



21 June 2017

Jeppe Danø

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EMERGENCY EXIT



DEFRIBILLATOR (AED)



MEETING POINT

AGENDA

12-13	Lunch and networking
13.00	Welcome Jeppe Danø, Energinet
13.10	Joint Balancing Zone Poul Johannes Jacobsen, Energinet
13.20	Status on Ellund exit capacity Jesper Bruun, Energinet
13.30	Status on supply situation without Tyra 2019-2022 Jess Bernt Jensen <i>and Christian Rutherford, Energinet</i>
13.45	Baltic Pipe Open Season status Julie Frost Szpilman and Christian Rutherford, Energinet
14.00	Gas Storage Denmark Hans-Åge Nielsen, Gas Storage Denmark
14.10	Coffee break and networking
14.40	Revised CAM NC Christian Rutherford, Energinet
14.55	European Gas Target Model Self-Evaluation by DERA and Ei Sara Steenberg Andersen and Henrik Nygaard Jensen, Danish Energy Regulatory Authority
15:10	Revised Security of Gas Supply Regulation Per Stokholm, Danish Energy Agency
15.25	End of programme



NEW LOGO



Legal name: Energinet.dk

ENERGINET

Contact information for shippers in Energinet's

Register of Players.



If you have questions or comments on our new website related to gas, please send an email to anmodning@energinet.dk



Secure communication with Edigas XML.

Registered shippers have access to trade gas and

capacity on a number of platforms.



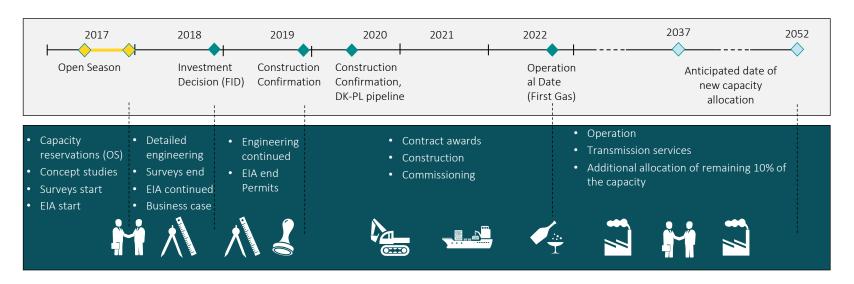
BALTIC PIPE, OPEN SEASON STATUS

Julie Frost Szpilman

BALTIC PIPE PROJECT - MILESTONE OVERVIEW

System

The business case and the FID will be based on Open Season capacity reservations and conceptual study costs. Once all permits are in place, construction will begin and the project will deliver First Gas in 2022





STAKEHOLDERS' COMMITMENT

Cooperation principles and strong stakeholders' commitment have been established

The Project Promoters have established principles of cooperation between all stakeholders from Poland, Denmark and Norway. The project has strong political and business support.

Poland and Denmark have signed a Memorandum of Understanding, and project activities including study and survey contract awards are progressing – strong commitment.

GAZ-SYSTEM and Energinet agreed on a launching of the Open Season procedure, which aims at collecting the binding bids for the available capacity from the market participants. A successful Open Season will facilitate the future decision on the project implementation, especially in the Fast Track Approach aiming at First Gas from 2022.



Photo: Paweł Supernak, PAP

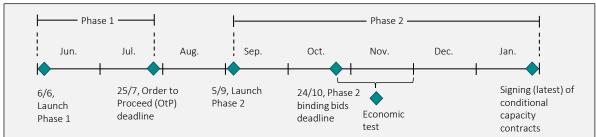


INTRODUCTION TO THE OPEN SEASON 2017

The Open Season Standard offers a structured process which is divided into 2 phases on the Baltic Pipe project

Open Season Phase 1

Open Season Phase 2





DVERVIEW

Open Season Phase 1- already launched





OPEN SEASON 2017 RULES – DOCUMENT OVERVIEW

The Open Season rules are documented in a systematic set of appendices

General Appendices:

- Appendix 1: **Phase 1** Order to Proceed **Bid Form**: North Sea Entry Point and Interconnection Point Baltic Pipe
- Appendix 2: Phase 2 Final Bid Form: North Sea Entry Point and Interconnection Point Baltic Pipe

Danish Appendices:

- Appendix 3: Rules applicable to participation in the Danish part of the OS 2017
- Appendix 3.A: Registration form
- Appendix 3.B:Guarantee
- Appendix 3.C:Draft of the OS 2017 Capacity Agreement
- Appendix 3.D: Standard Framework Agreement (Appendix 2 of the Rules for Gas Transport)

Polish Appendices:

- Appendix 4: Additional GAZ-SYSTEM's Rules for the Open Season 2017
- Appendix 4.A: Transmission **Network Code** of GAZ-SYSTEM
- Appendix 4.B:Tariff of GAZ-SYSTEM
- Appendix 4.C:**Registration** form
- Appendix 4.D: Framework transmission contract template
- Appendix 4.E: Draft of the OS 2017 Capacity Agreement



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https://en.energinet.dk/Gas/Shippers/Open-Season-2017 http://en.gaz-system.pl/strefa-klienta/konsultacje-z-rynkiem/aktualnekonsultacje/open-season-baltic-pipe/



STATUS JOINT BALANCING ZONE

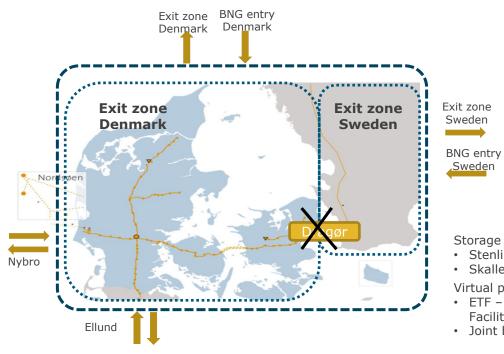
Between Sweden and Denmark

Poul Johannes Jacobsen

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SWEDEGAS

Status Joint Balancing Zone



Potential benefits

- Increased market area
- Improved liquidity
- More efficient market
- Improved Security of Supply
- Compliance with Network Codes at minimum cost
- More efficient TSO operation
- → Improved competiveness of gas

Storage points

- Stenlille and Lille Torup
- Skallen

Virtual points

- ETF Exchange Transfer Facility
- · Joint bilateral point

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Status - Joint Balancing Zone

SWEDEGAS

Market Consultation

- 31 representatives of 23 different players including gas suppliers, balance managers, end consumers, distributors, authorities and the Danish gas exchange participated
- We received about 10 answers to the distributed survey from 14 different stakeholders
- The general response was that a common balancing zone is in principle a step in the right direction, and the potential benefits presented are largely confirmed by the market
- But this obviously assumes that the market benefits are greater than the cost of implementing a common balancing zone

A strategic decision

- The boards of Swedegas and Energinet have made a strategic decision of introducing a common balancing zone for Denmark and Sweden based on the concept model developed jointly by the parties
- This means that a formal project has been initiated with the purpose of determining the details of a design that will enable more accurate estimates of costs and benefits for the project
- Decisions on implementation cannot be made until the end of 2017/2018 at the earliest, and an implementation phase is not expected to be completed until the first half of 2019



STATUS ON ELLUND EXIT CAPACITY

Related to oxygen from biomethane

Jesper Bruun



CONTENTS

Background
Internal task force
Operational solution
Changes to infrastructure
Summary





JUST TO RECAP ON LAST SUMMER

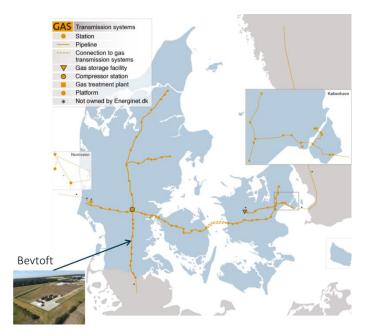
Due to different requirements for oxygen content in gas in Germany and Denmark, we had a capacity issue south-bound in the summer 2016.

A REMIT was communicated to the market the 1 July 2016.

The capacity remained reduced from 5 July to 31 August 2016.

Energinet developed a procedure for handling the biomethane in the 30-inch pipeline – with great operational help from the adjacent TSO, Gasunie Deutschland.

Following constructive meetings with Gasunie Deutschland regarding the development of a common operational procedure, the capacity was released to the market.





