

# BALANCING SYSTEM IN POLAND

Vienna, April 10th 2019



# POLISH GAS MARKET – CASE STUDY

## TIMELINE

- 2006 August – 1<sup>st</sup> edition of Polish Transmission Network Code
- 2013 January – 4<sup>th</sup> edition
  - New Entry – Exit model and virtual trading point
  - nominations and allocations in Energy units, gas day 6/6
- *2014 March/April – publication of BAL NC*
- 2015 June – 1<sup>st</sup> Interim Measures Report approved by NRA
- *2015 October – BAL NC start of apply*
- 2016 March – 5<sup>th</sup> edition of Polish Transmission Network Code
- 2016/2017 September – 2<sup>nd</sup> /3<sup>rd</sup> Interim Measures Report approved by NRA
- 2019 March – Current edition of Polish Transmission Network Code – without Interim Measures

# BALANCING AREAS IN POLAND

H-gas balancing area

L-gas balancing area

TGPS balancing area (transit)



# TGPS BALANCING ZONE - CHARACTERISTICS

- **TGPS** – Polish part of Transit Gas Pipeline System Yamal - Europa
- **Entry points:**
  - **Kondratki** (connection point, Belarus)
  - **Mallnow** (connection point, GASPOOL - Gascade)
  - **PWP reverse** (contractual connection point, H-gas balancing zone)
- **Exit points:**
  - **Mallnow** (connection point, GASPOOL - Gascade)
  - **PWP** (virtual interconnection point based on physical points between TGPS and H-gas balancing zone)



# L-GAS BALANCING ZONE - CHARACTERISTIC

- **Typically local character**
  - (2 subsystems: Lw1 and Lw2)
- **No connection** with any other systems
- **8 entry** points (production)
- **80 exit** points
  - 4 exit points to end users
  - 3 DSOs connected
- **All gas sources belong to one Producer**
- Local Production meets end users' demand
- Only 3 active Shippers



# H-GAS BALANCING ZONE – CHARACTERISTICS

## 62 entry points

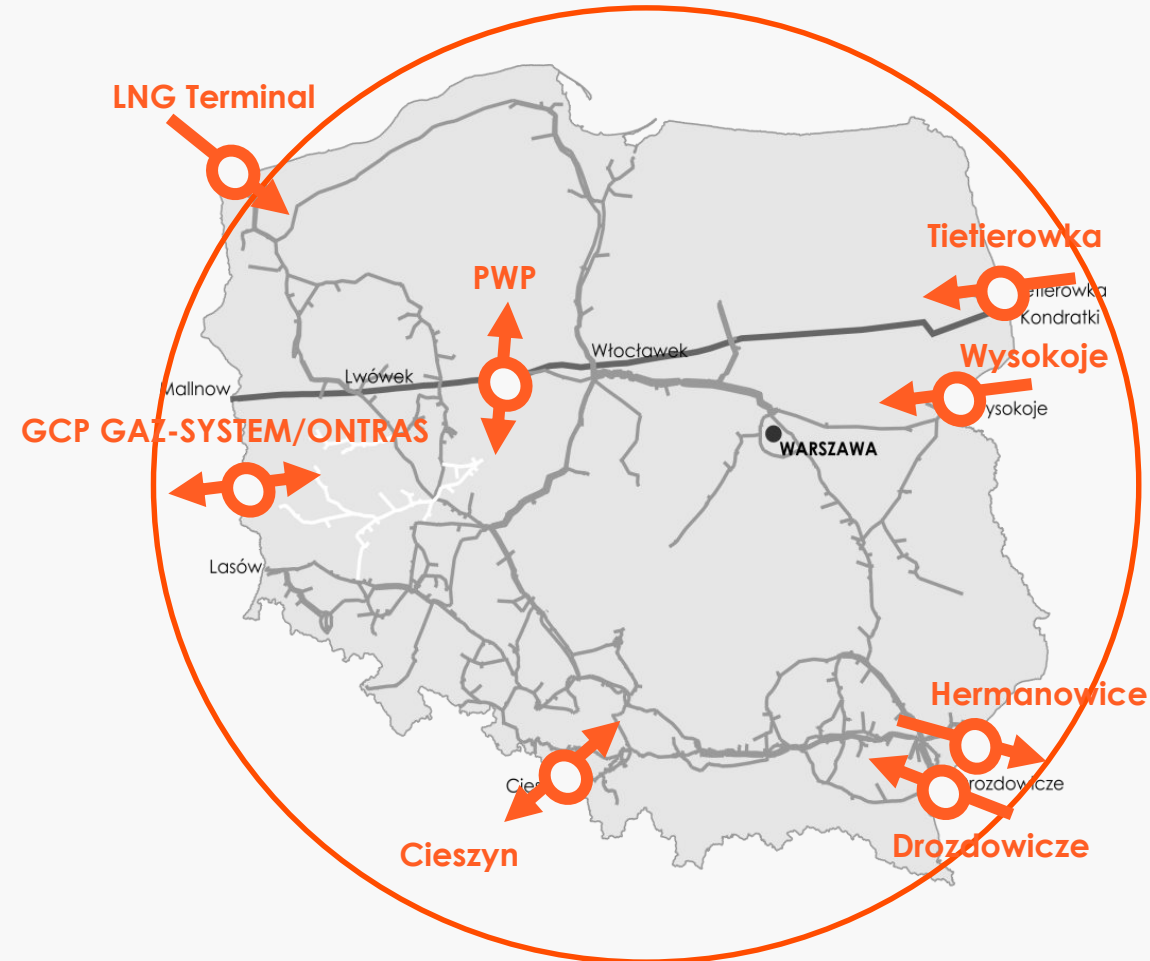
- IPs
- LNG Terminal
- Production

## 902 exit points

- IPs
- End users (industry)
- DSOs (23)

### ➤ Interconnection points:

- **BY → PL:** Tietierowka, Wysokoje
- **UA → PL:** Drozdowicze
- **PL → UA:** Hermanowice
- **PL ↔ CZ:** Cieszyn
- **PL ↔ DE (ONTRAS):** GCP GAZ-SYSTEM/ONTRAS
- **PL ↔ Yamal (transit):** PWP

