



EU4Energy



Core design of the electricity wholesale market and its practical implications to Georgian reality

High-level Policy Talks on the Electricity
Market of Georgia

Tbilisi, 9.11.2017

The EU Target Model for Electricity



- *The relevant Regulations and draft Codes discuss the Energy (only) markets*
- *Energy markets are segmented (different time frames, different products)*
- *Spot markets are created to support the traditional long term arrangements*
- *If enough liquidity is achieved in the spot market then the price it reveals could serve as reference price to forward trades*
- *Are Energy only markets enough even with high caps?*

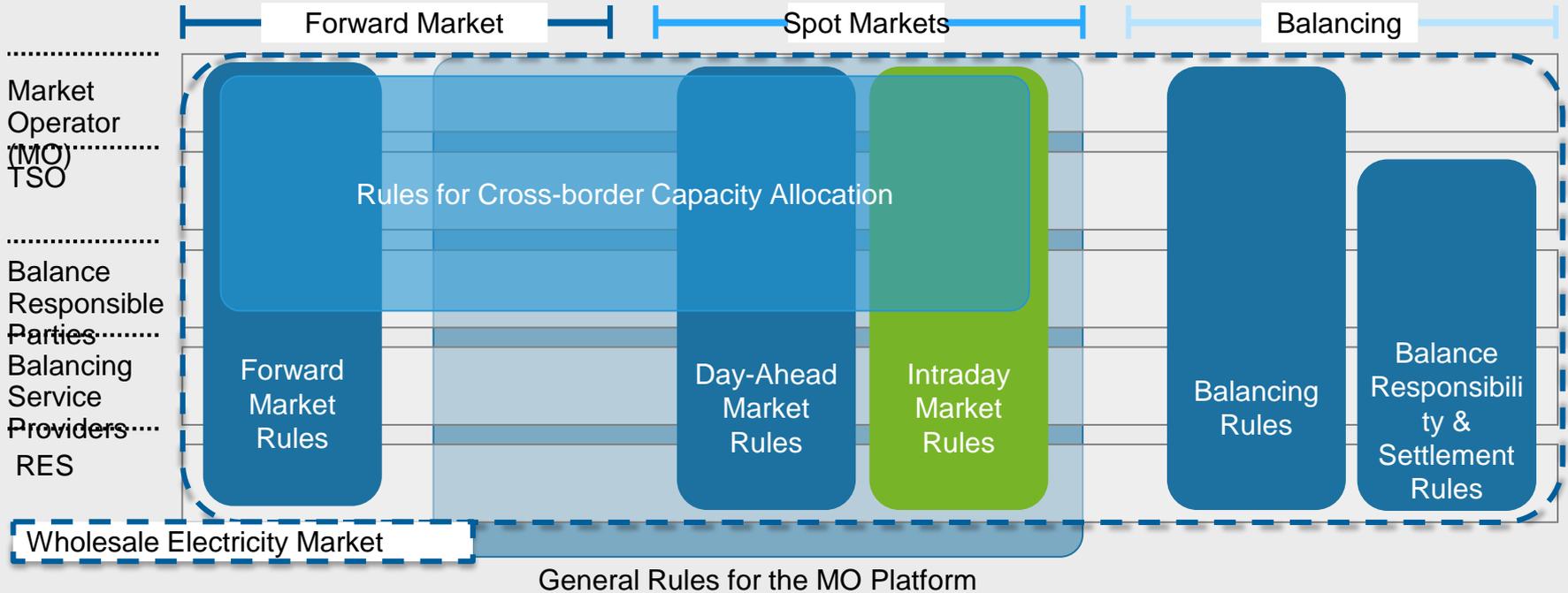
Capacity Schemes: an ongoing discussion



High penetration of RES, amongst others, revealed needs that energy only markets can not 100% address

- ***Efficient investment in correct type of generating technology –when the RTB reveals the need it is too late***
- ***Security of Supply –Strategic investments/needs***
- ***Incorporating RES into the electricity market in an non distortive way***
- ***Doing all the above in an an efficient (least cost) way (Capacity Markets /Mechanisms or PSOs?)***

