



NORD POOL

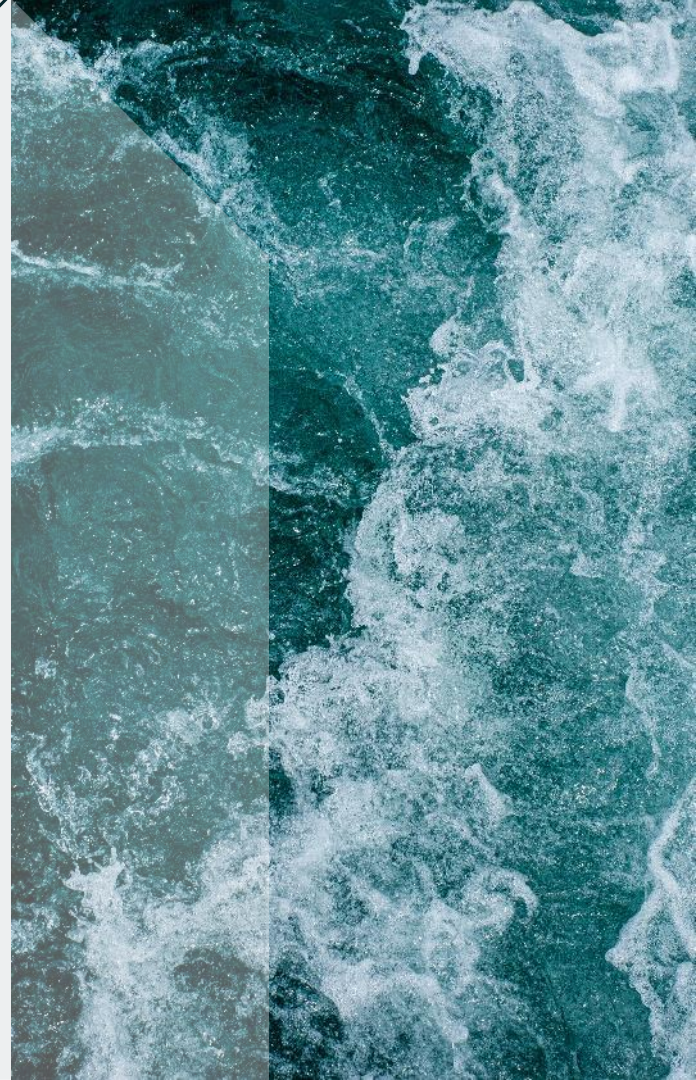
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NORD POOL MARKET UPDATE

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Riga, AST Conference, 1 November 2024



Agenda

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Nord Pool at a glance

02

Market dynamics
past and future

03

Nordic Flow-based

04

IDAs and 15 min MTU

05

Euronext Nord Pool Power
Futures Market

At a glance

- Nord Pool offers day-ahead and intraday trading, clearing and settlement services
- More than 400+ customers from 20 countries trade on Nord Pool's markets
- Operates in 16 European countries
- Serviced' markets
- ~150 employees, 35 nationalities, offices in Oslo, Stockholm, Helsinki, Tallinn, Paris, and London



