

An abstract geometric pattern of thin teal lines forming a complex, interconnected network of triangles and polygons, located in the top-left corner of the page.

SHIPPERS' FORUM

14 September 2023

PROGRAM

- 08:30 Arrival and breakfast
- 09:00 Welcome – *Clement Johan Ulrichsen, Energinet*
- 09:10 European gas sector, - *Torben Brabo, Energinet, GIE, ENTSOG, Prisma*
- 09:45 Future gas market – *Jens Kersting, RWE Supply & Trading*
- 10:00 A “German” view on the Danish market for offshore wind and H2, *Thomas Hwan Jensen, RWE Renewables*
- 10:20 The Danish Utility Regulator – *Birgitta Bundgaard, Danish Utility Regulator*
- 10:35 BREAK
- 10:50 Gas Storage Denmark – *Iliana Nygaard, Gas Storage Denmark*
- 11:05 Supply situation – *Christian Meiniche Andersen, Energinet*
- 11:20 Scenarios and potential risks to gas supply security - *Jane Glindvad Kristensen, Danish Energy Agency*
- 11:35 Balancing and invoicing – *Signe Louise Rasmussen, Energinet*
- 11:50 Remarks – *Clement Johan Ulrichsen, Energinet*
- 12:00 LUNCH
- 13:00 Guided tour
- 14:00 Thanks for today



WELCOME

Clement Johan Ulrichsen, Energinet



Safety Guide



Emergency Exits

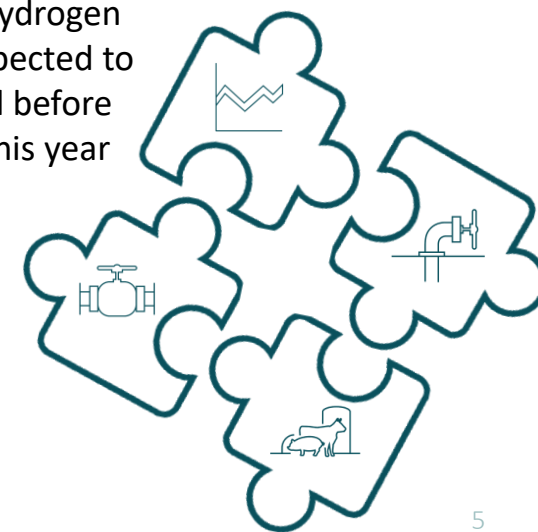
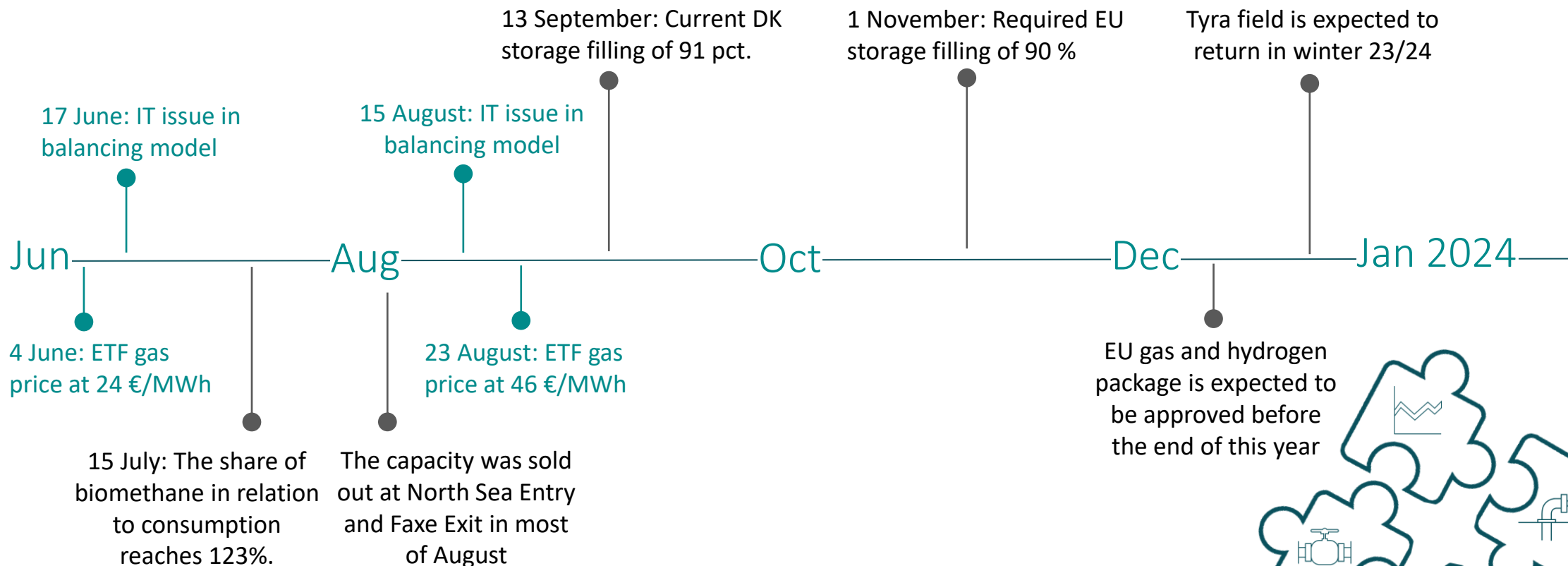


Defibrillator



Gathering Point

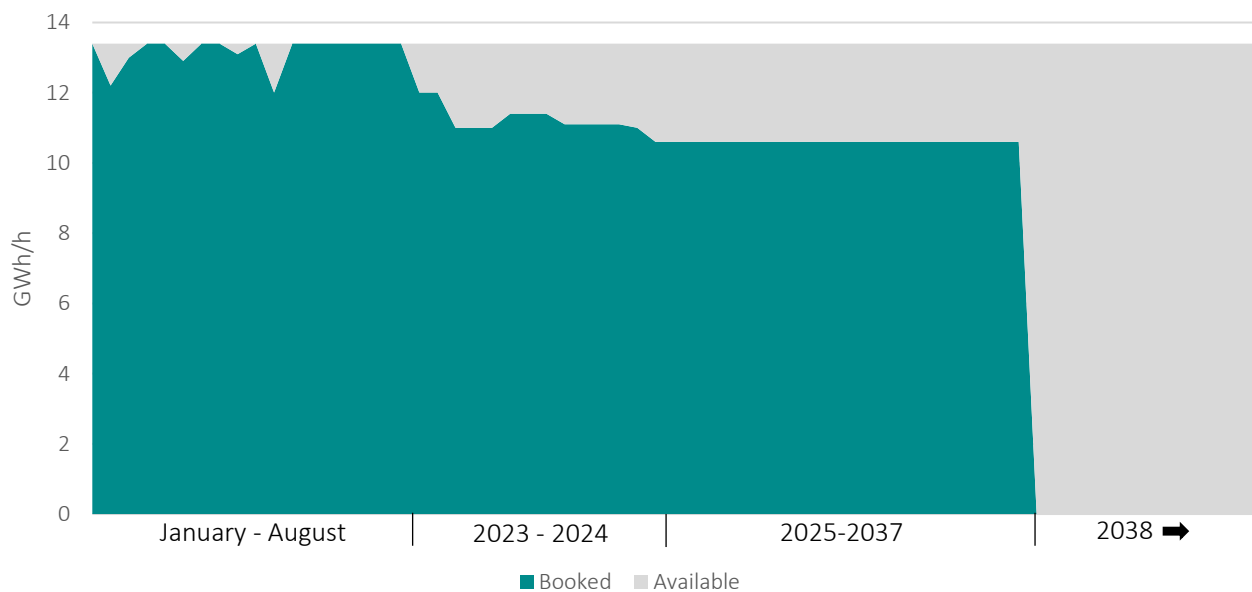
DEVELOPMENTS IN THE GAS MARKET



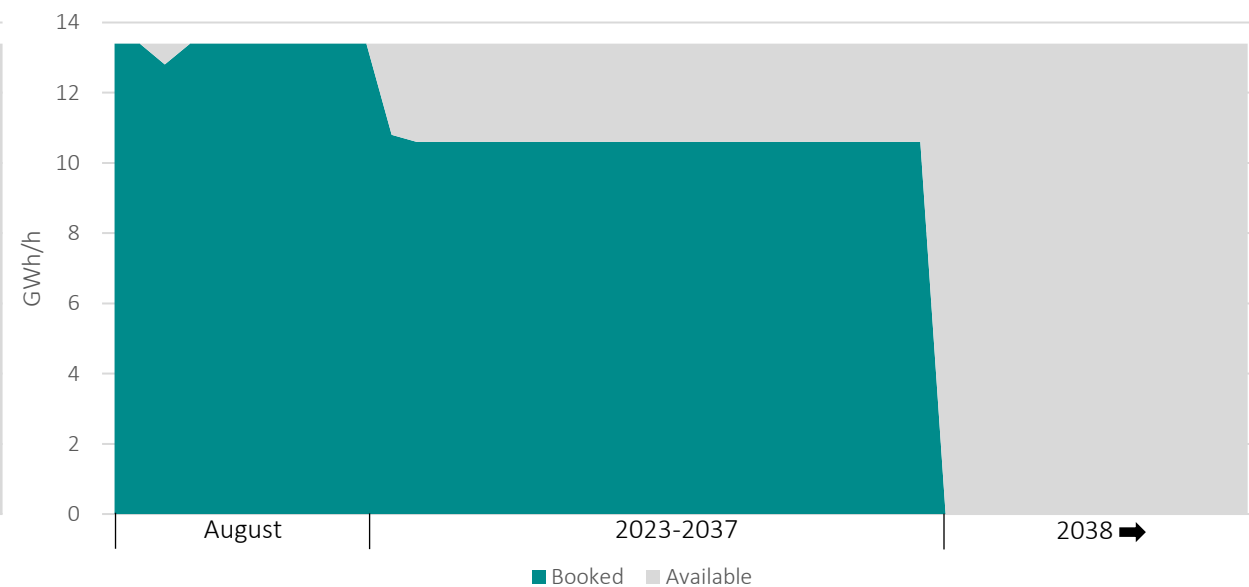
BALTIC PIPE CAPACITY

Recent and future bookings

North Sea Entry - Booked and Available



Faxe Exit - Booked and Available



GERMAN RESTRICTIONS ON SOUTHBOUND ELLUND CAPACITY

LNG facilities in Germany create a bottleneck

- Energinet disagree with Gasunie's decision to restrict Ellund capacity
 - No market consultation or dialogue with Energinet prior to decision
- Energinet have send a 'Letter of concern' to the Danish Utility Regulator
- German Net Development Plan restore the capacity in Ellund – expected in 2026/27
- Until then: Constructive dialogue on finding solutions to the capacity issue – so hopefully both more interruptible and firm capacity can be offered

Capacity in Ellund have been reduced to approx. 0.5 GWh/h
(approx. 33% of necessary capacity*)

* Estimated by Energinet



Source: ft.com

— German bottleneck
→ Import of gas to Northern Germany



EUROPEAN SCENE QUICK OVERVIEW

Torben Brabo, Energinet/GIE/ENTSOG/Prisma

AGENDA

Significant transition

EU legislation

2022-2023 supply and demand

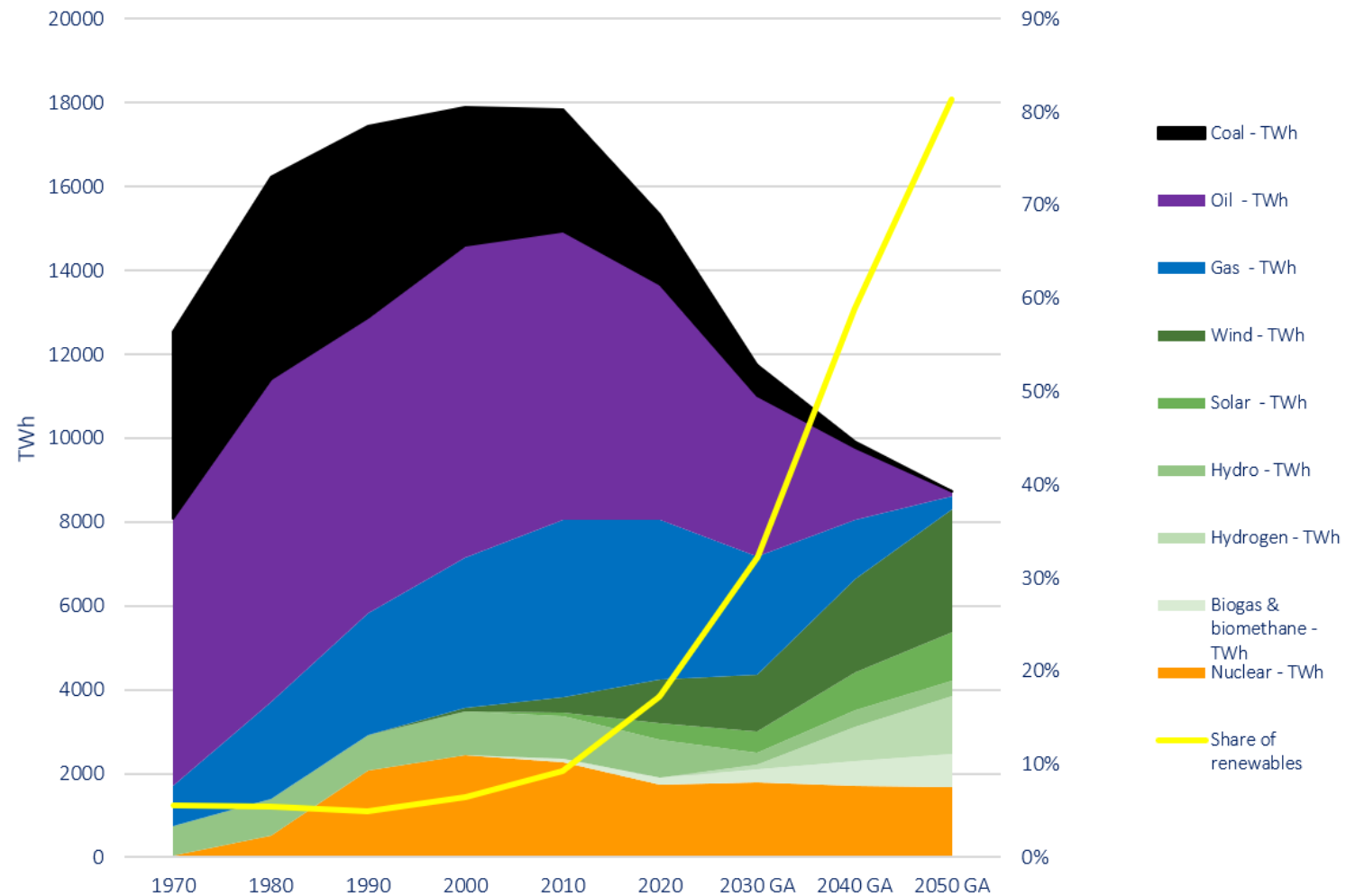
Storages

LNG

Green gasses

Back to the Future


THE EU ENERGY SYSTEM TRANSFORMS

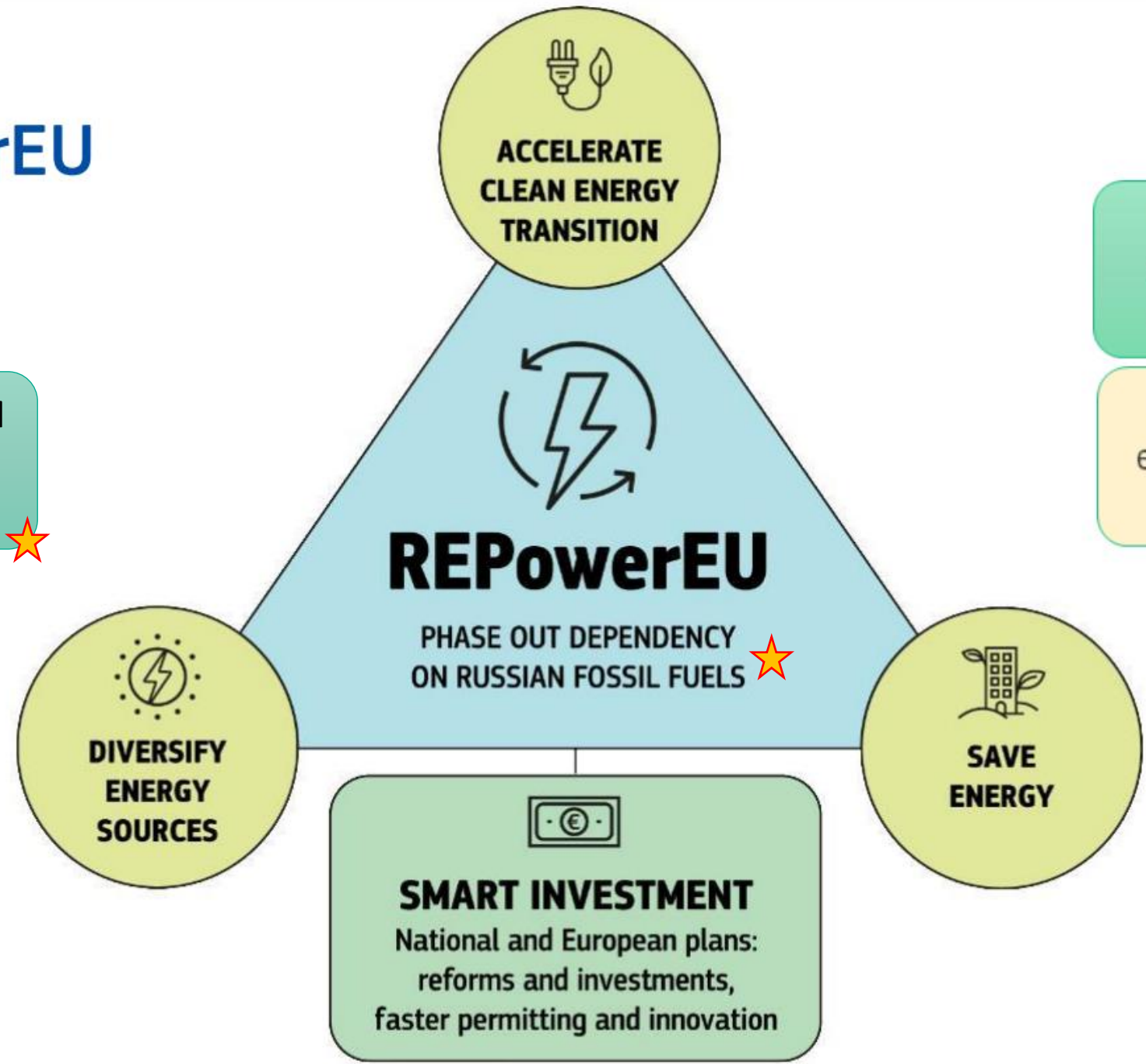


Overview of crisis measures



RePowerEU

Biomethane at 35 BCM and Hydrogen with 10+10 mTon by 2030 



Increase the target of renewable energy from 40% to **45%** by 2030

Increase the target of energy savings from 9% to **13%** by 2030

CURRENT EU AGENDA

As seen by DG Energy

Update of National Energy Climate Plans – NECP (ongoing)

Renewable Energy Directive III – RED3 (2024)

CCUS Strategy and Public Consultation

Decarbonised Gasses and Hydrogen (2023)★

Joint Purchasing – AggregateEU

Net Zero Industry Act - NZIA

Critical Raw Materials Act

Electricity Market Design – EMD (2023)★

EU Emergency regulations

Fast

Political strong

Unity

Acceleration

BUT....

SIGNIFICANT CHANGES IN GAS SUPPLY

Russian (piped) gas down - LNG imports up



LNG take over



New fast LNG terminals



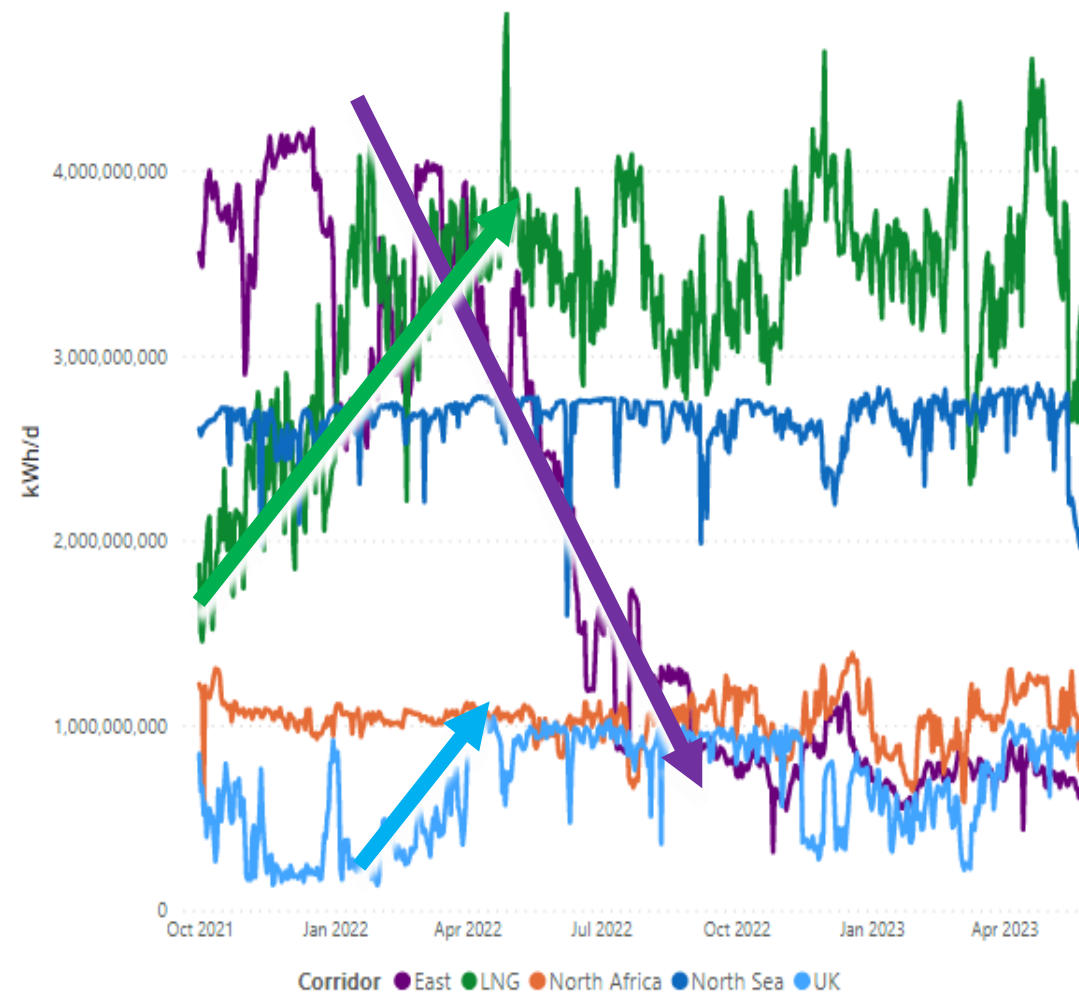
Demand reduction

Still Russian gas at 24-35 BCM/A

West-East bottlekneks

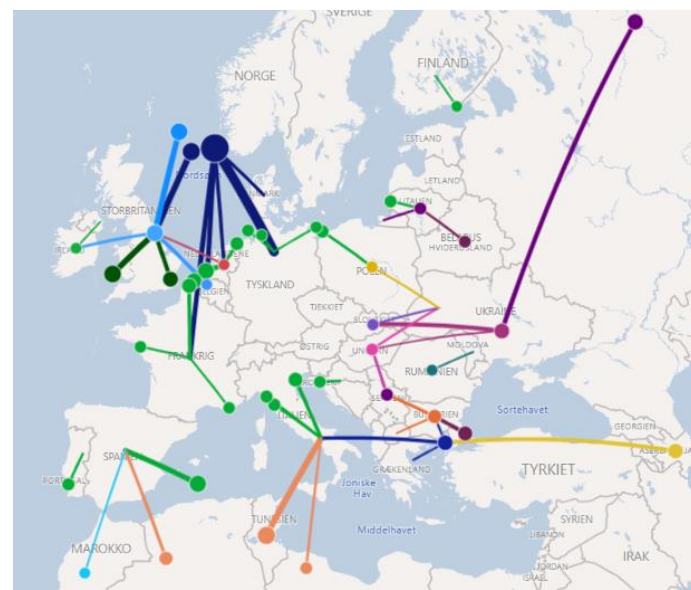
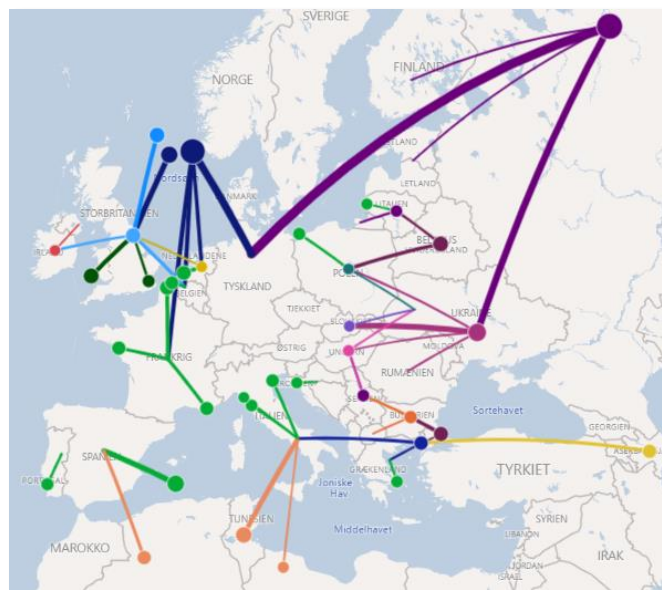
Demand destruction

