gasunie
transport services

# GTS Market session: Dutch balancing system

## Evaluation and potential improvements

1 Juli 2021

# Agenda

- **Introduction**
- Historical overview and context
- Evaluation randomizing timestamp balancing actions (ICE)
- GTS evaluation balancing system: Conclusions
- GTS interpretation of ACM observations
- GTS analysis
- Potential improvements
- Next steps

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# Historical overview and context (1/5)

- On 28 March 2017 ACM decided to increase the so-called LFS factor to 0.8% of the neutral gas price.
- This adjustment was necessary to comply with NC BAL
- ACM asked GTS to immediately prepare a code amendment proposal and submit it through the usual procedures.
- The main costs that network users have to incur with regard to their balancing obligations are related to their position at the end of the gas day (Article 26.2c of NC BAL).
- In other words, in the case of GTS: the end-of-day costs as a result of the linepack flexibility service (LFS) must be higher than the within-the-day balancing costs as a result of balancing actions.
- Both components were calculated as a market based total over a yearly period

# Historical overview and context (2/5)

- GTS has drafted a code change proposal
- Which was discussed in the GEN of 29 June 2017.
- Market parties were not happy about the increase to 0.8% and wanted to stick to 0.4%
- That is why GTS has looked for a compromise
- This resulted in a formula to calculate the LFS factor.
- With the data of that moment, the LFS factor resulting from this formula was 0.6%
- This result was acceptable for the market

# Historical overview and context (3/5)

- In preparation for implementation, the proposed method (formula) was applied for gas year 2017/2018
- This resulted in a LFS factor of approximately 5.5%. More than 10 times higher than the current LFS factor of 0.4%.
- Main reason for this was a limited number of balancing actions with extreme prices and extreme volumes in the gas year under consideration.
- At that time, it seemed to be an incident for which the formula was not robust enough.
- GTS discussed the situation with ACM and both parties agreed that GTS would withdraw the code change proposal
- GTS would analyze which adjustments and/or guarantees in the formula or in the code text would be necessary to prevent such extreme results.
- Because GTS had already started an internal evaluation of the entire balancing system, it was decided in consultation with ACM to wait for the conclusions from this internal analysis before presenting an update of the code proposal.

# Historical overview and context (4/5)

- In the meantime (as of 1 July 2018), the determination of the neutral gas price had been transferred from ICE to PEGAS (EEX).
- This is laid down in the Transport Code.
- The reason was that spot trading on ICE was sometimes so limited that ICE could not calculate the neutral gas price.
- Since the transition to PEGAS on 1 July 2018, this phenomenon has not occurred again.

# Historical overview and context (5/5)

- ICE Endex had found that some network users may be jeopardizing fair pricing around GTS balancing actions.
- Those network users took advantage of the transparent and predictable behaviour of GTS with respect to balancing actions (volume known, call 21 minutes past the hour)
- This was discussed with market parties on 17 April 2020 and 8 May 2020 and it was concluded that this behaviour should be prevented
- GTS has reduced the predictability of GTS balancing actions by randomizing the calling time.
- GTS executes a balancing action at a random moment between 21 and 22 minutes after the start of the hour.
- As of 3 September 2020 06:00 all balancing actions have been carried out by this method.

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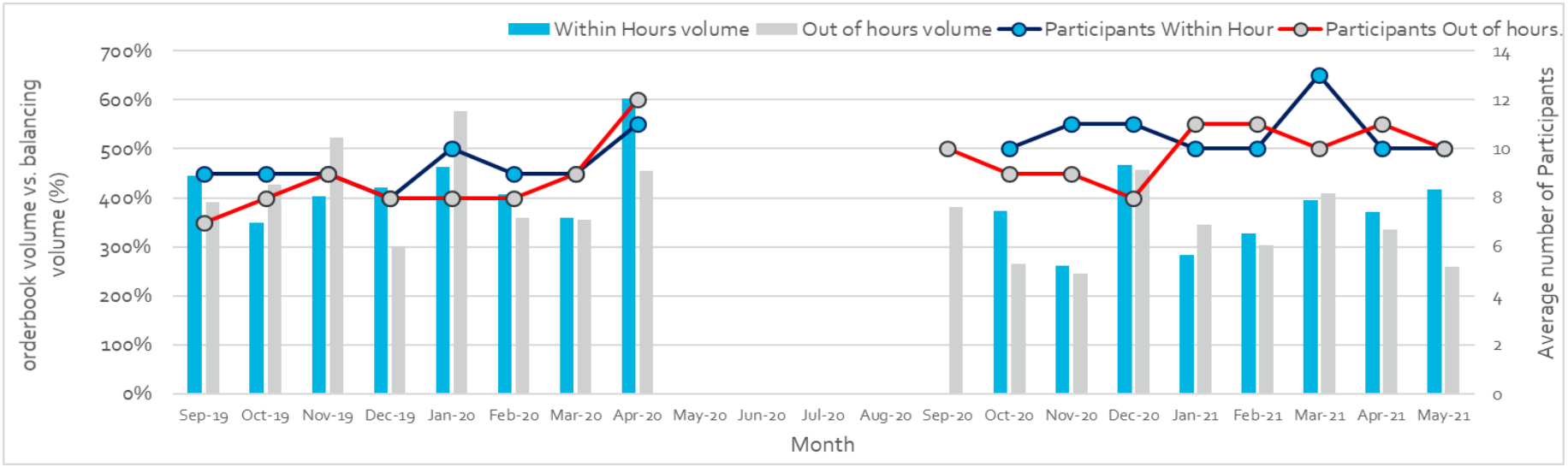
# TTF Balancing KPIs