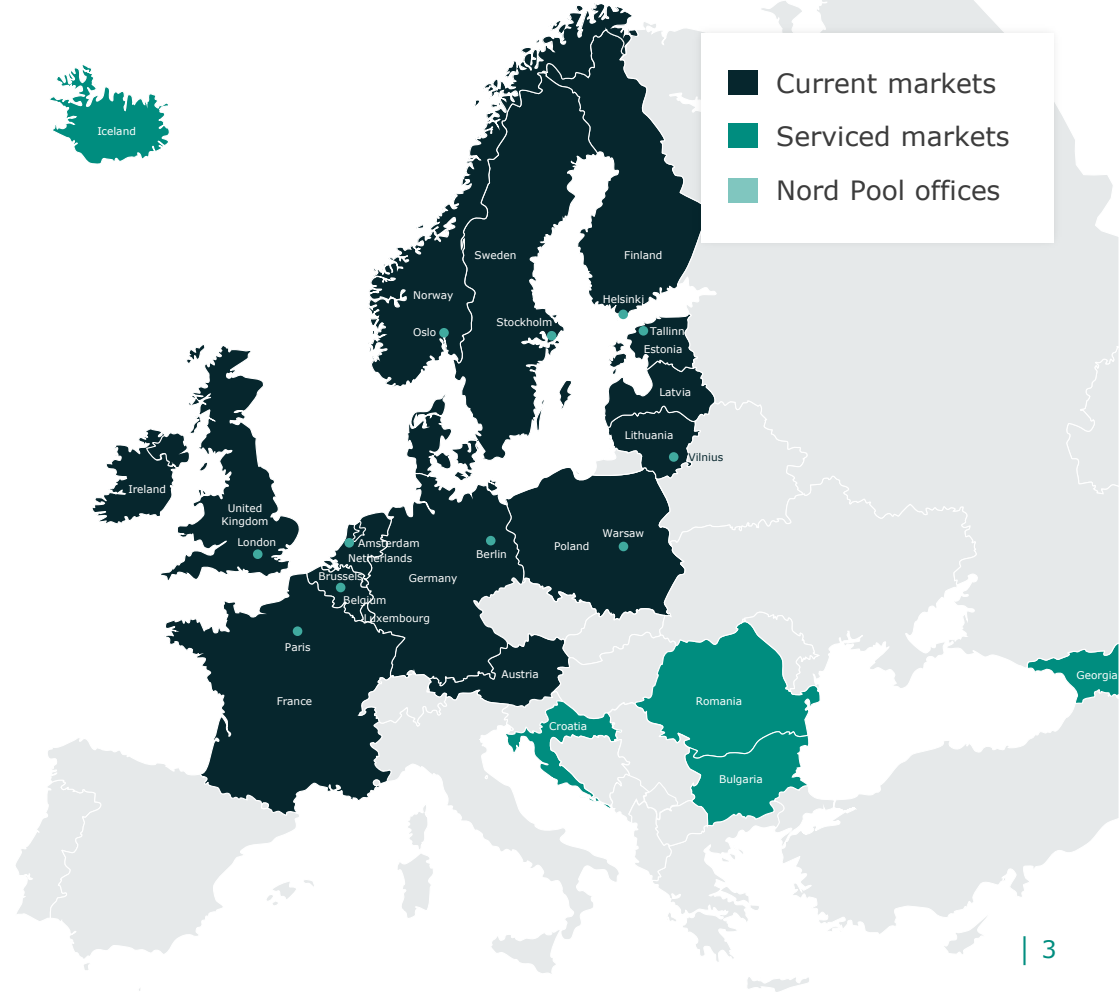
1104 TWh
day-ahead



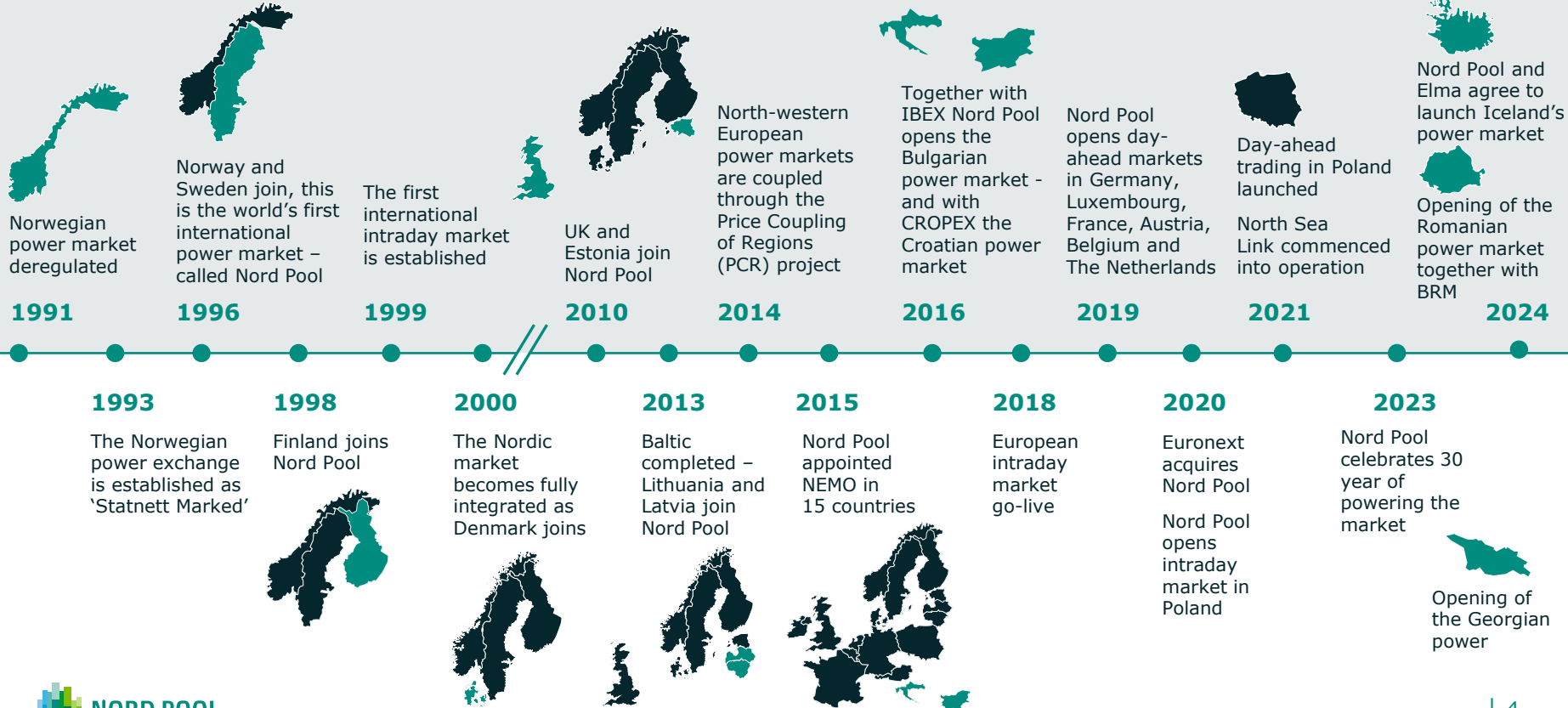
74 TWh
intraday



400+
customers



Towards an integrated European electricity market



European market integration–day-ahead

SDAC – SINGLE DAY-AHEAD COUPLING

The aim of SDAC is to create a single pan-European cross-zonal day-ahead electricity market. Single day-ahead coupling is the auction process where collected orders are matched and cross-zonal capacity is allocated simultaneously for different bidding zones in the day-ahead market.

