BALANCING MODEL 2022

User Group – 28 October 2021

Energinet and Nordion

Agenda

- The overall function of the balancing model (wrap up)
- Data and quality
- Future green zone
- Smoothing
- Fallback procedures and control mechanism
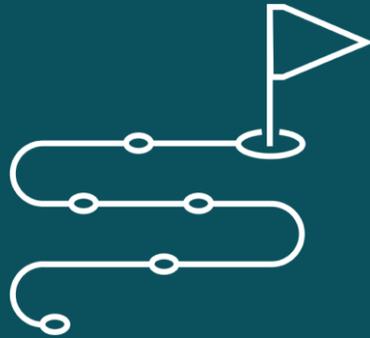- Next steps

PARTICIPANTS

SHIPPERS

- Ørsted
- SEAS-NVE Strømmen A/S
- PGNiG SA
- Norlys Energy A/S
- Energi Fyn
- Shell
- E.ON Sverige
- Modity A/S

ENERGINET AND NORDION

- Christian Rutherford
- Jannik Blok-Riisom
- Signe Rasmussen
- Søren Rasmussen
- Ylva Nordlund
- Martin Fahlvik

EXTERNAL

- Gas Storage Denmark
- Danish Utility Regulator
- European Energy Exchange
- EVIDA (DSO)

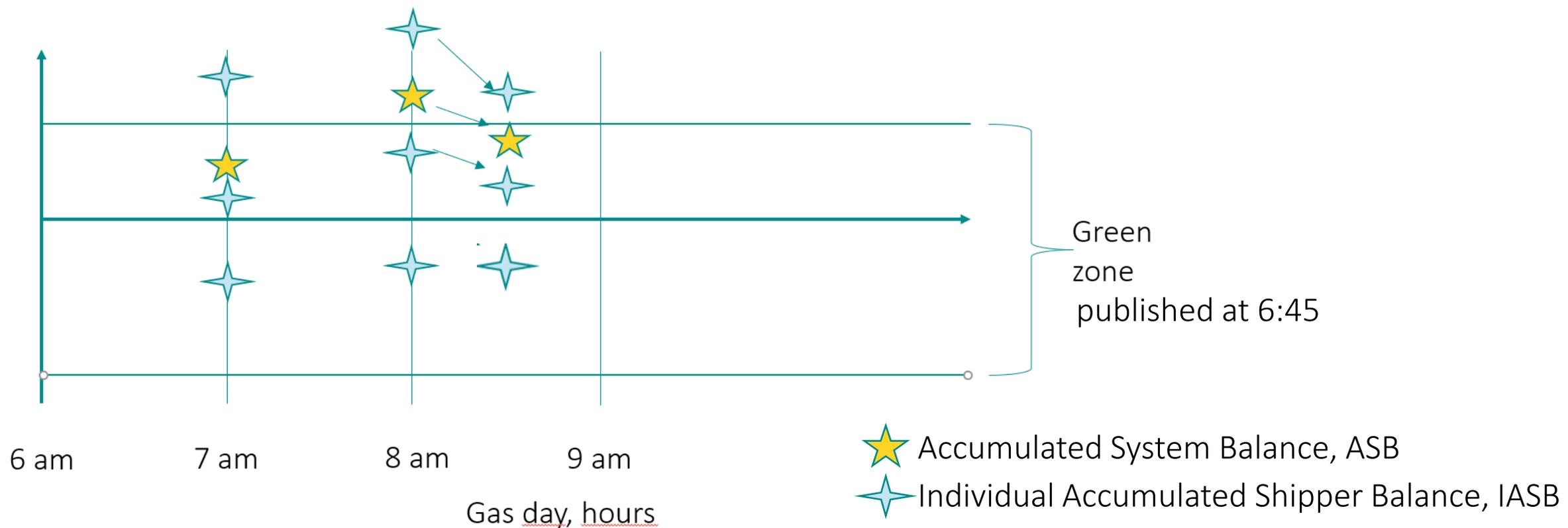# FUNCTION OF THE BALANCING MODEL AND DATA FLOW

BEFORE THE GAS DAY (D-1)

Shippers will still receive nDMS data as to day

- No later than 13:00 shippers will be informed about their expected offtake of nDMS for each allocation area (based on forecast)

- No later than 13:00 shippers will be informed about their individual S-Max value for the next gas day (based on marked shares)

DURING THE GAS DAY (D)

The mechanism behind the WDO and helper-causer model. Shippers with imbalance (IASB) in the same direction as ASB, in hours where ASB is outside the green zone, will be allocated at CAP to the marginal sales or purchase price.

Green zone
published at 6:45

6 am   7 am   8 am   9 am

Gas day, hours

⭐ Accumulated System Balance, ASB
✦ Individual Accumulated Shipper Balance, IASB

ENERGINET

DATA SHIPPERS WILL RECEIVE DURING THE DAY (D)

ASB IS PUBLISHED EACH HOUR STARTING FROM 7:10 TO 6:10

Based on:

Accepted nomination at exit and entry points

Offtake to Joint Exit Zone from MR data.

Allocation at the CAP and SAP from previous hours.