The EU target model segmentation



Forward Markets



- **Financial or Physical**
- **Physical (obligation for physical delivery)**
 - a through organised central places (PXs)
 - b OTC
 - c Hybrid
- **Financial Forward (Futures-Derivatives)**
 - d through organised central places (PXs/stock exchanges)-option for physical delivery
 - e through organised central places (PXs/stock exchanges)-option for cash settlement

Forward Markets

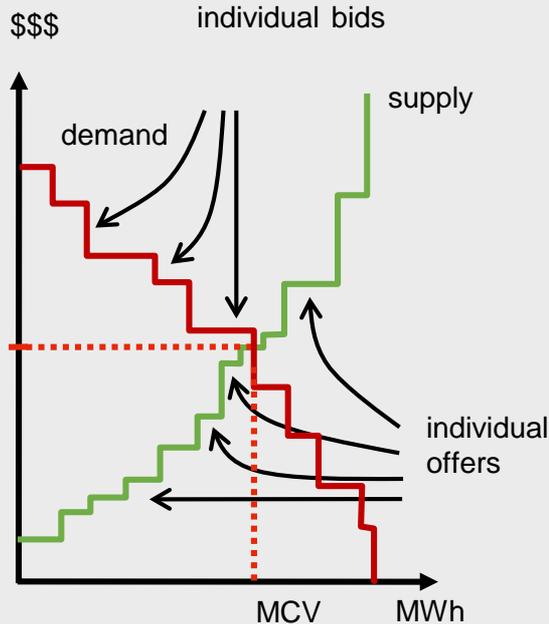
▪ ***Bilateral Physical Contract***

- Between seller and buyer
- Specifies delivery period and delivery points, delivery volume (MWh/h or MWh/period), price(s) and variables influencing delivery volume and/or price(s)
- Results in generation by seller and consumption by buyer of the specified volume

▪ ***Financial Contract (through a market place)***

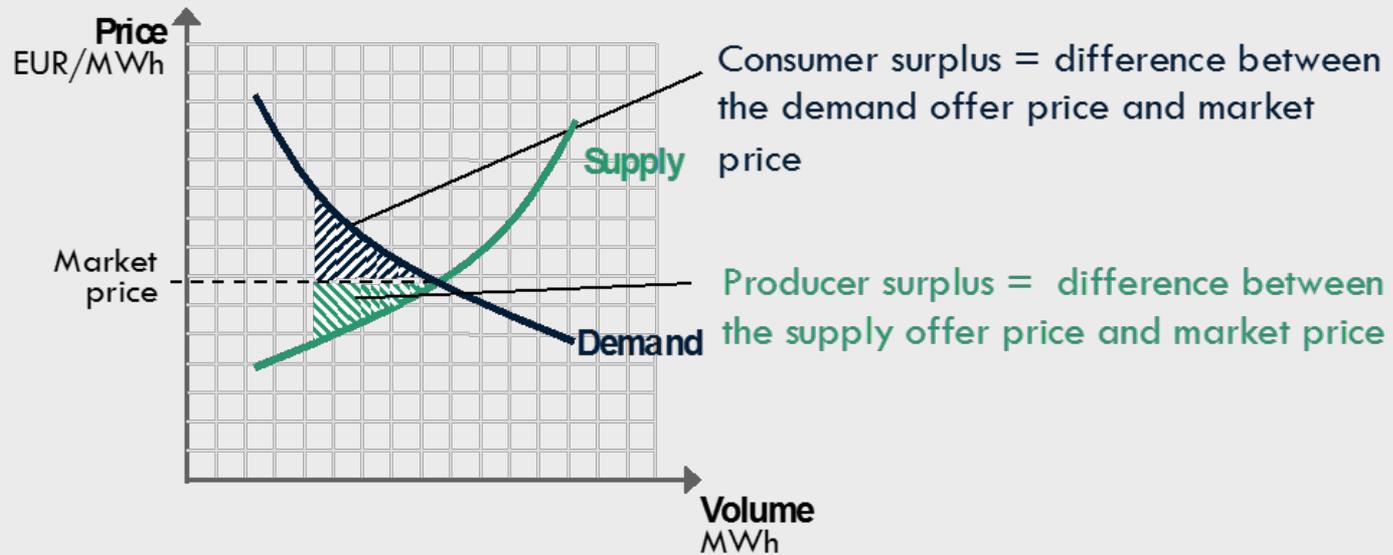
- Between seller/buyer and Clearing House (organized market)
- Specifies delivery period, contract volume (MWh/h) and contract price
- Settles against a physical reference price
- Results in cash flow from seller to buyer (if contract price lower than procurement costs) or buyer to seller (if contract price higher than procurement costs)