How SDAC works

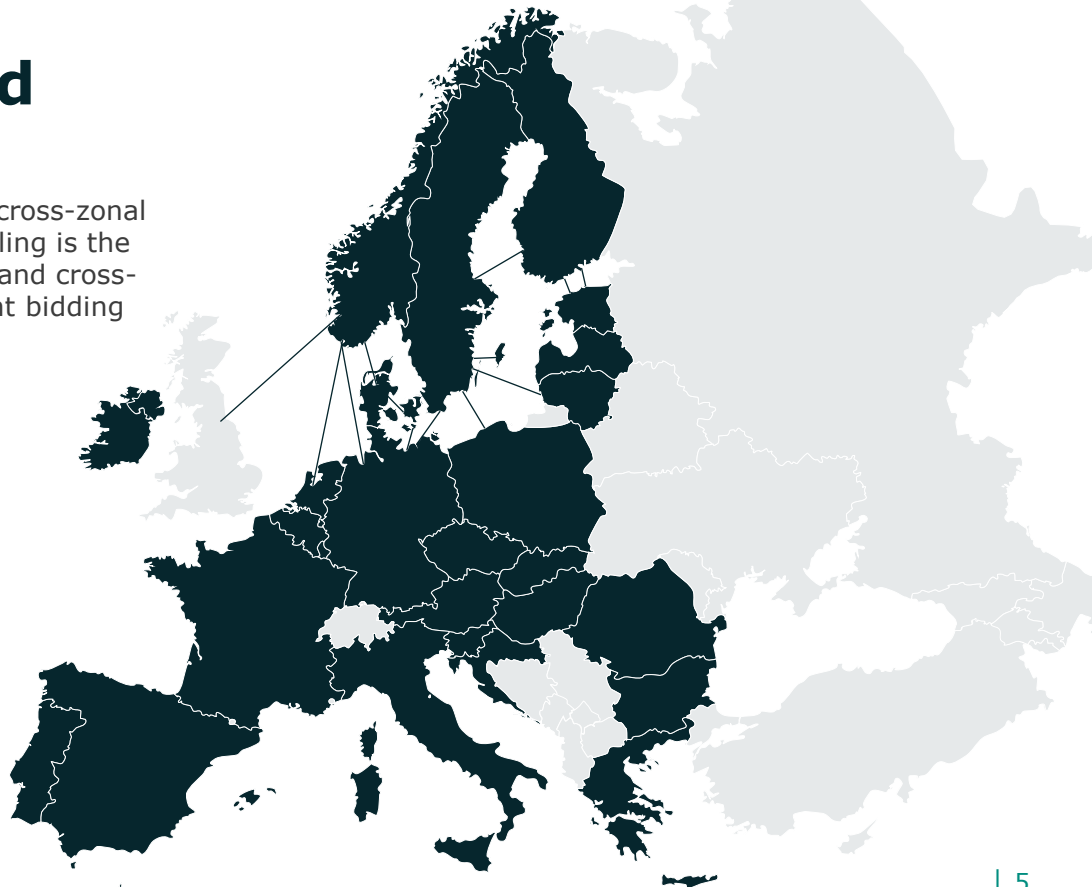
Day-ahead market coupling requires:

- processing offers, network capacities and constraints from all involved NEMOs and TSOs
- matching them by operating one single algorithm,
- validating and sending matched trades, clearing prices, and scheduled exchanges to NEMOs and TSOs.

SDAC makes use of a common price coupling algorithm, called PCR EUPHEMIA, to calculate electricity prices across Europe and to implicitly allocate auction-based cross-border capacity.

PCR EUPHEMIA matches energy demand and supply for 24 hours simultaneously.

This process maximises social welfare and considers price limits of orders and network constraints.