CAP: Causer Allocation Point

SAP: Smoothing Allocation Point

IASB IS SEND TO SHIPPERS EACH HOUR STARTING FROM 7:40 T0 6:40

Based on:

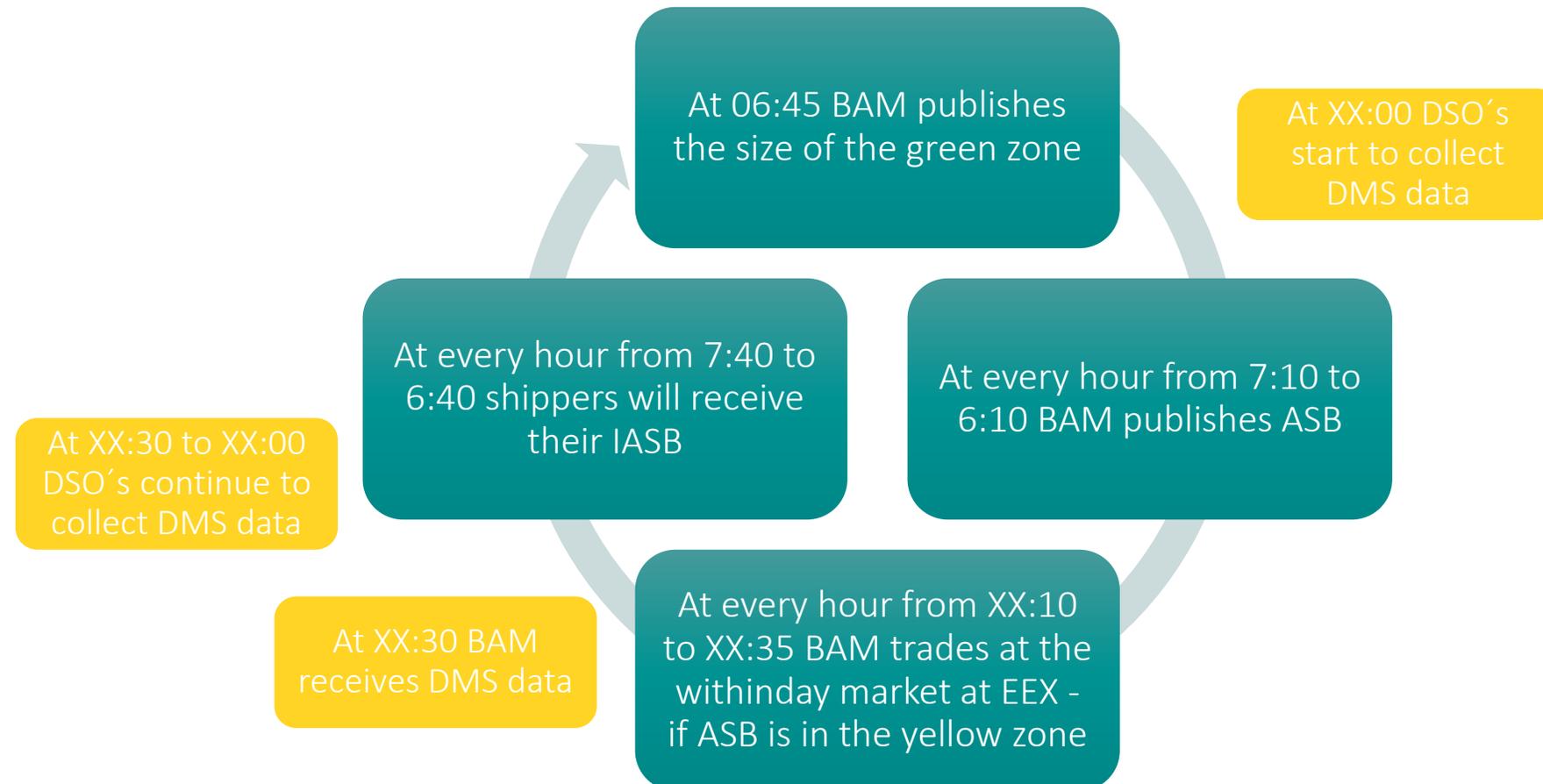Accepted nominations at exit and entry points

Offtake to Joint Exit Zone, DMS from DSO's (a mixture of collected and estimated) and nDMS is calculated as a residual (MR minus DMS)

Allocation at the CAP and SAP from previous hours and including hour X.

NDMS SEND 5 TIMES A DAY TO SHIPPERS

- Data are based on a forecast
- One daily value for each allocation area
- Deadline during the gas day: 13:45, 16:45, 19:45, 22:45 and 01:45

HOURLY PROCESS DURING THE GAS DAY (D)

At 06:45 BAM publishes the size of the green zone

At XX:00 DSO´s start to collect DMS data

At every hour from 7:40 to 6:40 shippers will receive their IASB

At every hour from 7:10 to 6:10 BAM publishes ASB

At XX:30 to XX:00 DSO´s continue to collect DMS data

At XX:30 BAM receives DMS data

At every hour from XX:10 to XX:35 BAM trades at the withinday market at EEX - if ASB is in the yellow zone

AFTER THE GAS DAY (D+1)

- The BAM will send the preliminary allocation to shippers between 11:15 and 14:00.

- The preliminary allocation will, all things being equal, be close to the IASB shippers received 6:40

AFTER THE MONTH (M+1)

- The BAM will send the valid allocation to shippers as to day

- Shippers will receive either a credit note or an invoice with daily cash-outs. Pricing will be as to day – except step 2 price.

- Shippers allocated at the CAP will receive either a credit note or an invoice with the marginal trade price for each specific hour.

Balancing

Purchase and sale of balancing gas for daily imbalances (cash out)

Definition of neutral price for balancing gas:
The within-day reference price at ETF on EEX, expressed in DKK/kWh.

 - Resulting price converted into DKK/kWh using the daily exchange rate as published by Danmarks Nationalbank (the Danish Central Bank)

Purchase price for balancing gas

Adjustment price:
When neutral gas price is positive: Neutral gas price minus 0.5 % of the neutral gas price
When neutral gas price is negative: Neutral gas price plus 0.5 % of the neutral gas price

- **Marginal purchase price:** Lowest price of either 1) lowest traded price by Energinet in the yellow zone during the relevant gas day, or 2) the adjustment price.

Sales price for balancing gas

Adjustment price:
When neutral gas price is positive: Neutral gas price plus 0.5 % of the neutral gas price
When neutral gas price is negative: Neutral gas price minus 0.5 % of the neutral gas price

- **Marginal sales price:** Higest price of either 1) highest traded price by Energinet in the yellow zone during the relevant gas day, or 2) the adjustment price.