1 July 2021

# TTF Spot - Balancing behaviour

## **Next Hour** – **KPI** May 2021

**Liquidity during the balancing event – available volume in the orderbook vs. requested balancing volume***

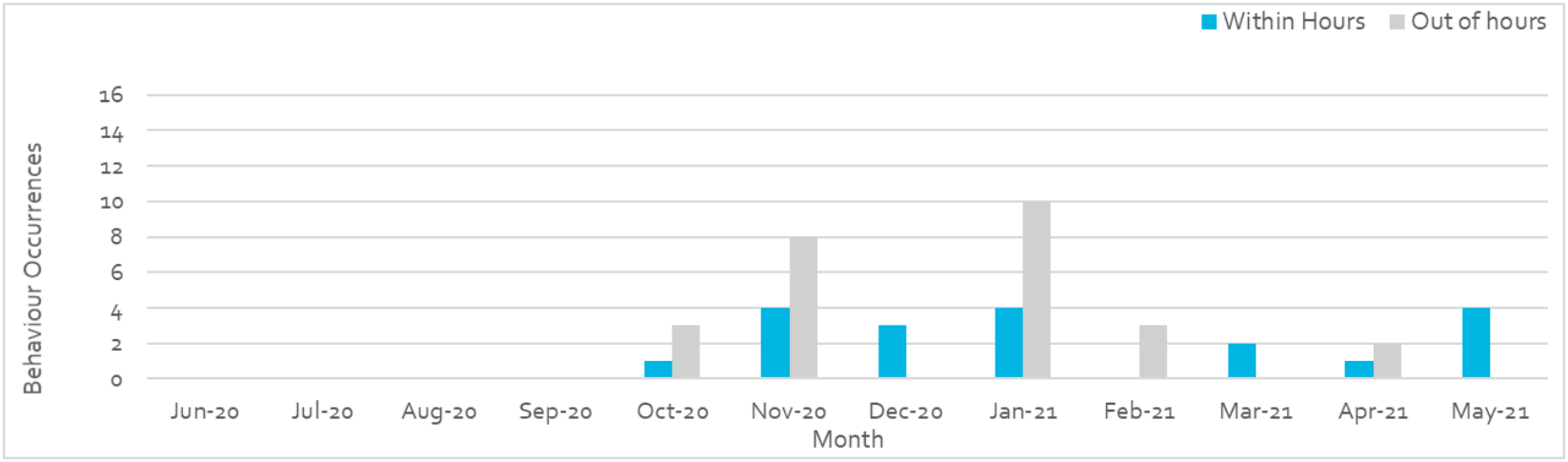



*No Next Hour balancing actions in the period May-20 to August-20.

# TTF Spot - Balancing behaviour

## **Next Hour** – **KPI** May 2021

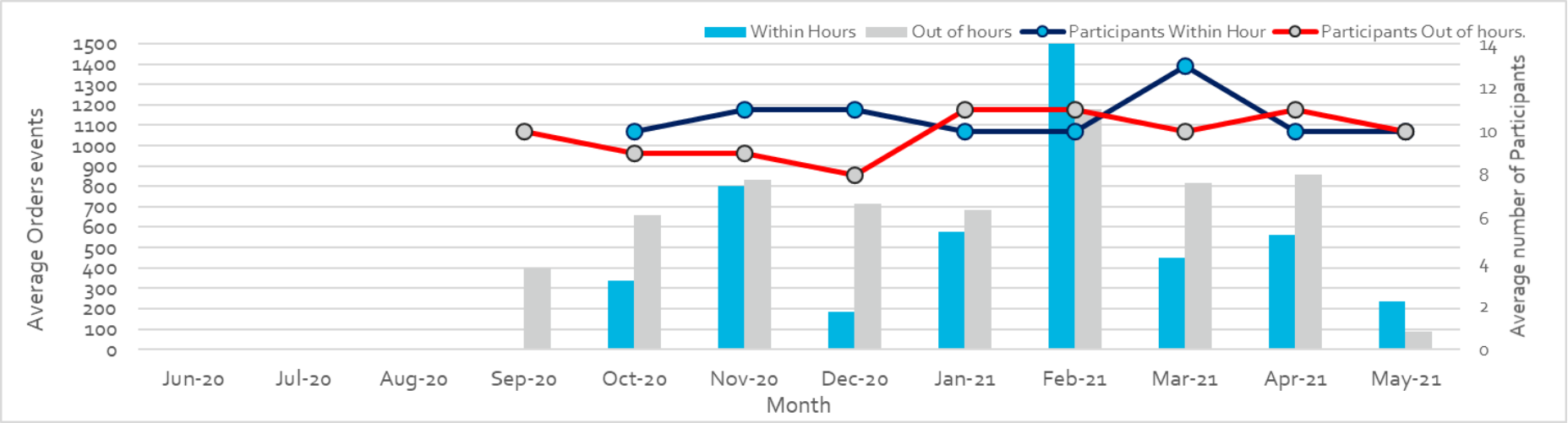
**Number of times that orders that have been submitted by a market party during a balancing action have been lifted by another market party to be replaced by an order at a different price level**



