Imbalance

e.g. Situation in h-57 on a PZ