In situations of "Early Warning", "Alert" or "Emergency", the percentages of adjustment price can increase up to 100%.

Purchase and sale of gas for hourly balancing obligation*

Purchase price

- Marginal purchase price: Lowest traded price by Energinet in the yellow zone during the relevant hour.

Sales price

- Marginal sales price: Higest traded price by Energinet in the yellow zone during the relevant hour.

Definition of European Spot Index price

The day-ahead reference price at ETF on EEX, epressed in DKK/kWh.

NO PUNISHMENT PRINCIPLE

Is only relevant for shippers who have offtake to the Joint Exit Zone. Shippers will be affected by No Punishment Principle if the valid allocation for offtake differs from the preliminary offtake.

Hourly Balancing obligation	Daily imbalance charge (Cash-out)
• The quantity allocated at the CAP in the specifik hour will remain unchanged.	• The daily imbalance quantity may change
• The price will either be marginal price or the European Spot Index on ETF.	• The price will either be the relevant imbalance price as set out in the price list or the neutral gas price (NG for wrong quantitues)
• Examples: (Positive CAP examples)	• Examples: (Shipper beeing short)

Hourly Balancing obligation examples:

If preliminary CAP = valid CAP	Marginal price on full quantity
If preliminary CAP < valid CAP	Marginal price on preliminary quantity
If valid CAP = 0	European Spot Index price
If preliminary CAP > valid CAP:	European Spot Index for the difference. Marginal price for the rest.

Daily imbalance charge examples:

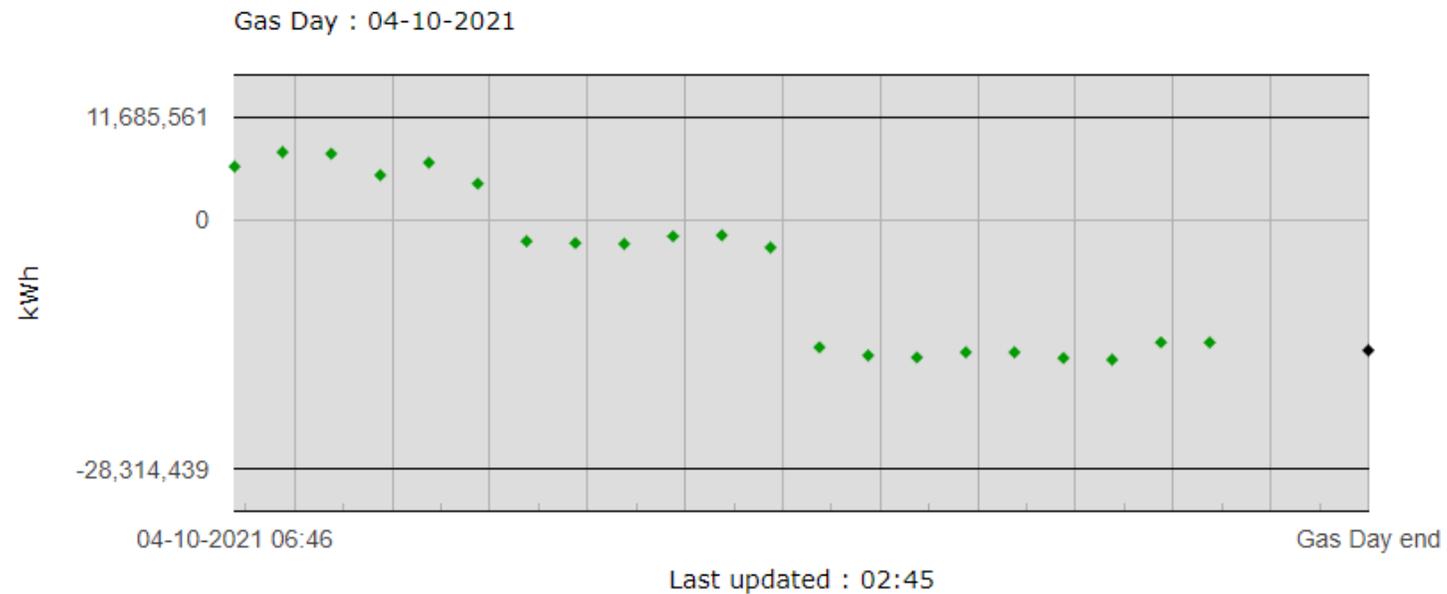If valid JEZ volume > preliminary JEZ volume = Cash-out quantity increases

If valid JEZ volume < preliminary JEZ volume = Cash out quantity decreases
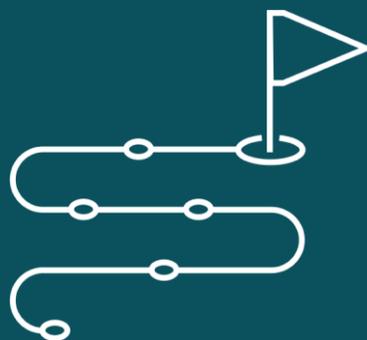
DATA AND QUALITY

BALANCING MODEL EXISTING VS FUTURE

1. Both regimes are daily settled

2. Future model has Within Day Obligations

3. Future model is accumulated over the day

Gas Day : 04-10-2021

Last updated : 02:45

DATA QUALITY

1. The need for good data is essential for the shippers to balance their portfolio and it brings credibility to the market

2. The BAM whishes a data quality, expressed in a difference on no more than max. 10% deviation in the first hour of the gas day, declining to max. 3 % pr. hour after 6 accumulated hours and 3% all the following accumulated hours for the rest of the gas day.