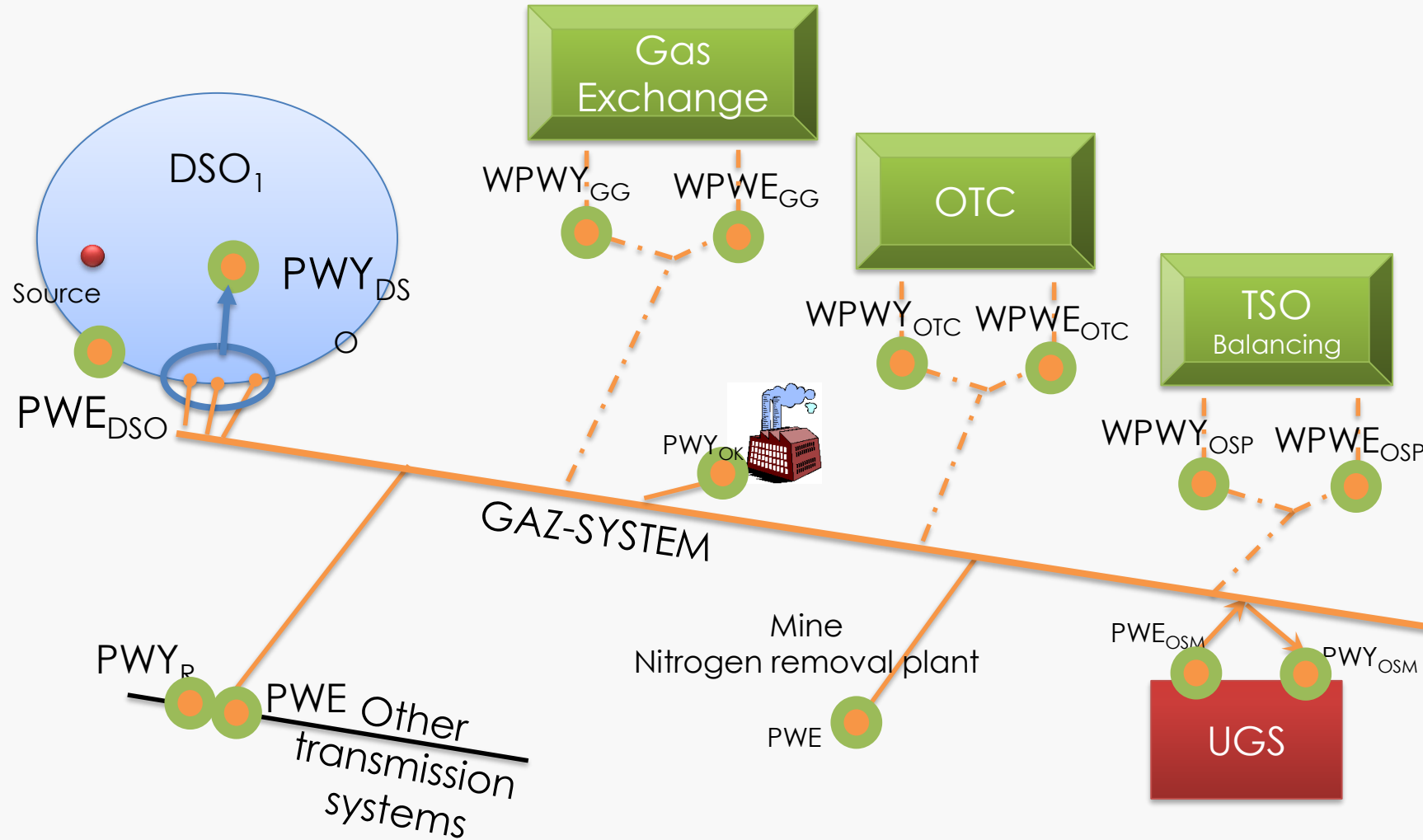


# COOPERATION WITH GAS EXCHANGE



- ▶ TGE allows buying and selling gas on gas exchange based on market prices, transactions are anonymous.
- ▶ 2011 start of cooperation
- ▶ Net code (IRiESP) statements request of cooperation between Gas Exchange and TSO at VTP in areas::
  - ▶ transactions realized at Virtual Trading Point of Gas Exchange
  - ▶ Nominations at Virtual Trading Point of Gas Exchange (as shipper nominations)
- ▶ Transaction done at Gas Exchange is valid for contractors and realized by TSO

# CONTRACTUAL POINTS – CURRENT MODEL





# NOMINATIONS - GENERAL PRINCIPLES

- Nomination procedure
  - Nomination and renomination procedure according to BAL NC
    - day ahead nomination
    - intraday renomination
  - Hourly quantities for contractual entries and exits
  
- Notification procedure connected with VTP entry/exit
  - Based on gas exchange trade
    - sent to TSO by gas exchange operator (TGE)
    - „a priori” confirmed
  - Based on OTC trade
    - sent to TSO by sides of transactions
    - must be matched (lesser rule)

# NOMINATIONS – DATA EXCHANGE (INT NC)

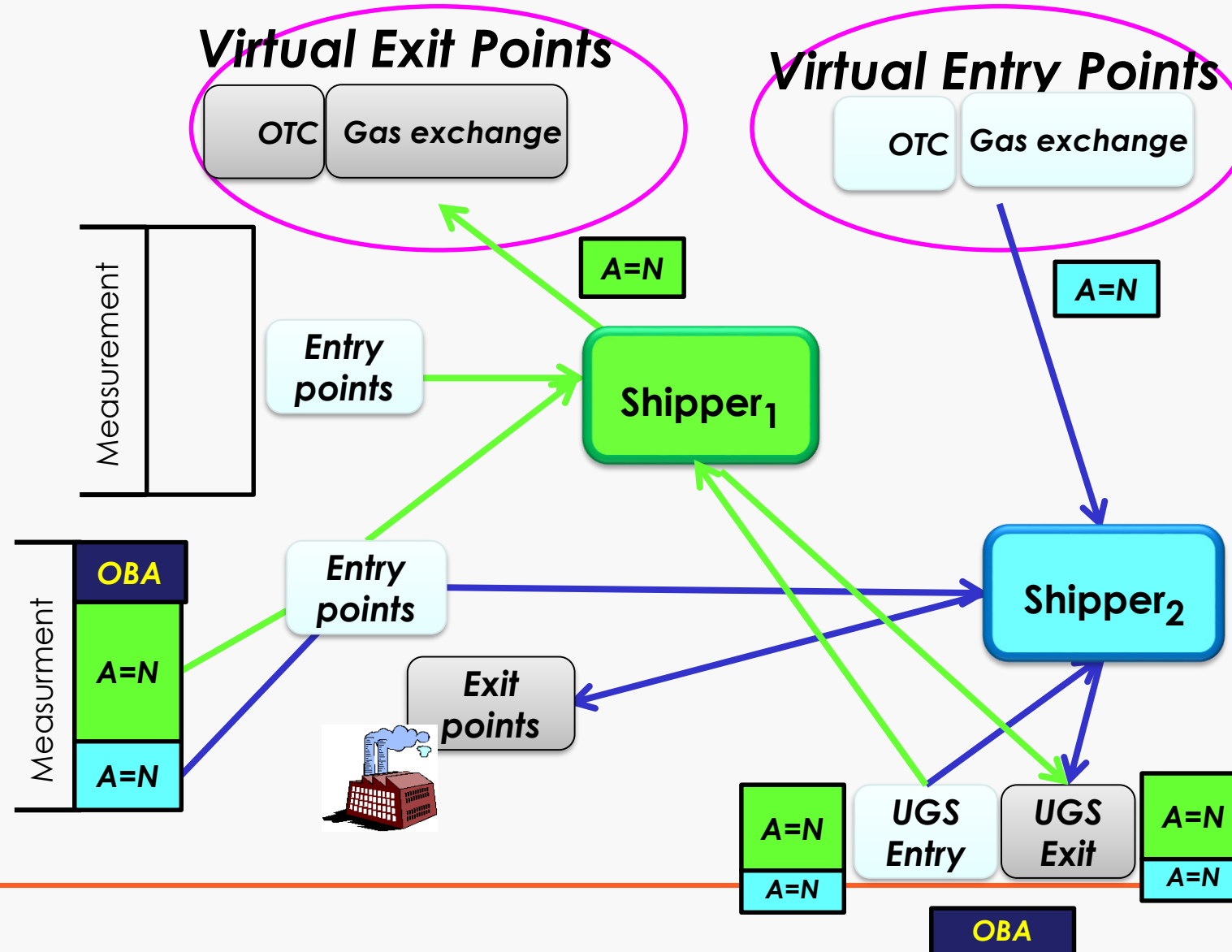
- Document based and interactive data exchange
- **Data exchange format: Edig@s – XML** (4.0. or 5.1. version):
  - Messages: NOMINT, ACKNOW, NOMRES
- **Data exchange protocol: AS4**