New Routes 
 Changed capacities

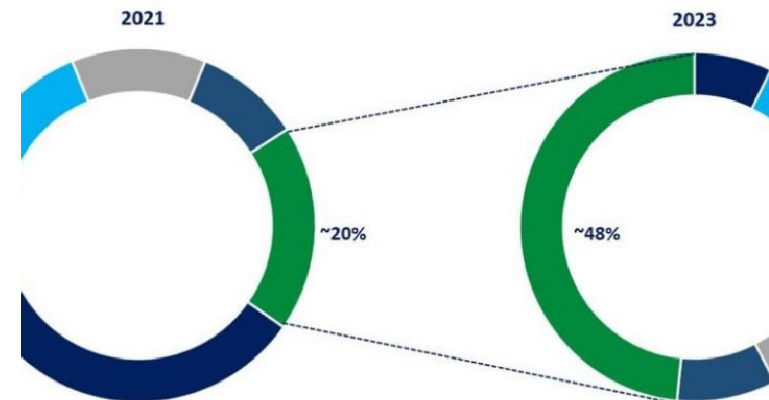


A HUGE SHIFT IN PARADIGM

Routes and exposure on spot prices



Pipe2pipe => LNG2pipe



LNG short term

Market pricing (spot related) ★

Save Gas for a Safe Winter

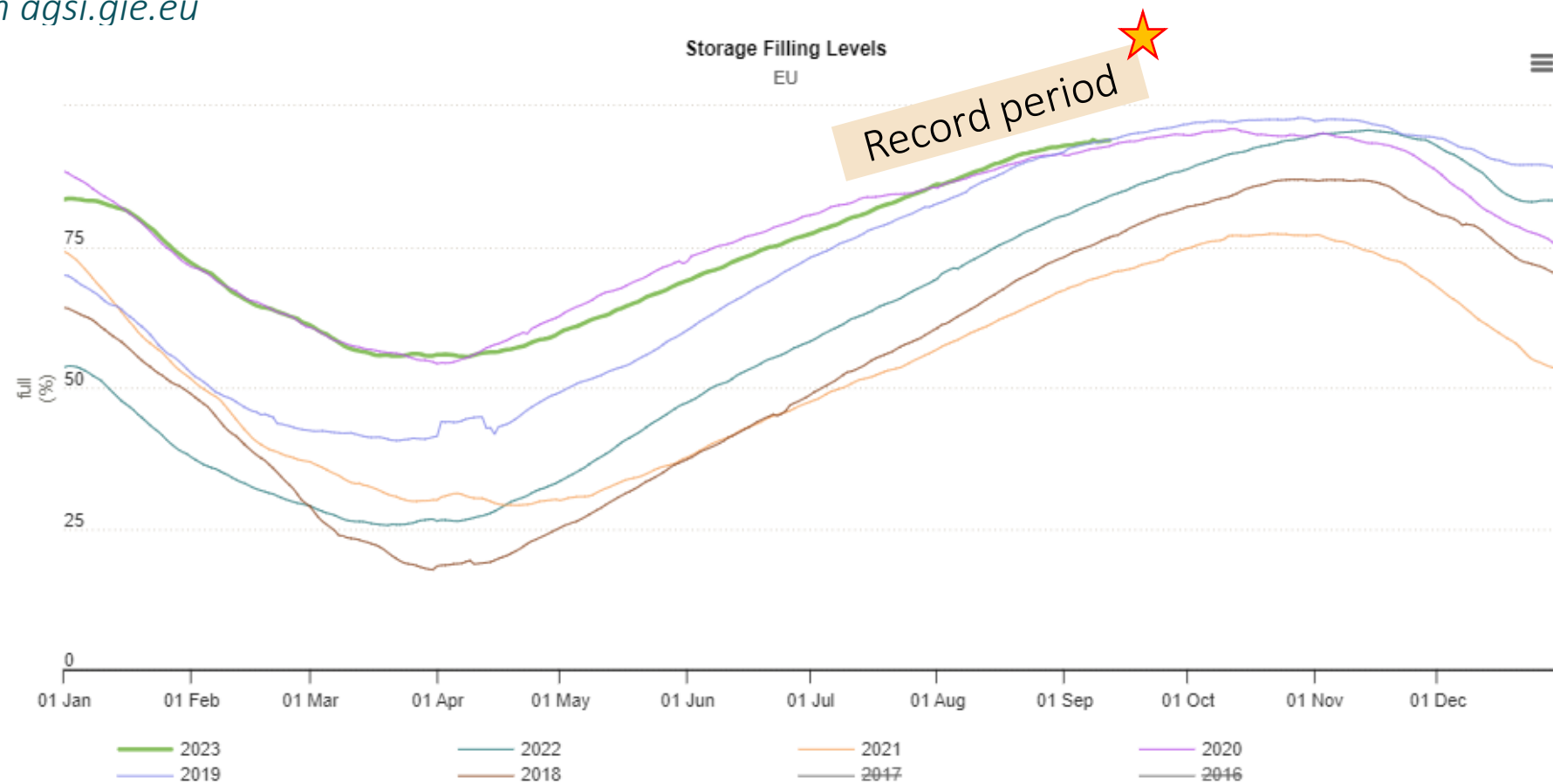


★
53 bcm saved
between 1 August
and 31 March

- **20 July 2022:** Commission proposal for the Demand reduction regulation (Art. 122)
- Objective of **voluntary gas demand reduction** by 15% between August 2022 and March 2023
- Reduction achieved of **18%**, saving 53 bcm
- **30 March 2023:** Formal adoption of the voluntary 15% of demand reduction objective's prolongation until March 2024 ★

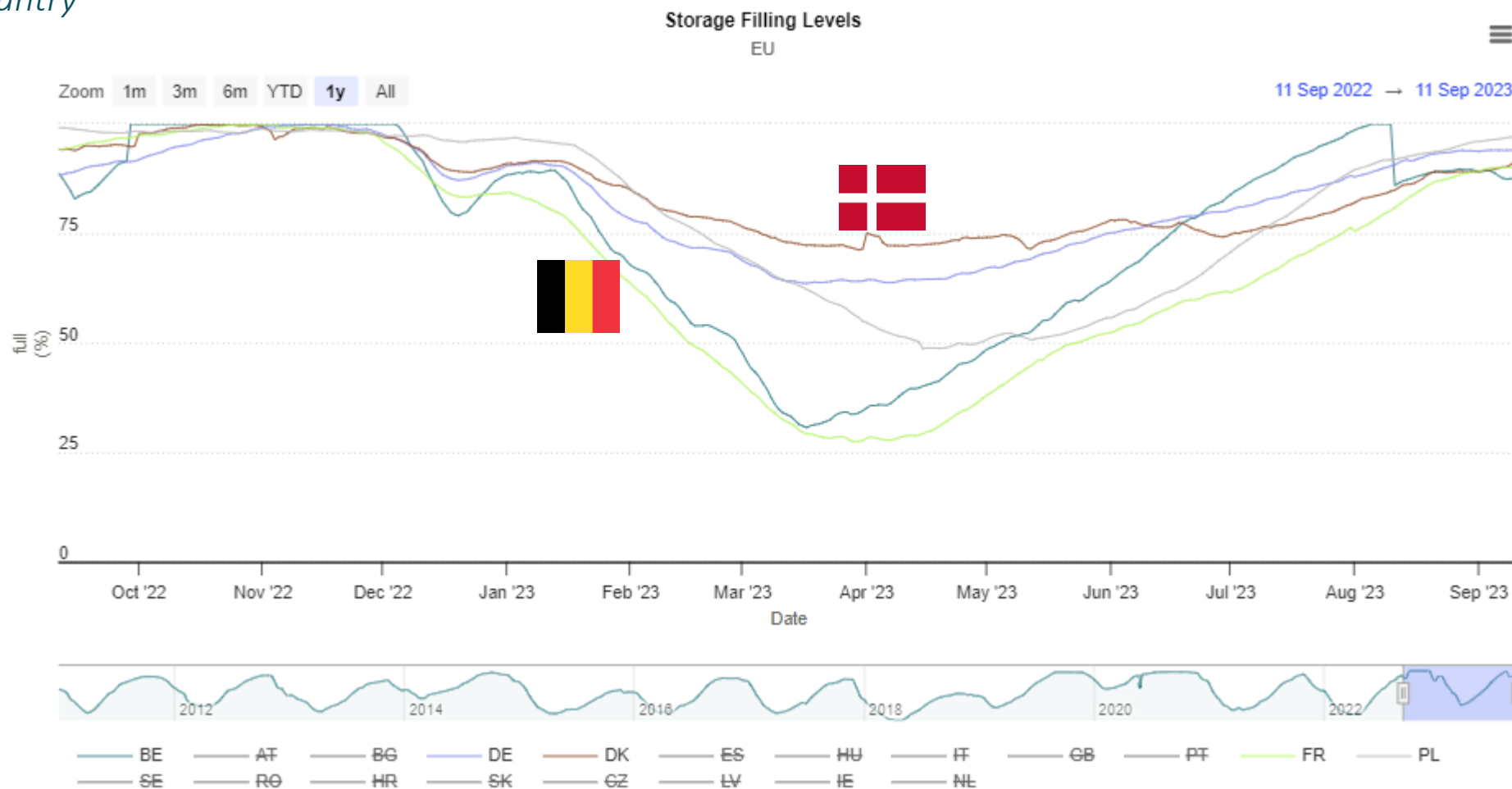
STORAGE FILLING

12.9.2023 from agsi.gie.eu



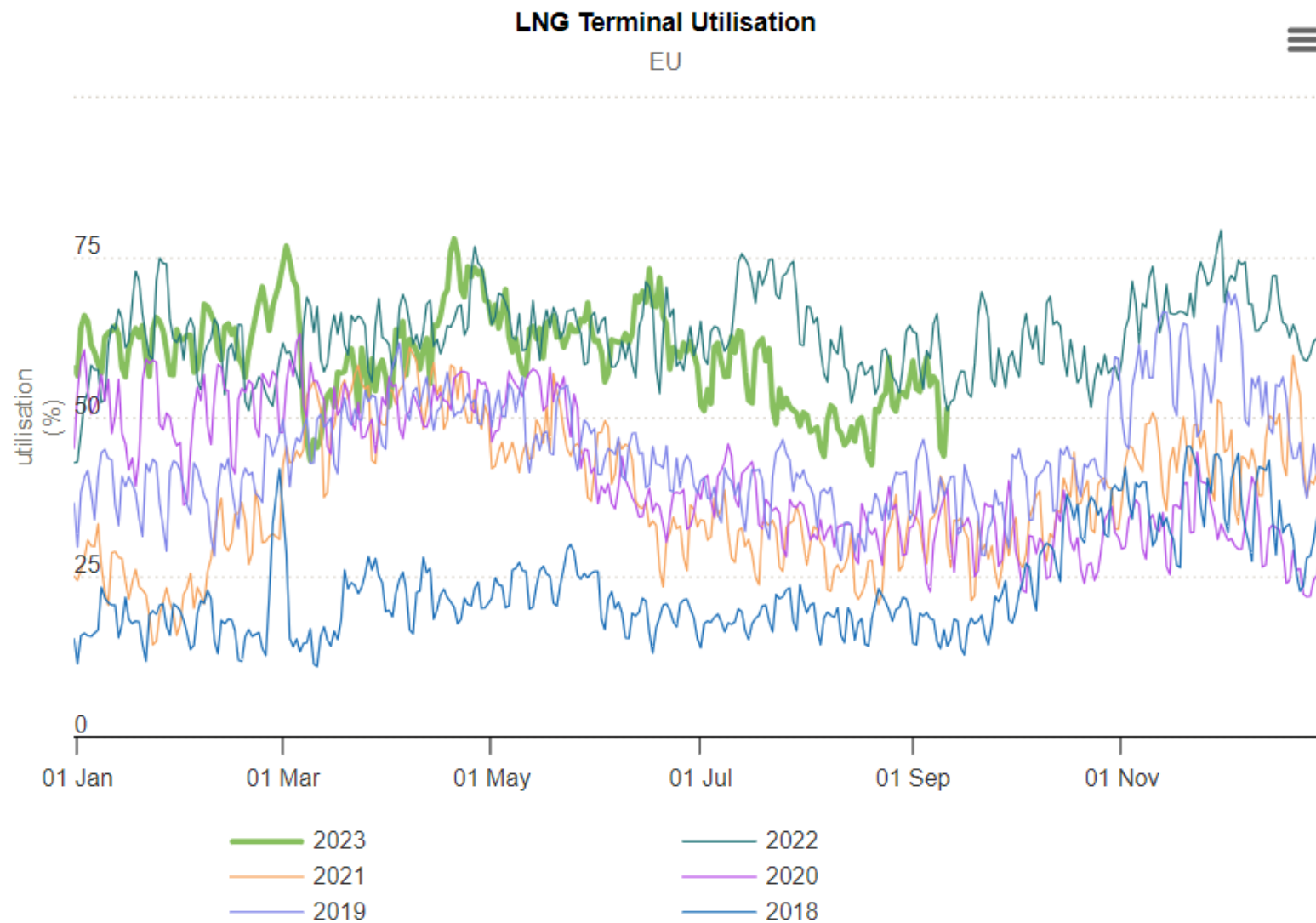
STORAGE FILLING

12.9.2023 by country



LNG IMPORTS

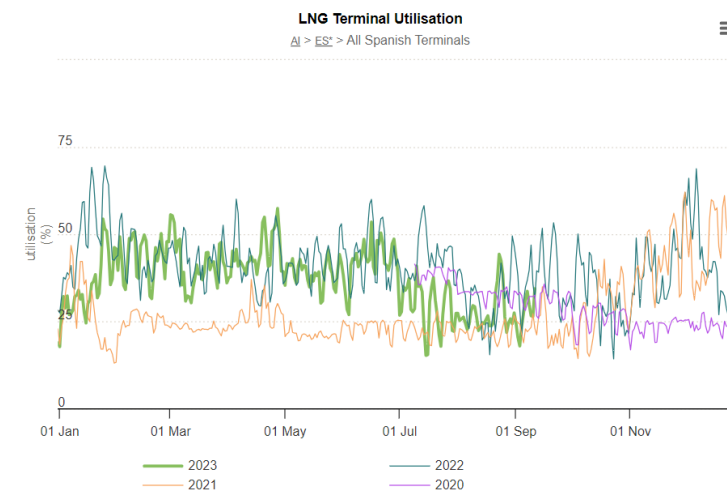
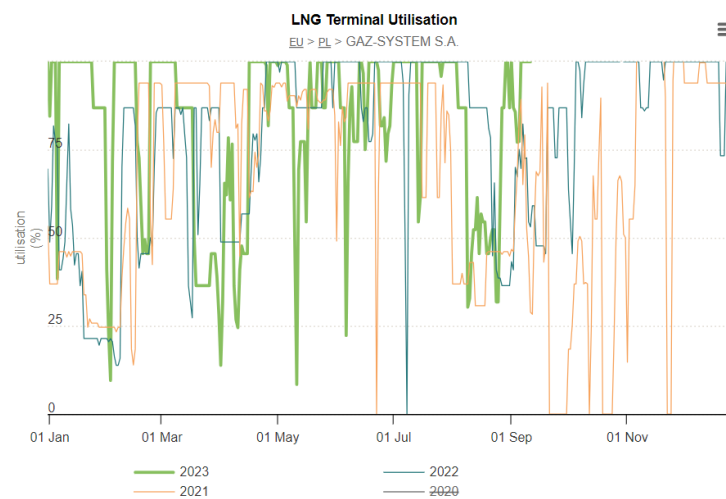
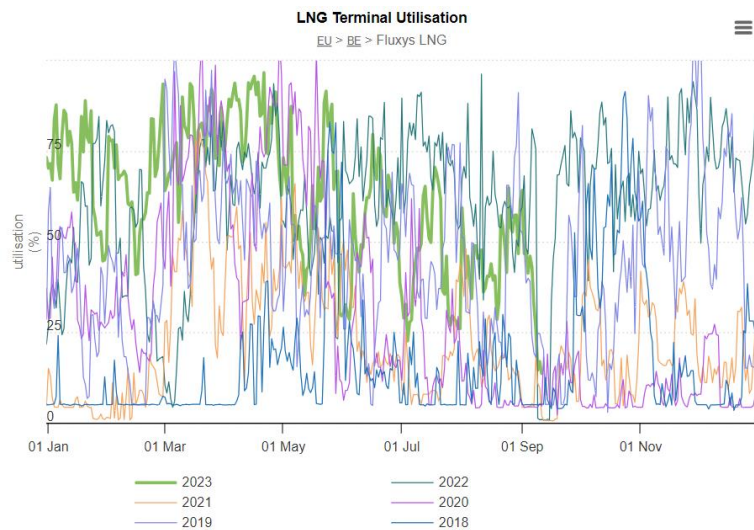
12.9.2023 from alsi.gie.eu



Storages full/Strike

LNG IMPORTS

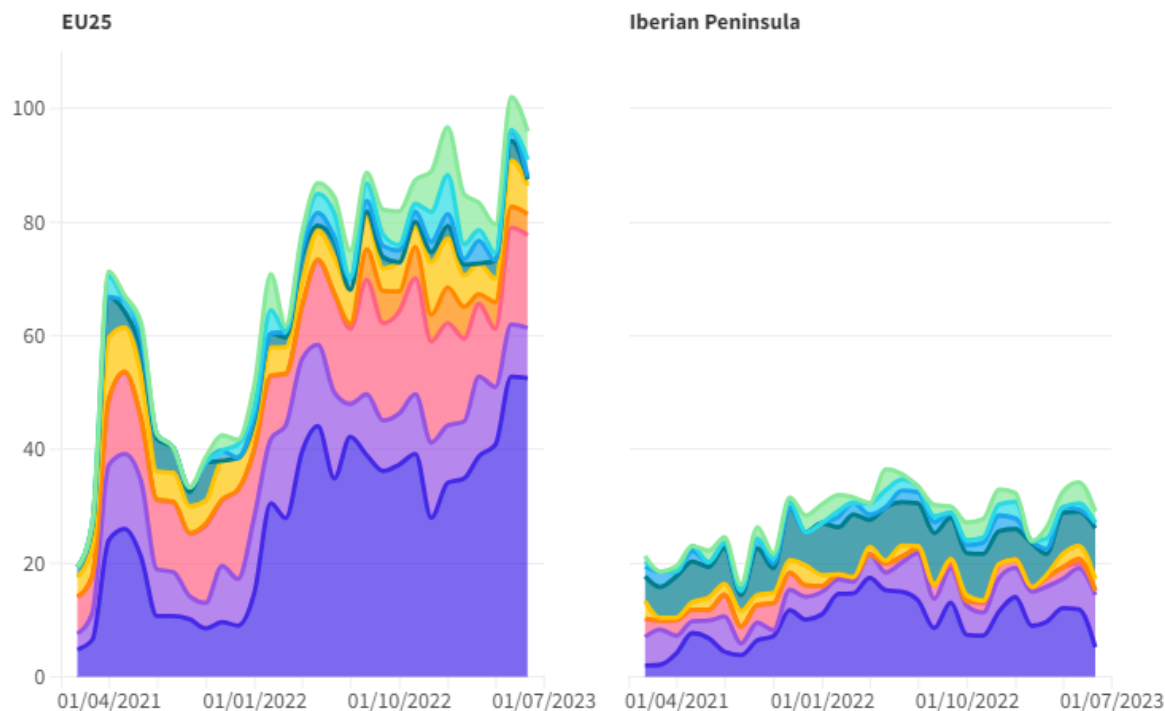
12.9.2023 by country



MORE LNG TO EUROPE FROM WHERE

Monthly LNG, TWh

United States Russia Qatar Norway Algeria Nigeria Trinidad & Tobago Egypt Other

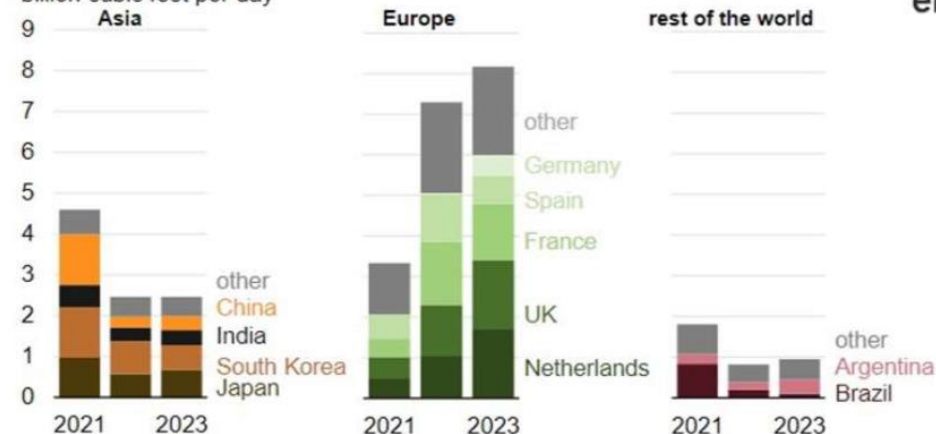


Source: Bruegel on Bloomberg.

Kilde: www.bruegel.org

US export data

U.S. liquefied natural gas exports by destination country (Jan 2021–Jun 2023)
billion cubic feet per day



Data source: U.S. Department of Energy, LNG Reports
Note: Data are annual averages for 2021 and 2022 and the six-month (Jan–Jun) average for 2023.