INTERNAL TASK FORCE - OXYGEN

Formed immediately after summer 2016 in order to regain capacity across Ellund Border

Internal group of specialists representing all relevant disciplines

Target of identifying concrete and economical solutions to the oxygen challenge

Collect the data for a cost-benefit analysis

Results:

- Cross-over connection between the two parallel pipelines between Egtved and Ellund Border decided on.
- Conclusion that the removal of oxygen is expensive and should be avoided in order to reduce the socio-economic cost of biomethane injection.
- Planned installation of additional oxygen analyser in the grid
- International possibilities:
 - A workshop planned for autumn 2017 among the Green Gas Initiative about oxygen from biomethane.
 - Launch the question in CEN Sector Forum Gas, WG Gas Quality, about the limit in the EN 16726 standard for oxygen.



BEVTOFT CROSS-OVER

It was decided to establish a cross-over connection between the parallel pipelines at Bevtoft.

The purpose is to route the biomethane direct to Danish consumption via the first Ellund-Egtved pipeline.

The benefit of the cross-over is to:

- Reduce the risk of hitting the limitations of the operational methodology
- Reduce the cost of the operational solution (hours and compression)





BEVTOFT CROSS-OVER FINALIZED IN MAY







SUMMARY

The capacity Exit Ellund was regained owing to an operational solution bilaterally with the adjacent TSO

An internal task force was formed and has delivered input for the solutions

A cross-over connection has been established that will

- reduce the cost of handling oxygen from biomethane in the southern part of the Danish transmission system
- reduce the risk of hitting the limitations of the operational methodology

The task force is still active with regard to avoiding new challenges relating to oxygen from biogas and facilitating effective integration of biomethane in the grid.





Tyra 2019-2022

Jess Bernt Jensen and Christian Rutherford



NEW BASIC ASSUMPTIONS

Demand and supply:

- Denmark and Sweden 2017-2040: "Analyseforudsætninger 2017", which is expected to be published end June https://www.energinet.dk/Analyse-og-Forskning/Analyseforudsaetninger/Analyseforudsaetninger-2017
- BNG: Analyseforudsætninger 2017"
- Natural gas production Danish North Sea: DEA 28 April 2017

https://ens.dk/ansvarsomraader/olie-gas/rapporter-om-olie-og-gasaktiviteter

Tyra field redevelopment plan:

DEA April 2017

https://ens.dk/ansvarsomraader/olie-gas/rapporter-om-olie-og-gasaktiviteter

Mærsk 22 March 2017 and 5 June 2017:

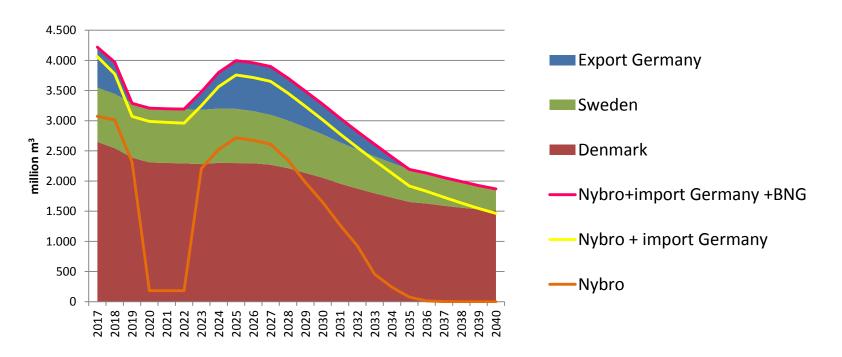
http://www.maersk.com/en/the-maersk-group/about-us/publications/maersk-post/2017-2/raising-tyra

Storage facilities:

 GSD Market message 5 April 2017: "Reduction in the GSD volume capacity" https://gasmarketmessage.dk/Pages/viewgenerelmessage.aspx