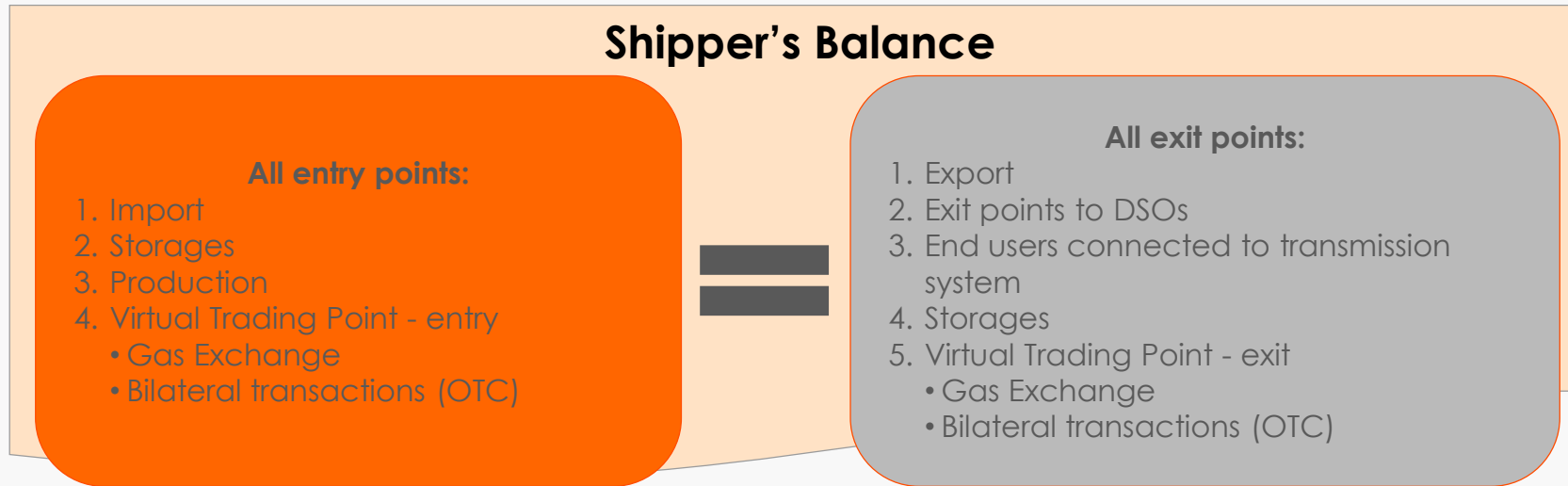
- Interactive data exchange - possibility to use web-portal – Information Exchange System IES - for submitting nomination (edig@s messages are automatically generated in Edig@s 5.1)

A login form for the Exchange Information System. It has fields for "Login" and "Password", "Sign in" and "Join now" buttons, and a "Forgot password?" link.

# ALLOCATIONS – METHODS OF ALLOCATION



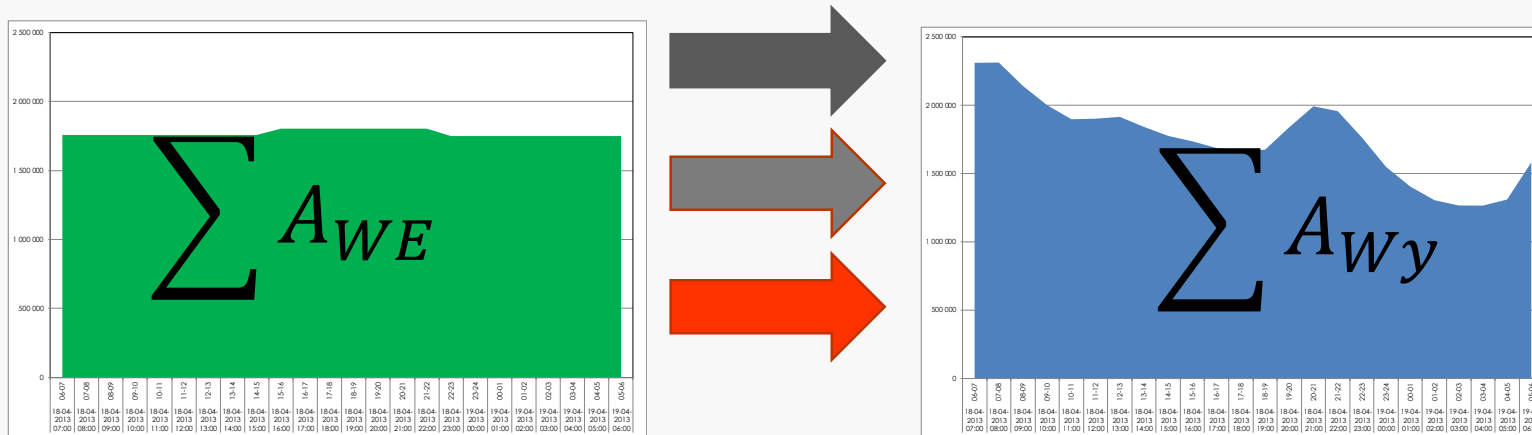
# COMMERCIAL BALANCING



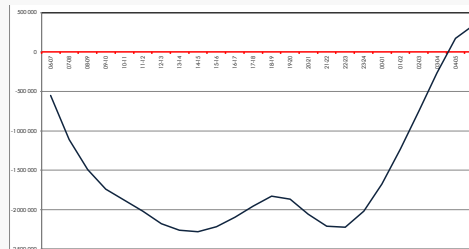
- **Daily balancing regime**
- Shipper's provisional imbalance is calculated after 4 hours, 8 hours of gas day and after gas day
- Final imbalance calculated after the end of the gas month, based on final allocations
- **Imbalance settlement for each gas day (based on final allocations)**

# DAILY BALANCING

TSO calculate **Shipper's Daily Imbalance** for each gas day as **difference between gas amount delivered at entries and withdraw at exits** from balancing area/zone by Shipper at each gas day .



$$DIN = \Sigma A_{WE} - \Sigma A_{Wy}$$



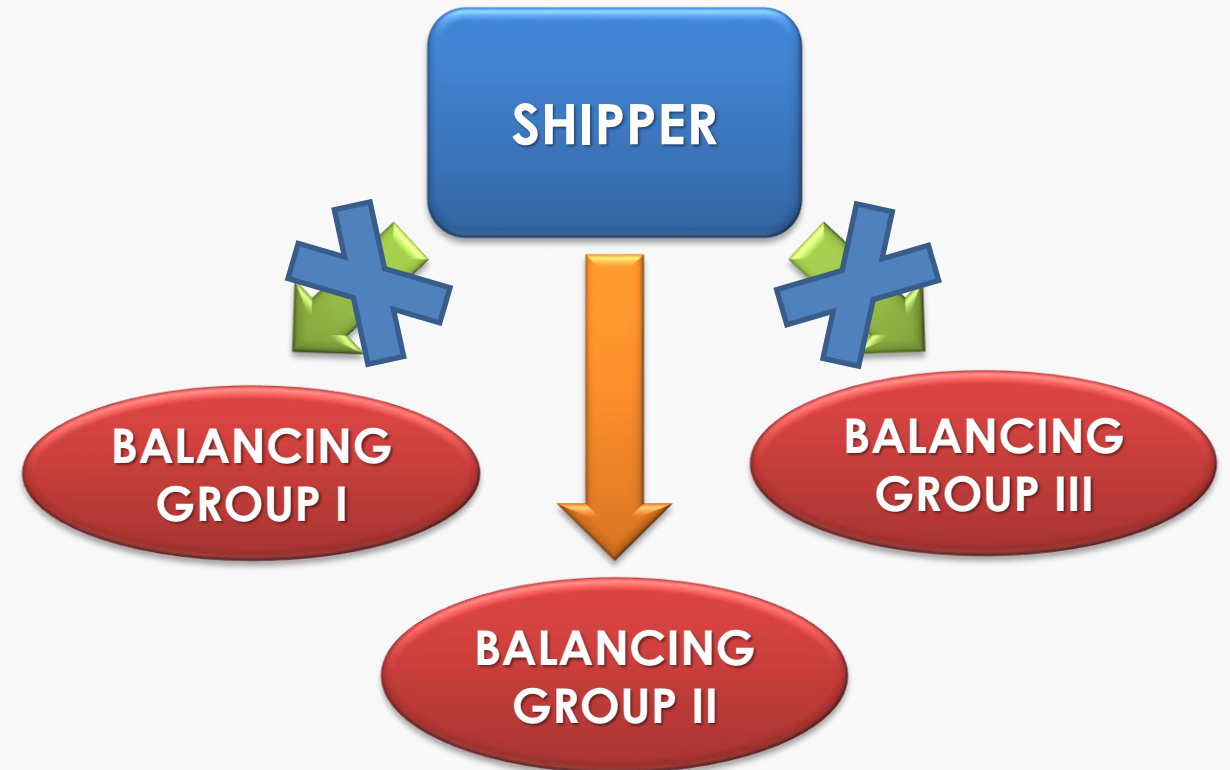
# IMBALANCE CHARGE – H-GAS BALANCING AREA

- Marginal prices in accordance with BAL NC
- **Marginal sell price** is equal to the lower of the two following prices:
  - lowest price of any sales of title products, in which the TSO is involved in respect of the given gas day,
  - CSRB in relation to this gas day, reduced by 10%.
- **Marginal buy price** is equal to the higher of the two following prices:
  - highest price of any purchases of title products , in which the TSO is involved in respect of the given gas day,
  - CSRB in relation to this gas day, plus 10%.
- where
- CSRB is the volume-weighted average price from all transactions of TGE (Gas Exchange) session of the Intraday Market ( $RDB_G$ ), related to the present gas day (index TGEgasID).