European market integration – intraday

SIDC – SINGLE INTRADAY COUPLING INITIATIVES

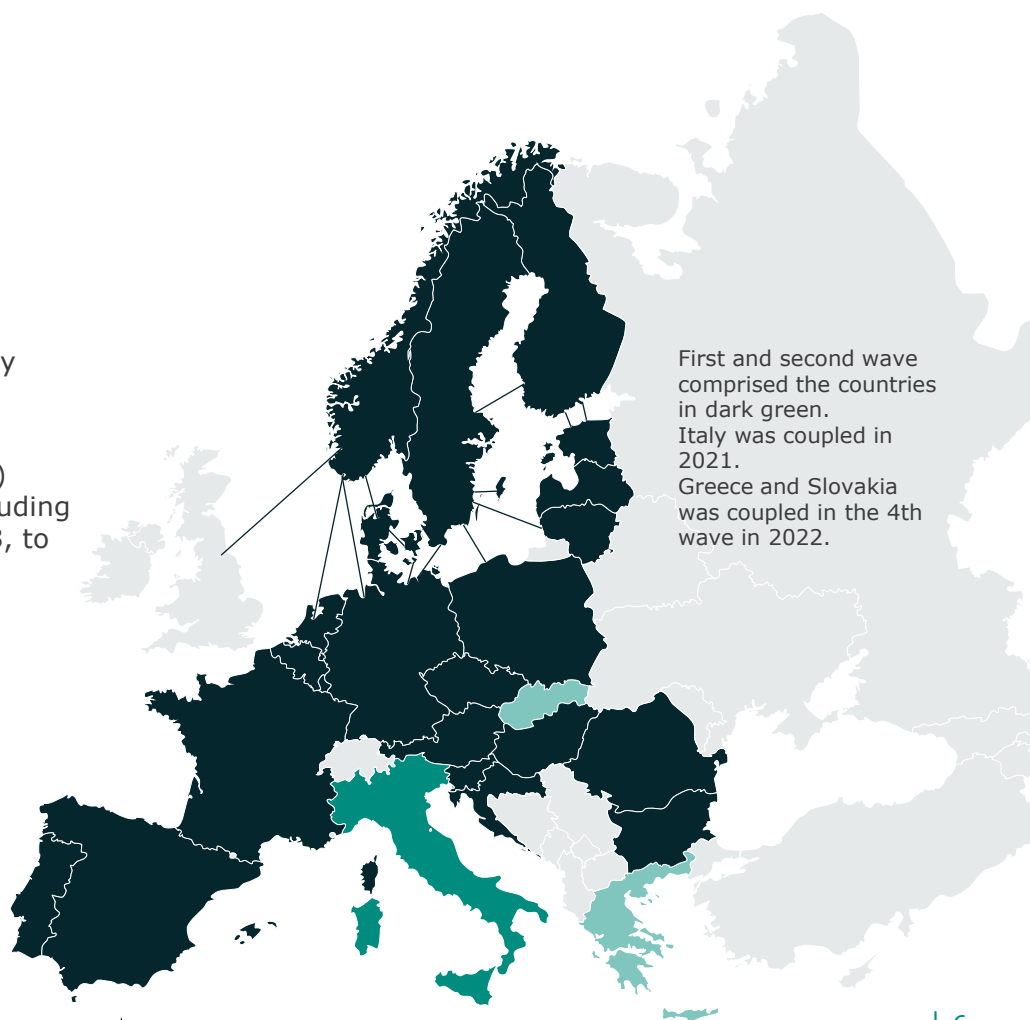
- SIDC creates a single EU cross-zonal intraday electricity market. Market participants can continuously trade electricity across Europe.
- SIDC follows on from the XBID (Cross Border Intraday) project initiated in 2012 by four power exchanges, including Nord Pool, with TSOs from 12 countries joining in 2013, to enable continuous cross-border trading across Europe.
- XBID delivered, in June 2018, the first go-live of the intraday continuous trading platform.

How SIDC works

A common IT system with:

- a Shared Order Book (SOB)
- a Capacity Management Module (CMM)
- a Shipping Module (SM)

When market participants of each NEMO submit orders, they are put together in one SOB. TSOs make available all the intraday cross-border capacities in CMM.



First and second wave
comprised the countries
in dark green.
Italy was coupled in
2021.
Greece and Slovakia
was coupled in the 4th
wave in 2022.

Externalities impacting our business



Political risk and Regulation

- State intervention
- Electricity market design
- CACM 2.0
- REMIT

- GB market design
- GB coupling / TCA



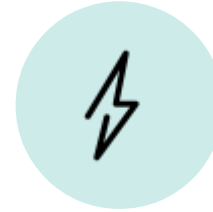
Climate change and energy transition

- Electrification
- Renewable penetration



Economic and geopolitical situation

- Inflation
- Increased currency variation
- Interest rates
- Impacts on GDP
- Energy consumption