SUPPLY AND DEMAND 2017-2040



ENERGINET

DEMAND AND SUPPLY 2017-2040

Demand Supply

	Year	Denmark		Denmark + Sweden	Commercial Export Germany	Total 's	d		Year	Supply North Sea (Nybro)	BNG	Commercial Import Germany	Total Supply
Calorifc value (upper heat value)	2017	32.053	10.890	42.943	8.107	51.050			2017	37.198	1.873	11.979	51.050
	2018	30.794	10.890	41.684	6.359	48.044			2018	36.463	2.392	9.189	48.044
	2019	28.900	10.890	39.790	1	39.791			2019	27.977	2.625	9.189	39.791
	2020	27.937	10.890	38.827	0	38.827		i	2020	2.208	2.653	33.965	38.827
	2021	27.826	10.890	38.716	0	38.716		[GWh]	2021	2.208	2.732	33.776	38.716
	2022	27.741	10.890	38.631	0	38.631			2022	2.208	2.831	33.591	38.631
	2023	27.594	10.890	38.484	3.630	42.114			2023	26.699	2.819	12.596	42.114
	2024	27.852	10.890	38.742	7.260	46.002			2024	30.545	2.860	12.596	46.002
	2025	27.801	10.890	38.691	9.680	48.371			2025	32.871	2.903	12.596	48.371
	2026	27.768	10.454	38.222	9.680	47.902			2026	32.369	2.937	12.596	47.902
	2027	27.460	10.019	37.479	9.680,0	47.159			2027	31.586	2.977	12.596	47.159
	2028	26.775	9.583	36.358	8.470,0	44.828			2028	28.355	3.018	13.455	44.828
	2029	25.821	9.148	34.968	7.260,0	42.228			2029	23.936	3.058	15.234	42.228
	2030	24.856	8.712	33.568	6.050,0	39.618			2030	19.967	3.135	16.517	39.618
	2031	23.682	8.276	31.958	4.840,0	36.798			2031	15.378	3.174	18.247	36.798
	2032	22.681	7.841	30.522	3.630,0	34.152			2032	11.205	3.212	19.735	34.152
	2033	21.738	7.405	29.143	2.420,0	31.563			2033	5.504	3.251	22.809	31.563
	2034	20.863	6.970	27.833	1.210,0	29.043			2034	2.920	3.290	22.833	29.043
	2035	19.997	6.534	26.531	0,0	26.531			2035	915	3.329	22.288	26.531
	2036	19.685	6.098	25.783	0,0	25.783			2036	158	3.640	21.985	25.783
	2037	19.229	5.663	24.892	0,0	24.892			2037	25	3.958	20.909	24.892
	2038	18.856	5.227	24.083	0,0	24.083			2038	0	4.275	19.808	24.083
	2039	18.511	4.792	23.302	0,0	23.302			2039	3	4.593	18.707	23.302
	2040	18.265	4.356	22.621	0,0	22.621			2040	-3	4.911	17.714	22.621



SUPPLY AND DEMAND 2019-2022

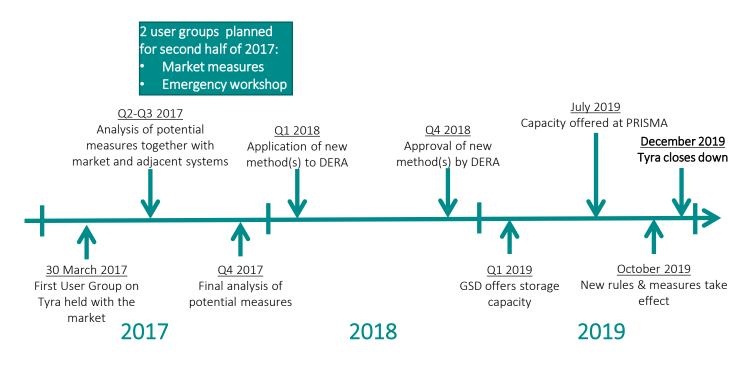
Next step in relation to the supply situation

- Based on the new assumptions, Energinet will analyse the supply and demand situation 2019-2022
- At the next Shippers Forum in September 2017, Energinet will present the result of the updated analysis (similar to the analysis in August 2016)
- The following time schedule is foreseen



TIMELINE FOR TYRA — MARKET DEVELOPMENT

Anticipated timeline and steps towards Tyra shutdown



GAS STORAGE DENMARK

SHIPPERS' FORUM

21 June 2017

Hans-Åge Nielsen hni@energinet.dk



One commercial storage facility backed by two physical storage sites

- A salt cavern storage facility at Lille Torup
- An aquifer storage facility at Stenlille
- Total capacity