# IMBALANCE POOLING ->BALANCING GROUPS

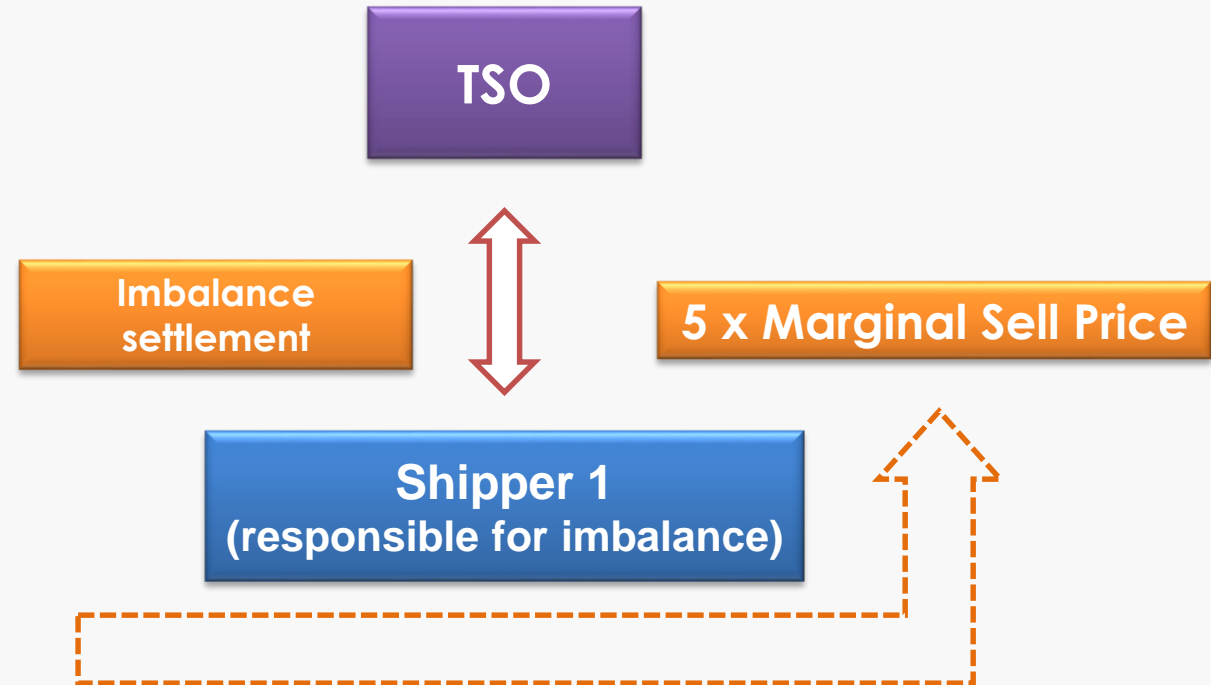
Group created by the Shippers in which one Shipper is responsible for the commercial imbalance of the whole group

- Mechanism implemented on 1st October 2014 – in H-gas and L-gas balancing areas
- The Shipper may be a participant of only one balancing group (the whole portfolio of this Shipper must be in such case in this balancing group)
- The Shipper may be responsible for balancing of only one balancing group. This Shipper may not be a participant of another balancing group
- The imbalance of a balancing group is settled between the TSO and Shipper responsible for the imbalance
- The neutrality charge is settled with each Shipper separately
- Shipper may join/ leave the group on a monthly basis



# BALANCING GROUPS – IMBALANCE SETTLEMENT

Balancing group	Imbalance
Shipper 1 (responsible for imbalance)	- 20
Shipper 2	+ 1
Shipper 3	+ 10
total	+5



Imbalance settlement just between TSO and Shipper 1



# H-GAS BALANCING ZONE – BALANCING ACTIONS

## Platforms

### TGE trading platform (Polish gas exchange)

#### Balancing platform

- interim measure between October 2015 and March 2019
- implemented before entry into force of BAL NC in January 2014
- only locational products on the eastern boarder available

#### Trade within adjacent balancing zone

- GASPOOL
- approved by NRA

## Merit order

- WD title product on TGE trading platform
- WD and DA locational product on the balancing platform
- WD and DA title product on the trading platform within the adjacent balancing zone
- balancing services

### Balancing actions undertaken by TSO so far: at TGE trading platform (WD title products):

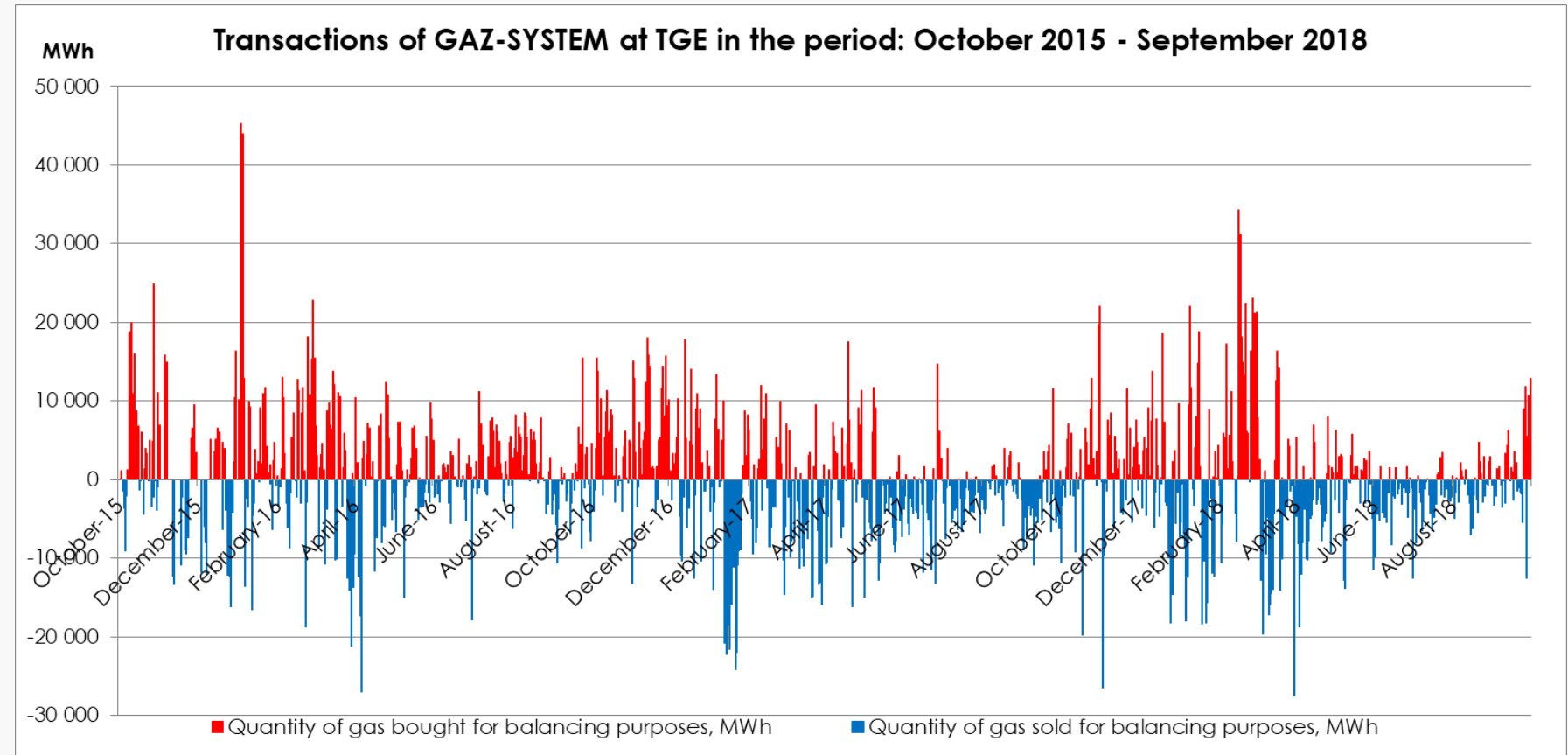
- after the end of a gas day
- based on net total Shippers' imbalance