# TTF Spot - Balancing behaviour

## **Next Hour** – **KPI** May 2021

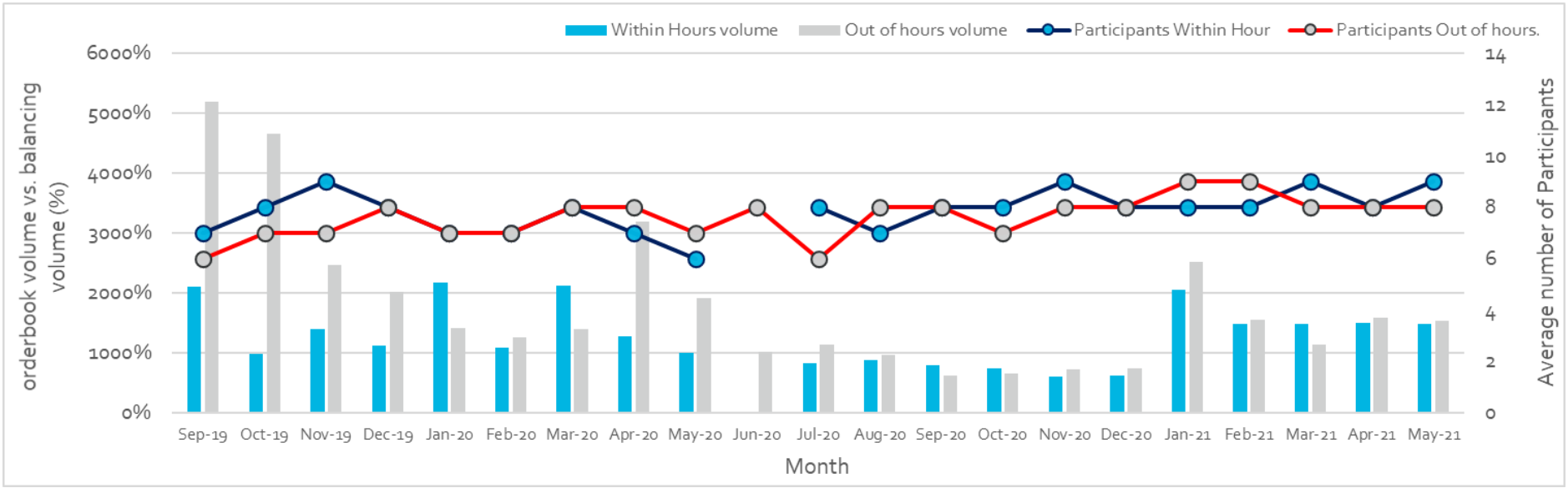
**Price competition during the balancing window* - orders submitted, adjusted or cancelled**



# TTF Spot - Balancing behaviour

## **Within Day** – **KPI** May 2021

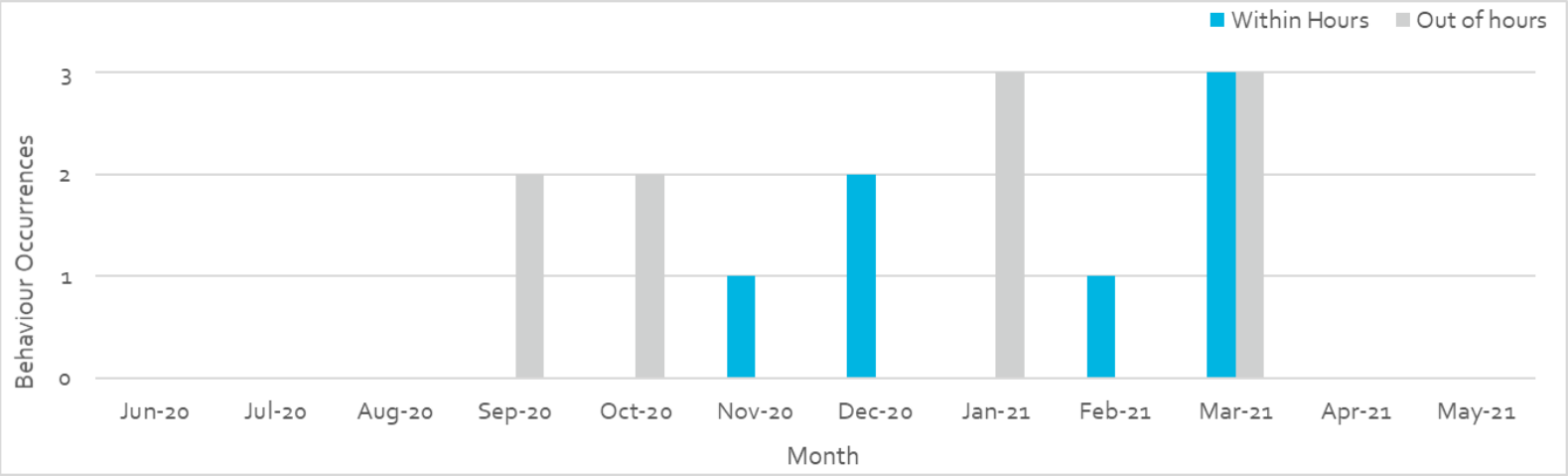
**Liquidity during the balancing event – available volume in the orderbook vs. requested balancing volume**