Geographical coverage

AGSI – ALSI Transparency Platforms 3 hits/sec

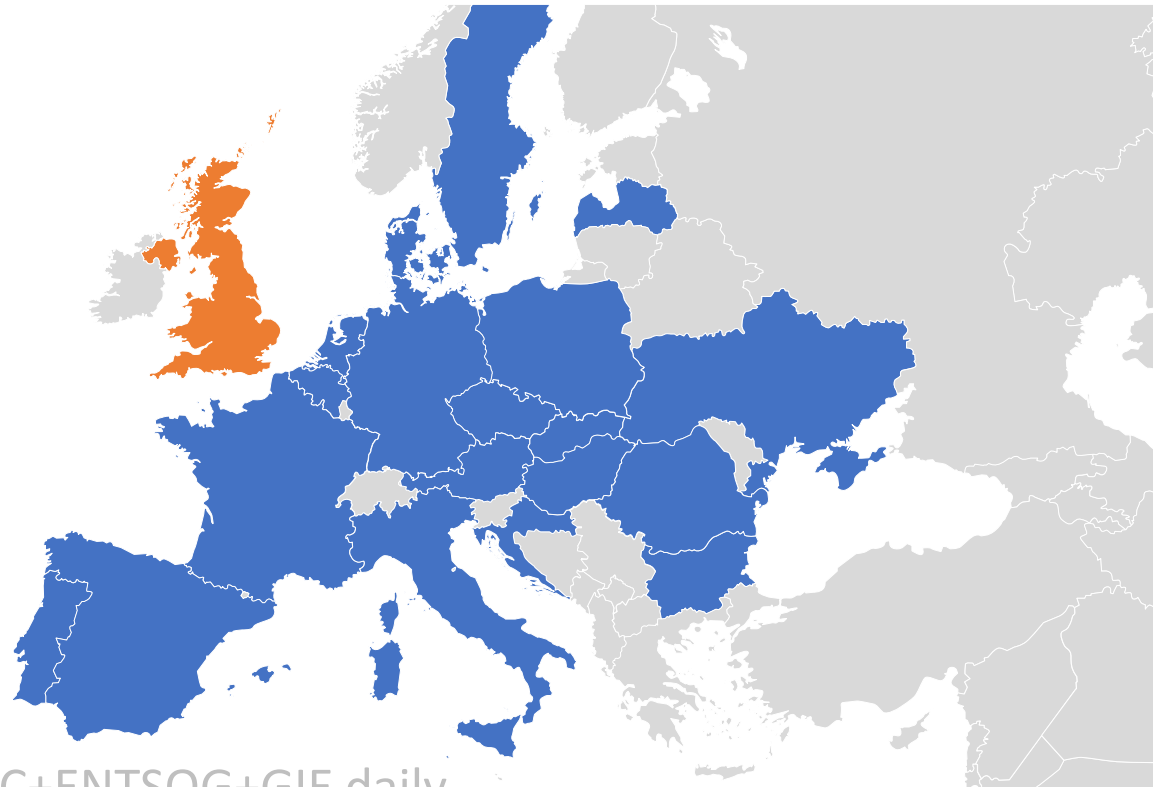
- Full coverage
- Partial coverage
- No coverage



Current data coverage

100% of EU27 SSO

20 hits/minut



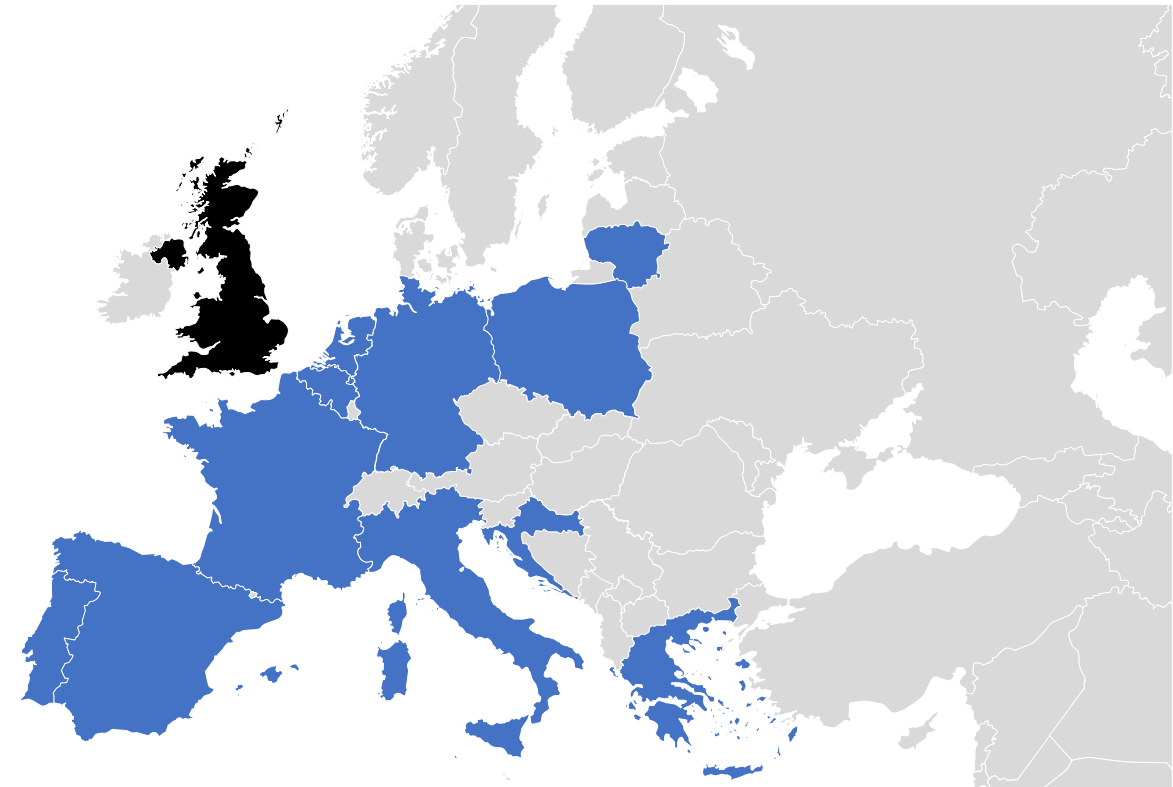
EC+ENTSOG+GIE daily



Current data coverage

100% of EU27 LSO

4 hits/minut



Positive contribution of REMIT

On data quality and coverage of GIE Transparency Platforms

- Daily data reporting to **ACER**
- Daily data publication on **AGSI**
- Direct data provision by **SSO**

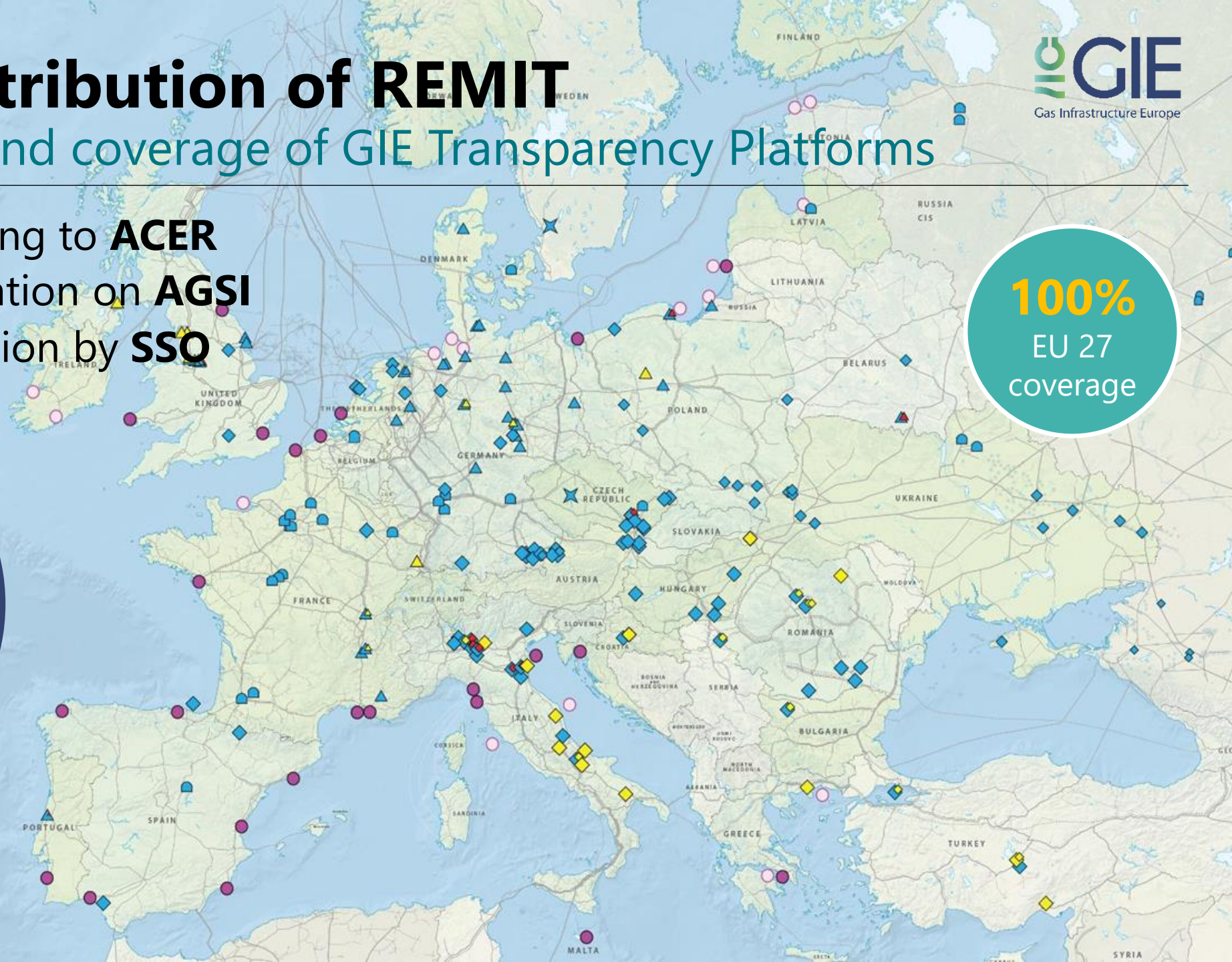
100%
EU 27
coverage


Aggregated Gas Storage Inventory

164 facilities
20 countries

**1 new
facility
in 2023**

WGV
1128
TWh



Positive contribution of REMIT

On data quality and coverage of GIE Transparency Platforms

- Daily data reporting to **ACER**
- Daily data publication on **ALSI**
- Direct data provision by **LSO**

100%
EU 27
coverage







 **ALSI**
Aggregated LNG Storage Inventory

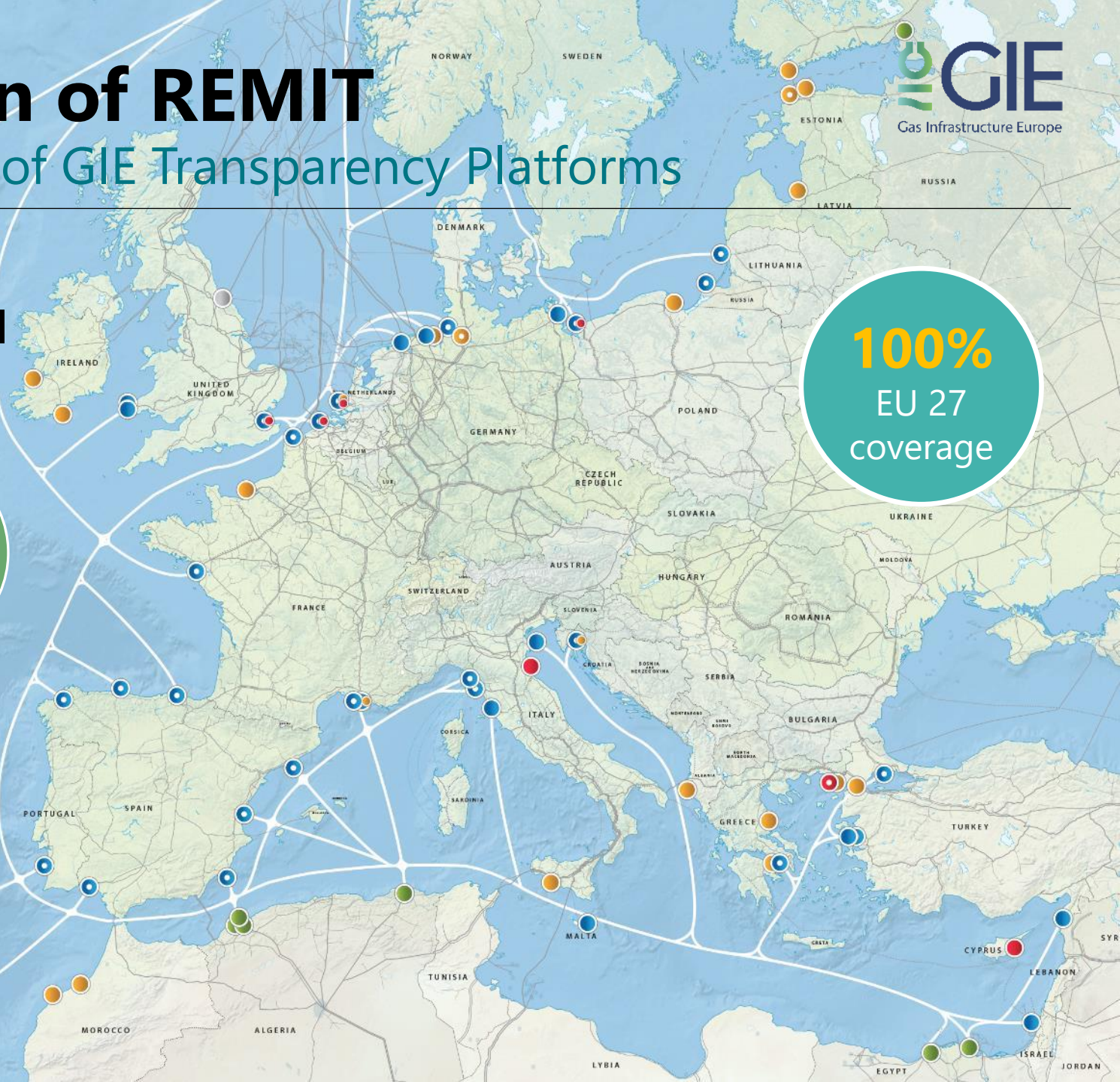
25 terminals
11 countries

STORAGE
53 TWh

SEND-OUT
6 TWh/d

6 new
terminals
in 2023

-  IMPORT / OPERATIONAL
-  IMPORT / PLANNED
-  IMPORT / UNDER CONSTRUCTION
-  EXPORT
-  SUSPENDED
-  SMALL SCALE LNG SERVICES

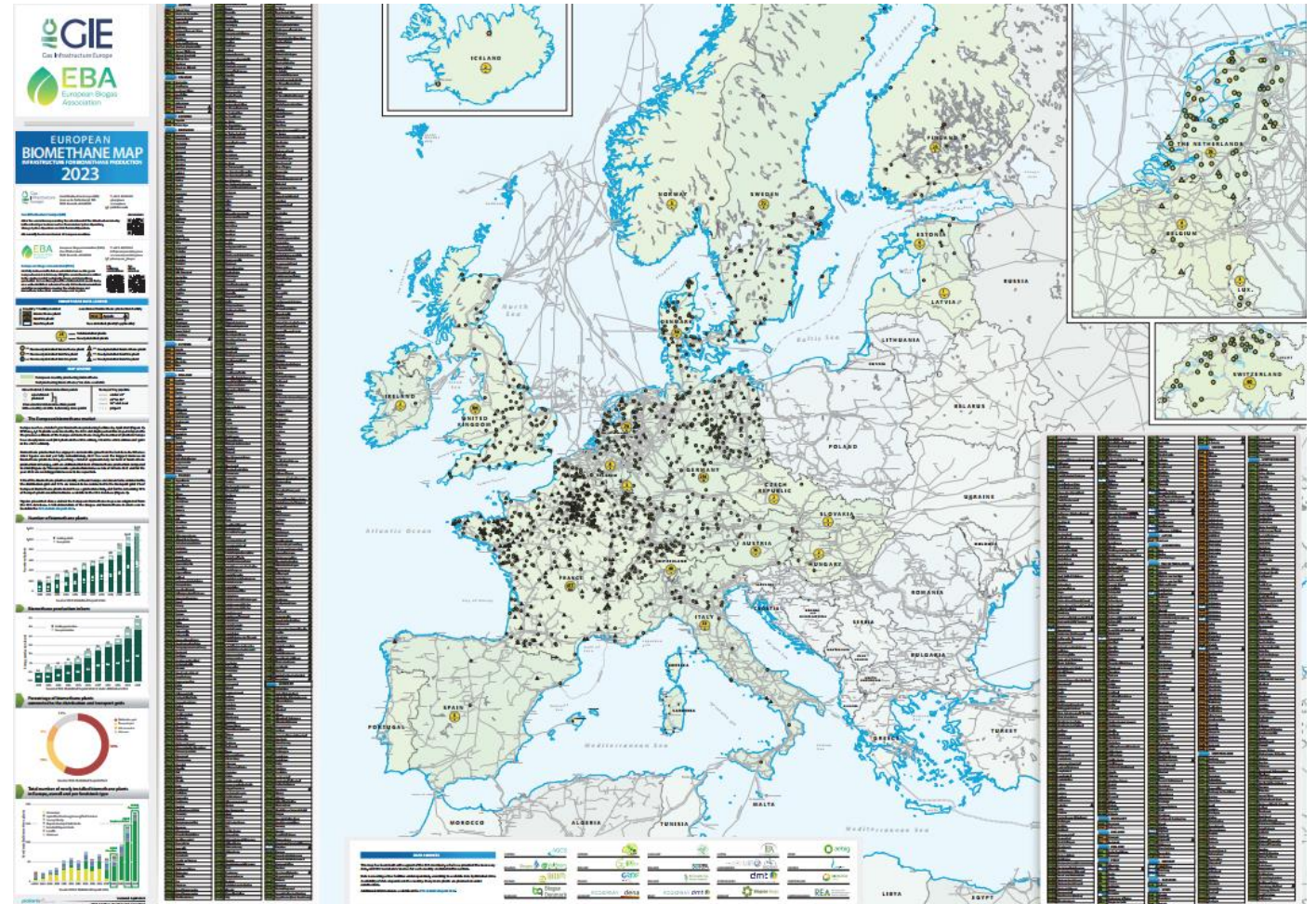


GIE Working Group on Biomethane

GIE EBA Biomethane map 2023



- The 2023 map covers 1322 plants (30% more biomethane plants compared to 2021 edition)
- Active facilities under operation according to the available data by October 2022
- Pdf version and ordering of the print version available at [GIE website](#)
- For more information read the [Press release](#)



Interactive Hydrogen Map

Request from European Commission



➤ ENTSOG + GIE + GEODE + EUROGAS

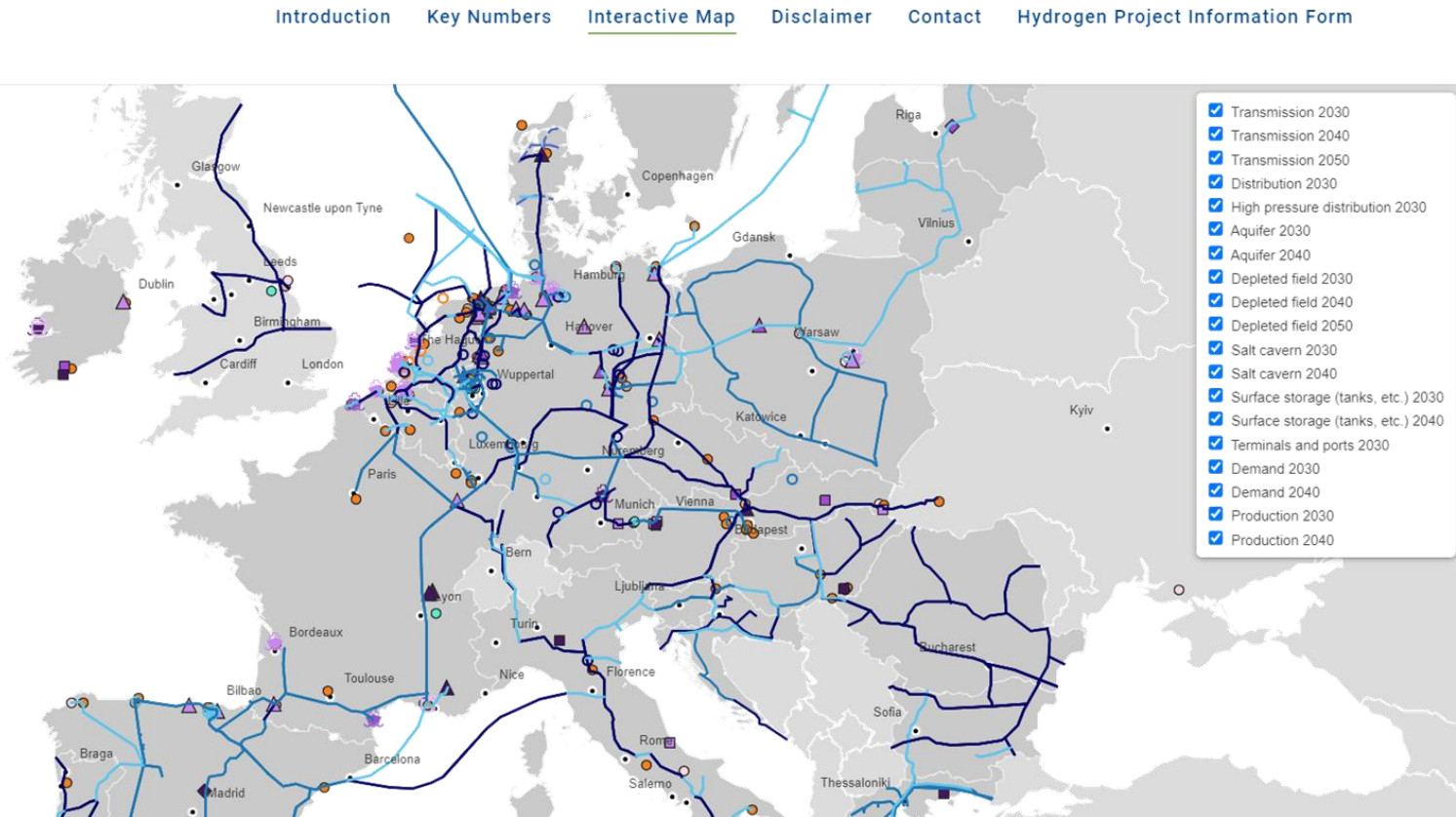


➤ Stats

- 500 projects
- 300 TSO/DSO
- 50 Storages
- 20 Terminals
- 120 demand/production

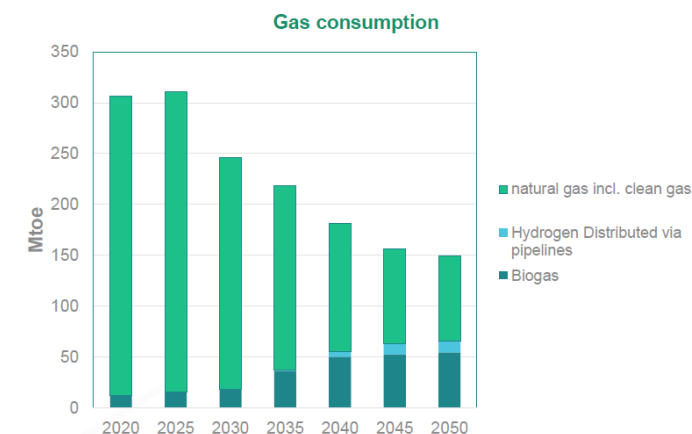
➤ Send your projects

➤ Find it here: <https://www.h2inframap.eu/>



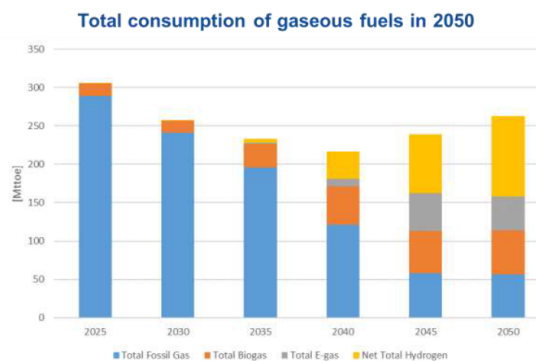
TRANSFORMATION OF GAS SECTOR

- 2020-2050 have significant and complex transformation of entire EU energy system
- Some stakeholders drive "Decommissioning Gas"
- Politically discussed in Parliament and in some Member States (NL, DK)
- Main assumptions for GIE/EU
 - Energy efficiency (like 2022 showed)
 - Shift to renewables
 - Gas infrastructure to
 - Adapt, Decommission, Repurpose



PRIMES Fit-for-55 scenario

Future of gas quality management Integration of renewable and low carbon gases



Source: EC PRIMES MODEL, MIX H2 scenario

REPowerEU target of 35bcm of Biomethane production by 2030

Address gas quality standardization issues included in the actions



QUESTIONS





RWE Supply & Trading

What is next for EU gas markets?

A brief recap of what happened in 2022 in (most) EU gas markets (1/1)

- Following a steep increase in gas prices to historically unprecedented levels, a number of politicians declared the gas market being in a failed state and called for price caps
- EU countries / market players now have an opportunity to consolidate their demand via the Prisma platform – a big (political) success...?
- Governments have become deeply involved in the gas storage business, by setting target fill levels and mandating state-owned players (e.g. THE) to actively fill gas storages
- Costs of securing storage fill levels have been socialised by substantially increasing TSO fees across Europe, amongst other cost drivers
- LNG capacities have been expanded in rapid pace and have outpaced grid expansion

What lies ahead for gas market players in the EU? (1/4)

- **Market Price Cap (180€/MWh)**

- In essence, after months of debating, the EU implemented a gas price cap that has had two main effects:
 1. It might cause a (theoretical) problem in attracting sufficient LNG supplies to newly-built and established LNG terminals when the market needs these volumes the most
 2. It took ICE just a few weeks to implement a loophole to allow market participants to trade outside of the capped regime
- Instead of intervening what was working perfectly well (‘the price signal of the market’), governments should have provided compensation measures to consumers directly (which many did anyway)
- Capping gas prices won’t help consumers, if there is no gas around to heat your home or run your business

What lies ahead for gas market players in the EU? (2/4)

- **Joined procurement of gas**

- With a lot of cheering, EU politicians celebrated the introduction of AggregateEU as a milestone in transparent procurement of gas volumes for European players
- In essence, this platform is able to:
 - Collect buying interests from European gas market players
 - Match these interest with offers from sellers
 - Allow small players to combine their demand to meet sellers' lot sizes

⇒ **What is the difference to existing trading venues and aggregators?**

- The difference is that you get an indicative price first, then initiate KYC check and contract/credit negotiations, before you get a firm price that you can execute on – most of the industry worked the other way round over the past decade

What lies ahead for gas market players in the EU? (3/4)

- **Storage MinFill restrictions & Government-backed filling**
 - Exiting this recently established instrument is certainly the biggest challenge for the years to come
 - Any storage filling restriction limits the time value of a storage contract – to the detriment of the SSO
 - Any state actor paying storage prices above market would in fact cause consumer prices to rise without necessity
 - Observations from the last heating season showed that not all countries have done equally well in filling storages at the lowest possible costs.
 - Countries that have had no state-backed player filling gas storages have done equally well in ensuring SoS in Win22 compared to their state-backed peers
 - The big unknown: By when and how will state-owned gas-in-store be made available to the market

What lies ahead for gas market players in the EU? (4/4)

- **TSO fees & Grid expansion**
 - TSO fees have seen some drastic increase over the past 18 months as a result of:
 - Skyrocketing fuel gas costs
 - A generally rising cost base driven by overall inflation
 - New levies that seek to recover newly incurred costs (storage filling)
 - Besides efficient cost management to shore up their rising cost base, TSOs are now facing the challenge of overcoming physical bottlenecks that are created by partly dramatically changed flow patterns in the European system
 - German example:
 - Lots of gas is flowing West to East these days following the reduction of Nord Stream flows to zero
 - Brunsbuttel LNG terminal needs proper connection to German grid to reduce the capacity restrictions it currently causes in the DeuDan pipe

And what about the Danish gas market? (1/1)

- Denmark's high degree of market liberalisation and transparency as well as the experience in using market-based tools to achieve desired outcomes led to:
 - Denmark being amongst the first countries whose storage inventories rose above 90% in Sum22
 - Denmark being able to attract gas volumes at very moderate location spreads over THE in Sum22
 - Tenders to contract MinFill Levels proved to be a cost-transparent instrument to steer the filling level of the storage
- Some challenges remain:
 - IT systems have to provide a reliable real-time balance again as soon as possible
 - Gas specifications need to be reconsidered to account for additional LNG volumes in the European grid

„Underlying most arguments against the free market
is a lack of belief in freedom itself“

(Milton Friedman)



Thank you very much for your attention!