**introduction of balancing services - 1st Jan 2016**



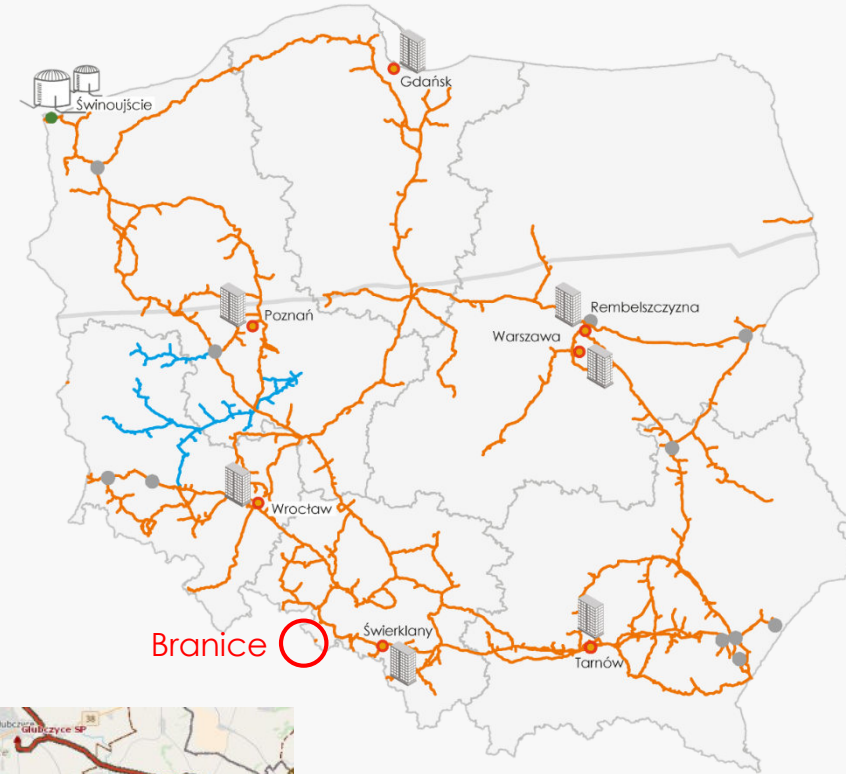
# H-GAS BALANCING ZONE – BALANCING ACTIONS AT TRADING PLATFORM

- TGE trading platform (Polish gas exchange)
- TSO undertakes balancing actions at TGE trading platform (WD title products):
  - After the end of gas day
  - Based on net total Shippers' imbalance



# H-GAS BALANCING ZONE – BALANCING SERVICES

- Branice – entry point from Czech distribution system (GasNet) to Polish transmission system - the only source of gas for end users connected to distribution system in Poland in this region (no possibility to supply gas from another source/direction)
- Shipper holding 100% of the capacity at this entry point informed GAZ-SYSTEM at the end of 2015 that he is not going to provide gas in this point starting from 2016
- GAZ-SYSTEM had to undertake balancing action
- Reasons to apply Art. 8:
  - **STSPs are not providing the necessary response to keep transmission network within its operational limits**
  - Transport via Czech DSO requires trading license
- Balancing services used since 1st January 2016



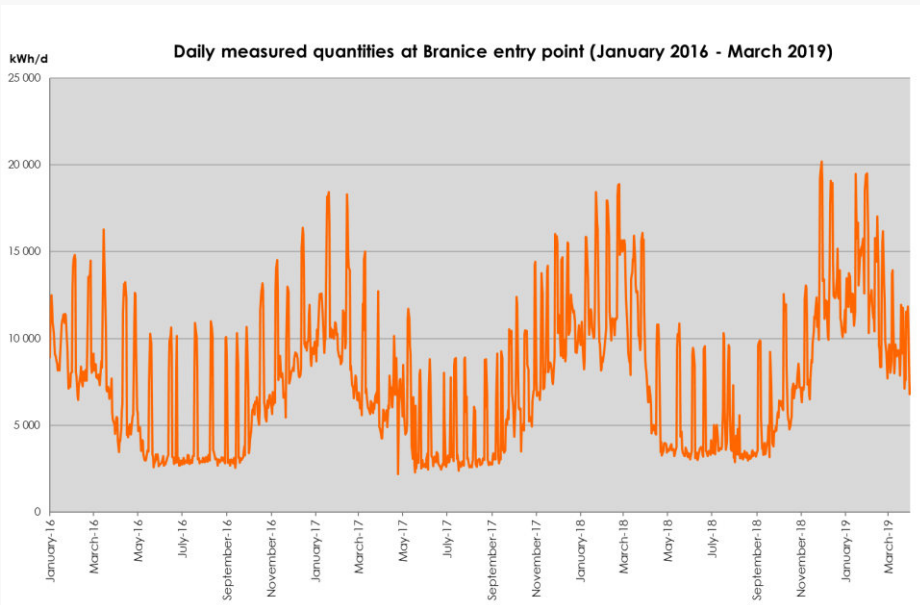
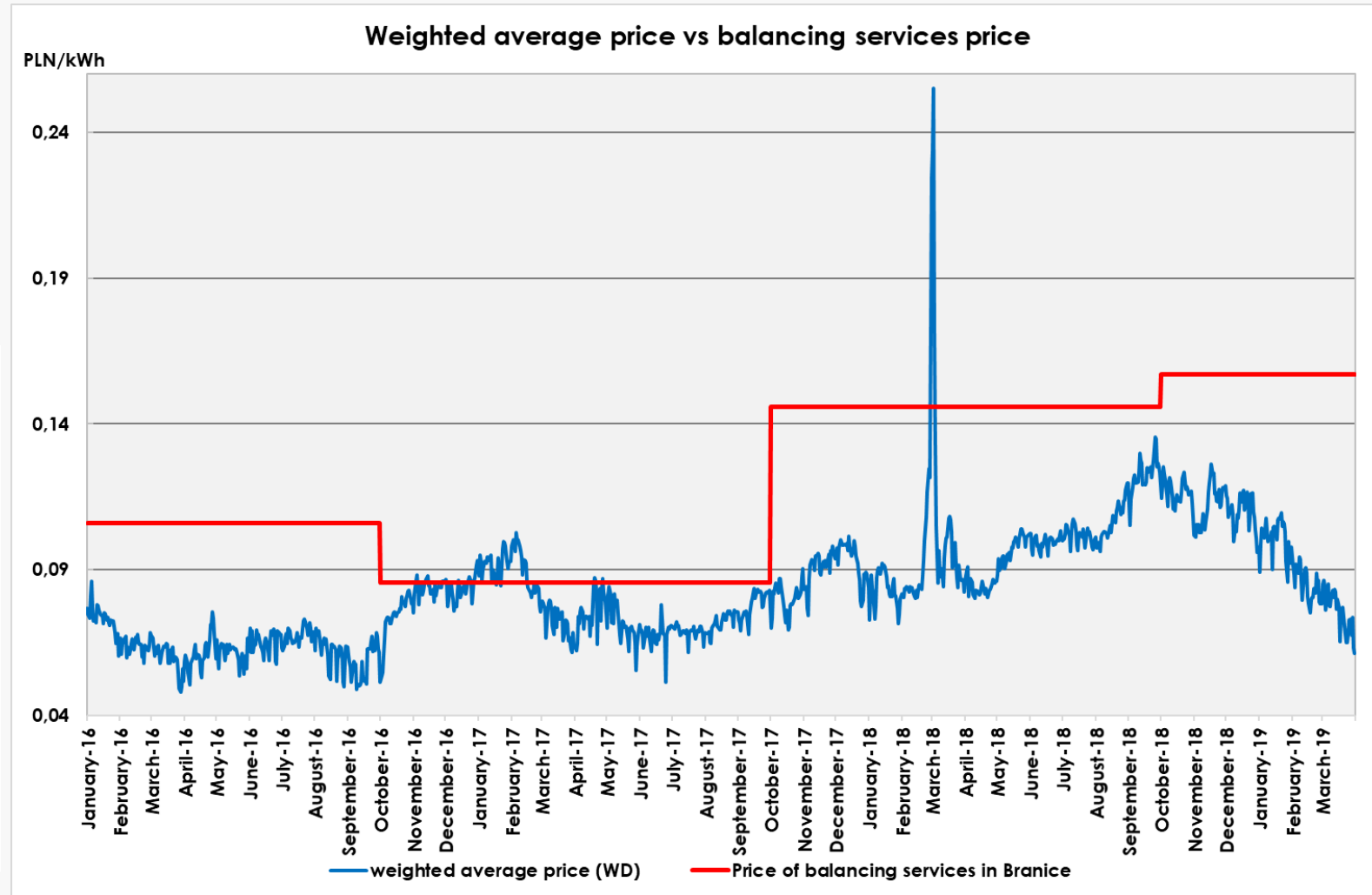
# H-GAS BALANCING ZONE – BALANCING SERVICES