# TTF Spot - Balancing behaviour

## **Within Day** – **KPI** May 2021

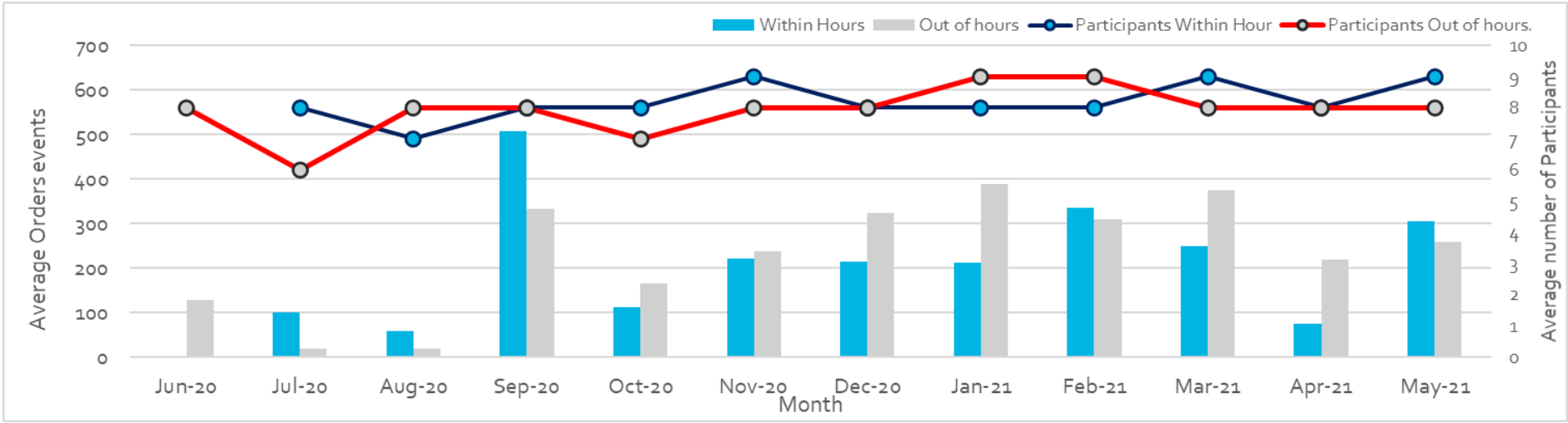
**Number of times that orders that have been submitted by a market party during a balancing action have been lifted by another market party to be replaced by an order at a different price level**



# TTF Spot - Balancing behaviour

## **Within Day** – **KPI** May 2021

**Price competition during the balancing window* - orders submitted, adjusted or cancelled**



# Conclusions

Key conclusions after 9 months of randomization

- **Price formation**
  - Price formation of balancing trades has much improved as GTS is not coming into the market at a fixed time but at a random moment between .21min and .22min; this strongly reduces the possibility of orders being traded ahead of GTS' market order and subsequently to be replaced by orders with higher offers or lower bids;
  - Price discovery process has improved as well as participating firms are submitting orders throughout the balancing window and not limited to very shortly before, or directly after, the appearance of GTS' market order as seen prior to 3 September '20.

- **Volume**
  - Available volume in the orderbook in relation to the required balancing volume more than sufficient; on average 250%-600% for Next Hour and between 500%-5000% for Within Day.

- **Behaviour**
  - Undesired behaviour seen prior to 3 September 2020 in submitting illogical prices on screen around balancing actions not seen since.

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- Product Specifications
  - https://www.theice.com/products/31435802/Dutch-TTF-Gas-Spot

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# GTS evaluation balancing system: Conclusions

- The Dutch balancing system is operational since 1 April 2011, and adopted some changes in 2014 when NC BAL came into force
- Based on own experience, feedback by market parties and ACM, GTS concluded that the experiences are mainly positive and that the market has embraced the basic features.
- The Dutch NC BAL implementation essentially works well, is simple, robust and effective
- The balancing system is compliant with NC BAL, however there is discussion about LFS pricing
- Information to shippers is excellent (near real time)
- GTS observed non prudent behaviour of some network users (see later)
- Overall, according to GTS, a total redesign of the balancing system is not necessary.
- GTS expects that the main mechanisms of the current balancing regime (cumulative POS, balancing zones, WID balancing actions, LFS) can also be maintained in the coming years and that they are robust to the market developments.
- Recommendation by GTS is to maintain these basic elements of the Dutch balancing system
- Improvements are necessary to give network users a better incentive to fulfil their balancing obligations stemming from NC BAL and to prevent the non prudent behaviour

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# GTS interpretation of ACM Observations (1/2)

- ACM carried out their own evaluation, based on market information
- ACM has informed GTS about its observations
- GTS interpretation of these observations is as follows:
  1. Balancing regime appears largely compliant with NC BAL
  2. LFS pricing does not appear to be compliant with NC BAL, because EOD balancing costs are (usually) not higher than costs for within-day balancing.
  3. NC BAL aims for market participants to be in balance at the end of the gasday. NC BAL is designed for that. In the Netherlands this is not necessary because of LFS. As a result, choices in NC BAL do not always match the situation in the Netherlands.
  4. NC BAL aims for effective balancing. So far this has always been successful
  5. NC BAL aims for balancing prices in line with the market, and (thereby) the lowest possible balancing costs. There are regularly price outliers in balancing actions, especially NextHour products. These outliers may be (partly) preventable. (this point has a link with the non prudent behaviour that GTS has encountered)

# GTS interpretation of ACM observations (2/2)

Do choices in current balancing regime contribute to price outliers in balancing actions?

At least three properties of the balancing regime contribute to price outliers in balancing actions:

1. The presence of a relatively cheap linepack at EOD
2. Use of a (too) limited set of instruments from the orange zone of the system balance; with a short lead time, market parties have limited options
3. The predictable and price-taking behaviour of GTS