3. The data quality is calculated based on the DMS data measured/estimated and accumulated during the gas day and the actual valid allocation end of month

4. Data quality is calculated at a regional level, to ensure data quality across the market area

time1: 10%
time2: 8%
time3: 6%
time4: 5%,
time5: 4%
time6: 3%
time7: 3%
....
time24: 3%

Limits for deviation

Simulationsresultat med
25 min til hjemtagning
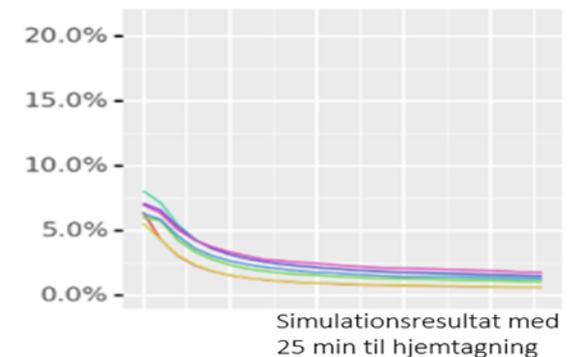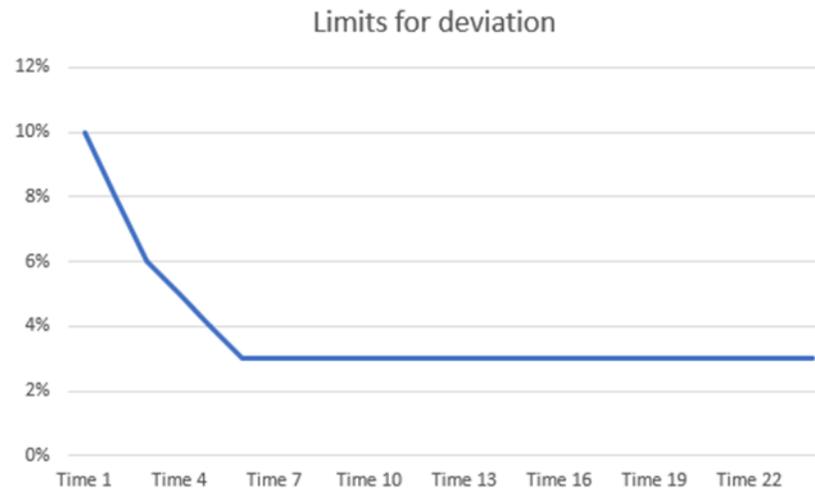
DATA QUALITY

- The adjustment from the previously communicated 10% - 5% is due to the fact that the DSO's has been given 10 extra minutes every hour to collect data

- The regional approach is introduced to try to mitigate any possible differences in data quality across the gas market

- Energinet has the legal basis to demand a certain level of data quality in Denmark (copied to Sweden)

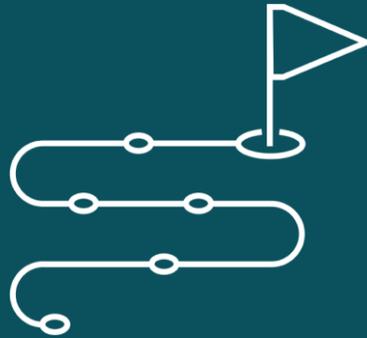- The results will be published on a monthly basis
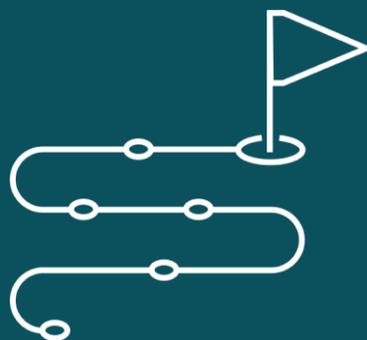
FUTURE GREEN ZONE

GREEN ZONE

1. Asymmetric green zone removed

2. Symmetric green zone introduced

3. Supports the market, specially in the first hours

4. Lowers the uncertainty of how the green zone looks in the beginning of the day
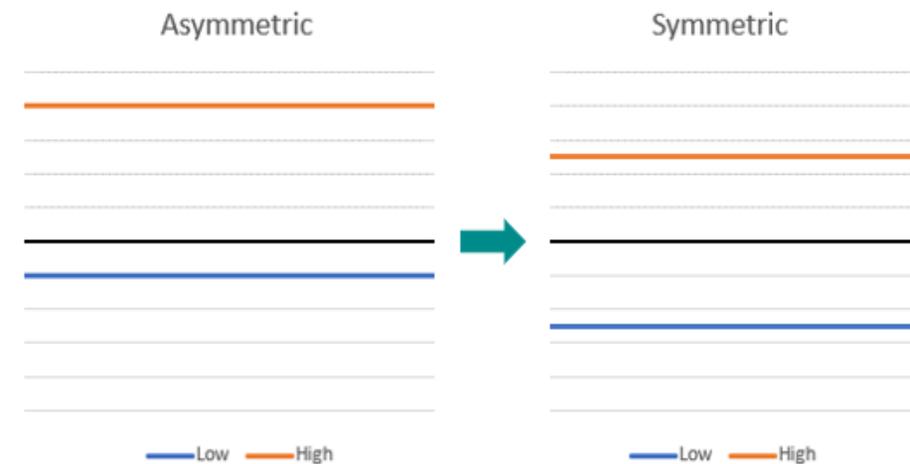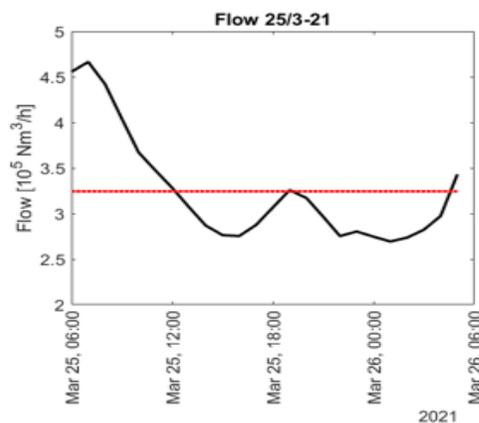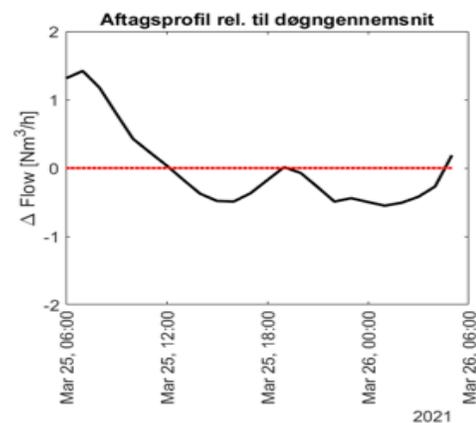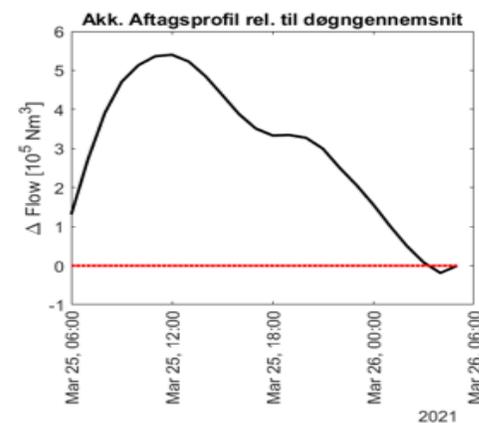
SMOOTHING