For any questions feel free to contact:

Jens Kersting
Gas Origination East
Jens.Kersting@rwe.com

Stefan Stehling
Gas Origination East
Stefan.Stehling@rwe.com



A “German” view on the Danish market for offshore wind and H2

Thomas Hwan Jensen
Head of Regulatory Affairs Denmark & Hydrogen Nordics
14th of September 2023

We are one of the leading offshore developers globally and on the forefront of innovation



Investing more than €50 billion gross in green growth



19 offshore wind farms in operation
Global offshore wind capacity to grow further from 3.3 GW to 8 GW by 2030 (RWE's share only).



More than 20 years of experience in developing, building and operating **bottom-fixed offshore wind projects**



RWE is driving innovation and becoming a leader in floating wind

Vibratory pile driving

We are investigating new installation techniques to **reduce noise emissions**



Offshore hydrogen

We are part of the Aqua initiative driving the **production of hydrogen at sea**



Rødsand2 Offshore Windfarm

Technical Details

Turbines	90 x SWT 2.3-93-VS
Capacity	207 MW
Foundation	concrete gravity foundations
Commissioned	2010
Distance to O&M base	6nm
Water Depth	6-12m LAT
Ownership	JV: 20% RWE, 80% Andel

Off-shore substation owned by Energinet

RWE



We are building Denmark's largest offshore wind farm

Thor offshore wind farm at a glance:



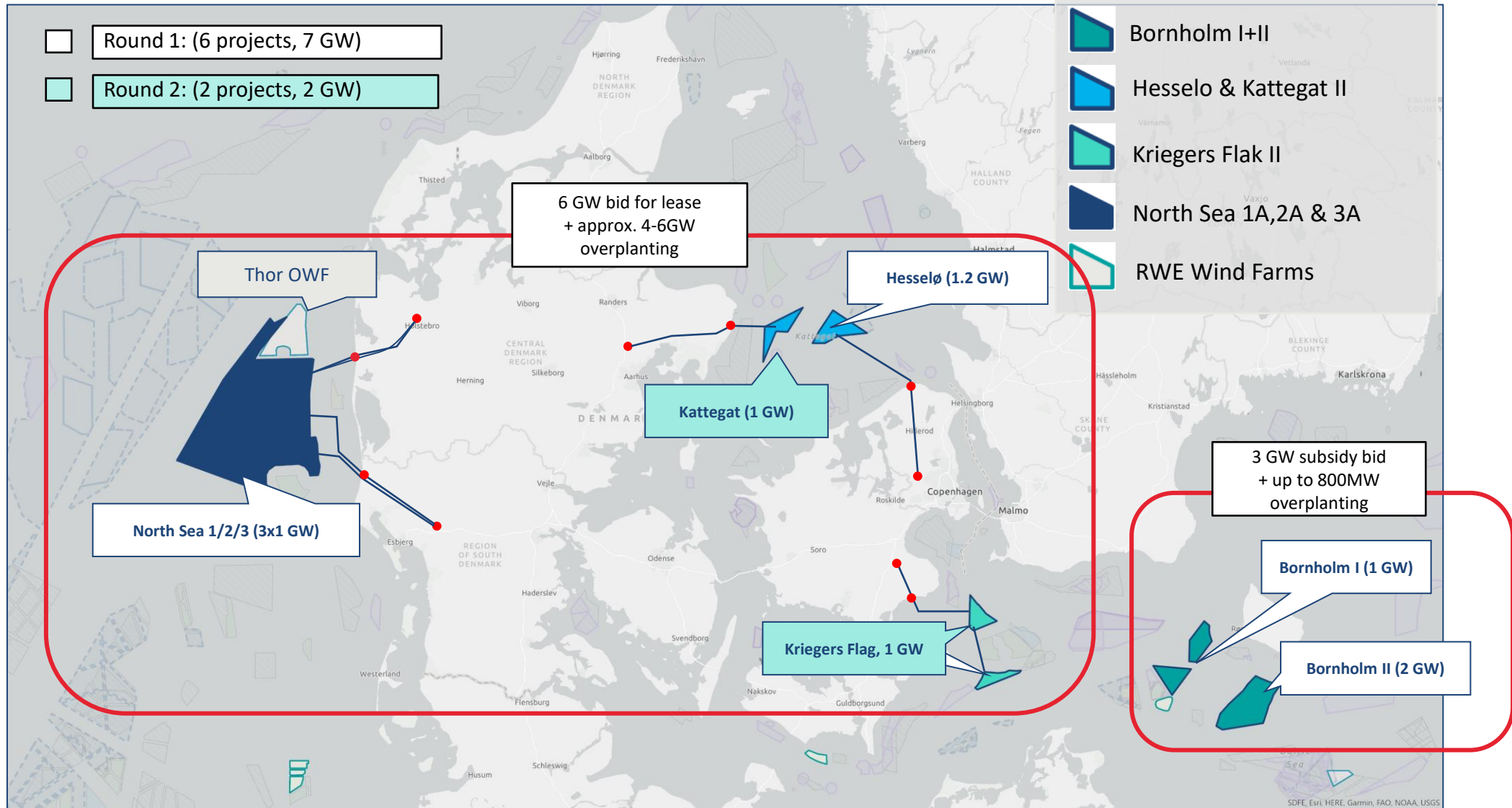
- More than **1,000 MW** of capacity, to go into full operation in 2027 at the latest. **Green electricity for over 1 million Danish households**
- **Siemens Gamesa will deliver 72 turbines**, installation to start in 2026. **50% of turbines to be equipped with CO2-reduced towers**
- **40/72 turbines will be equipped with recyclable blades**



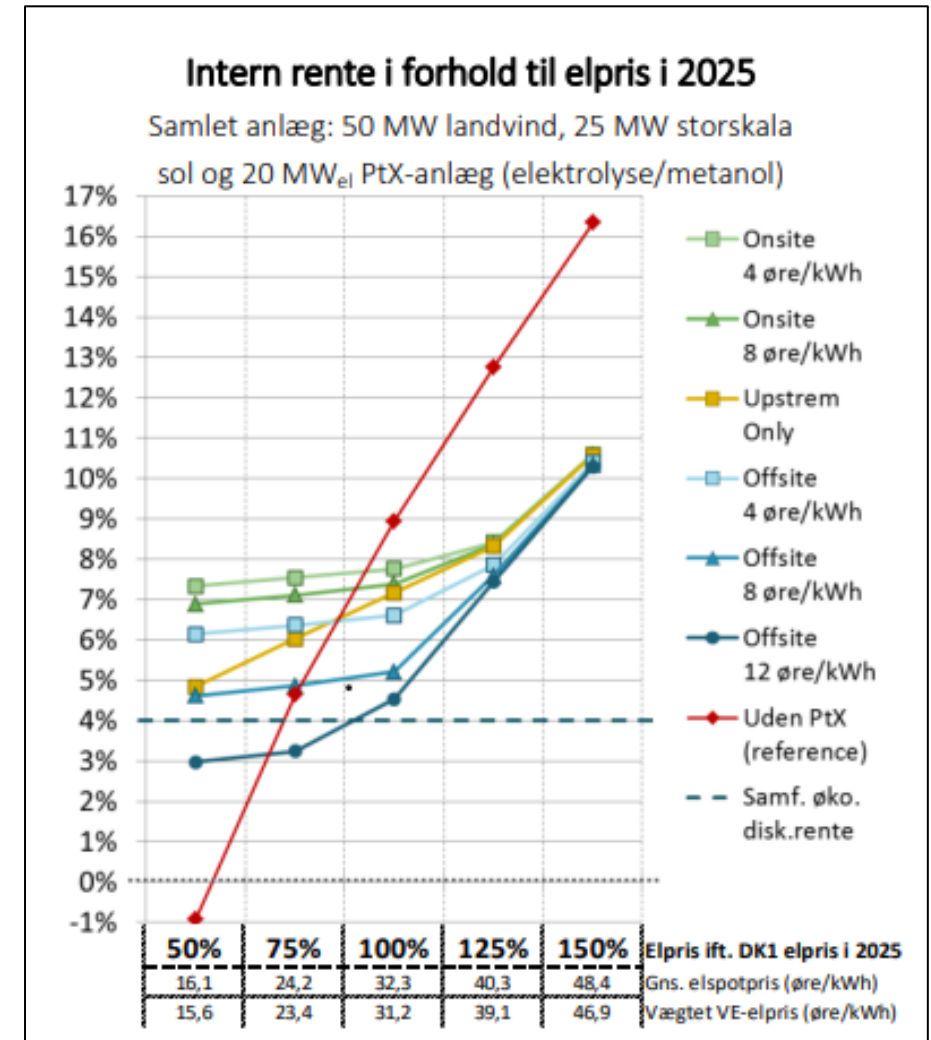
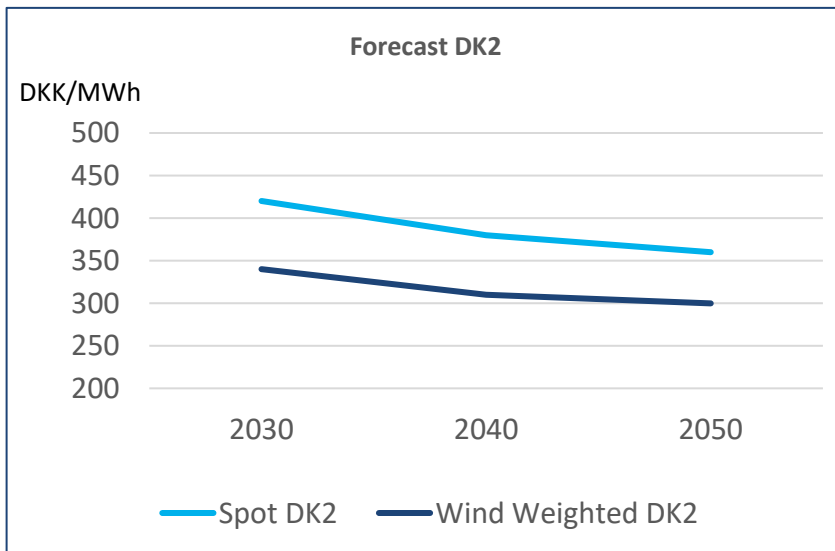
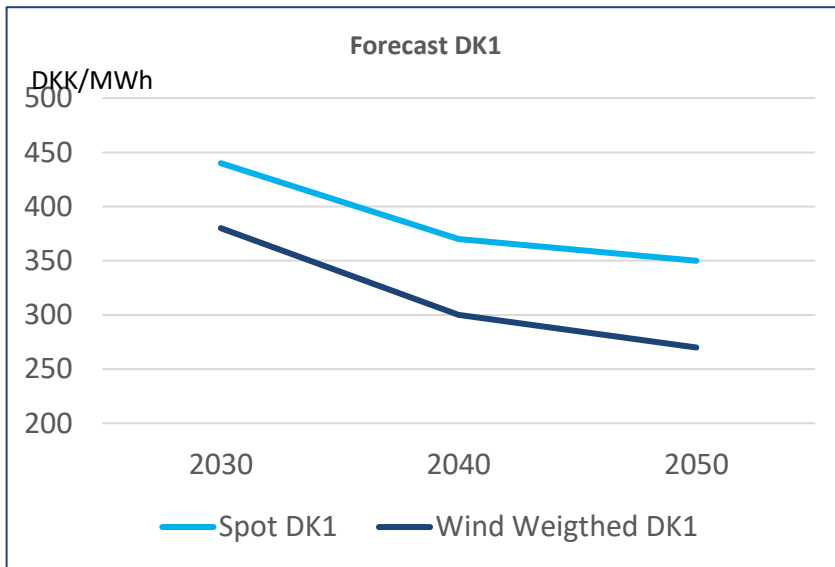
- **Operation and Maintenance Base in Thorsminde:** Port offers both the shortest sea and fastest air routes to Thor offshore wind farm. We intend to create **up to 60 jobs** there
- **We work closely with the local supply chain and communities we are active in and look to create local value**



Overview of upcoming tenders



Bulk offshore wind production will reduce capture rates significantly and thus potentially be a key enabler for Danish H2-production...



We are ideally positioned for the hydrogen economy with extensive expertise along the value chain

Danish target:
4-6 GW of electrolyzers in 2030.

2GW target
10 GW pro rata

Logistics
(storage & transport)

Equinor
Norway

Eemshydrogen
Eemshaven

Windpark Oranjewind (HKW VII)
North Sea

AquaVentus
Helgoland

HyTech Hafen Rostock
Rostock

H₂ Brunsbüttel
Brunsbüttel

Pembroke Green Hydrogen
Milford Haven

NorthH₂
North of The Netherlands

GET H₂
Lingen

HySupply und H2U
Berlin

FUREC
Prov. of Limburg

H₂ercules
Germany

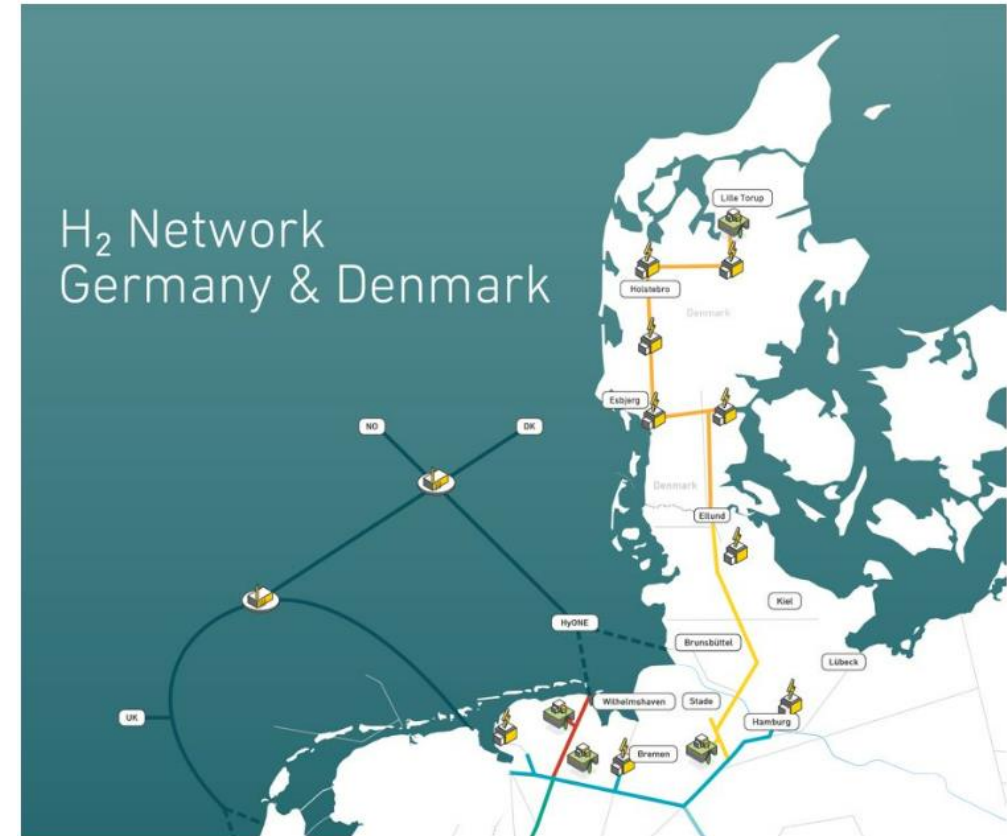


Connecting Denmark to Germany with H2-infrastructure as vital an element to utilise the large Danish H2 potential



German Minister of Economics and Climate Robert Habeck (L) and Denmark's Minister of Business Morten Bødskov present the two countries' plan to build a hydrogen pipeline. Photo: Emil Nicolai Helms (Ritzau Scanpix, AFP)

Germany and Denmark will work together to construct a pipeline to transport hydrogen between the two countries, ministers announced on Friday.



The Commercial



-problem

(TSO) Limited optimisation potential due to step fixed costs

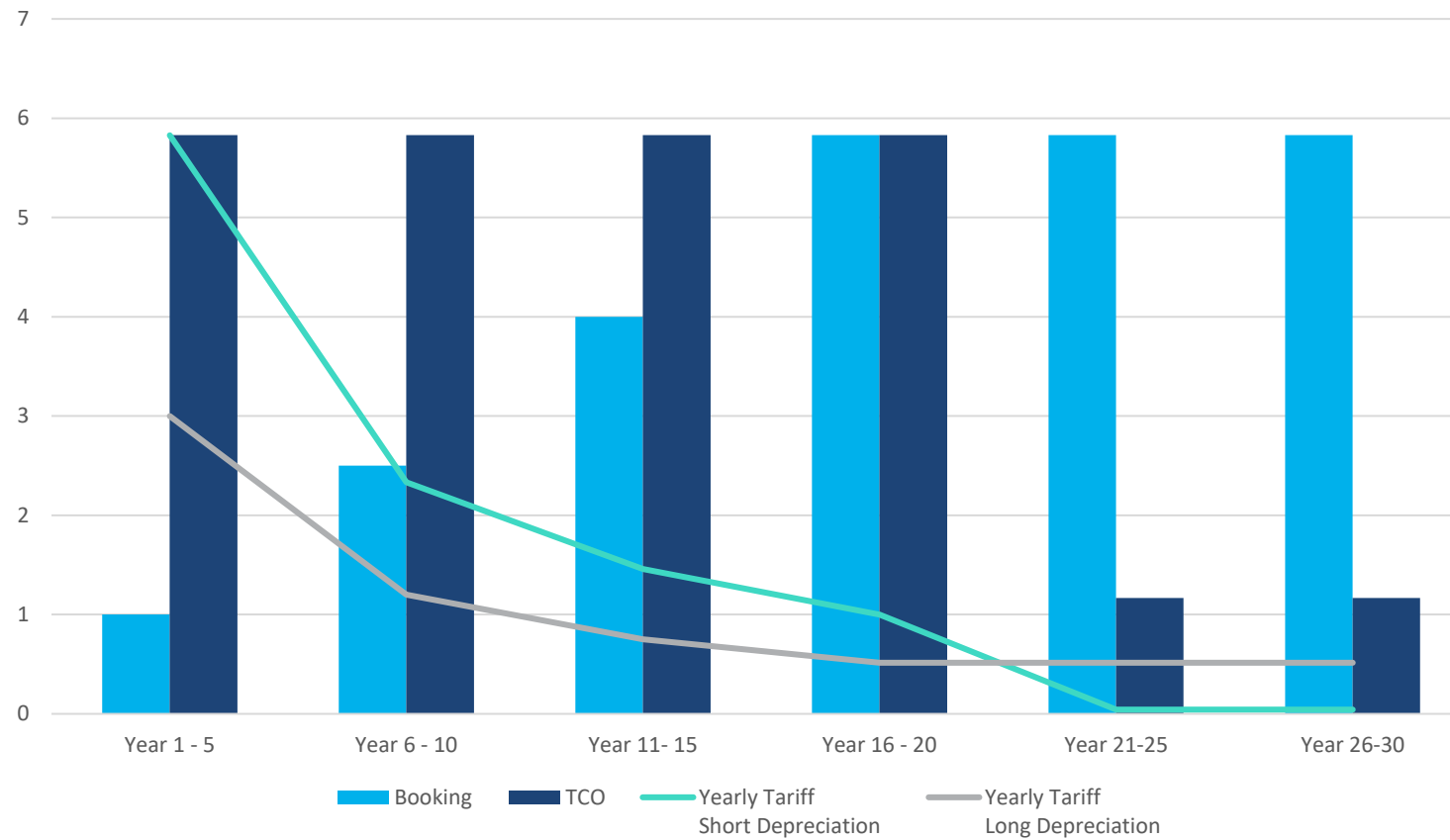
$$\frac{\sum \text{grid cost}}{\sum \text{capacity bookings}} = \emptyset \text{tariff}$$

Risk of high tariffs prohibiting the grid use, hence the market scale-up

(Shipper) Depending on RES, electrolyser capacity and costumer commitment

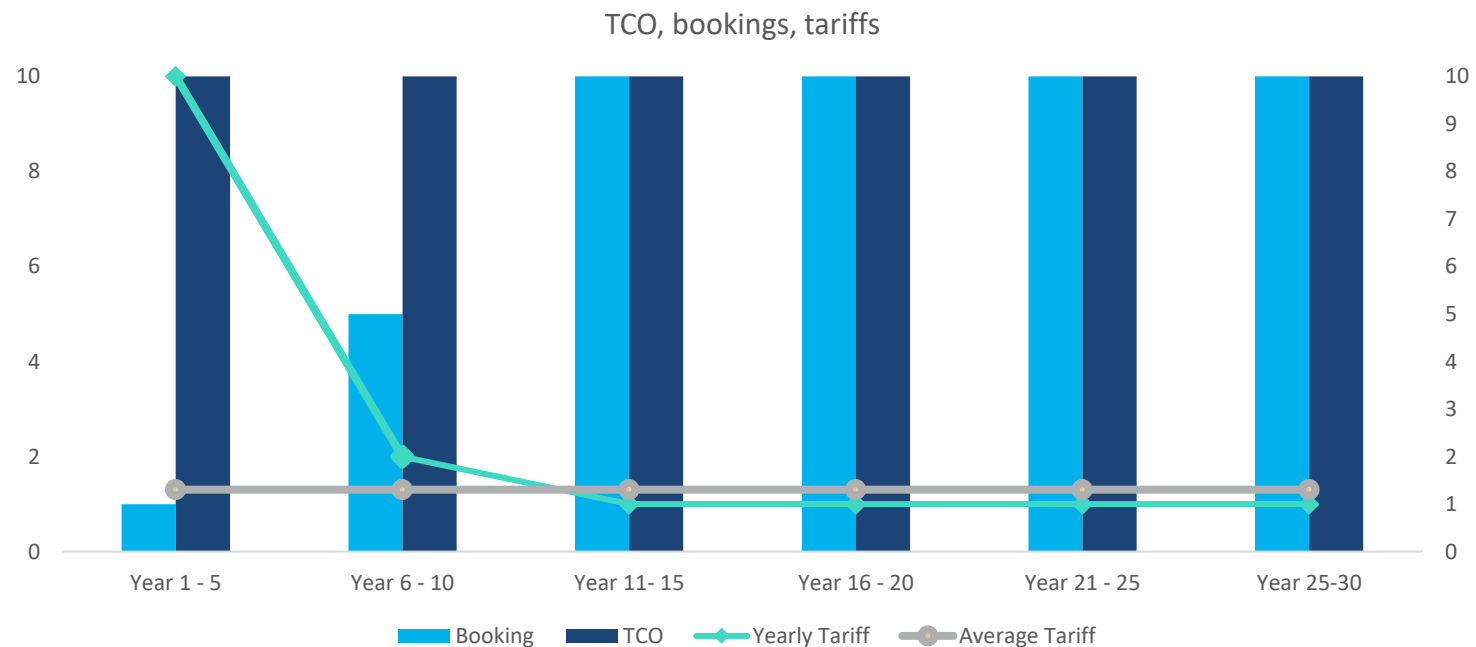
Process-wise: Incremental Capacity
Commercially: increasing flexibility with increasing time“

Longer depreciation: Addressing the ramp-up period



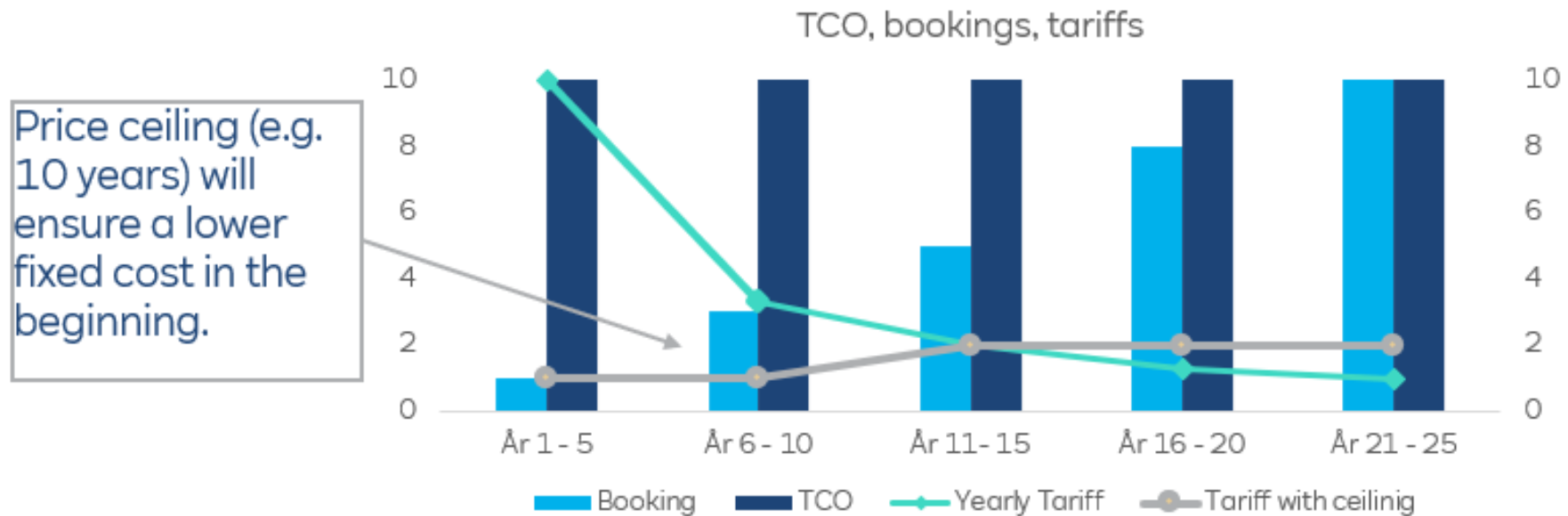
Average tariffs: addressing the ramp-up phase

Average tariffs over the lifetime (e.g. 30 years) would heavily decrease the tariff in the early years.