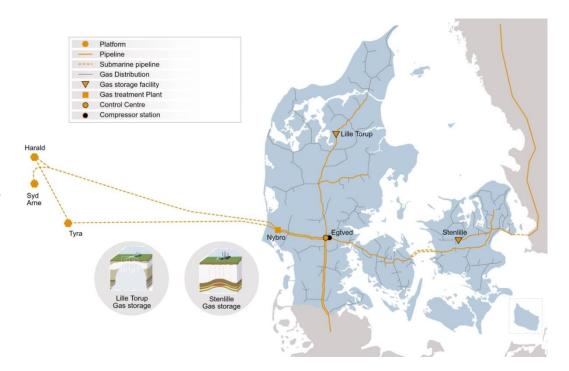
•	Volume	10.7 TWh
•	Injection	4.2 GW
•	Withdrawal	8.1 GW

Operational track record

- Only 3-4 days of unplanned reduced capacity in the last 10 years
- No unplanned complete shutdown ever

Transparent pricing and no-fee policy

- Price is based on the value creation
- Contract duration from WD to 10+years
- No annual/administration fee



BALTIC PIPE PROJECT



Stable Norwegian supply via Denmark to the Polish market

Increased gas trading and new players to spur the Danish gas market even more

Storage in Denmark may play a vital role as potential flexibility provider to the Polish market

Gas Storage Denmark is open to matching storage capacity to an open-season bid



GAS STORAGE DENMARK

BOOK A MEETING?

PLEASE CONTACT OUR SALES TEAM:

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COFFEE BREAK AND NETWORKING







Capacity Allocation Mechanisms Network Code

Christian Rutherford



REVISED CAM NC

General information

- Effective at the beginning of April 2017
- Includes a series of important updates
- For the Danish system, there are 4 important updates
- These are:
 - Incremental capacity process
 - Capacity conversion
 - Offer of capacity products for the next 5 years
 - Interruptible capacity short-term



INCREMENTAL CAPACITY PROCESS - 1 OF 2

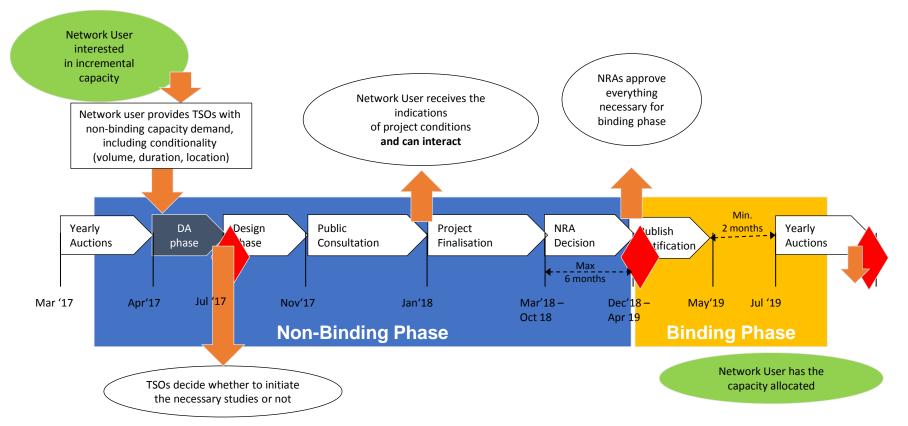
"New way of conducting an Open Season"

Main points in the short term

- Very precise and formalistic process of collecting potential investment signals for new capacity
- Must be conducted every second year
- Process starts in odd-numbered years and may result in new capacity being offered in equalnumbered years (the subsequent year)
- The process starts by the TSO collecting non-binding demand indications from the market
 - Energinet has done so up until 1 June 2017
 - Result: no demand indications received
- In future, the TSO must complete a demand assessment report towards each relevant adjacent system
- First reports must be finalised by the end of July 2017



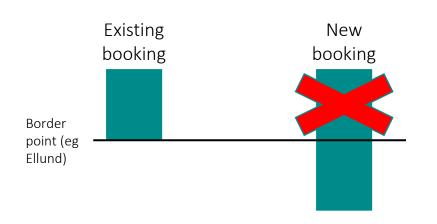
INCREMENTAL CAPACITY PROCESS – 2 OF 2





CAPACITY CONVERSION

Avoidance of double payment for capacity



Main principles

- Shippers with existing unbundled firm capacity at a border point should not pay double for capacity at one side when only bundled firm capacity is available
- Applicable for longer-termed contracts (annual, quarterly, monthly)
- Precise principles to be defined by ENTSOG by 1 October 2017
- To be implemented by 1 January 2018