SMOOTHING

1. Profile vs daily flat

2. Hourly imbalances when flowing flat profile = total offtake – avg.(total offtake)

3. Accumulated hourly imbalance through the day

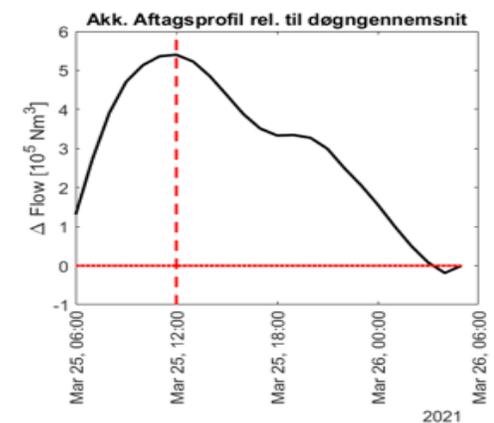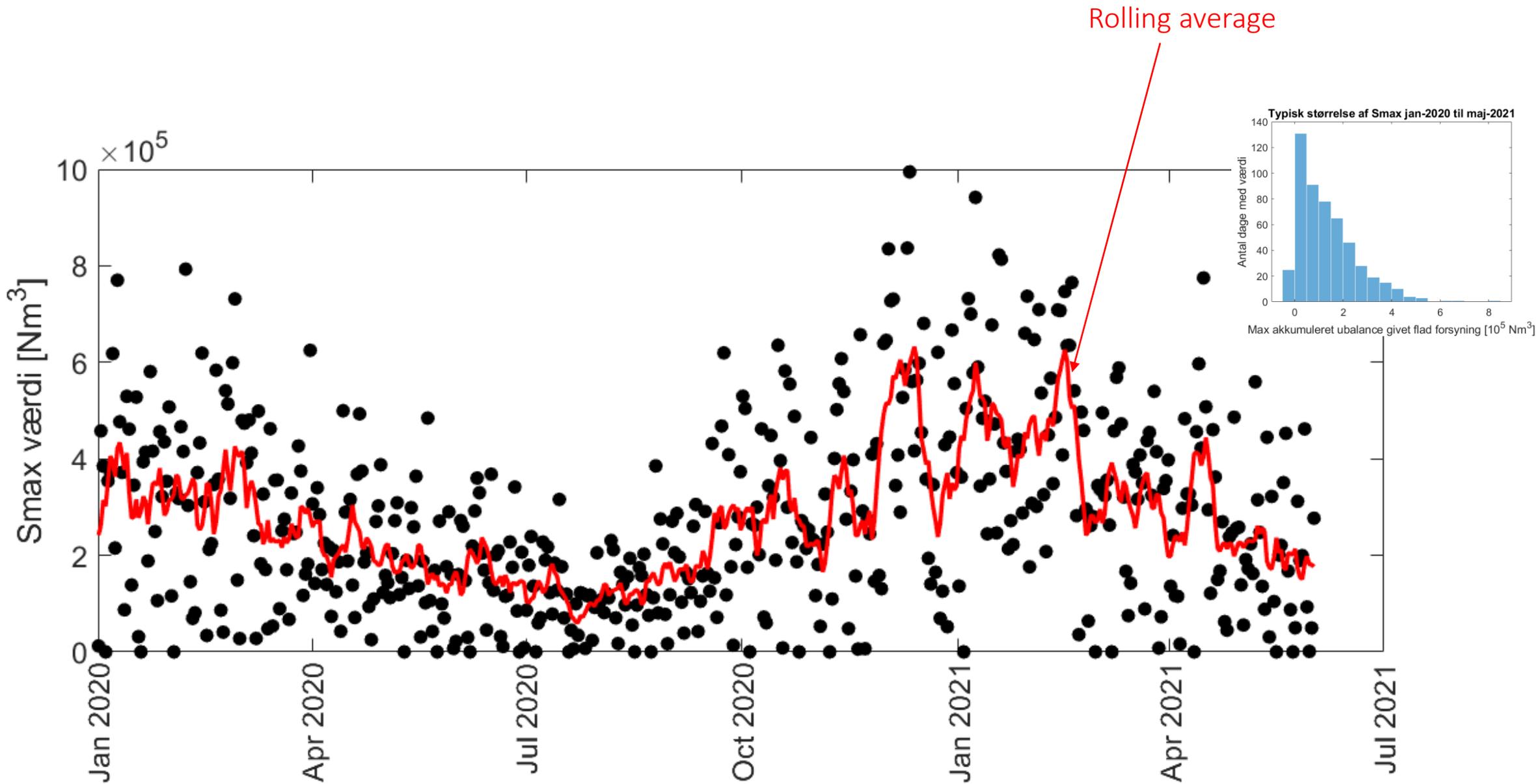4. S-Max (maximum value of accumulated imbalances)