Market dynamics

- Day-ahead volume development
- Intraday volume development

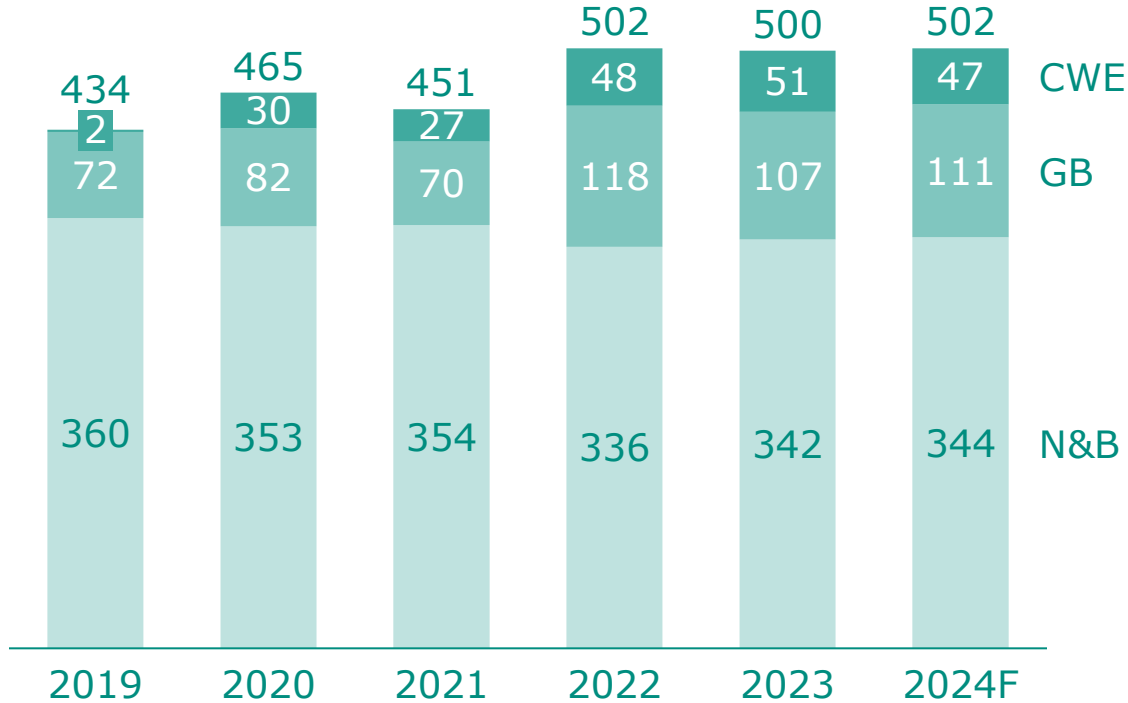


Competitive landscape

- Market consolidation
- Diversification strategies

Day-Ahead markets are mature

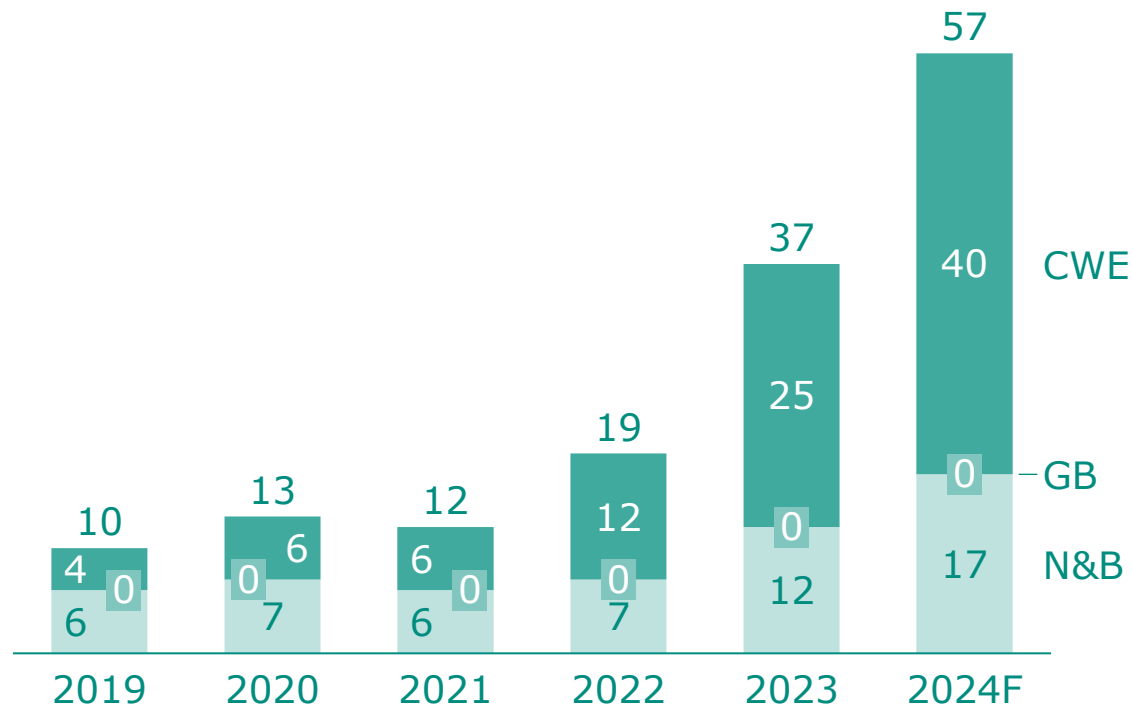
NORD POOL DAY-AHEAD VOLUMES (TWH SINGLE-SIDED)