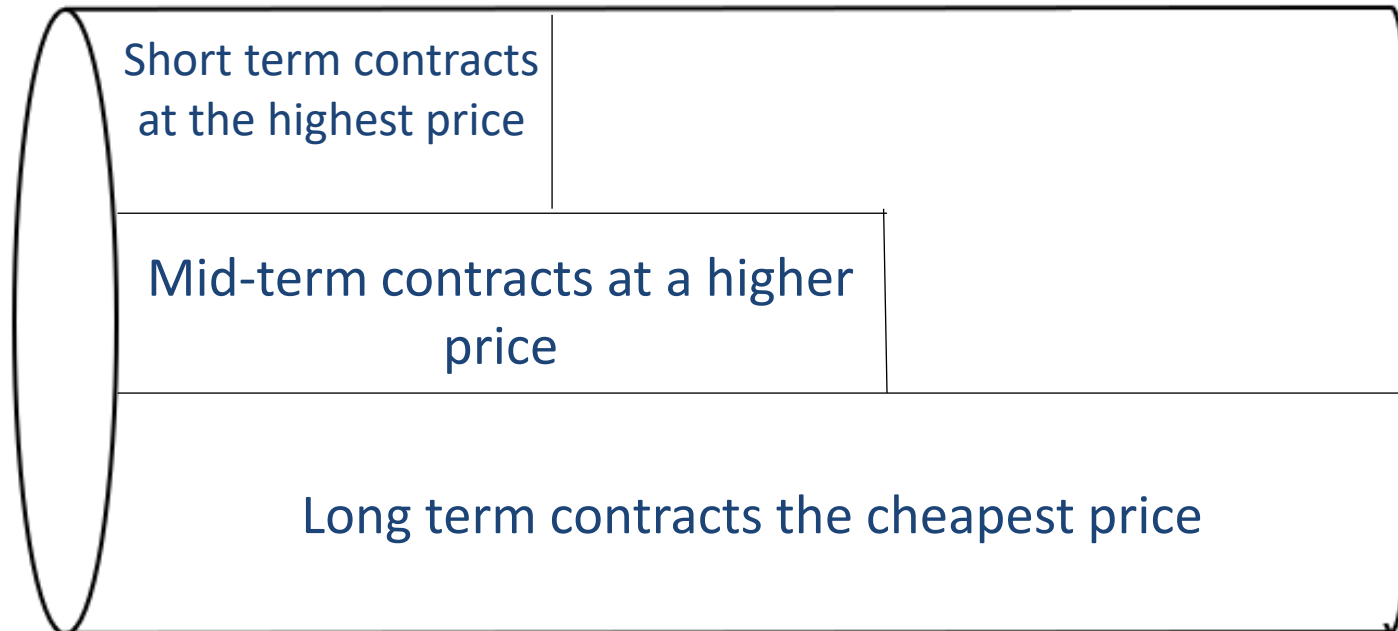


Price cap: addressing the ramp-up phase

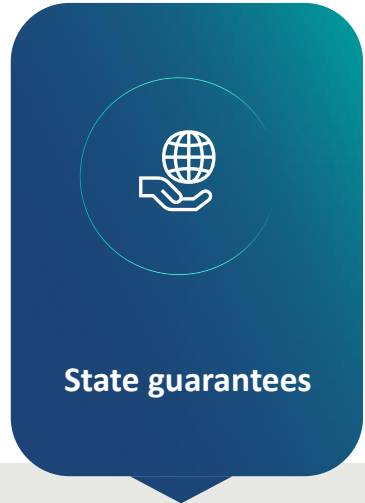
Introducing a price ceiling (e.g. first 10 years) would heavily decrease the tariff in the early years.



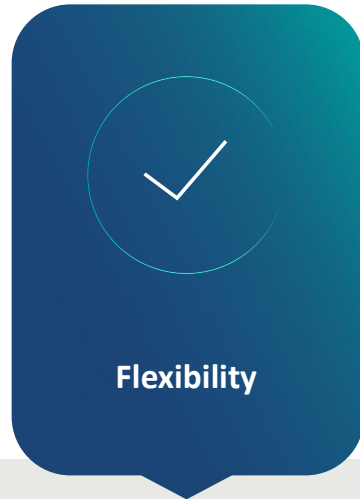
Capacity contracts needs to be flexible and tradeable



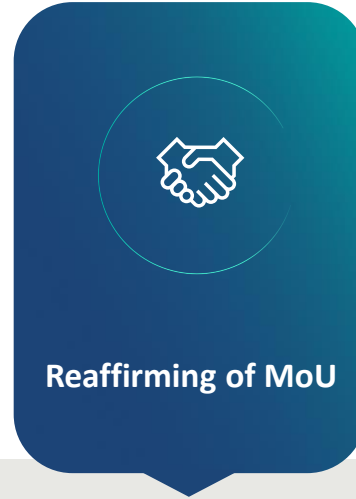
How to succeed...



State guarantees are most likely necessary if a FID is to be taken.



Flexible framework required in order to enable longer amortisation, tariff caps etc., incl. the under coverage of the assets in the ramp-up period.



The MoU between DK-DE needs to be reaffirmed in order to ensure same level of commitment.



Min. 36" eq. of approx. 10GW electrolysis capacity.



Direct subsidies can be considered which has been implemented and/or are considered in other EU MS.



Thank you very much for your attention!

For any questions feel free to contact:

Thomas Hwan Jensen
RWE Renewables Denmark
Thomas.westringJensen@rwe.com

The Danish Utility Regulator

Shippers' Forum
September 14, 2023
Birgitta Bundgaard

Agenda:

DUR - Independent regulator

TERI - Tasks and legal framework



Danish Utility Regulator

Goal

Maintain a strong and effective supervision of the utility sectors
– electricity, natural gas and district heating



Danish Utility Regulator (DUR)

Independent regulatory authority of Denmark and an associated independent body of the Ministry for Climate, Energy and Utilities.

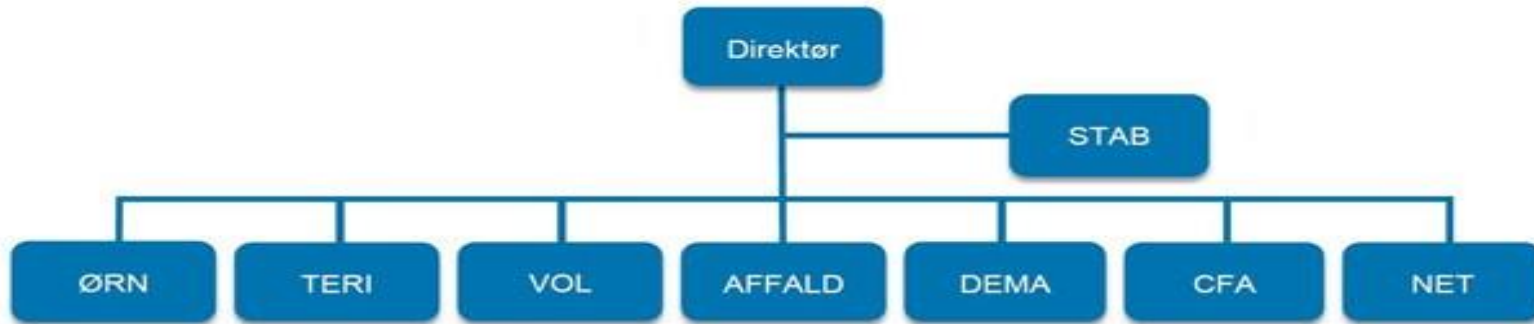
Established on July 1st 2018.

Purpose:

Securing consumer interests in the utility sectors by striving for a higher level of efficiency, the lowest possible costs in the short and long term, a stable and secure supply, and a cost-effective development in technology and climate-friendly initiatives.



Organisation of DUR



~ 110 employees, mostly economists and lawyers

Director General appointed by the minister for a five year period, renewable once

Offices located in Frederiksværk, North Sealand



Legal framework and tasks

DUR's tasks are set out in the Law on The Danish Utility Regulator as well as Danish and EU legislation on electricity, gas, district heating and waste.

DUR carries out its tasks with the following in mind:

- Administration of the regulation and supervision of the utility sectors **in accordance with the sector laws**;
- Analyzing and monitoring the utility sectors with the purpose of reaching **a higher level of transparency** in the utility sectors;
- Contributing to **reaching the goals set in the sector laws** and providing **stable framework conditions** for suppliers;
- Creating **effectively integrated supply markets** in accordance with national legislation and EU regulation.

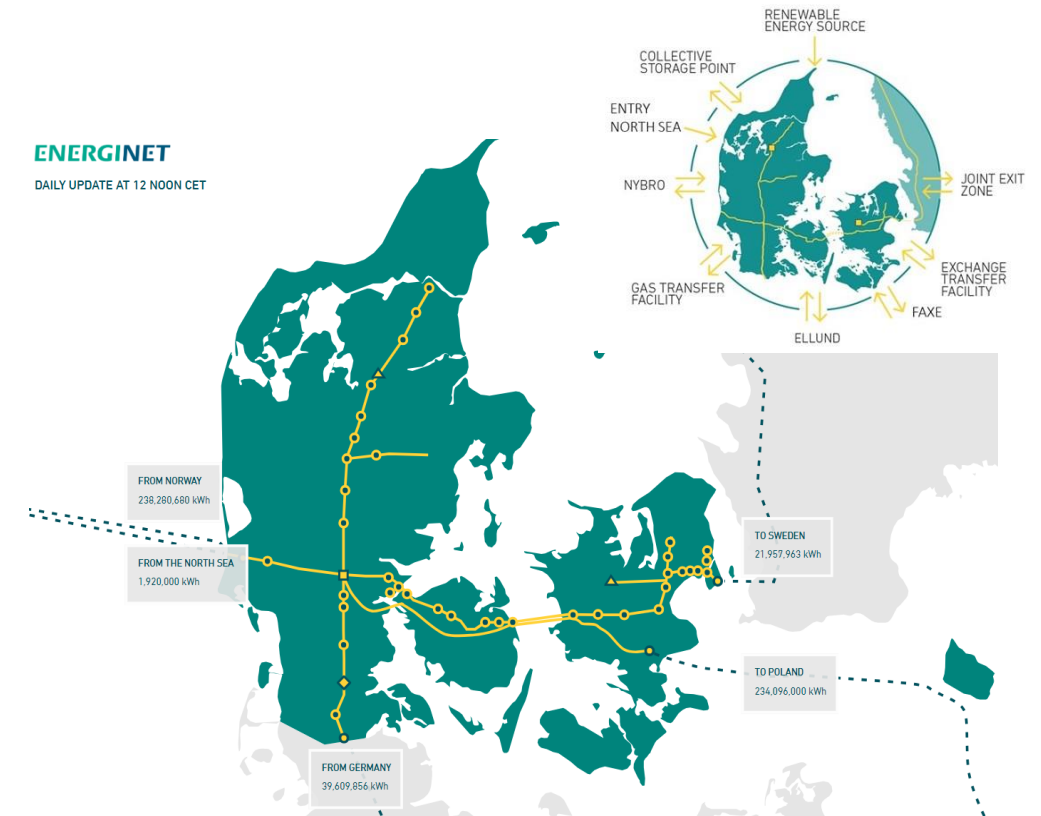


TERI GAS TEAM

- ensure open, transparent and well-functioning gas markets

TERI: Transmission, Wholesale, REMIT and International Cooperation

- Monitoring of markets
- Approval of TSO methodologies
- Enforcement of EU and DK legislation
- Upstream and storage regulator
- International cooperation
- REMIT



Market Monitoring





MARKET MONITORING

DUR's market monitoring duties as set out in EU law

Directive (EU) 2009/73 concerning common rules for the internal market in natural gas

National Regulatory Authorities are given powers to, among others:

- Monitor the level and effectiveness of market opening and competition at wholesale and retail levels, including on natural gas exchanges, prices for household customers
- Monitor investment plans of the transmission system operators



Method Approvals



METHOD APPROVAL

TSO must seek regulatory approval of market rules

- Transmission System Operator proposes new rules for the development of the market
- Proposals take the form of a method – DUR does not approve specific prices, terms and conditions
- The methods have to comply with EU legislation both in terms of procedure and substance
- The methods are subject to public consultation and must be made publicly available



Examples:

Capacity conversion, March 2023

Tariff method, May 2022

Common market zone, February 2022

New balancing model, December 2021

Negative balancing prices, July 2020



METHOD APPROVAL

Public consultation on decisions



DUR strives to conduct public consultation on all draft decisions on methods

Shippers and other stakeholders are encouraged to participate

Opinions of both large and small market participants are important

DUR always available to meet and listen to market participants



Upstream and Storage Regulator



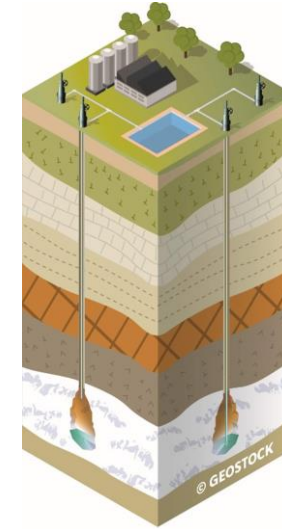
Upstream and Storage

Negotiated third party access



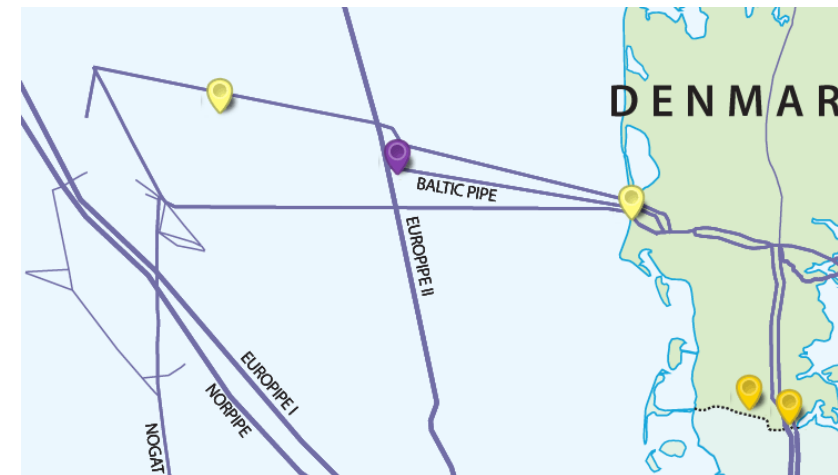
Storage:

- Objective, transparent, non-discriminatory terms of access
- DUR monitors access and sales procedure – But not prices



Upstream:

- DUR monitors prices and terms
- If negotiations fail – appeal body
 - Mediator role
 - Decides on access, prices and terms on basis of complaint



International Cooperation



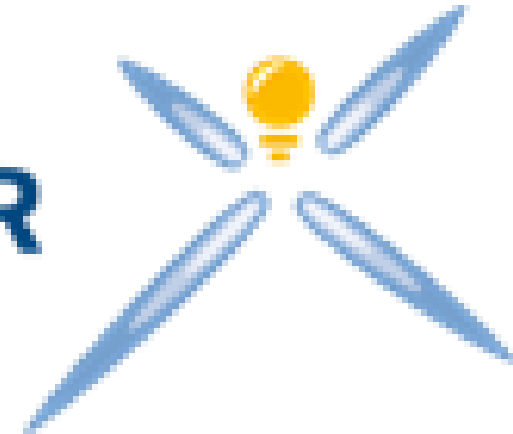
DUR's participation in International Fora



European Union Agency for the Cooperation
of Energy Regulators



Council of European
Energy Regulators



Danish
Utility Regulator

REMIT



REMIT

Regulation on Wholesale Energy Market Integrity and Transparency



- DUR operates the national register and receive data on all transactions from ACER
- ACER and PPATs monitor the markets and inform DUR of potential REMIT breaches
- DUR investigates potential REMIT breaches
- Competence on enforcement split between DUR and State Prosecutor
 - Administrative sanctions by DUR
 - Criminal law sanctions by State Prosecutor
- ACER and/or DUR publish guidance on REMIT

2022 Performance Highlights

Building trust through monitoring of wholesale gas and power markets



Thank you for your attention



BREAK



—
**GAS
STORAGE
DENMARK**
—

SHIPPERS FORUM

14 SEPTEMBER 2023

AGENDA

1. CAPACITY OVERVIEW
2. REDUCED CAPACITY 7 DAYS IN OCT23
3. ONLINE CAPACITY BOOKING FCFS
4. SUBSCRIPTION TO NEWS
5. THE CO₂RYLUS PROJECT
6. Q&A

CAPACITY OVERVIEW

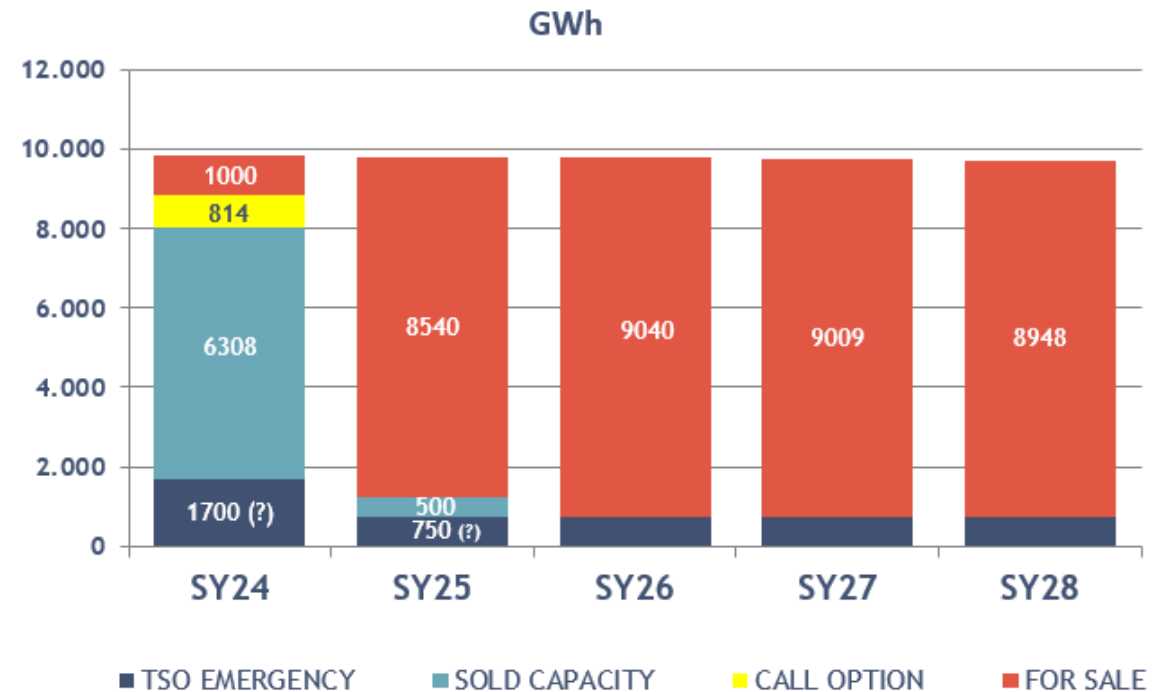
- ❑ 2023, RoY → recalculation in process
- ❑ 2024 → 1,000 GWh will be auctioned
- ❑ 2025+ → available for bilateral sale now

Pricing:

- 120/60: 4.6 €/MWh/year
- 170/85: 4.1 €/MWh/year
- 170/170: 3.6 €/MWh/year

Additional flex:

- Injection: 750 €/MW/year
- Withdrawal: 2,100 €/MW/year



REDUCED CAPACITY DURING THE FIRST 7 DAYS OF OCT23

If all customers nominate their booked firm capacities, all received nominations will be reduced in proportion to the customers' booked firm capacity

WHAT TO DO?

- You can nominate as usual (also if you wish to nominate your max booked capacity)
- If other storage customers do not use their booked firm capacities, your nomination will be accepted and confirmed
- Have an alternative solution-plan in case of reduction of your nomination

The capacity will be back on line on the 8th of October 2023 at 06:00 AM

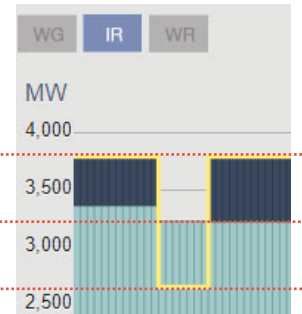


<https://gasstorage.dk/news/2023/05/01/reduced-inj-wd-week-40-2023/>

3,780 MW (max firm IR)

3,217 MW (booked firm IR)

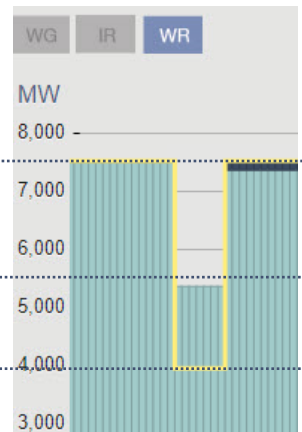
2,645 MW (new max for 7 days)



7,500 MW (max firm WR)

5,344 MW (booked firm WR)

3,933 MW (new max for 7 days)



ONLINE CAPACITY BOOKING FCFS

- HOURLY products
- DAILY products
- MONTHLY products

WHY IT IS A GOOD IDEA?

- Unbundled firm INJECTION and WITHDRAWAL are often available even the VOLUME is sold out
- FROM A SYSTEM PERSPECTIVE: interruptions at ENTRY/EXIT border points can be handled by boost of storage capacity on short term
- 24/7 fully authorized booking process

ONLINE BOOKING FCFS will be available in production in the beginning of NOV23. A manual will be distributed accordingly.

SUBSCRIPTION TO NEWS

WE HAVE SWITCHED TO SUBSCRIPTION

<https://gasstorage.dk/newsletter/sign-up/>

Choose which content you want to subscribe to?

NEWS

select / deselect all

Company news Future storage news Gas storage news

Subscribe to our newsletter

Total selected: 3 topics

Email address:

Enter your email

SUBSCRIBE



<https://gasstorage.dk/news/2023/08/28/news-from-gsd/>

CHANGE/CANCEL SUBSCRIPTION

News from Gas Storage Denmark A/S: Gas storage news: ALL WITHDRAWAL CAPACITY IS BACK IN OPERATION

You receive this e-mail because you have signed up for e-mail notifications from gasstorage.dk



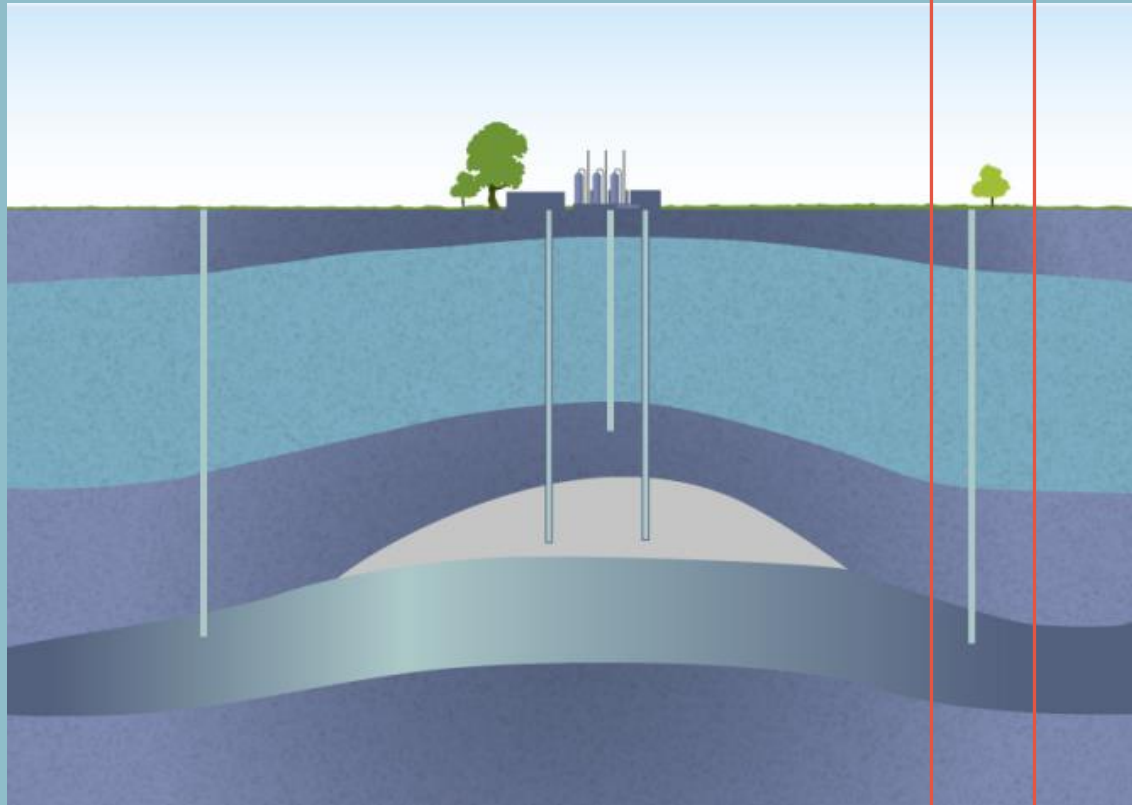
ALL WITHDRAWAL CAPACITY IS BACK IN OPERATION

With reference to our message REDUCED WITHDRAWAL CAPACITY announced earlier today.