Rolling average

Typisk størrelse af Smax jan-2020 til maj-2021

Smax værdi [Nm³]

Antal dage med værdi

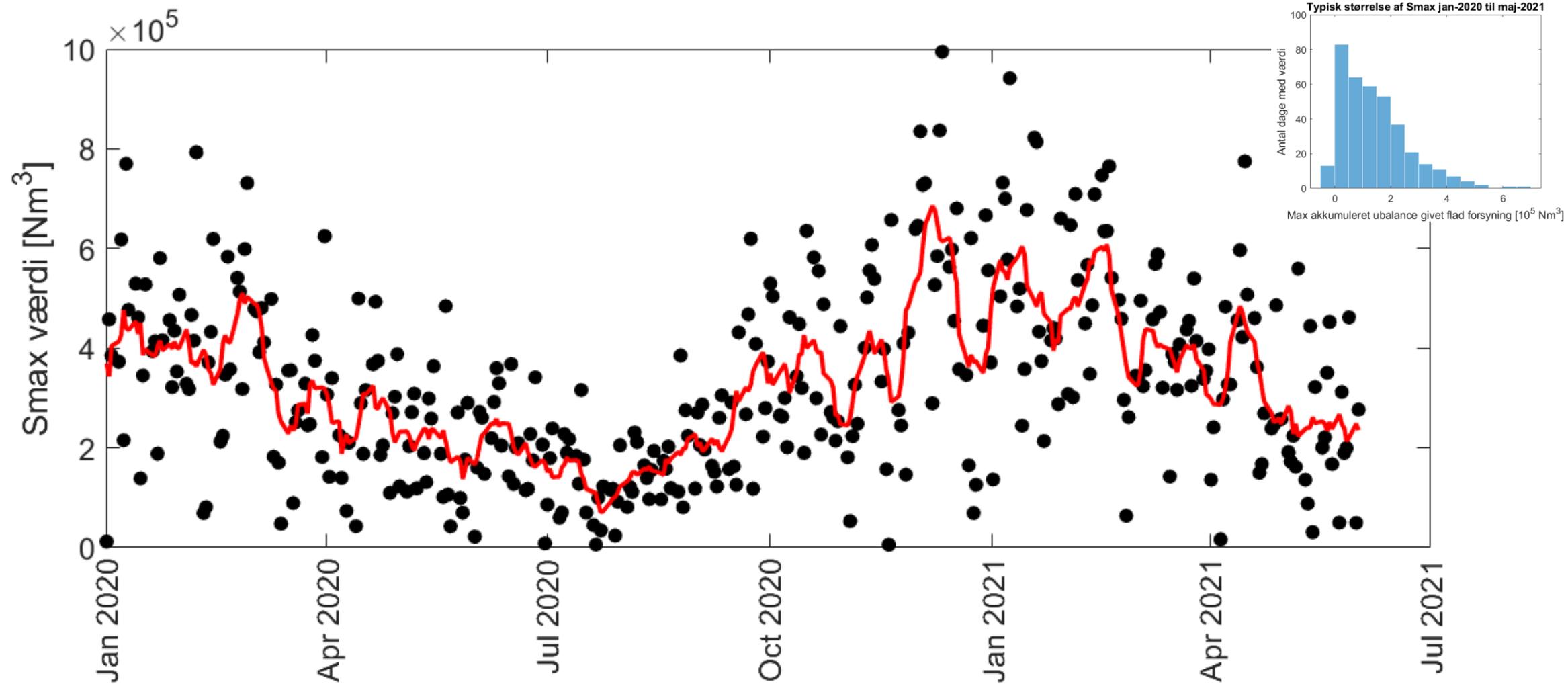Max akkumuleret ubalance givet flad forsyning [10⁵ Nm³]

ENERGINET

SMOOTHING PROCEDURE
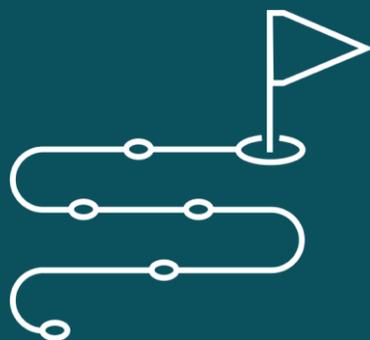
1. SAP nomination point in the market model