- Balancing services procured in a market-based manner – non-discriminatory public tender procedure
- Details of procedure published at GAZ-SYSTEM website – portal dedicated to public procurement (public access, platform in Polish language only)
  - Description of Product/ Procurement criteria
  - Questions and answers
  - Results
- Tenders submitted via email or official correspondence
- Annual tender process:
  - 1st process in December 2015 – for the period January – September 2016 (till end of gas year)
  - 2nd process in September 2016 – for the period October 2016 – September 2017 (gas year)
  - 3rd process in September 2017 – for the period October 2017 – September 2018 (gas year)
  - 4th process in July 2018 – for the period October 2018 – September 2019 (gas year)
- Description of Product/ Procurement criteria
  - Supply of gas at Branice entry point in quantities resulting from demand of end users supplied from this entry point
  - Balancing services used in case when no Shipper nominates Branice entry point
  - Price is determined by the tenderer



# H-GAS BALANCING ZONE – BALANCING SERVICES – QUANTITIES & PRICES

Gas year	quantity [kWh]	price [PLN/kWh]	costs [PLN]
2015/2016	1 716 778	0,10593	181 858
2016/2017	2 533 424	0,08535	216 228
2017/2018	2 863 191	0,14578	417 396
2018/2019	?	0,15700	?



# INTERIM MEASURES – LEGAL FRAMEWORK

■ Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks (NC BAL)

■ Art. 45

„1. **In the absence of sufficient liquidity of the short term wholesale gas market, suitable interim measures** referred to in Articles 47 to 50 **shall be implemented by the transmission system operators**. Balancing actions undertaken by the transmission system operator in case of interim measures shall foster the liquidity of the short term wholesale gas market to the extent possible.



# INTERIM MEASURES AS A BRIDGE TO THE GOAL

- Oligopoly
  - at supply side of the gas market
  - at supply side of the wholesale gas market
- Bilateral contracts



- Competitive liquid gas market
- Most contracts at gas exchange



# INTERIM MEASURES – TOOLS

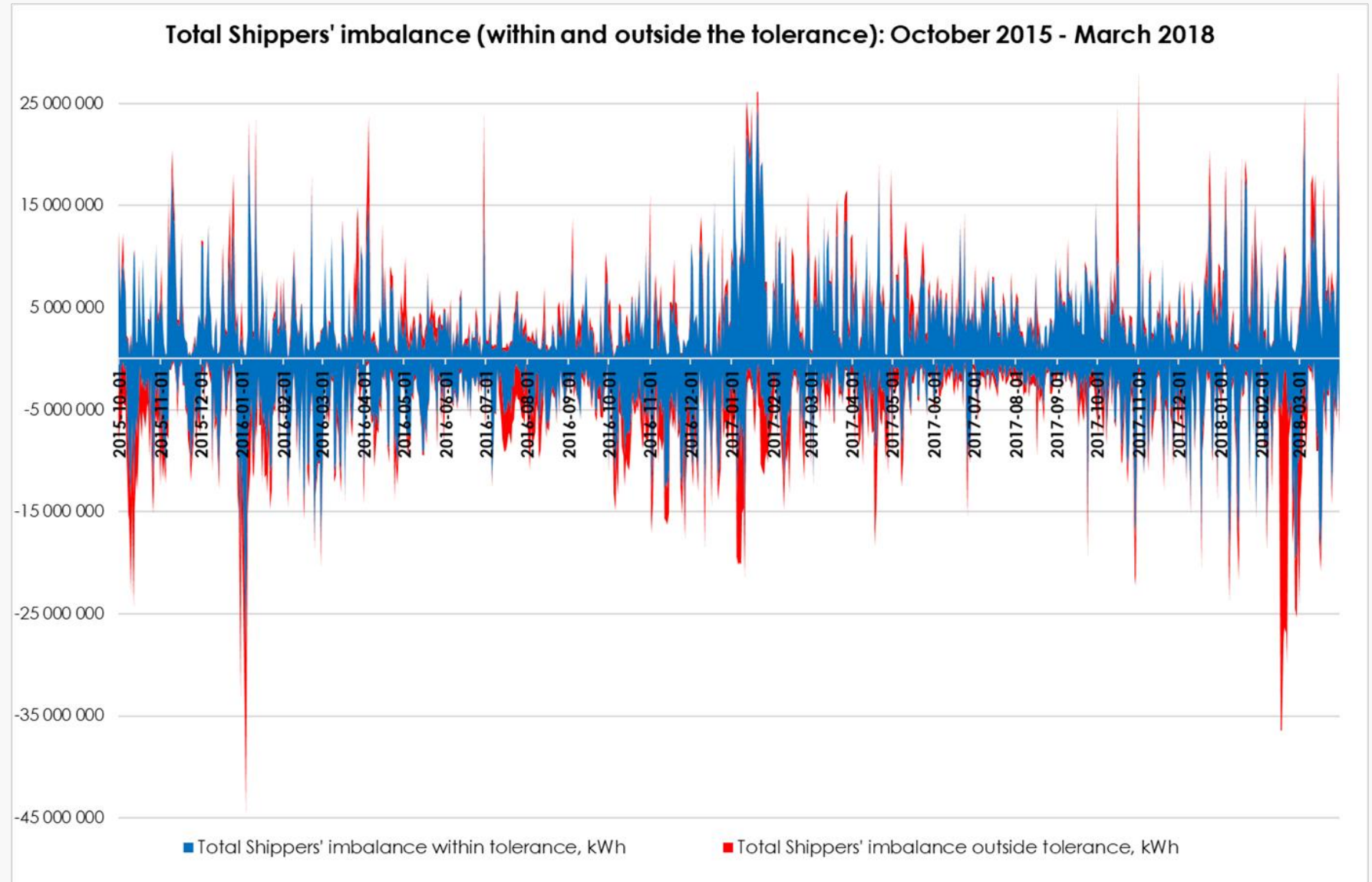
- Balancing platform
  - A trading platform where the transmission system operator is a trading participant to all trades
- Alternative to a balancing platform
- Interim imbalance charge
  - charge which calculation method substitutes the method of the calculation of a daily imbalance charge set forth in Chapter V of the Regulation
- Tolerance
  - the level of which defines the maximum quantity of gas that can be bought or sold by each network user in the settlement of the imbalance at a weighted average price