Price Coupling Algorithm in DAM



- **Area between the buy and sell curves represent the total economic surplus of buyers and sellers for each hour**
- **Transmission network limitations (bottlenecks) can create bottleneck income (Congestion rent)**
- **Main Objective = Maximize Social Welfare - while respecting all the given constraints**
- **Social welfare = consumer surplus + supplier surplus + congestion rent**
- **Bidding zones approach**

The matching curve

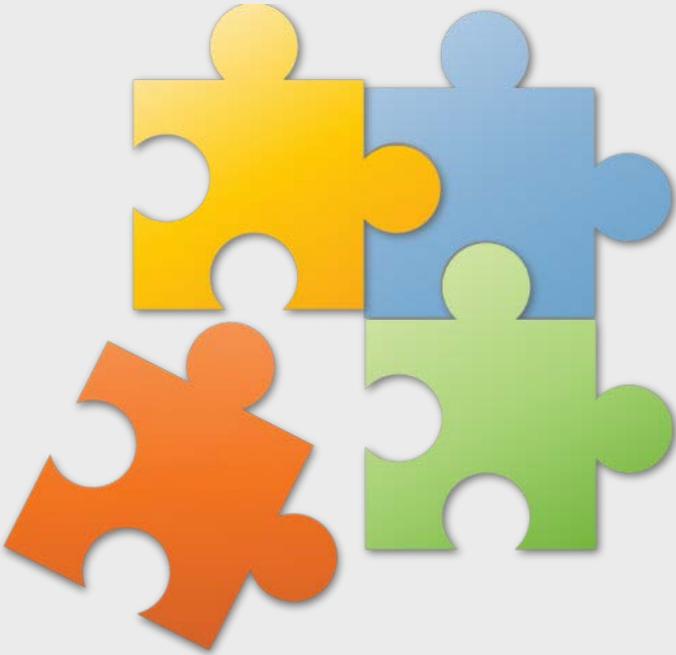


DAM variations



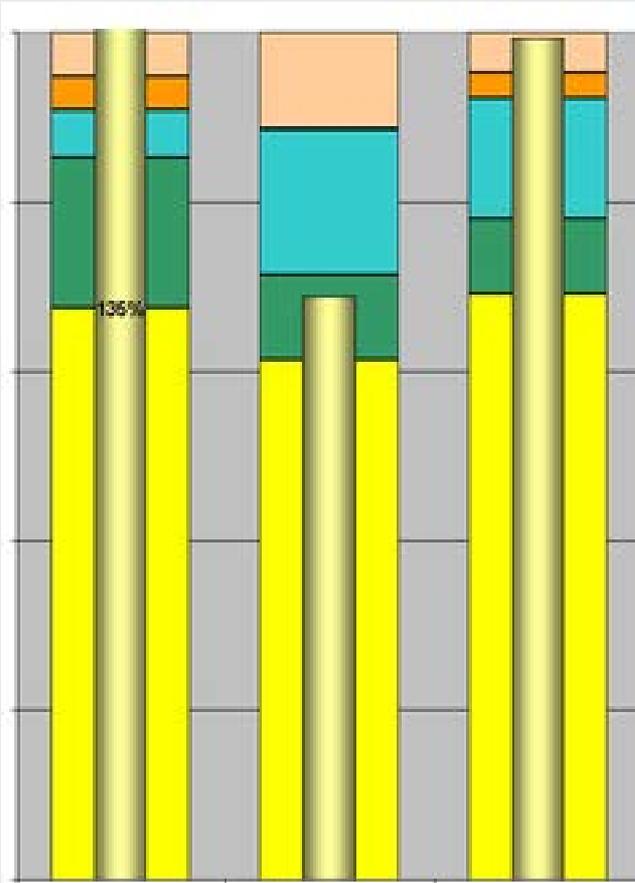
- **Portfolio vs per unit (side) bidding**
- **Physical bidding**
- **Implicit vs Explicit auctions for cross border trade**
- **TRs (ATC or flow based)**
- **TRs Physical or Financial**
- **Type of Orders (products): Simple, Block, linked**
- **Clearing Options**
- **Risk management methodologies**