Go to page

THE CO₂RYLUS PROJECT

TENDER FOR CCS AT STENLILLE



MARKET INPUT ON CO₂ STORAGE NEEDS

READ MORE »



<https://gasstorage.dk/news/2023/06/29/open-for-market-input/>

TECHNICAL SOLUTION

- Convert an existing observation well into a CO₂ injection well
- Top site designed for truck delivery of CO₂ in liquid form

PURPOSE

- Fast-track project with the aim to establish a knowledge-base through early experience and provide the basis for development of new CCS value chains
- Knowledge-sharing with the market

PROJECT DETAILS

- Total Volume Capacity: +10 MT
- Injection Capacity: 2-300.000 ton/year
- 10-year capacity contracts expected

TIMELINE

- Tender Published / Invitation to bid: Oct 2023
- Bid Submission Deadline: Nov 2023
- Bid Evaluation and Selection / Contract Signature: Dec 2023



CONTACT



Iliana Nygaard

✉ iny@gasstorage.dk

☎ +45 61 24 34 03



Marni Jacobsen

✉ mjq@gasstorage.dk

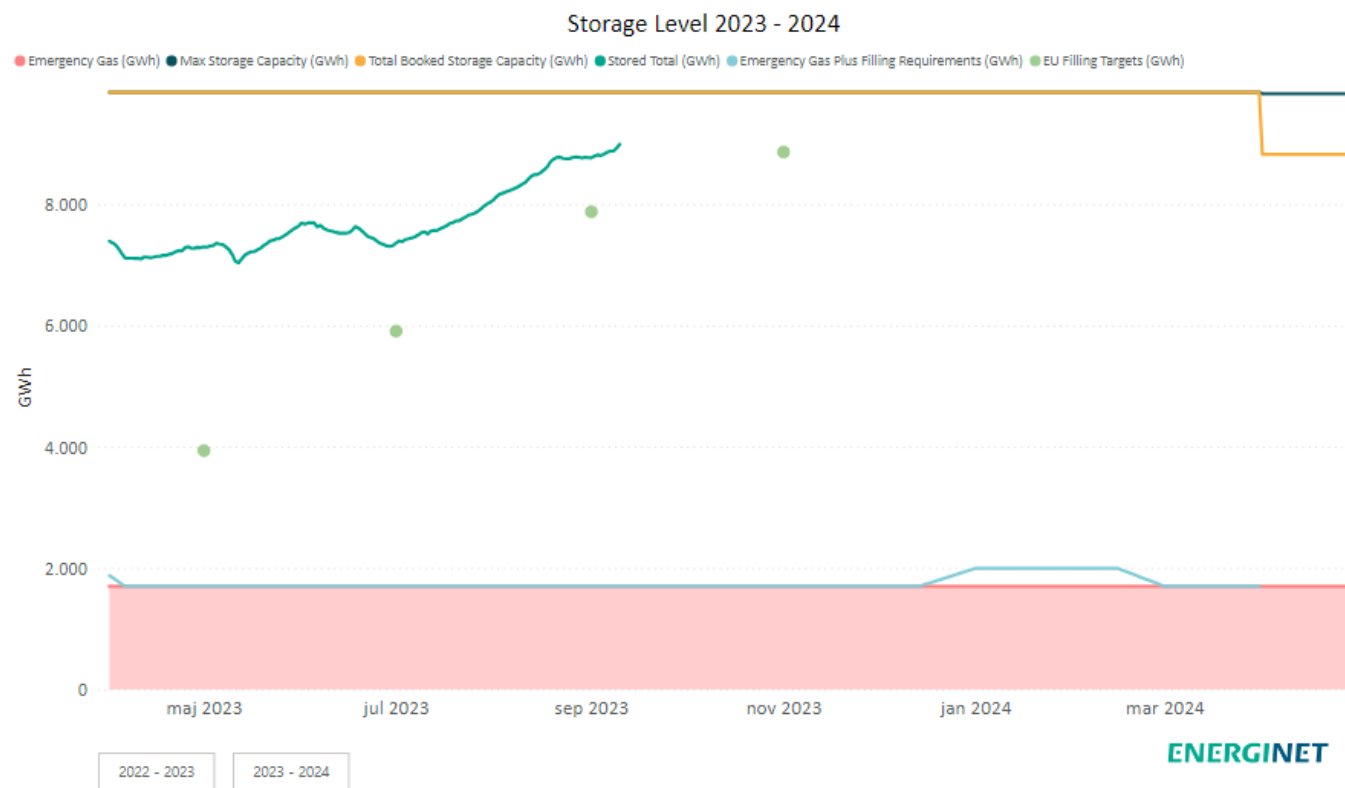
☎ +45 30 59 41 37



SUPPLY SITUATION

Christian Meiniche Andersen, Energinet

SECURITY OF SUPPLY



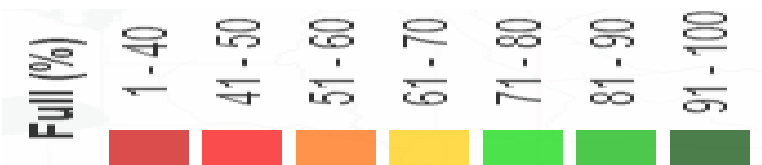
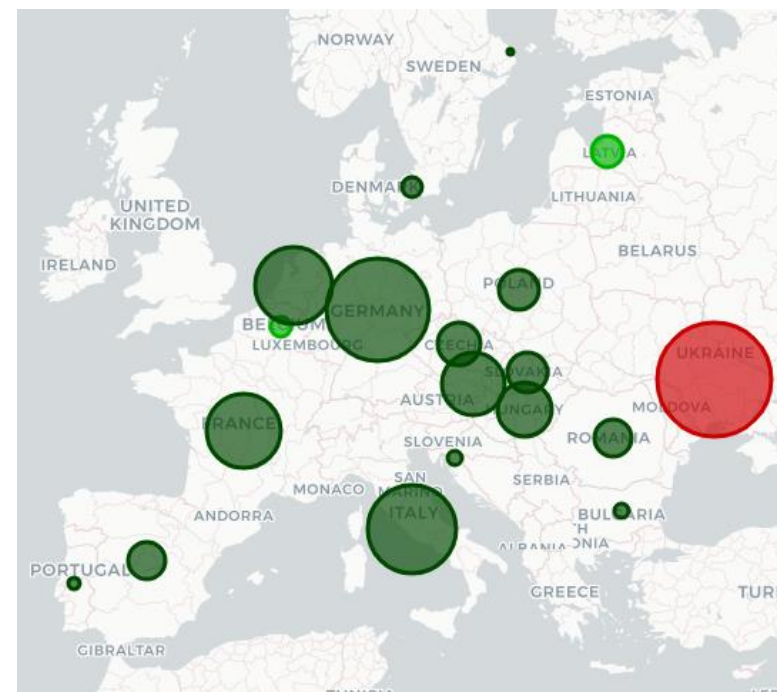
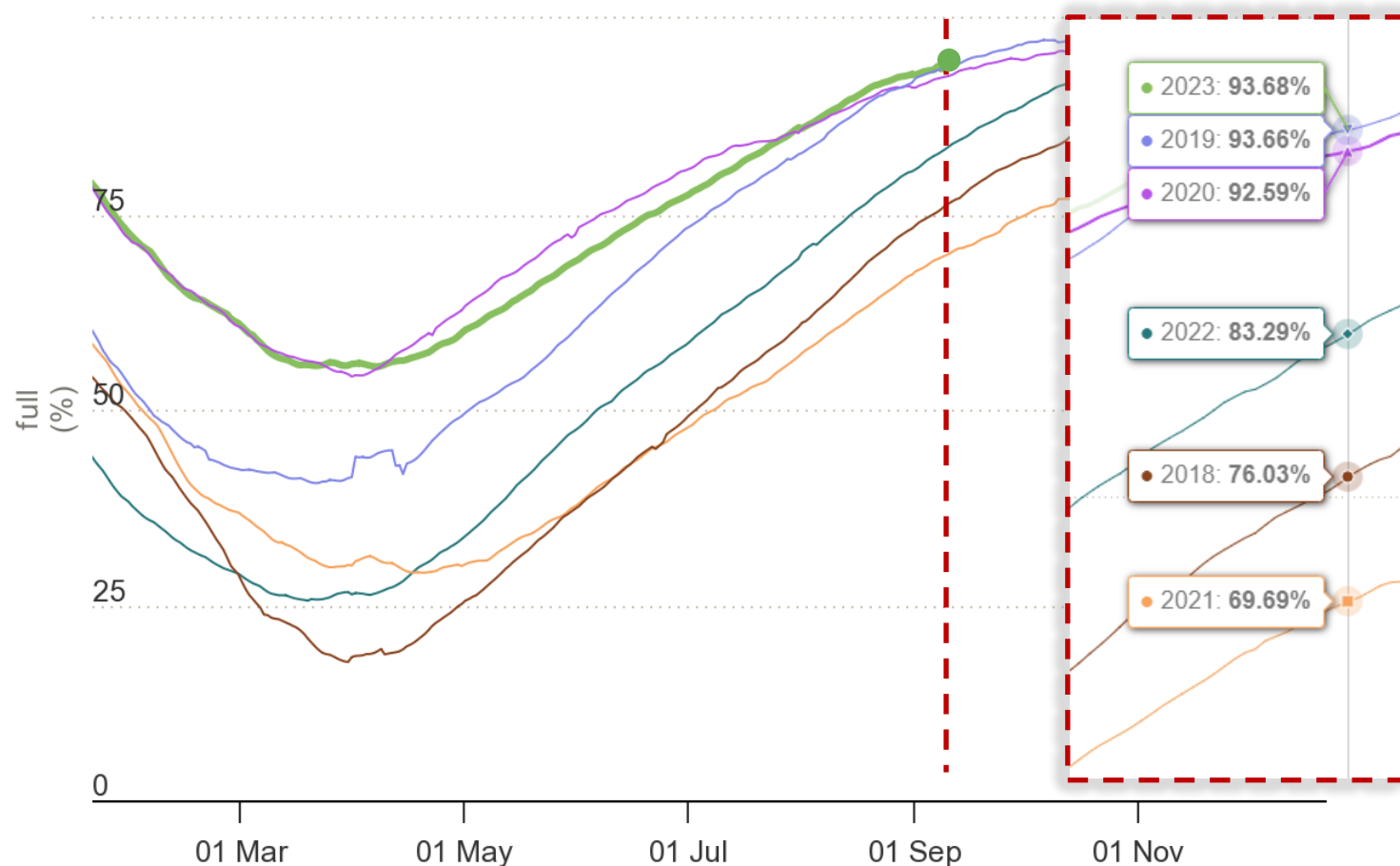
Inventory level 1 Sep. 2023: 91 %

EU-filling target 1 Nov. 2023: 90 %

Kilde: [STATUS IN THE DANISH GAS STORAGE FACILITIES | Energinet](#)

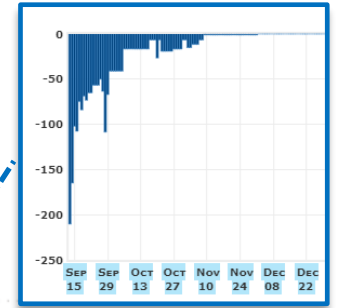
EU GAS STORAGE INVENTORY LEVEL

Storage Filling Levels
EU



[Data Visualisation / Filling Levels - AGSI \(gie.eu\)](https://www.gie.eu/Data-Visualisation/Filling-Levels-AGSI)

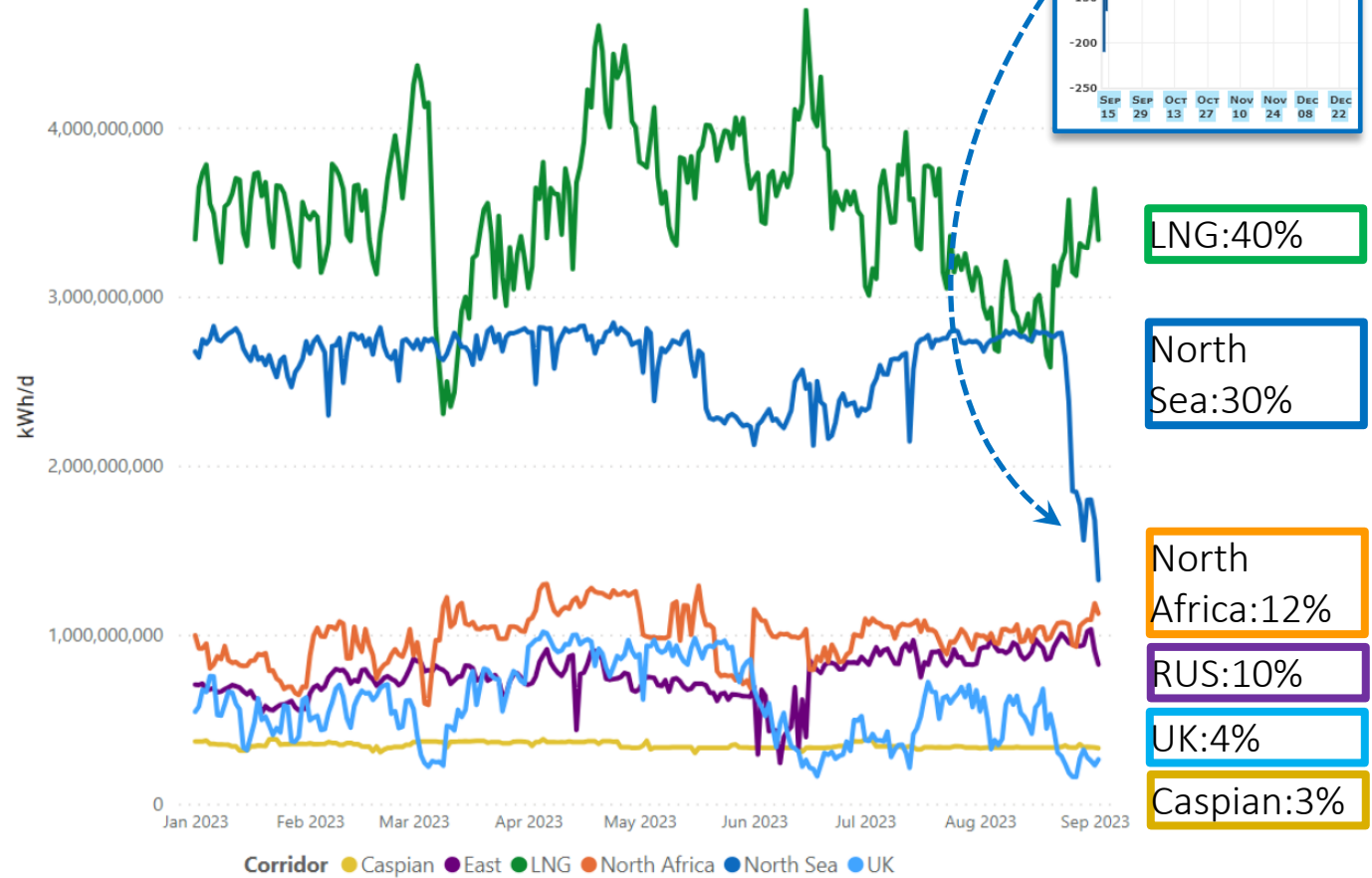
Gassco planned maintenance



GASFLOWS TO EU 2023

% share June/July/august

- LNG is the largest supply source 40%
- North sea 30% - reduction due to planned maintenance (Gassco)
- Russia stable 10%





ANNUAL ANALYSIS FROM SETS THE STAGE

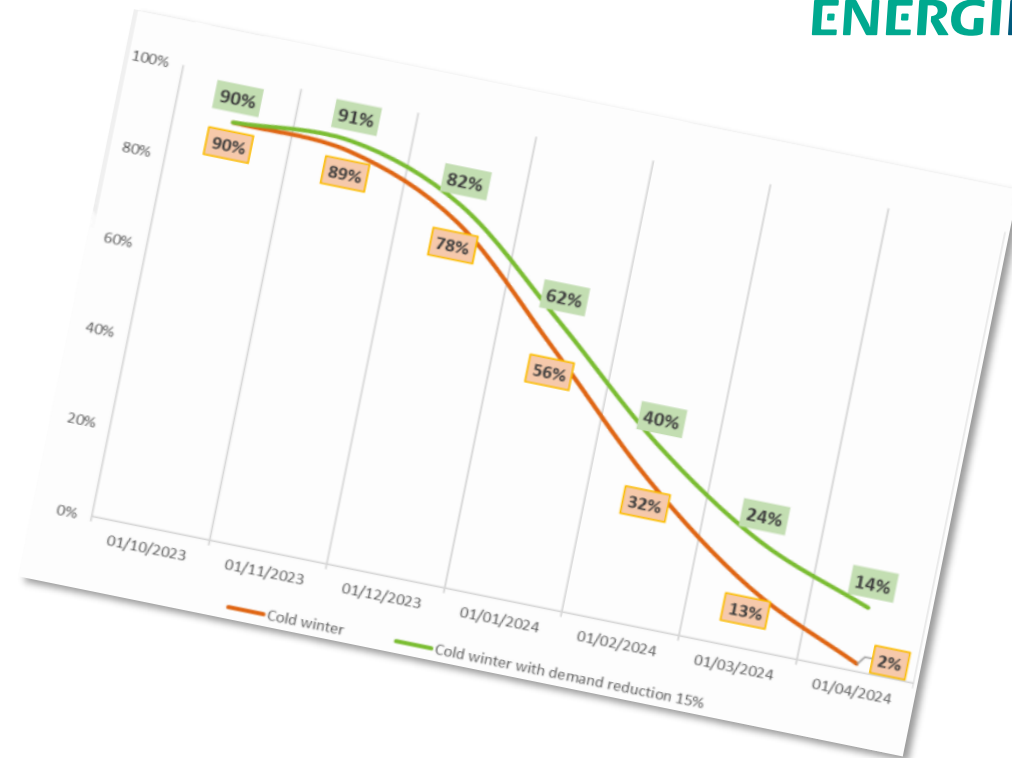
A good starting point...



entso-g WINTER OUTLOOK

There is a prospect of a more uncertain supply situation in the winter 2024/2025

- Inventory level after winter 2023/2024
- Cold winter will be challenging
- Consumption reductions are the most effective “insurance”
- Security of Supply is highest in Western Europe



Supply	Demand	Normal winter		Cold Winter	
		2023/24	2024/25	2023/24	2024/25
RUS	Normal	2023/24	2024/25	2023/24	2024/25
RUS	- 15%	2023/24	2024/25	2023/24	2024/25
No RUS	Normal	2023/24	2024/25	2023/24	2024/25
No RUS	- 15%	2023/24	2024/25	2023/24	2024/25

QUESTIONS



Contact: CAN@energinet.dk



Scenarios and potential risks to gas supply security in the winter of 2023/2024

Jane Glindvad Kristensen



Supply situation – now 23 and 23/24

	NOW (23)	THE FOLLOWING WINTER (23/24)
GAS	Stable supply. Lower but still volatile prices.	Risk for Russian stop and lack of LNG may lead to need for a reduction of consumption and increasing prices. Low risk of interruption of consumers, if savings can be maintained.
ELECTRICITY	Stable supply. More sun with less wind has caused higher prices in Denmark.	Risk of lower production in Europe, low risk of brownout.
OIL	Stable supply with higher prices.	Higher prices in the second half of 2023 and the beginning of 2024. Low risk of supply interruptions
HEAT & BIOMASS	Stable supply with higher prices.	Higher prices as in 2022. Low risk of fuel shortage.

Gas supply



Slightly challenged gas supply this winter

- ▶ From the beginning of September, Danish gas stocks are more than 90 pct. filled
- ▶ Gas consumption has been lower during the first 6 months, but has gone back to normal in July and August
- ▶ Lower gas prices in Q2 2023, but increasing prices are expected for the second half of the year.
- ▶ Baltic Pipe has from 2022 become the primary supply road to Denmark
- ▶ Low or no Russian gas is expected to the EU
- ▶ Greater competition for LNG on the world market is expected, especially due to Chinas industrial reopening after COVID-19



SCENARIO G1: EXTREME - THE GAS MARKET IS COLLAPSED

Current conditions: The uncertainty on the European gas market and a large Danish dependence on a well-functioning market in the EU is seen as a direct risk for the Danish supply in the winter of 2023/2024.

- If, on the other hand, the European market works in 2023, Denmark and Sweden will be guaranteed a better and more stable supply due to two new supply routes – Baltic Pipe, with commissioning in 2022, and the Tyra platform, which will be commissioned again in January 2024.

Potential consequences for the Danish supply situation:

Commissioning of the Tyra platform adds a general greater security of supply. But commissioning does not exclude the market risk of access to gas.

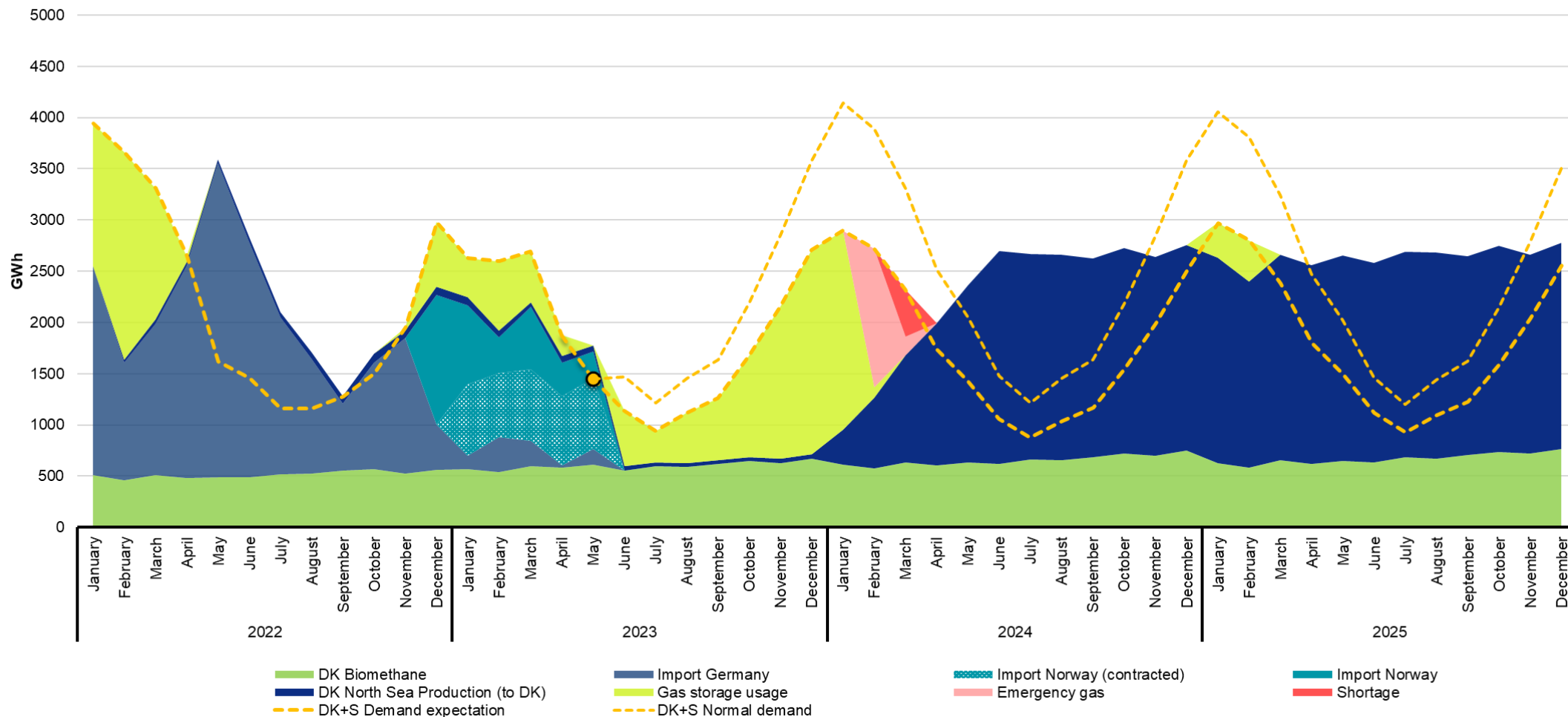
- The conditions in Germany during the winter of 2023/2024 and the demand in the EU market may have an impact on how large a share of the gas available in the EU Denmark can receive.
- In the worst case, the uncertainty on the market can lead to increased protectionism in the member states.