2. Shippers active in JEZ can nominate at the SAP point

3. S-Max for the whole system set by BAM for a given period

4. Customers individual S-Max is calculated daily and distributed by BAM

5. Nomination between 13:00 and 04:00 D-1

6. Any unused smoothing allocation is calculated into the green zone

FALLBACK PROCEDURES AND CONTROL MECHANISM

FALLBACK DATA

General principles

- In case of missing data from DSO's, the BAM will use fallback data

- Fallback data will be the most relevant data previously successfully received

- In most cases data 7 days ago will be the most relevant fallback data to use
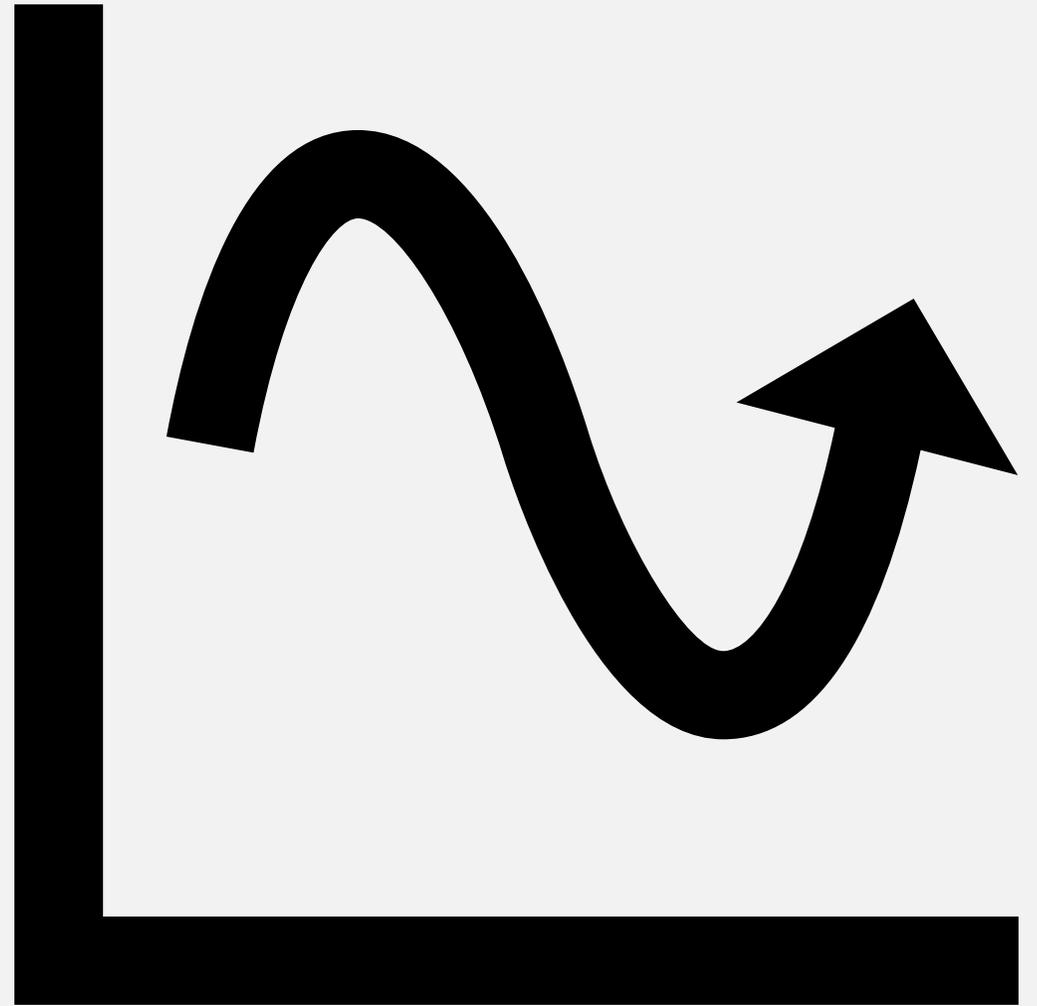
ESTIMATIONS VS. METERED VALUES

General principles

- Every hour, the Danish and Swedish DSO's will send a mix of metered and estimated values for the DMS offtake

- The DSO's will send a signal together with the data, indicating how large a portion of the data is based on actual measurements, and how large a portion is estimated

- These signals will be forwarded to the market participants, for them to make their own evaluation on expected data quality level

- Will require experience to evaluate how to interpret the signals
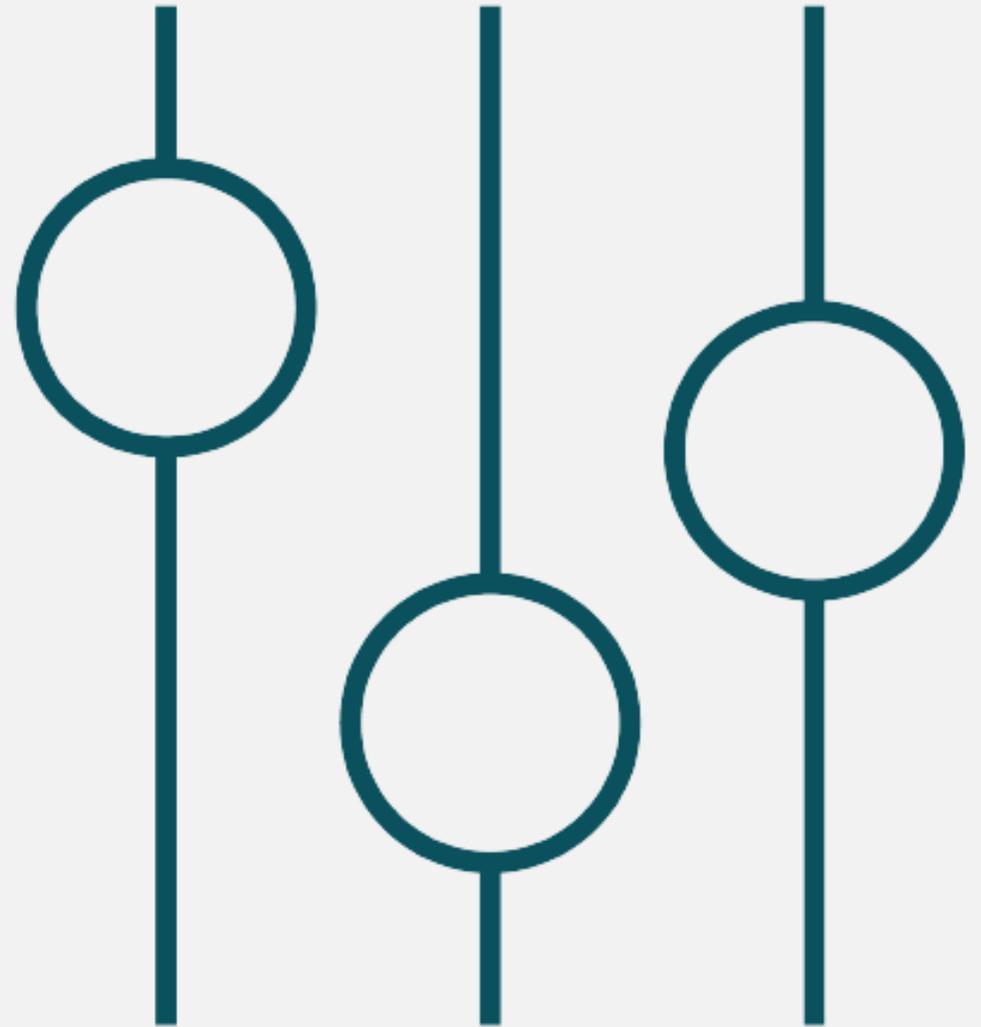
CONTROL MECHANISMS