IDM: A residual market for position adjustment



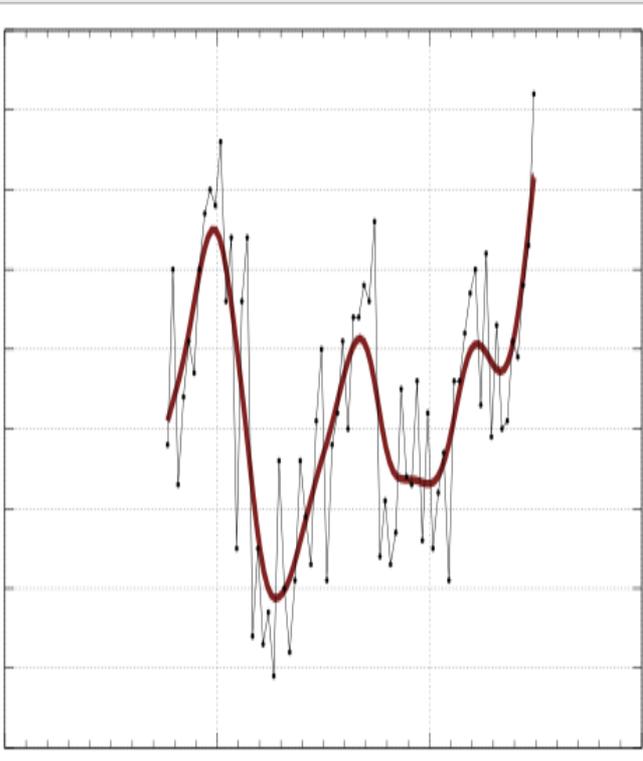
- ***The market objective is to avoid imbalance cost***
- ***Normally, IDM is not scheduling generation units, only fine tunes***
- ***Manages: generation equipment trips, renewable forecasting errors, load forecasting errors, demand side changes***

IDM design parameters



- **Portfolio based**
- **Continuous or in sessions**
- **Implicit vs explicit auctions for cross -border trade**
- **Matching methodology for Price Formation**
- **Type of Orders (Simple, Block, Linked)**
- **Clearing Options**
- **Risk management methodologies**

Balancing Services: Balancing Energy and Reserves



- **Balancing Energy- RTB mechanism**
- **Balancing (Operational Reserves): forward purchases or close to real time**
- **Co-optimisation processes for reserves and balancing energy vs simple RTB**
- **Possibility to bid differently close to Real Time (ENTSO-E Balancing Code) and for different products, actually eliminates co-optimization**
- **Self-Dispatch vs Centralized Dispatch**
- **Obligatory vs optional participation**

Imbalance Settlements



- ***BRPs position: open or closed***
- ***Overall settlement over a “Price signaling good behavior”***
- ***Good behavior means: Helping the TSO or adopting overall practice that does not distort the market***
- ***Penalties for systematic abuse***
- ***Penalties for non performance according to Rules***

Market Stakeholders and trading participants



- ***The Regulator***
- ***The TSO***
- ***The DSOs***
- ***The Market Operator (NEMO)***
- ***Metering Administrator***
- ***Settlements Administrator***
- ***Trading Participants: GenCos, Suppliers, Cross border Traders, Wholesalers, BSPs, BRPs***