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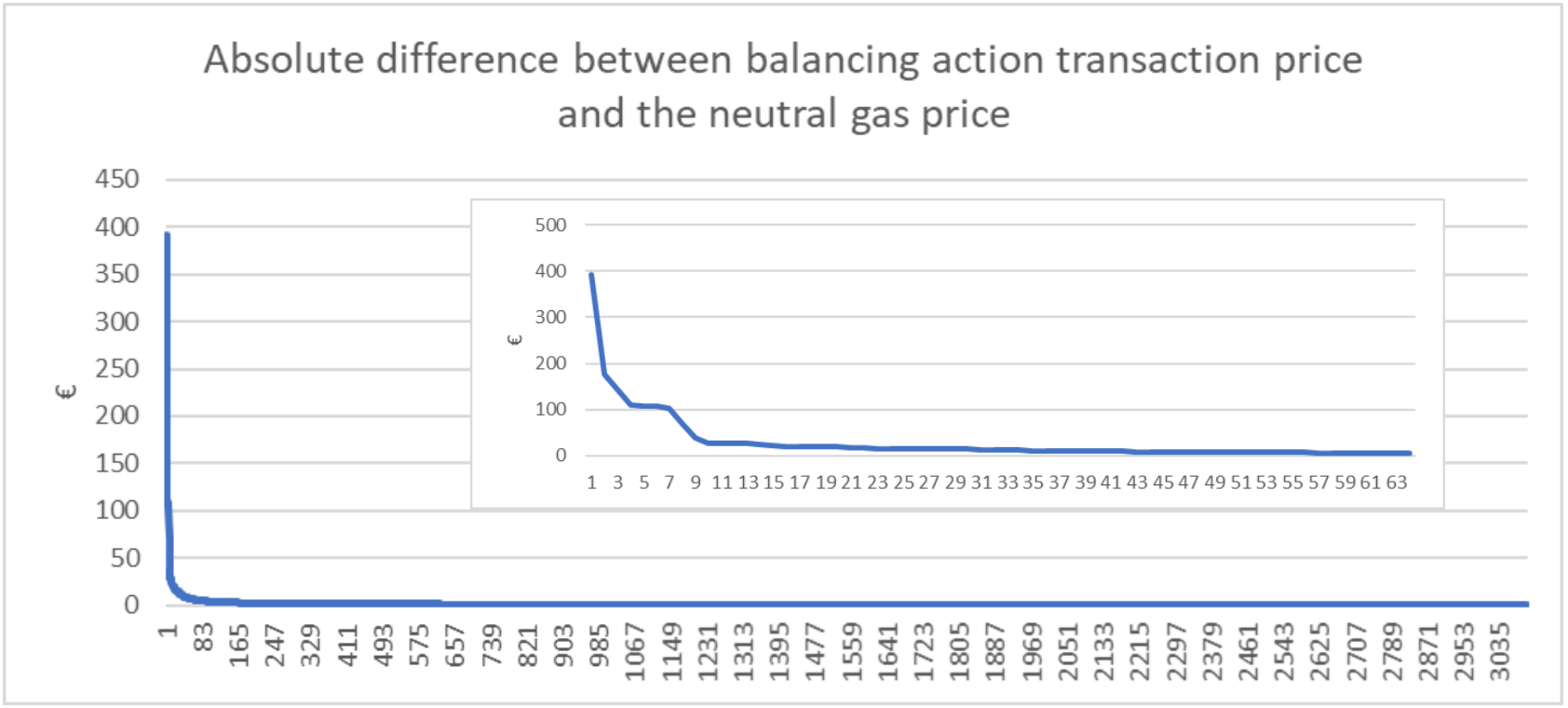
# Balancing action transaction price (1/3)




X-axis: number of balancing actions: October 2015 – April 2021

# Balancing action transaction price (2/3)

| | Average of absolute difference between transaction price and neutral gas price | Average of relative difference between transaction price and neutral gas price |
|---|---|---|
| **TTF NextHour** | **€ 2,84** | **9,83%** |
| 2015/2016 | € 2,57 | 14,61% |
| 2016/2017 | € 1,00 | 5,59% |
| 2017/2018 | € 9,06 | 12,40% |
| 2018/2019 | € 1,10 | 6,02% |
| 2019/2020 | € 1,82 | 17,38% |
| 2020/2021 | € 1,13 | 6,75% |
| | | |
| **TTF WD** | **€ 0,63** | **3,80%** |
| 2015/2016 | € 0,49 | 3,15% |
| 2016/2017 | € 0,46 | 2,70% |
| 2017/2018 | € 1,07 | 3,19% |
| 2018/2019 | € 0,44 | 3,08% |
| 2019/2020 | € 0,80 | 8,37% |
| 2020/2021 | € 0,46 | 2,57% |
| | | |

# Balancing action transaction price (3/3)

| **Average of absolute difference between transaction price and neutral gas price** | | |
|---|---|---|
| | **Before randomizing** | **After randomizing (3 september 2020)** |
| TTF NextHour | € 3,19 | € 1,12 |
| TTF WD | € 0,66 | € 0,45 |
| | | |