- In general, Energinet is working on replacing its old backend system with a new and modern system towards 1 October 2022

- This will include new possibilities to notify specific persons, in case of faulty or missing data

- Both Evida and Nordion are working on similar projects, to replace or update old IT-systems

- Also, the BAM will calculate the data quality level per hour, which will be published on a relevant website after each month
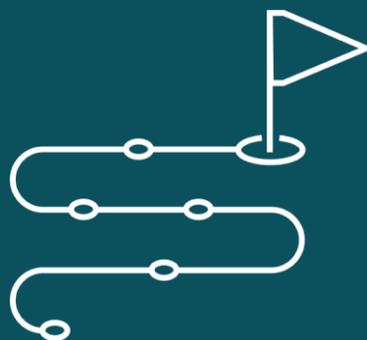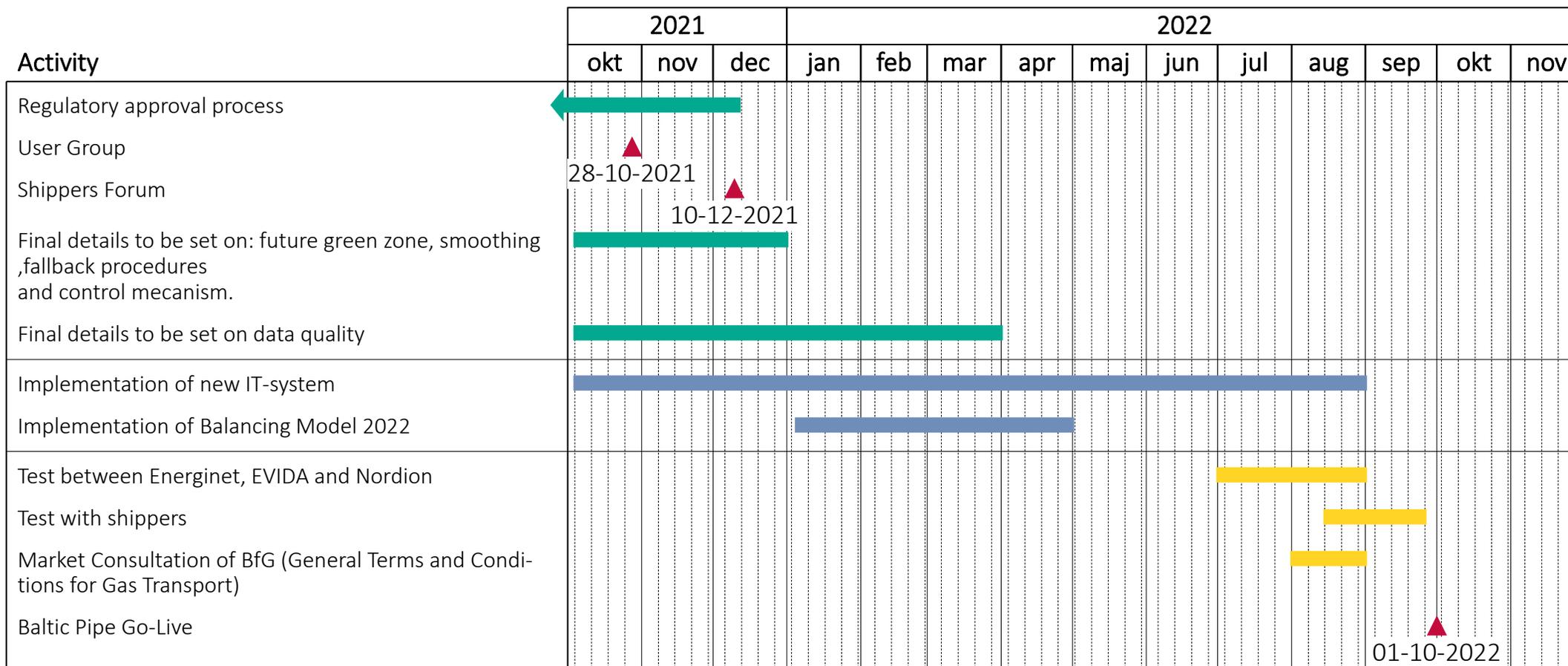
NEXT STEPS

TIME LINE VERSUS NEXT STEPS

Next milestone is decision from the regulators in Sweden and Denmark mid-December

Activity	2021			2022										
	okt	nov	dec	jan	feb	mar	apr	maj	jun	jul	aug	sep	okt	nov
Regulatory approval process														
User Group		28-10-2021												
Shippers Forum			10-12-2021											
Final details to be set on: future green zone, smoothing ,fallback procedures and control mecanism.														
Final details to be set on data quality														
Implementation of new IT-system														
Implementation of Balancing Model 2022														
Test between Energinet, EVIDA and Nordion														
Test with shippers														
Market Consultation of BfG (General Terms and Conditions for Gas Transport)														
Baltic Pipe Go-Live													01-10-2022	

QUESTIONS

Contact: cru@energinet.dk jlo@energinet.dk or slr@energinet.dk