The Regulator (1 of 2)



- *Approve the Concept Design and all detailed Market Rules:*
 - Rules for the physical Forward Market (Financial Markets are regulated by other authority)
 - Rules for the DAM and the IDM
 - Rules for Balancing and AS procurement
 - Rules on settlement towards metered quantities
 - Commercial Metering Methodology

The Regulator (2 of 2)



- *Investigate and approve use of regulated contracts where “no competition” exists*
- *Certify the TSO*
- *License participants according to the New Energy law*
- *Approve the Grid Code*
- *Monitor the implementation of the appropriate software and approve respective manuals*

The TSO (1 of 2)



- *Transmission Network physical operation (owning, maintaining and expanding)*
- *System Operator in line with the requirements of Directive 2009/72/EC*
- *Provide non-discriminatory connection service to all system users connected to the transmission networks*
- *Define the conditions for becoming BRP and BSP*

The TSO (2 of 2)



- *Implementing a coordinated (joint) capacity calculation processes in line with the requirements in the organized markets*
- *Operate a RTB market*
- *Tariffs, terms and conditions of access to the transmission system will be regulated by GNERC*

The DSOs



- *A **DSO unbundled from Supply** will own, maintain, expand and operate its distribution system*
- *Participate into the wholesale electricity market only:*
 - If they perform the role of the metering administrator
 - If they are responsible to buy losses

The Metering and the Settlements Administrators



- *Metering Administrator is needed to collect and calculate (in cases of interval metering absence appropriate hourly data – Data hub)*
- *Settlements Administrator is needed to overall settle what has been commercially traded vs actual and metered quantities – coverage and clearing is part of this process as well*

The Market Operator (1 of 3)



- *Make available all systems and interfaces required to operate the DAM and IDM*
- *Receive Orders (bids and offers for buying and selling power) from participants*
- *Receive and process interconnection capacities from the TSO and other related information*
- *Conduct the required auctions and trading operations according to approved rules using the European market coupling algorithm*

The Market Operator (2 of 3)



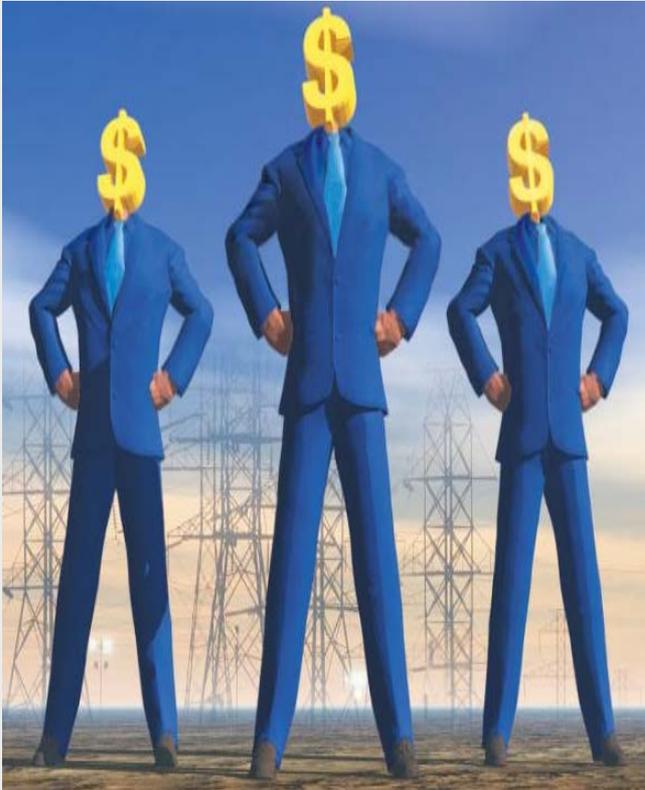
- *Send confirmation of trades including the allocated volumes and prices to participants*
- *Publish the allocated volumes and prices according to the agreed time lines*
- *Submit Credit Notes and Invoices to the relevant participants*
- *Enforce collateral requirements and payments*