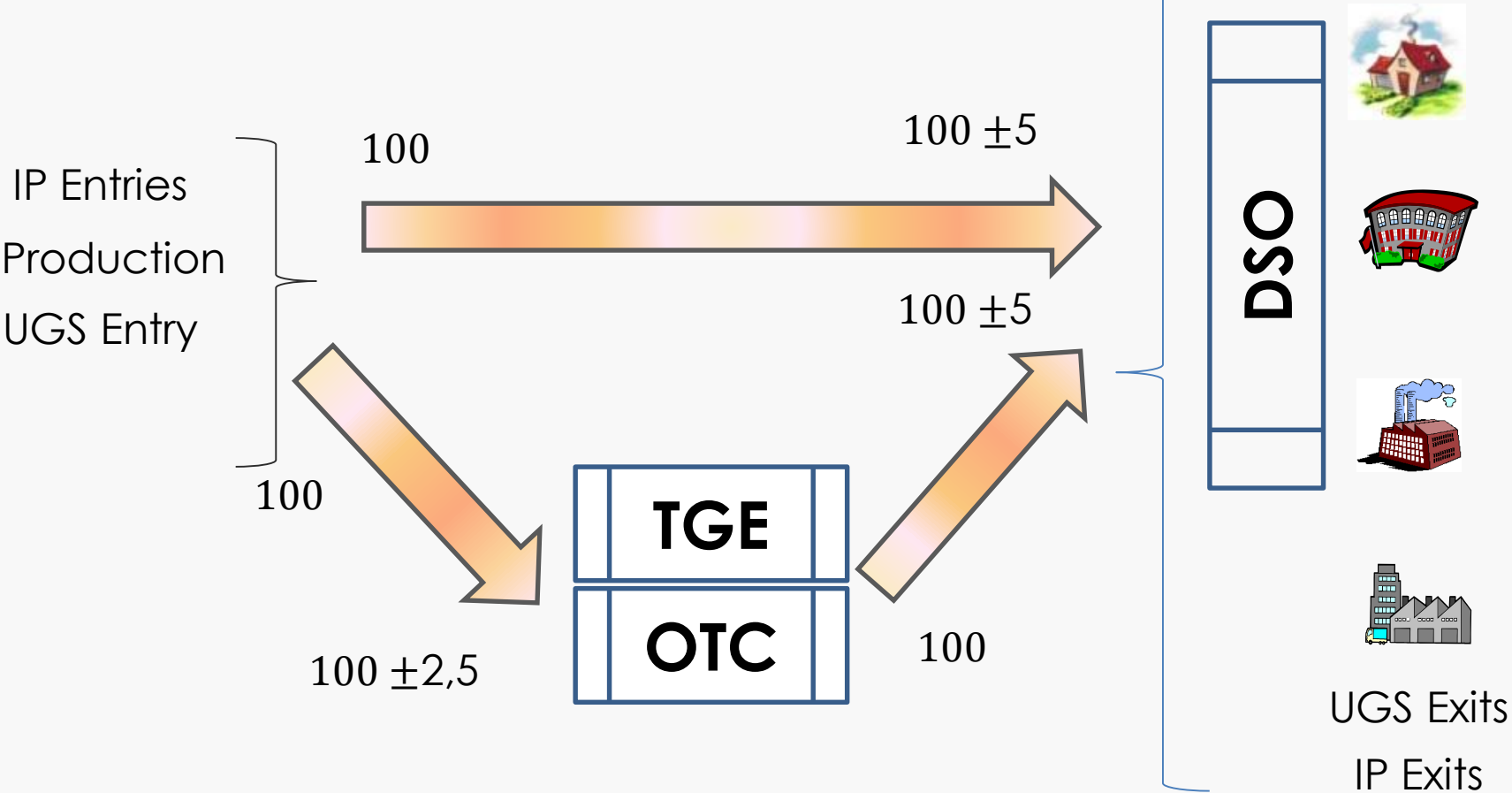
# BALANCING PLATFORM

- Short Term Standardised Products
  - H-gas balancing area: October 2015 – September 2016
  - L-gas balancing area: October 2015 – March 2019
  - TGPS (ISO): October 2015 – September 2019
  
- Locational products (EU border)
  - H-gas balancing area: October 2015 – September 2016
  - TGPS (ISO): October 2015 – March 2019
  
- Locational products (non – EU border)
  - H-gas balancing area: October 2015 – March 2019
  - TGPS (ISO): October 2015 – March 2019
  
- Locational products (internal points)
  - L-gas balancing area: October 2015 – March 2019

# TOLERANCE

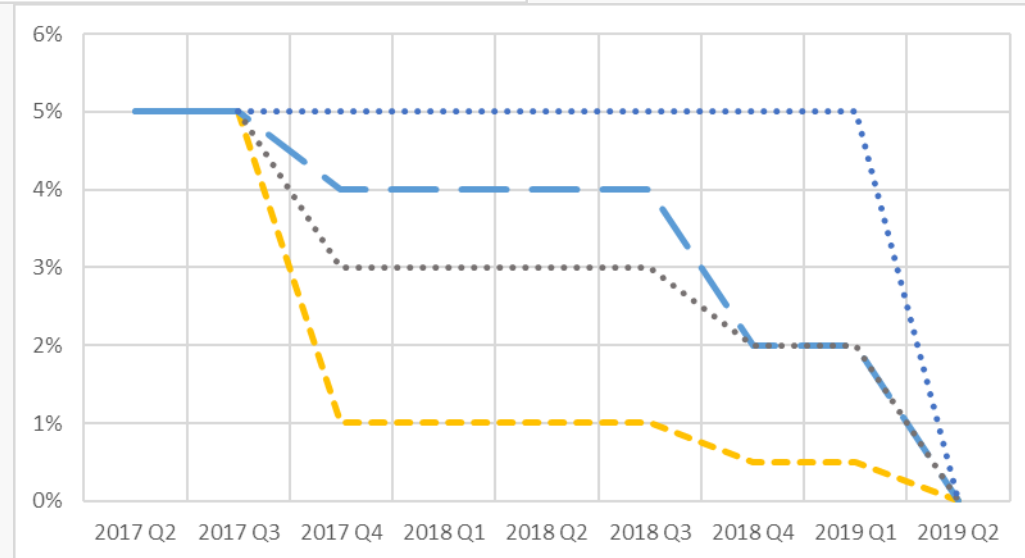
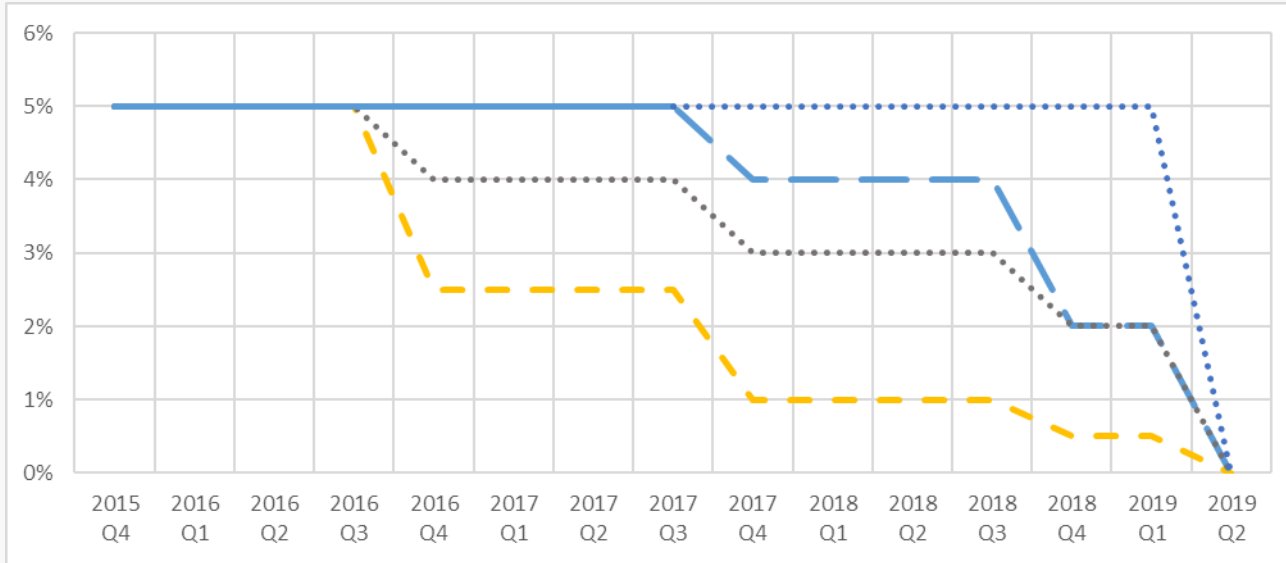