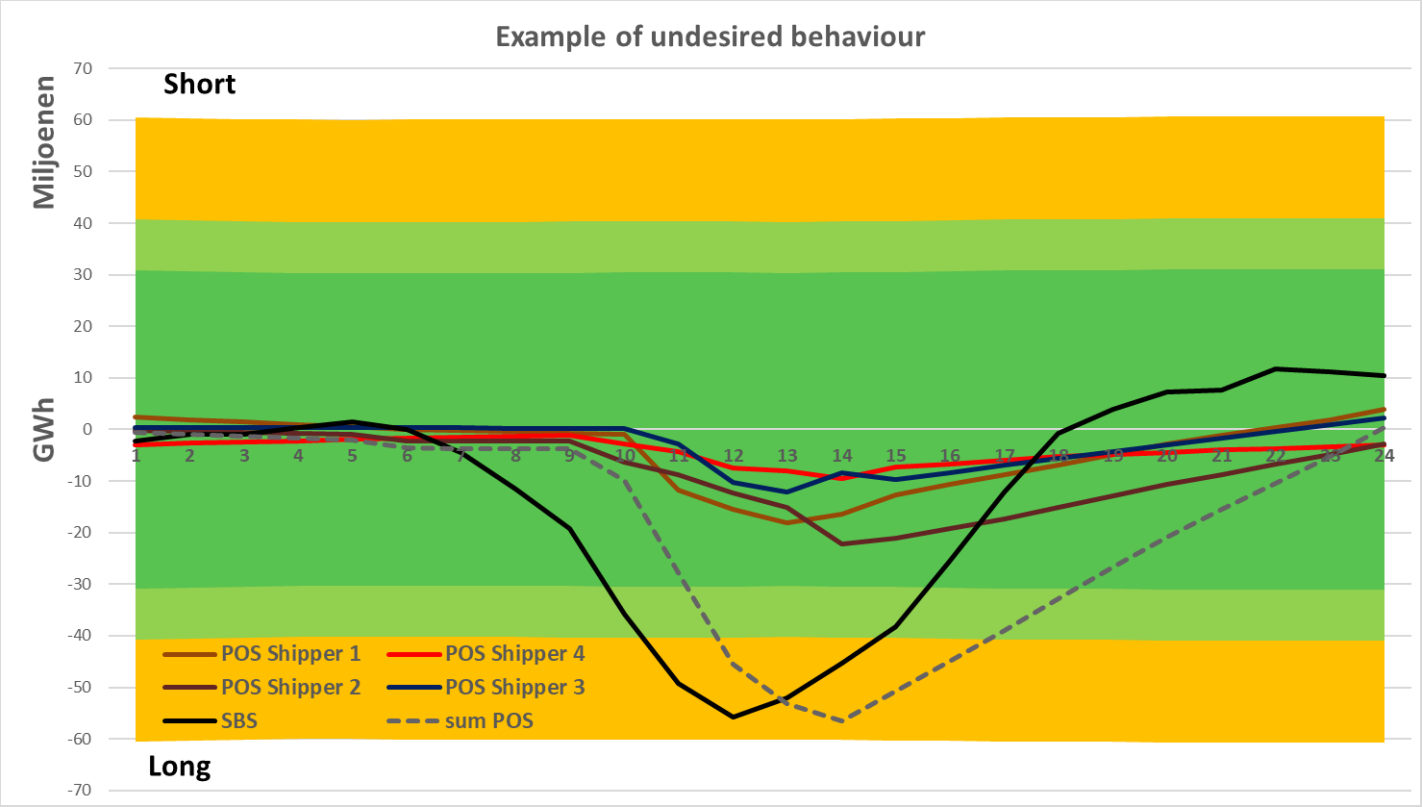
- Price competition has improved
- No price outliers since randomizing

# Deeper look into linepack observations

- EOD linepack is cheap, also cheaper than EOD small adjustments in other countries
- Shippers who are provider of gas products on the ICE Exchange can also be partly responsible for causing a balancing action (or intentionally try to force a balancing action).
- The provided volume will be sold at a high price on the exchange and will be allocated against a lower balancing transaction price (because GTS determines a volume weighted price)
- Their potential high portfolio imbalance is maintained and will be invoiced against a low LFS price at EOD.
- Some shippers sell Nexthour product on exchange, but deliver WD product or next gas day (slow portfolio imbalance adjustment)
- Those shippers are not properly incentivised to prevent balancing actions and minimize their (EOD) imbalance
- But this behaviour is also in breach with article 4.1 of NC BAL and can therefore be classified as non prudent

# Example of non prudent behaviour

1. SBS out of balance (long) because of physical changes
2. Two hours later, some shippers are causing, on purpose, a higher portfolio imbalance (POS) and push the SBS further out of balance
3. Balancing action GTS: call Nexthour products on exchange and sell gas
4. No Nexthour product delivered, SBS too slowly back to dark green zone



# Deeper look into limited volume provided

- Volume provided on ICE Endex by network users for Nexthour product is sometimes limited
- A high volume call by GTS in case of a balancing action for Nexthour product (SBS in orange or red zone) can lead to a situation in which also the provided volume with the highest prices has to be called
- Such a situation leads to price outliers
- Price outliers can therefore be an indication of insufficient provided volume on the exchange
- The system should provide incentives and possibilities for more shippers to provide more volume, in order to minimize the number of occasions with price outliers.
- However, price competition has improved since variation in timestamp of call of balancing action (3 September 2020)
- No price outliers since that change, but non prudent behaviour still present

# Deeper look into predictable behaviour of GTS

- Current codes oblige GTS to perform balancing actions in a very transparent and predictable way
- GTS needs the predetermined volume and buys/sells that regardless of the price
- That was a conscious design choice, because GTS must primarily keep its network integrity, so volume is more important than price.
- It has also been used to encourage short term trading
- A high transaction price also gives causers a desired incentive to manage their portfolio better next time and prevent balancing actions, but market fundamentals must be appropriate

# What is the purpose of NC BAL?

*Network users*

- Article 4.1, General principles: The network users shall be responsible to balance their balancing portfolios in order to minimise the need for a TSO to undertake balancing actions
- Regular solution: network users buy and sell gas, and/or renominate entries/exits and/or do TTF deals

*TSO*

Operational balancing, article 6, General provisions: The transmission system operator shall undertake balancing actions in order to maintain the transmission network within its operational limits;

- A balancing action is in essence buying or selling gas by a TSO, what should have been done by a network user
- Network users can be incentivized (to buy or sell gas by themselves) via charges on balancing actions and EOD settlement

# Current interpretation of article 26.2c

- Article 26.2c: the main costs to be incurred by the network users in relation to their balancing obligations shall relate to their position at the end of the gas day
- Current interpretation: ∑ EOD costs > ∑ Within-day costs
- On a yearly basis for all network users
- EOD costs (LFS): 0,4% * abs (POS) * Neutral GasPrice
  - art. 4.1.7 Transmission Code Gas
- Within-day costs: sum of costs for balancing actions where price is compared to Neutral Gas Price
- The sum of all shipper portfolios is considered, no individual approach
- GTS observes that a daily (rather than a yearly) approach and potentially an individual (rather than a collective) approach may be a more logical approach and more in line with NC BAL: an individual network user should be incentivized in case of insufficient portfolio balancing