The Market Operator (3 of 3)



- *Keep transaction records*
- *Fulfil transparency requirements based on Regulation 543/2013*
- *Ensure the trading platform is available and accessible to all stakeholders*
- *The Market Operator may outsource any of the above responsibilities to any competent party upon agreement with the Regulator*

Trading Participants

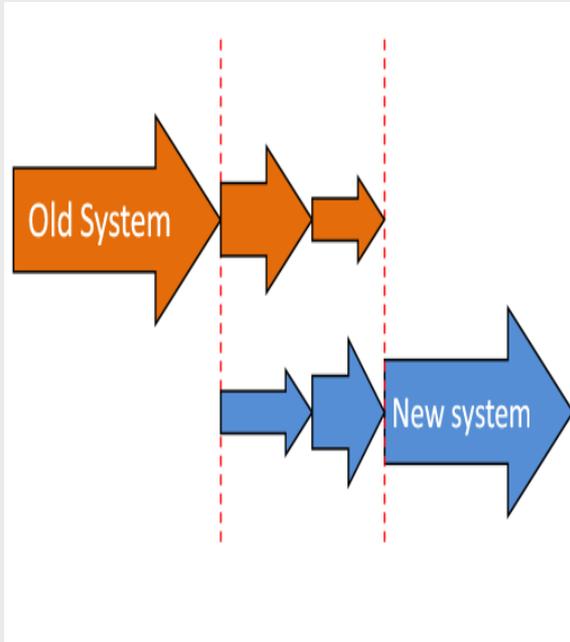


- *Generators want to optimize quantity to be delivered over price*
- *Retail Suppliers want to hedge against load variations*
- *Wholesalers want to hedge against spot market prices*
- *Cross border Traders want to maximize interconnectors capacity in the direction of price differential surplus*
- *BRPs want to optimize imbalances of a group of participants and reduce exposure*
- *BSPs want to co-optimize between balancing services offers and energy offers*

Overall steps for the establishment of a wholesale electricity market

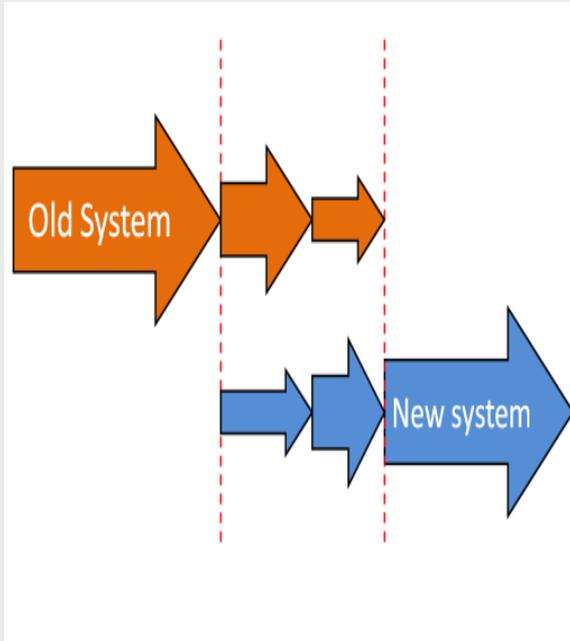


Implications to the Georgian reality (1 of 2)



- *TSO unbundling process to secure fair and transparent third party access and congestion management*
- *DSOs unbundling process with the Retail Supply branch being active market participant*
- *Long term PPAs create distortion to the market and will need special treatment*
- *Cross border capacity allocation based on fair and transparent rules – no priority access to any type of technology*

Implications to the Georgian reality (2 of 2)



- *Management of Cross Border Trade arrangements*
- *Generation costs to be revealed*
- *Supplier switching Rules*
- *Universal Service Supply*
- *Deregulation of Prices*
- *Management of long term PPAs*
- *Balancing services by the TSO not the MO*



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*Thank you
for your attention!*

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