See calculation for G1 on the next slide.



SCENARIO G1: THE GAS SUPPLY IN THE EVENT OF A MARKET COLLAPSE

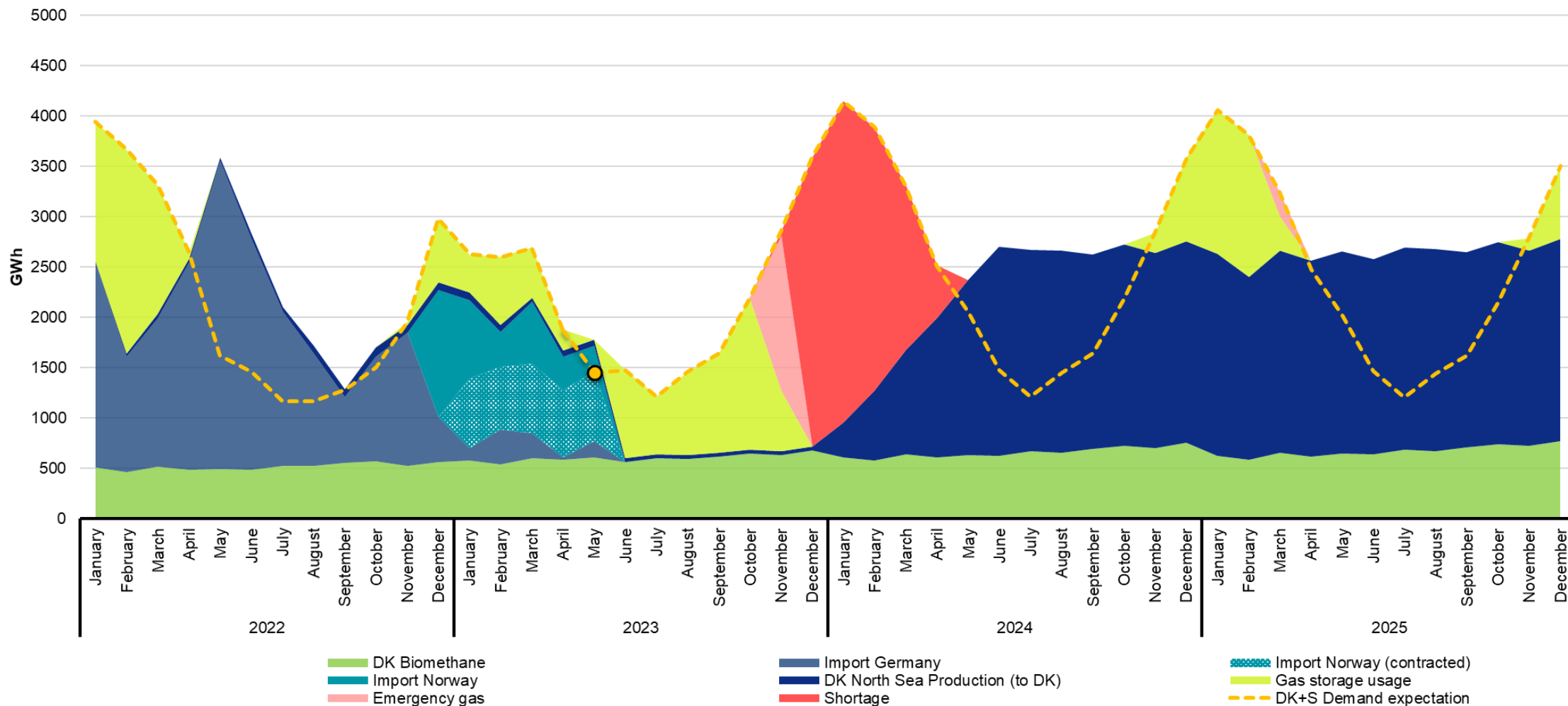
Scenario G1: Market collapse - Demand expectation





SCENARIO G1: THE GAS SUPPLY IN THE EVENT OF A MARKET COLLAPSE

Scenario G1: Market collapse - Normal demand



SCENARIO G2: RUSSIAN STOP FOR PIPELINE GAS TO EU

Current conditions: The supply of gas is stable in Q2, 2023. The European gas stocks have been well filled, and stock removal has been moderate throughout the winter. Furthermore, the Danes have been great at saving energy.

Potential consequences for the Danish supply situation:

- If Russia completely shuts down the export of gas to the EU, it will lead to increased uncertainty and higher prices on the market. Denmark should therefore prepare to reduce gas consumption, in order to handle the gas quantities that disappear from the market if the Russian supply to the EU stops in 2023 or in the winter of 2024.
- This will mean that pipeline gas to the EU will be reduced by 8% compared to the first 6 months of 2023.
- Danish imports from Germany and Norway will be reduced by 35% compared to the 'normal import volume' before the war in Ukraine.

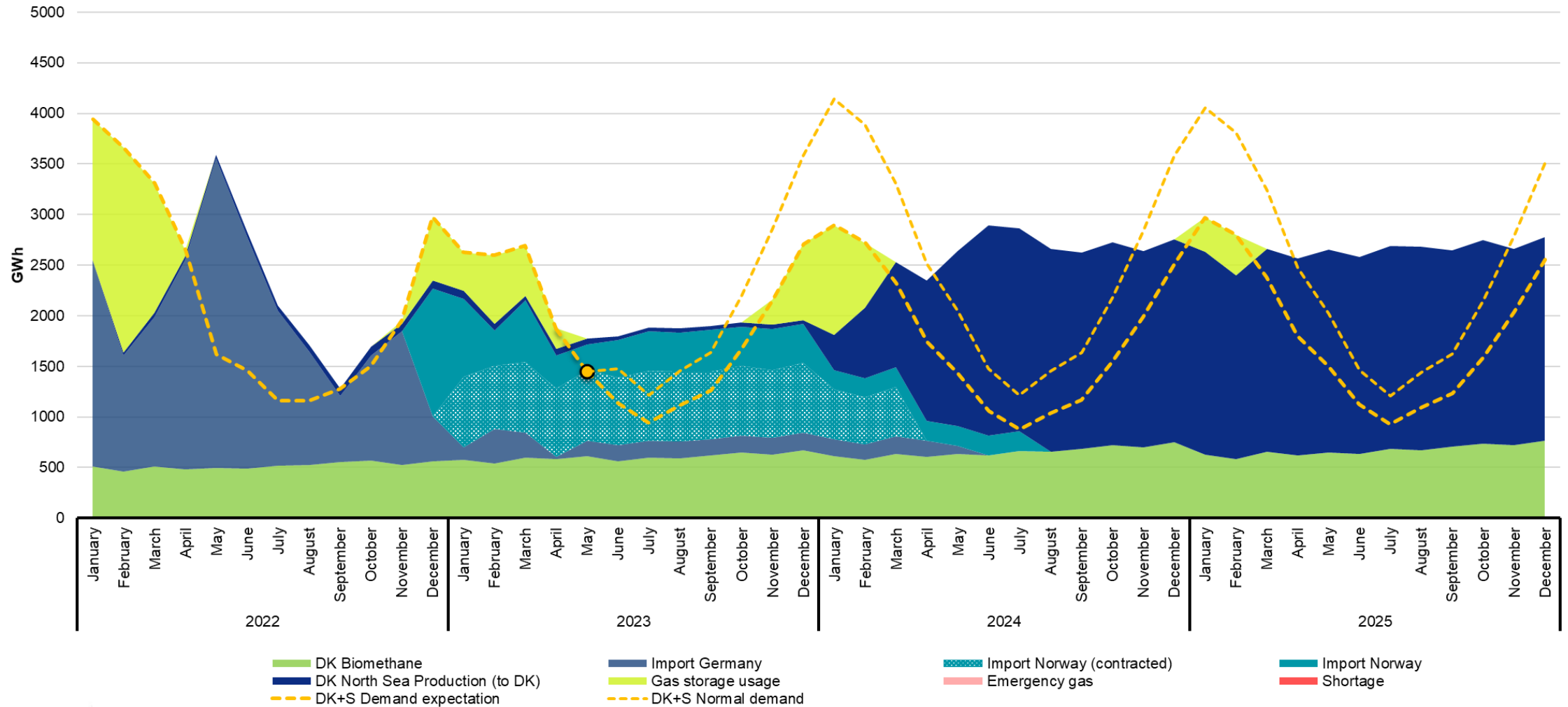
See calculations for G2 on the next slide





SCENARIO G2: RUSSIAN STOP FOR PIPELINE GAS TO EU

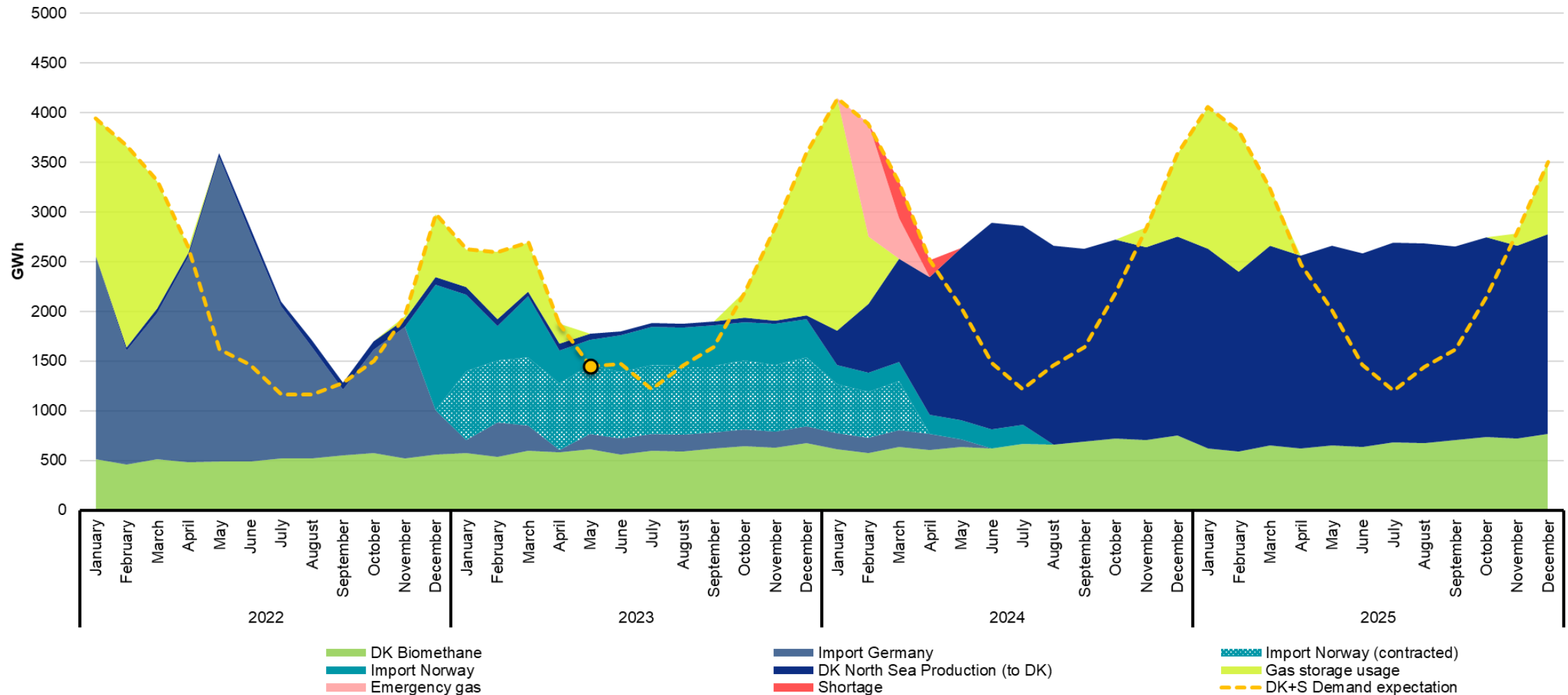
Scenario G2: No russian gas - Demand expectation





SCENARIO G2: RUSSIAN STOP FOR PIPELINE GAS TO EU

Scenario G2: No russian gas - Normal demand



SCENARIO G3: LNG-IMPORTS IN CHINA INCREASE IN 2023



Current conditions: China's reopening after Covid-19 in Q1 2023 and their growing LNG consumption is expected to create uncertainty in the European market and for overall supply. This will indirectly affect the Danish supply on the price.

Potential consequences for the Danish supply situation:

In 2022, demand for LNG was growing and marked by a sharp increase in LNG imports to the EU, which was offset by a decrease in the rest of the world – especially China. The contribution, that LNG has made to the European and Danish storage filling in 2022 is not guaranteed in relation to the winter of 2023/2024.

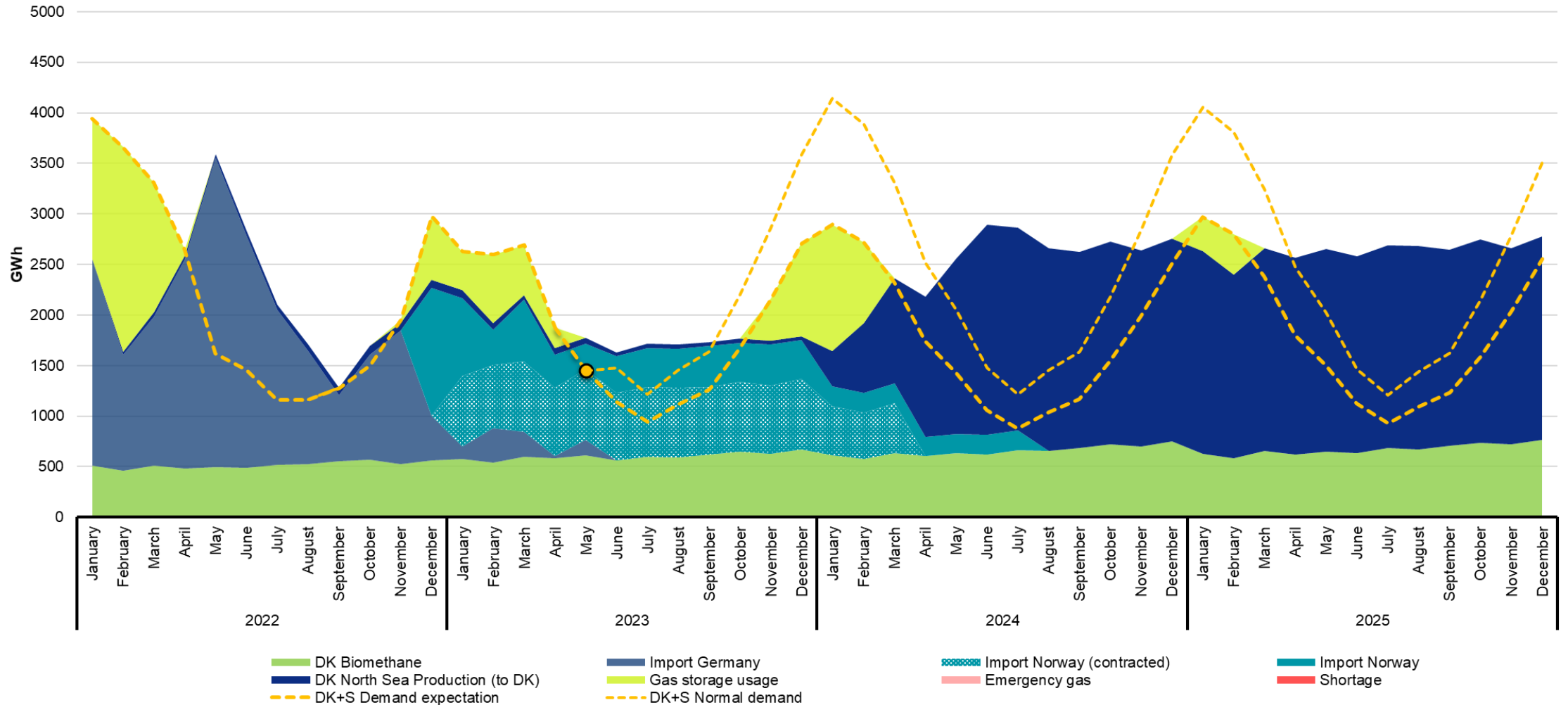
- A reopening of the Chinese market will mean that the international market, the EU and Denmark will most likely notice a period of greater market competition between EU, Japan, South Korea and China with rising prices, as seen during the summer of 2022.
- In 2022, high income countries in the West that use natural gas have shown a very high willingness to pay, which contributed to an increase in the price of gas and LNG. On a global level, there are several countries who do not have the same high willingness to pay. Therefore, growing political tensions are expected in countries such as India, Pakistan and Bangladesh, which must involuntarily return to coal.

See calculation for G3 on the next slide



SCENARIO G3: LNG-IMPORTS IN CHINA INCREASE

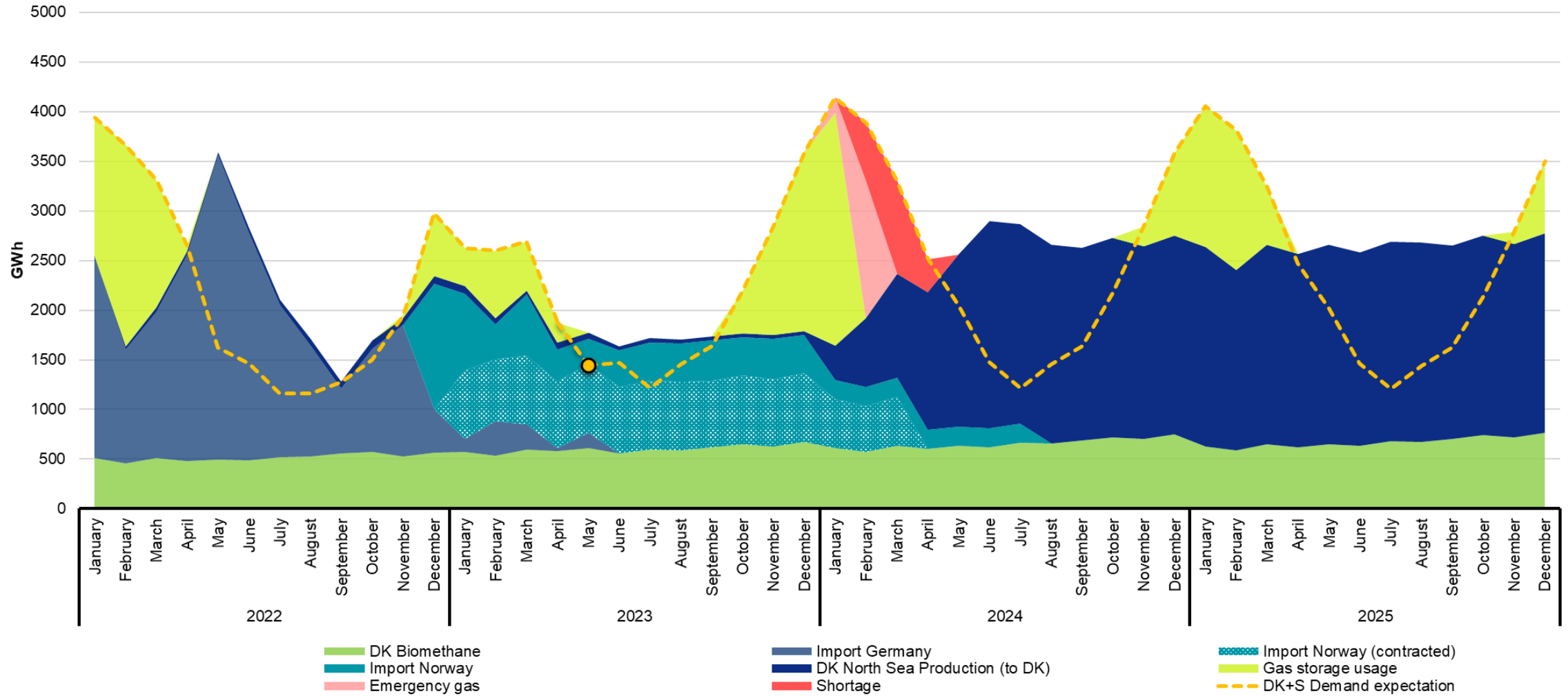
Scenario G3: Reduced LNG to EU - Demand expectation





SCENARIO G3: LNG-IMPORTS IN CHINA INCREASE

Scenario G3: Reduced LNG to EU - Normal demand



SCENARIO G4: GENERAL RISK OF SABOTAGE

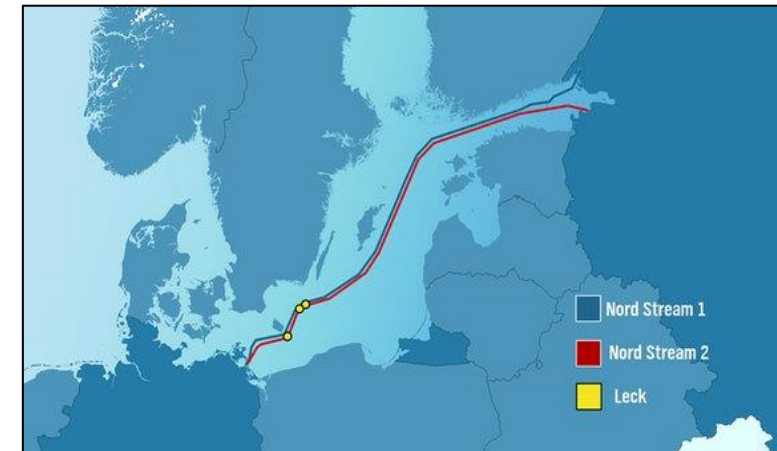
Current state: Espionage of critical infrastructure can provide access to information that can enable physical sabotage actions.

However it is less likely at present according to the assessment by PET, that foreign states will perform physical sabotage against critical infrastructure on the Danish territory. The threat assessment however may change at a very short notice in the event of an escalating conflict.

Potential consequences for the Danish supply situation.

Where and how critical this will be for the European supply remains uncertain. However increasing gas supply in 2023 with Baltic Pipe and Tyra will contribute to reducing the negative market impact as was seen after the explosions of NS1 and 2 in September 2022 with exponentially rising prices on the global market.

See the calculations/estimations for G4 on the next slide.



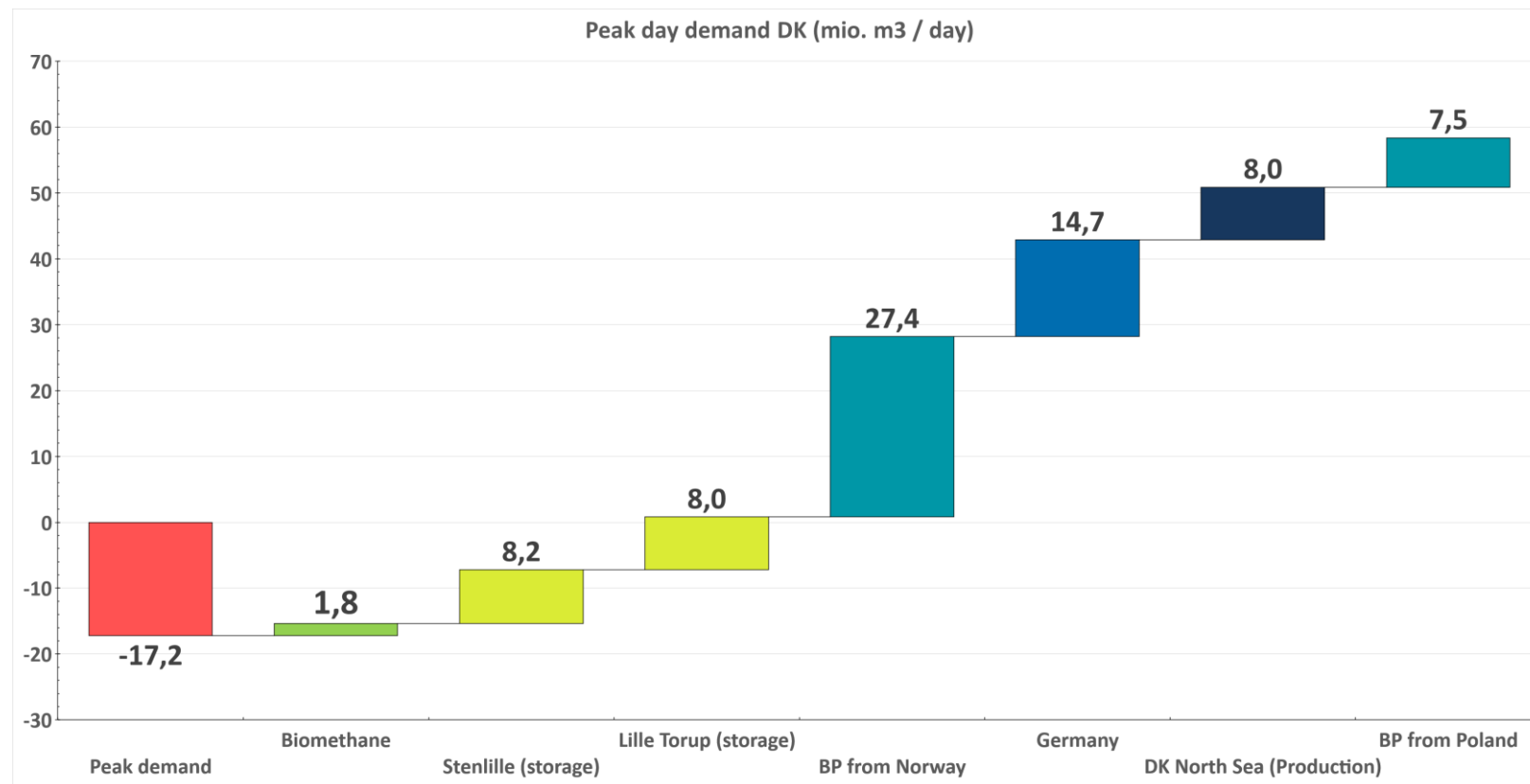


SCENARIO 4: GENERAL RISK OF SABOTAGE

DK has a very large capacity in the gas infrastructure.