# Individual daily approach (1/2)

Example

- Suppose a network user is co-causer of a balancing action and has to pay €50.000 for gasday D
- Suppose the EOD imbalance position of that network user is zero, so perfectly in balance
- So EOD cost is zero and network user is (at EOD) fully in line with aims and rules of NC BAL
- However, EOD costs < Within-day costs
- This is not in line with current approach/interpretation: EOD costs > Within-day costs

# Individual daily approach (2/2)

- How to interpret article 26.2c in the situation where the long position of a network user will be sold at EOD
- This is for instance the case in Germany and Belgium
- Selling the long position is a *revenue* for the network user (in theory this revenue can be used by the network user to buy back the same volume for the same price to restore the original position)
- A selling action by a TSO will only become *costs,* and therefore an incentive for a network user to minimize its imbalance position, when applying a charge (small adjustment = Δ)
- Charges are the real costs for a network user and therefore an incentive to comply with NC BAL:
  - TSO sells for P
  - Network user receives P – Δ
- Similar situation when TSO has to buy gas at EOD:
  - TSO buys for P
  - Network pays P + Δ

# New interpretation of article 26.2c

- The individual daily approach examples make clear that charges are the real costs for network users and not the buying/selling of gas
- Pricewise it makes no difference who (TSO or network user) does the buying/selling call on an exchange.
- The individual daily approach in both examples shows that Article 26.2c is not meant for comparing gas buying/selling activities between EOD and Within-day
- The charges are the real costs for a network user and the charges will incentivize the network users to comply with NC BAL by preventing balancing actions and minimize their (EOD) portfolio imbalance
- Article 26.2c is therefore more about comparing price charges than comparing absolute costs
- The biggest incentive (= charge) should be at EOD

- **EOD charge > Within-day charge**

# Current framework: overview of building blocks

| Nr | NC BAL | Goal | How | GTS activity | Charge |
|---|---|---|---|---|---|
| 1 | Article 4.1 | Basic obligation for a network user to balance its portfolio in order to minimise the need for transmission system operators to undertake balancing actions | by buying and selling gas | GTS sends near real time POS and SBS info | |
| 3 | Article 25.1 | Bring SBS within its operational limits | | GTS performs balancing action when SBS outside dark green zone. POS of causers will be adjusted | 0% |
| 4 | Article 26.2c | EOD settlement | LFS: 0,4% * abs(POS) * NGP | LFS invoice | 0,4% |

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# Guidelines for improvement

- Basic NC BAL obligation for network users: they shall be responsible to balance their balancing portfolios in order to minimise the need for a TSO to undertake balancing actions
- Highest incentive (charge) to fulfill NC BAL obligations must be at EOD
- NC BAL strives for minimal EOD imbalance
- Main mechanisms of the current balancing regime (cumulative POS/SBS, balancing zones, WID balancing actions, LFS) will be maintained.

Goals:

- Incentivize the network users to minimize the need for GTS to undertake balancing actions
- EOD charge > Within-day charge
- Prevent the non prudent behaviour (slide 29)

# Potential framework

- GTS will present a potential framework in the next slides, consisting of four building blocks:
  - one emphasizes the current situation,
  - one of them is new,
  - two existing blocks will be changed in this framework
- GTS expects with this potential framework that the formulated goals will be accomplished

# Potential framework: Block 1

| Nr | NC BAL | Goal | How | GTS activity |
|---|---|---|---|---|
| 1 | Article 4.1 | Basic obligation for a network user to balance its portfolio | buying and selling gas | GTS sends near real time POS and SBS info |

- This is not changed compared to current situation
- Network users shall be responsible to balance their portfolios in order to minimize the need for transmission system operators to undertake balancing actions
- Network users can do that by buying and selling gas, and/or renominate entries/exits and TTF deals
- Minimization of imbalance position will lower the need for balancing actions by GTS

# Potential framework: Block 2, new

| Nr | NC BAL | Goal | How | GTS activity | Charge |
|---|---|---|---|---|---|
| 2 | Article 25.2 | Limit imbalance of each portfolio | Abs(POS) < 4 GWh | If Abs(POS) > 4 GWh then GTS performs balancing action for this network user (WD product) when SBS in dark green zone | 1% |

- This is an addition to the current situation
- This is to prevent that network users are able to create a huge portfolio imbalance position
- This should prevent network users to intentionally cause a balancing action in combination with offering products on the exchange and profit financially while they do not limit their imbalance position fast enough
- It will also limit the number of times that network users can create a huge system imbalance situation, so we expect less “orange” and “red” calls and as a consequence less price outliers
- Portfolio Long: TSO sells volume V for P, Network user receives V * P * 0,99
- Portfolio Short: TSO buys volume V for P, network user pays V * P * 1,01
- Level of charge, portfolio limitation and volume to be discussed
- The intended charge will be part of neutrality charge and T+2 reimbursed to the network users
- We could also add time aspect: if portfolio imbalance position stays “constant” during N hours then GTS is allowed to perform a balancing action for that portfolio to lower the imbalance position

# Potential framework: Block 3, adjusted

| Nr | NC BAL | Goal | GTS activity | Charge |
|---|---|---|---|---|
| 3 | Article 25.1 | Bring SBS within its operational limits | GTS performs balancing action when SBS outside dark green zone. POS of causers will be adjusted | 2% |

- This type of action is not changed compared to the current situation
- The causers are not fulfilling their basic NC BAL obligations, GTS has to "repair" this
- New is the additional charge for causers when GTS executes a balancing action

SBS long (outside dark green zone):
- GTS sells volume V for P, causer receives V * P * 0,98

SBS short (outside dark green zone) :
- GTS buys volume V for P, causer pays V * P * 1,02