# TOLERANCE



$$DLN = 0,05 * \text{MAX} \left[ \frac{(We_f + Wy_f)}{2}; Wy_f \right]$$

# TOLERANCES – POSSIBLE TIMELINE



# TOLERANCE (DAILY IMBALANCE LIMIT - DLN) INTERIM MEASURE IN H-GAS BALANCING AREA

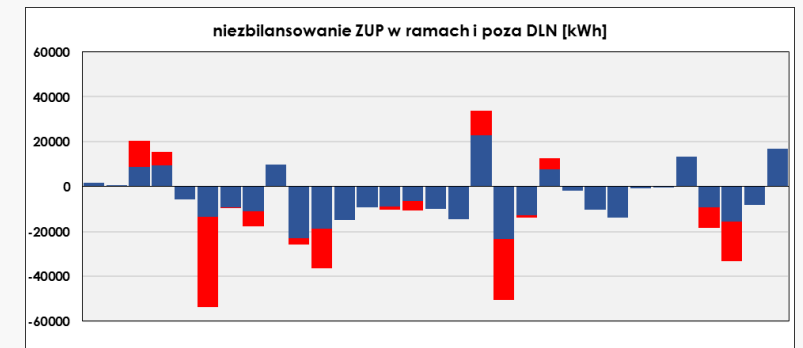
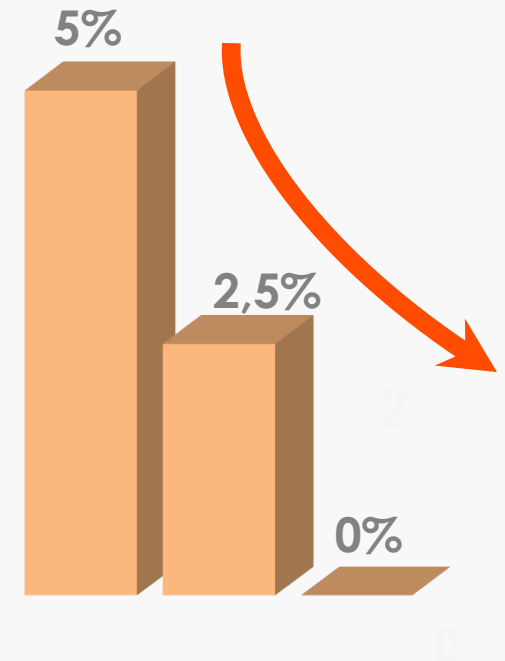
- Tolerance (high-methane gas balancing area):

$$DLN = t \% * MAX \left[ \frac{(\sum W_{e_f} + \sum W_{y_f})}{2}; \sum W_{y_f} \right]$$

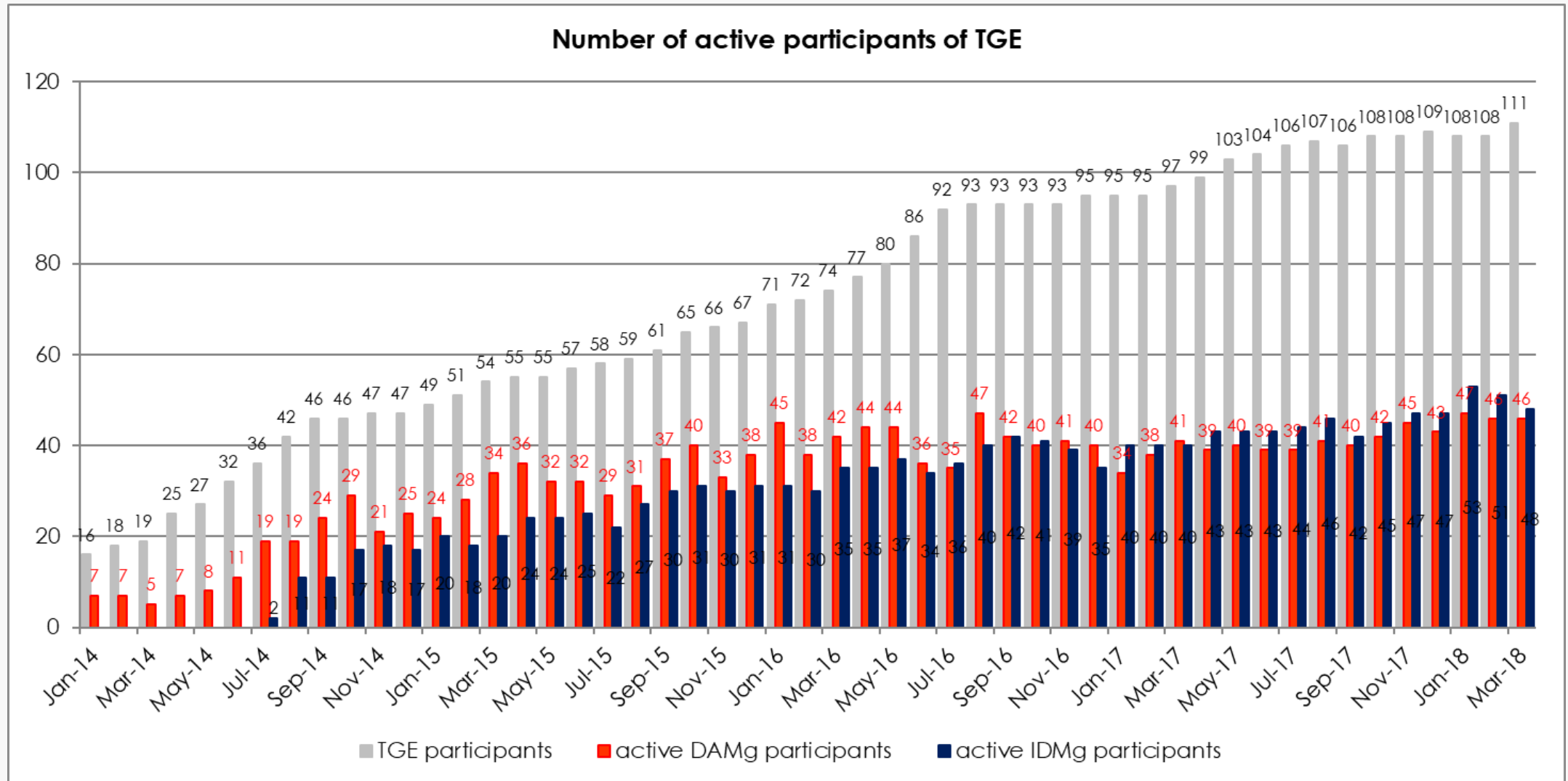
$W_{e_f}$ ,  $W_{y_f}$  – the quantities of gas delivered/offtaken, as appropriate, at Entry/Exit Points (excluding virtual entry/exit points – Gas Exchange, OTC, Balancing Services Market)

$t$  – the level of tolerance:

- **5 %** before 1 April 2018
  - **2.5 %** from 1 April 2018 to 30 March 2019
  - **0 %** as of 1 April 2019
- **Within the tolerance (DLN)** – Settlement of imbalance at the CSRB price equal to TGE's TGEgasID index
  - **Outside of the tolerance** – imbalance settled at KCK, KCS marginal prices



# SHORT TERM WHOLESALE GAS MARKET DEVELOPMENT



## OPERATIONAL LINEPACK

OR

## MARKET POSITION

$$E_{LP}(t) = \frac{\pi}{4} \frac{273,15}{0,1013} \sum_k^{i=1} \left( d_i^2 \int_0^l \frac{z_n(x,t) p(x,t)}{z(x,t) T(x,t)} C_v(x,t) \cdot dx \right)$$

World of physics phenomena:

- Dispatchers
- Engineers
- Scientists (fluid mechanics)

$$MP = \sum_{i=1}^n N_{ENT_i} - \sum_{j=1}^m N_{EX_j}$$

World of market participants:

- Traders
- Market analysts
- Scientists (economy)

THANK YOU FOR YOUR ATTENTION