Even in the event of a shutdown of all 4 import streams, there will still be capacity to maintain the system as a whole with biomethane and storage capacities

Peak day: A day with the highest consumption in relation to the last 20 years



GAS SUPPLY – WINTER 23/24

It is assessed, the continuous gas demand reductions in the EU is needed in order to get through safely through the winter:

- According to the EU all member states must reduce 15% in order to secure sufficient supply to get through the next winter.
- IEA estimates, that the EU can get safely through the winter by utilizing renewable energy, having more energy efficiency improvement, transition to other fuels and large saving initiative/measure.





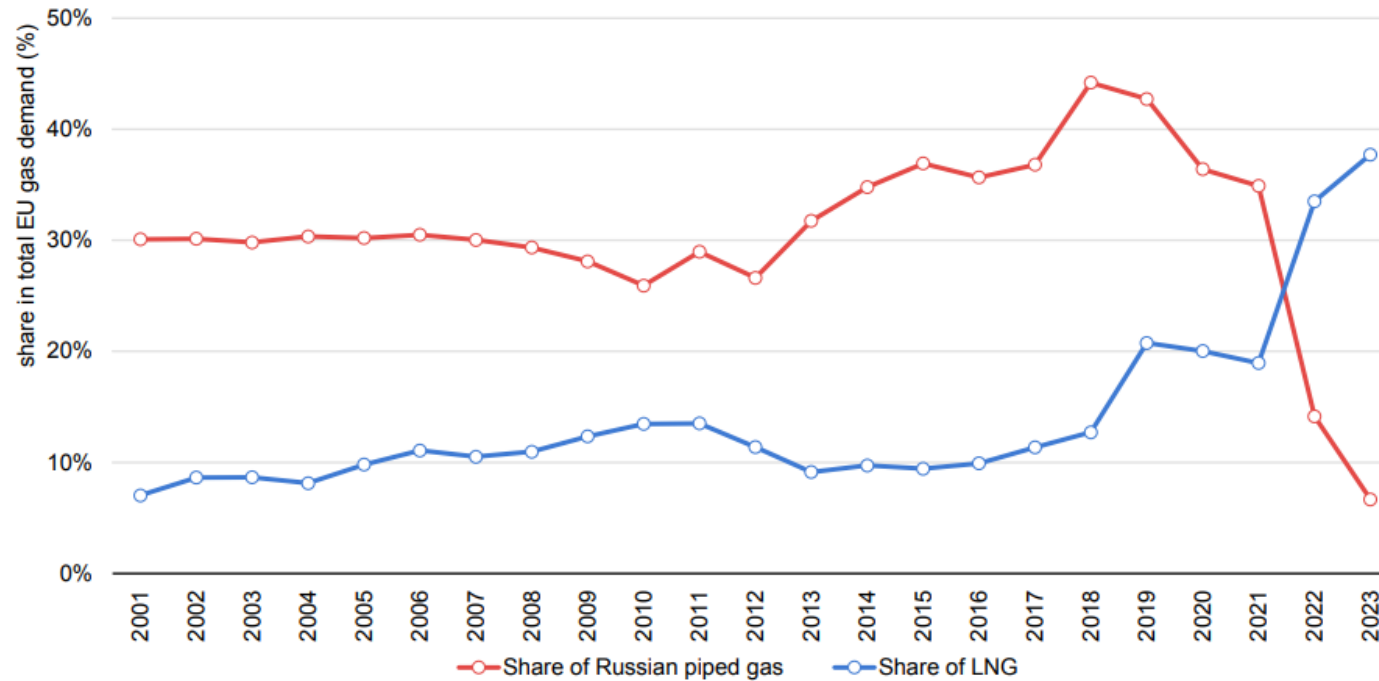
IEA: LNG IS EU'S NEW BASELOAD

Global Gas Security Review 2023
Including the Gas Market Report, Q3-2023

Executive summary – Towards a New Global Gas Market

LNG became a new baseload supply for the European market

The share of LNG and Russian piped gas in the European Union's natural gas demand (2001-23)



IEA. CC BY 4.0.

Sources: IEA analysis based on ENTSOG (2023), [Transparency Platform](#); Eurostat (2023), [Energy Statistics](#); Gas Transmission System Operator of Ukraine (2023), [Transparency Platform](#); ICIS (2023), [ICIS LNG Edge](#); IEA (2023), [Natural Gas Information](#).



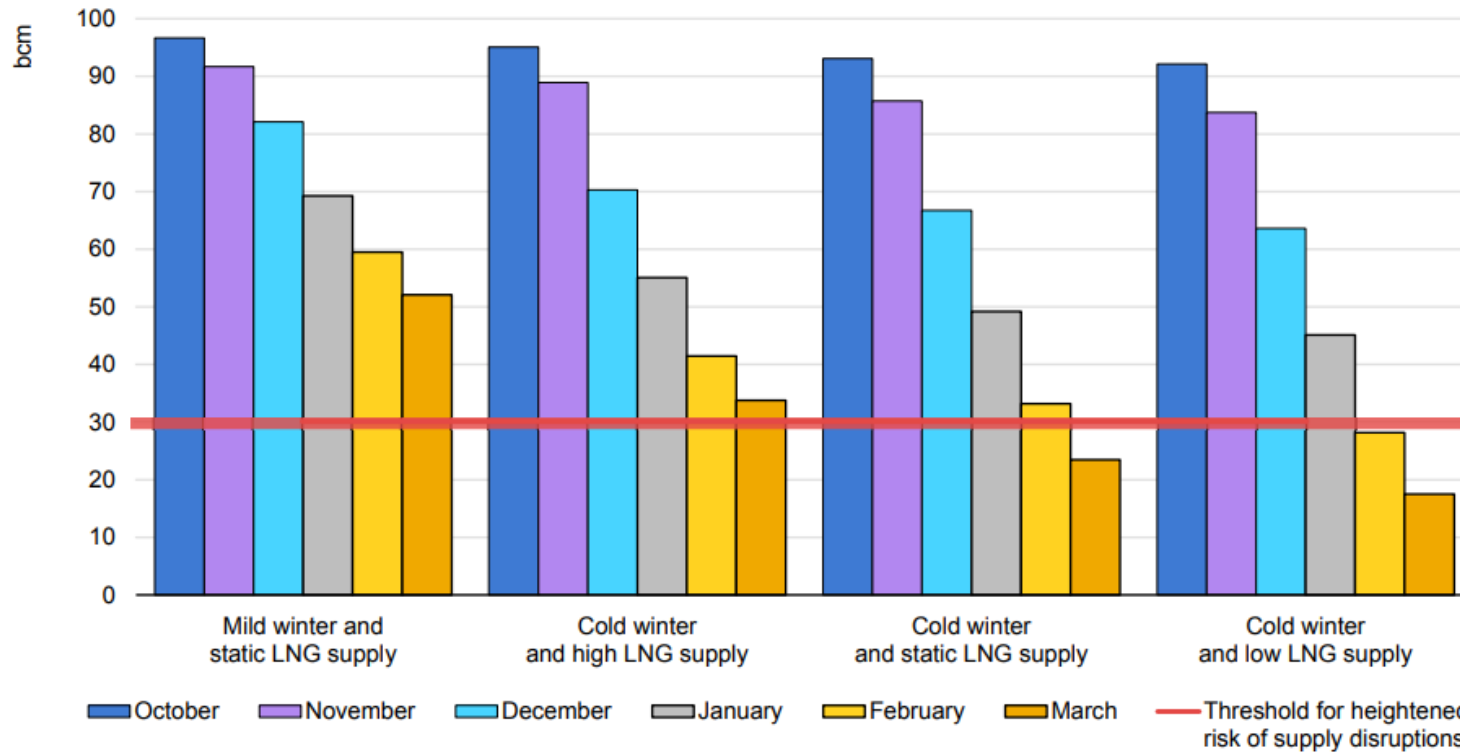
IEA: MULTIPLE EVENTS IS CRITICAL

Global Gas Security Review 2023
Including the Gas Market Report, Q3-2023

Executive summary – Towards a New Global Gas Market

Full storage sites are no guarantee against winter volatility and the risk of renewed market tensions

Potential EU gas storage trajectories without Russian piped gas under different scenarios during the 2023/24 winter season



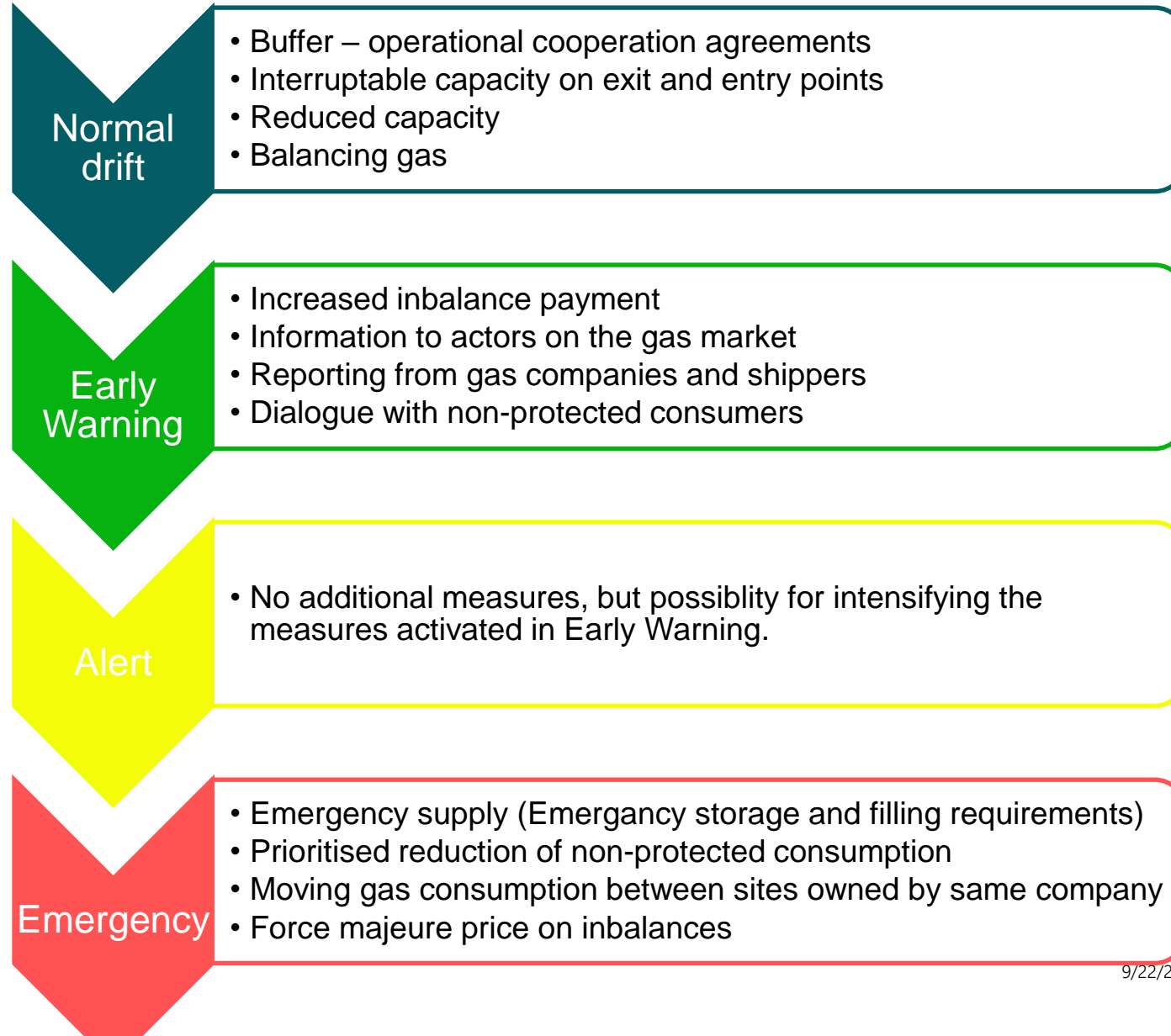
IEA. CC BY 4.0.



New Emergency Plan



INITIATIVES IN NEW EMERGENCY PLAN





REPORTING FOR SHIPPERS DURING CRISIS

- Shippers and gas storage customers must report key figures to DEA
- Information at portefolio-level on share of long contract/spot, expected (end-use) sales in DK, expected profile for storage use, etc.
- Reporting format will be kept simple
- Reporting only at portefolio-level – **not** specific distribution level
- Reporting will **not** include prices and similar contractual content
- Reporting is only during crisis – but frequency in Emergency is expected to be daily



Status - AggregateEU



FIRST AND SECOND TENDER ROUND OF JOINT PURCHASING OF GAS (AGGREGATEEU)

- Succes with the 2. tender round with a higher demand than in the first round

First tender round (April-May 2023):

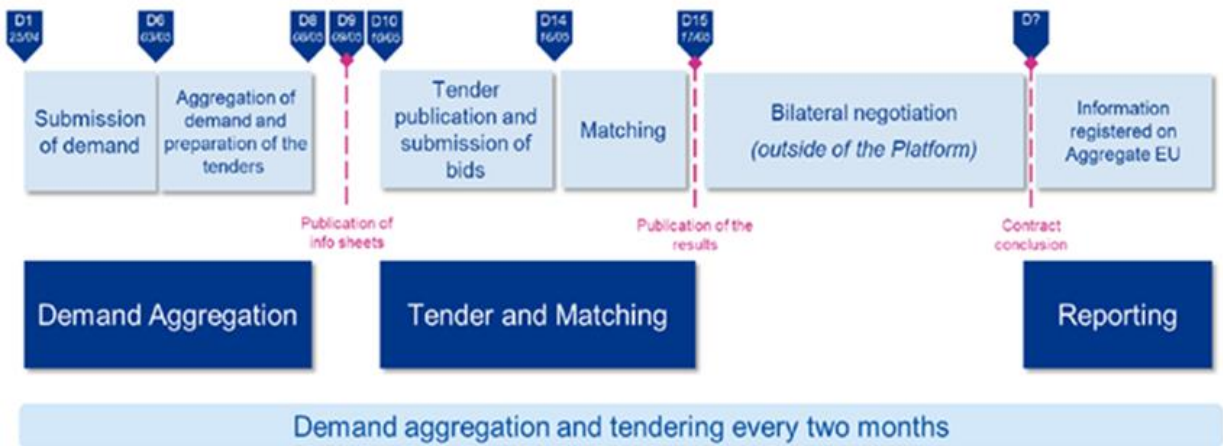
- Demand of 13,4 bcm
- Matched 10,9 bcm

Second tender round (June-July 2023):

- Demand of 15,19 bcm
- Matched 12 bcm

DKs interest in AggregateEU:

- Denmark is obliged to demand a quantity of gas equivalent to 1,33 TWh in order to meet the obligation of 15% of DKs storage filling requirements (90%)
- Danish companies have not yet participated in the tender rounds



THIRD TENDER ROUND



- Third tender round starts the 21st of September 2023 and ends the 27th of September 2023.
- In order to participate in the third tender round, the companies must have registered on the platform and sent the necessary documentation before the 18th of September 2023.

MON September 18 2023	THU September 21 2023	WED September 27 2023	THU September 28 2023	FRI September 29 2023	MON October 2 2023	MON October 2 2023	TUE October 3 2023	WED October 4 2023	THU October 5 2023	FRI October 6 2023	FRI October 6 2023
Subscription deadline	Entering demand		Processing of demand		Publication of info sheets & review	Window of demand declination closes	Tender publication and bidding		Matching & confirmation of matched positions		Publication of matching results
	Start	End	Start	End	Start	End	Start	End	Start	End	
	09:00 CEST	18:00 CEST	09:00 CEST	18:00 CEST	09:00 CEST	18:00 CEST	09:00 CEST	18:00 CEST	09:00 CEST	10:00 CEST	12:00 CEST



Thank you



BALANCING & INVOICING

Signe Louise Rasmussen, Energinet

STATUS ON THE BALANCING MODEL

1 year anniversary 1 October 2023. Last 6 months Energinet experienced less IT issues. There are still challenges to solve.

Balancing model as of 14 September 2023

General status

- From end March 2023 till today 4 days with yellow zone trades:
 - 17 June and 15 August, both triggered by physical incidences. The model worked as intended. But IT-system did not respond correct.
 - 1 and 11 September after normal procedure (1/9 planned capacity reduction)
- Energinet delayed with invoices: November 2022 to July 2023

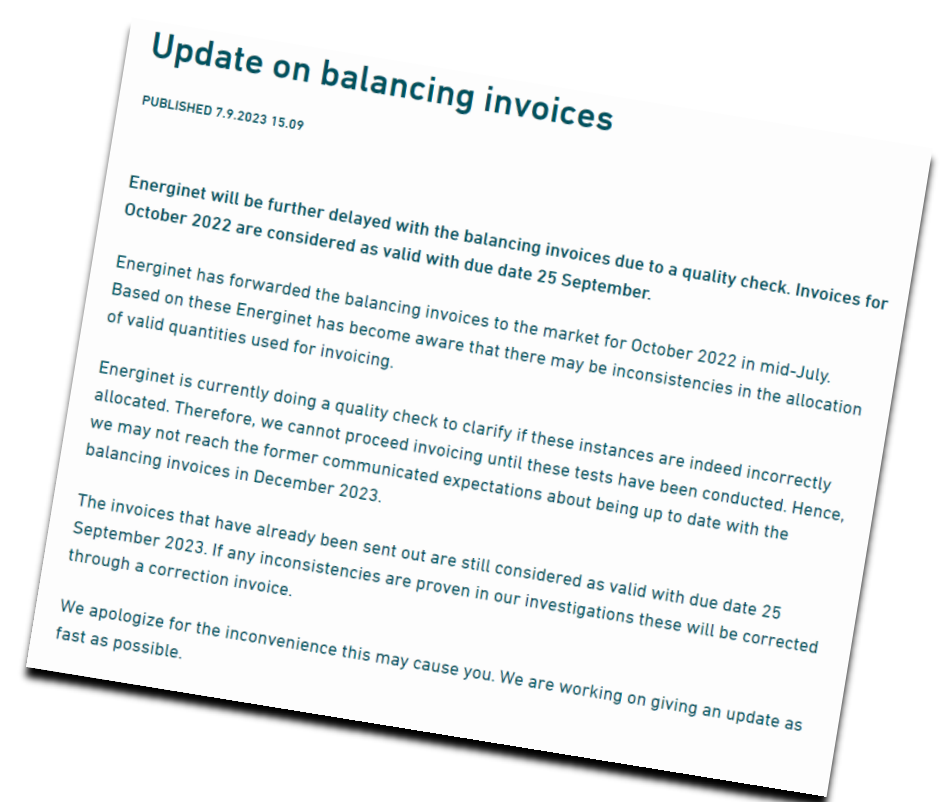
IT functionality of the model

- Faster detection of errors and corrections
- In the process of defining automatic control mechanisms
- Old Energinet Online closed 1/9 2023
- Expect valid data to be shown at new portal in October 2023.
- We are working on a work-around via MARSIT file

STATUS OF BALANCING INVOICING

Energinet has invoiced for October 2022. Energinet decided to pause the invoicing process in order to do a quality check of data – based on the responses from shippers.

- Investigating possible inconsistencies in the allocation of valid quantities used for invoicing.
- Invoice for October 2022 is considered as valid with due date 25 September 2023.
- Any inconsistencies will be corrected via correction invoice.
- Deadline of being up-to date in December 2023 may not be reached.
- More information will follow as soon as possible



EVALUATION OF THE BALANCING MODEL

The Evaluation is postponed.

Energinet expect to have a market consultation mid October 2023.

Market consultation on the evaluation rapport of the balancing model is postponed

PUBLISHED 18.8.2023 09.29

The market consultation on the evaluation report of the start-up period of the balancing model will be postponed. It is expected to be forwarded to the market in October 2023.

It was previously announced that Energinet would publish the evaluation report of the start-up period of the balancing model for public consultation in beginning of August. However Energinet is still in the **process of collecting the necessary data in order to make the full analysis on data quality**. Therefore the report is delayed. We expect to have a market consultation in October 2023.

QUESTIONS



Contact: slr@energinet.dk



FINAL REMARKS

Clement Johan Ulrichsen, Energinet

EMERGENCY TARIFFS

1 OCTOBER 2023

	2022/2023	2023/2024	Pct.
Protected customers	0.02008	0.00295	-85 %
Non-protected customers	0.01046	0.00128	-88 %

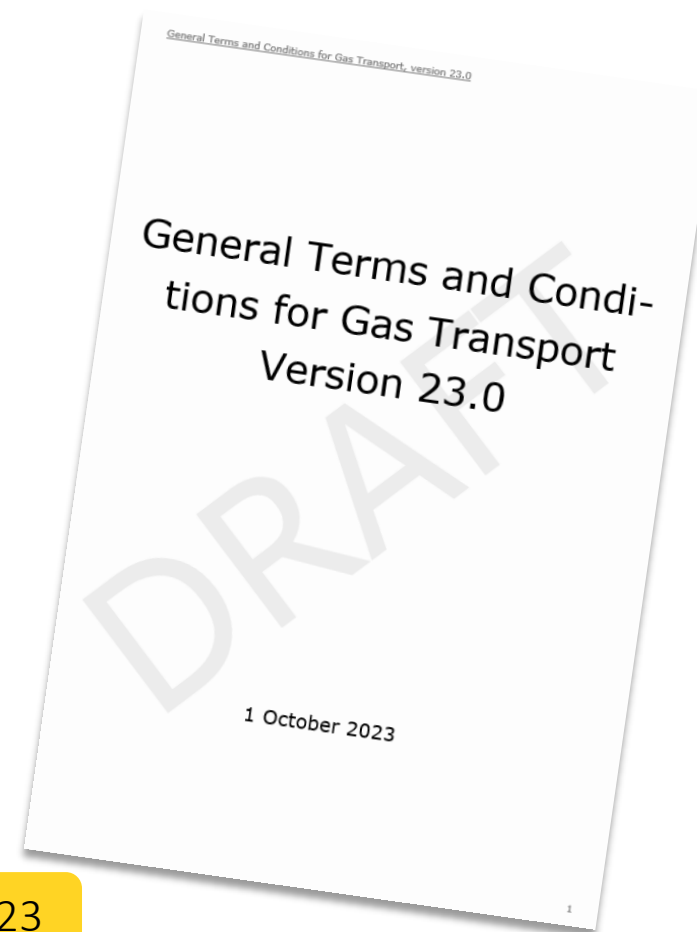


GENERAL TERMS AND CONDITIONS FOR GAS TRANSPORT 23.0 (BFG)

Market consultation – Deadline 15. September 2023

Changes compared to General Term and Conditions for Gas Transport 22.3 is listed in the Preface

- Adjustments made to reflect changes as of 1. October 2022 and system capabilities
- Changes to chapter 9. balancing;
 - Publication of ASB move 5 minutes
 - Hence, window for yellow zone trades will be reduced by 5 minutes
 - Intensified appeal to Shippers to be in balance is added (9.1) following dialogue with the Danish Utility Regulator



Please send your comments to gasinfo@energinet.dk by 15 September 2023

ALREADY ON
MONDAY

WEBINAR: HYDROGEN TRANSMISSION PROJECT

Energinet will present the hydrogen transmission project and a process for how we hope you as market player will contribute to our work.

DATE 18 September 2023

TIME 01.00 PM-02.15 PM

PLACE Online webinar via Microsoft Teams

Register at Energinets website:

[Webinar: Hydrogen transmission project \(energinet.dk\)](https://energinet.dk)



NEXT SHIPPERS FORUM: 14 DECEMBER 2023