- Level of charge is to be discussed
- The intended charge will be part of neutrality charge and T+2 reimbursed to the network users

# Potential framework: Block 4, adjusted

| Nr | NC BAL | Goal | How | GTS activity | Charge |
|---|---|---|---|---|---|
| 4 | Article 26.2c | EOD settlement | LFS: 3% * abs(POS) * actual gasprice | LFS invoice | 3% |

- The LFS mechanism will not be changed, POS position at EOD will not be reset to zero, due to LFS

- LFS must have the highest charge to comply with article 26.2c: EOD charge > Within-day charge
- LFS charge must be higher than current level to prevent the aforementioned non prudent behaviour
- We consider to use the actual gas price at EOD instead of the neutral gas price
- This to better reflect that the network user should have bought or sold gas himself and therefore shall pay the actual gas price
- Level of charge is to be discussed
- The intended charge will be part of neutrality charge and T+2 reimbursed to the network users

# Potential framework: overview of building blocks

| Nr | NC BAL | Goal | How | GTS activity | Charge* |
|---|---|---|---|---|---|
| 1 | Article 4.1 | Basic obligation for a network user to balance its portfolio in order to minimise the need for transmission system operators to undertake balancing actions | by buying and selling gas | GTS sends near real time POS and SBS info | |
| 2 | Article 25.2 | Limit imbalance of each portfolio | Abs(POS) < 4 GWh | If Abs(POS) > 4 GWh then GTS performs balancing action for this network user (WD product) while SBS is in dark green zone | 1% |
| 3 | Article 25.1 | Bring SBS within its operational limits | | GTS performs balancing action when SBS outside dark green zone. POS of causers will be adjusted | 2% |
| 4 | Article 26.2c | EOD settlement | LFS: 3% * abs(POS) * actual gasprice | LFS invoice | 3% |

* Level of charge to be discussed

# Additional ideas: Withdrawal of license

- Article 4.1, General principles: The network users shall be responsible to balance their balancing portfolios in order to minimise the need for a TSO to undertake balancing actions
- Network users who are regularly pushing the SBS outside the dark green zone and are co-causer of a balancing action are not fulfilling this basic NC BAL obligation for network users
- In other words: a network user does not comply with the general provision of NC BAL if this network user is regularly co-causer of a balancing action and does not show that they try to prevent such a balancing action by steering the SBS actively in the opposite direction (from causer to helper).
- This repeating behaviour can be considered as a breach with EU regulation and is therefore non prudent
- This can lead to withdrawal of the license
  - Transportcode article 3.2.0.c
- This solution is additional to the third formulated goal on slide 40 (prevent/banish the non prudent behaviour).

# Additional ideas: Increase offered volume (1/6)

- In the next slides we present potential ideas to increase the offered volume on an exchange
- This is a potential addition to the presented framework
- If needed, ideas can be combined

Consequence:

- A higher available volume will lead to less situations in which the most expensive offers have to be called
- This discourages the non prudent behaviour, but does not prevent it
- Does not automatically lead to fulfil the other two goals

# Additional ideas: Increase offered volume (2/6)

- Next to WD and Nexthour product: additional products
- Two/three/four hour leadtime with high volume delivery in a couple of hours

# Additional ideas: Increase offered volume (3/6)

- Involve Storage capacity and volume through Balancing services to prevent price outliers
- Article 8.1: The transmission system operator is entitled to procure balancing services for those situations in which short term standardised products will not or are not likely to provide the response necessary to keep the transmission network within its operational limits or in the absence of liquidity of trade in short term standardised products.
- In case of a balancing action, GTS determines the cheapest volume weighted price based on offered volume on the exchange and contracted volume via balancing services
- According to NC BAL a balancing service must be organised via a transparent tender procedure and contracted for only one year
- Balancing service only from storage operators
- Explicit approval of ACM needed

# Additional ideas: Increase offered volume (4/6)

- Involve network users with contracted storages capacity and volume
- Do they already provide volume on the exchange?
- Why not?
- How can this be made more attractive?

# Additional ideas: Increase offered volume (5/6)

- Principles of balancing zones unchanged, but also balancing actions in dark green zone when SBS trend is towards light green zone
- In line with article 25.1c: the consequential balancing actions of the transmission system operator when the operational limits of the transmission network are approached or reached
- Will potentially lead to more balancing actions, but per balancing action less volume needed
- Prevents potentially outliers to other zones
- More network users can provide volume on Exchange?

# Additional ideas: Increase offered volume (6/6)

- In current situation when SBS is around border of light green zone and orange zone, the product choice can flip at late stage when SBS moves from one zone to the other
  - Light green zone: WD product
  - Orange zone: Nexthour
- Potential improvement: Once a product type (WD, Nexthour) has been announced, stick to that product
- This might enable providers who intend to deliver physically to offer more volume at sharper prices

# Additional ideas: GTS more unpredictable

- Volume and timestamp of balancing action will be determined by GTS randomly.
- Most extreme form: no pre-announcement, no fixed volume

Consequence

- If GTS becomes totally unpredictable, it will be difficult to apply charges for balancing actions
- Advantage for network users of presented potential framework: GTS can remain transparent and predictable

# Agenda

- Introduction
- Historical overview and context
- Evaluation randomizing timestamp balancing actions (ICE)
- GTS evaluation balancing system: Conclusions
- GTS interpretation of ACM observations
- GTS analysis
- Potential improvements
- **Next steps**

# Next steps

- GTS is happy to receive your written view by 23 July cob
- Please send it to: gasmarket@gastransport.nl

- GTS will inform ACM about progress and content
- Based on all information, GTS will then draw a draft code change proposal, which will be presented and discussed in a formal GEN meeting of Netbeheer Nederland
- In the end, ACM will take a final code decision