OFFER OF CAPACITY FOR 5 GAS YEARS AHEAD

New CAM NC requirement

Details

- TSOs must offer capacity for 5 gas years ahead at all interconnection points
- Capacity can be booked for single years, 5 years ahead
- Relevant for Ellund and Dragør
- Must be offered for the first time at the next annual auction in July 2018
- Pricing will be discussed by the Shipper Task Force on tariffs

Open questions at this stage

- Is capacity offered 5 years ahead also relevant for other points?
- Can we avoid offering capacity 5 years ahead at Dragør, taking into account the Joint Balancing Zone project?



INTERRUPTIBLE CAPACITY SHORT-TERM

Change regarding when to auction interruptible capacity

New order in revised CAM NC

TSOs are not allowed to offer interruptible capacity until firm is sold out, for annual, quarterly and monthly products (business as usual for Energinet)

TSOs are still allowed to offer interruptible day-ahead capacity, even if firm is not sold out (main principle in Germany)

Expected action

Energinet expects to change to the German principle, to offer interruptible capacity even though firm is not sold out, for day-ahead contracts:

- Shippers' own choice which product is relevant – own risk assessment
- Interruptible auction is held later than firm (17:30 to 18:00) – closer to the end of typical trading hours

Timeframe

Expected timeframe: Implementation during 2018

To be discussed with market participants and DERA





GAS TARGET MODEL SELF-EVALUATION BY DERA & EI

Danish Energy Regulatory Authority
Sara Steenberg Andersen & Henrik Nygaard Jensen
Shippers' Forum June 2017



INTRODUCTION TO THE GAS TARGET MODEL

Gas Target Model

- -ACER's vision for the European gas market
- -Focus on wholesale market functioning, security of supply and the future role of gas

Self-evaluation

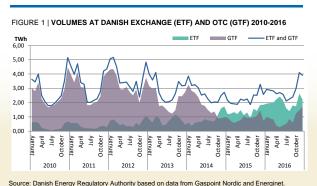
- -Focus on wholesale market functioning
- -Phase 1: assess current state of market functioning and expected state in the short term
- Phase 2: analysis of potential market reforms to improve market functioning



THE DANISH AND SWEDISH GAS MARKET

Positive developments in recent years

- Physical import of large amounts of gas from Germany
- -Danish gas exchange, Gaspoint Nordic
- -Increase in traded volumes at Gaspoint Nordic
- -Danish gas price correlated with gas prices in Northwest Europe



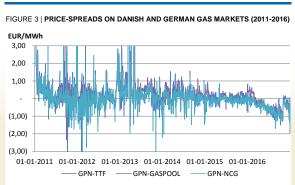
Source: Danish Energy Regulatory Authority based on data from Gaspoint Nordic and Energinet.

Note: ETF (Exchange Transfer Facility) is the delivery point for gas exchange (Gaspoint Nordic)

contracts and GTF (Gas Transfer Facility) is the delivery point for OTC contracts on the Danish gas

Sourmarket.

Not





METRICS IN THE GAS TARGET MODEL

Market participants' needs

Market participants' needs are met if "products and liquidity are available such that effective management of wholesale market risk is possible."

- -Order book volume
- -Bid-offer spread
- Order book price sensitivity
- -Number of daily trades

Market health

A market has market health if "the wholesale market area is demonstrably competitive, resilient and has a high degree of security of supply."

- —Herfindahl-Hirschman Index
- Number of supply sources
- —Residual Supply Index
- -Market concentration for bid/offer activities and for sales/purchase activities.

METRICS - RESULTS

TABLE 1 | GAS TARGET MODEL RESULTS FOR DENMARK AND SWEDEN

Market participants' need metrics	Day Ahead	Month Ahead	Forward
Order book volume (bid-side)	450-750 MW	0-150 MW	NA
Order book volume (offer-side)	450-750MW	0-150 MW	NA
Bid-offer spread	1-1.25 pct.	2-2.5 pct.	NA
Order book price sensitivity (bid-side)	-	-	NA
Order book price sensitivity (offer-side)	-	-	NA
Number of trades	0-50	0-50	NA

Market health metrics	Denmark-Sweden
Herfindahl-Hirschmann Index	1,720
Number of supply sources	3
Residual Supply Index	179 pct.
Market concentration for bid activities	-
Market concentration for offer activities	-
Market concentration for sales activities	< 40 pct.
Market concentration for purchase activities	> 40 pct.

IDENTIFIED PROJECTS

Renovation of Tyra: Tyra will be fully rebuilt, and production could increase

Baltic Pipe Project: Increase in transit volumes, potentiality of new market participants and lower tariffs in the Danish gas transmission system

-Common Market Zone: increased market area and one entry/exit tariff

Joint Balancing Zone: Increased market area and fewer barriers of trade

Gaspoint Nordic: Joined PEGAS – potential for more trade in ETF products

LNG in Sweden: Extra supply source may increase flexibility

Many projects in the pipeline which may increase the market area, gas volumes and the number of market participants.

MARKET REFORMS (PHASE 2)

- —DERA and Ei recommend that Energinet looks at potential ways to ensure that there is enough gas in the market during the renovation of Tyra through enhanced TSO cross-border cooperation and by optimizing the use of capacity at Ellund, eg through the effective use of CMP tools and other tools for allocation of capacity such as secondary auctions and implicit allocations.
- -DERA and Ei support the Danish and Swedish TSOs' work on analysing the costs and benefits of creating a joint balancing zone.
- -DERA recommends that it should be analyzed whether a common market zone could also include the existing Danish upstream system.
- —DERA and Ei recommends that a more extensive analysis of potential market reforms or adjustments for the Danish-Swedish market should await the next self-evaluation, which is expected to be performed in 2020 due to the many expected projects in the short term.

PUBLIC CONSULTATION

Examples of questions to be considered

- —Do you share the NRA's analysis regarding the state of wholesale market functioning?
- —What do you think should be done to improve wholesale market functioning?
- —What do you think are the main barriers to a well-functioning wholesale market?

Deadline for public consultation: 30 June 2017

Email comments to: Sara Steenberg Andersen, saan@energitilsynet.dk

The Danish and Swedish regulators' self-evaluation will be sent to ACER and published on their respective websites (energitilsynet.dk and ei.se)



Revision of Regulation No 994/2010 concerning measures to safeguard the security of gas supply

State of Play

- Adoption in the Energy Working Group
- Linguistics (National Language)
- Final adoption in the Council July/August 2016

Energistyrelsen

New elements in the revision

- Improved regional cooperation (within predefined regions)
- New provision on solidarity
- Increased transparency in gas contracts

Regional Cooperation

Denmark (and Sweden), member of three groups:

- Baltic Sea: A, BE, CS, ES, DK, FR, DE, LU, NL, SL, S
- Norway: BE, DK, FR, DE, IR, IT, LU, NL, PT, ES, S, UK
- Denmark: DK, LU, NL, DE, S

Regional Risk Assessment

- ➤ ENTSOG's simulation of disruption scenarios by 1 November 2017.
- Regional and National Assessment Plans by 1 November 2018
- ➤ Based on the Assessments Plans, National Preventive Action Plan and Emergency Plan by 1 March 2019

Solidarity

- MS can request solidarity measures from neighbouring connected countries to supply solidarity-protected customers
- Solidarity-protected customers means households, district heating installations (households and essential social services) and essential social services

Solidarity

- > The solidarity measures are a last resort
- MS not able to supply its solidarity-protected customers
- All market-based measures exhausted
- Solidarity must be provided on the basis of full compensation

Energistyrelser

Solidarity

- MS concerned must adopt the technical, legal and financial arrangements by 1 December 2018
- MS covering gas consumption for its solidarityprotected customers from its own production is exempt from the obligation – but not exempt from providing solidarity to other MS

Gas Contracts - Transparency

Notification of gas contracts providing more than 28 % of annual national consumption:

- Contract duration
- Yearly volumes
- Maximum daily volumes in case of an alert or emergency
- Delivery points
- Minimum daily and monthly volumes
- Conditions for suspension of deliveries

What is next?

- Final adoption in July/August 2017
- ENTSOG simulation by 1 November 2017
- Each Regional Group must agree on a cooperation agreement by 1 December 2017
- ENDK and DEA after consultation with stakeholders - to draw up new plans



SEE YOU AT THE NEXT SHIPPERS' FORUM 7 SEPTEMBER 2017