- Day-Ahead markets are well established
- Most of the physical trading is happening there
- Competition between NEMOs: market share effect in CWE

Intraday markets are booming

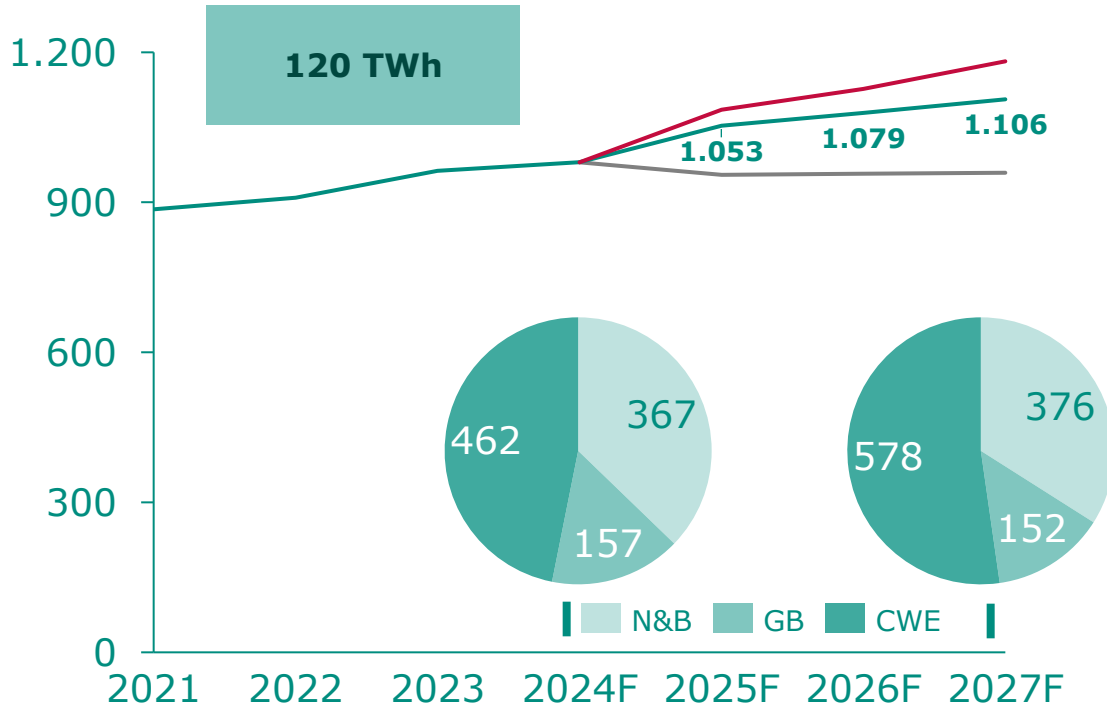
NORD POOL INTRADAY CONTINUOUS VOLUMES (TWH SINGLE-SIDED)



- Renewables
- Volatility
- Algorithmic trading
- Competition between NEMOs: market share effect in CWE

Day-Ahead markets: outlook

ALL NEMOS DAY-AHEAD VOLUMES (TWH SINGLE-SIDED 16 COUNTRIES IN WHICH NORD POOL OPERATES)



Upsides:

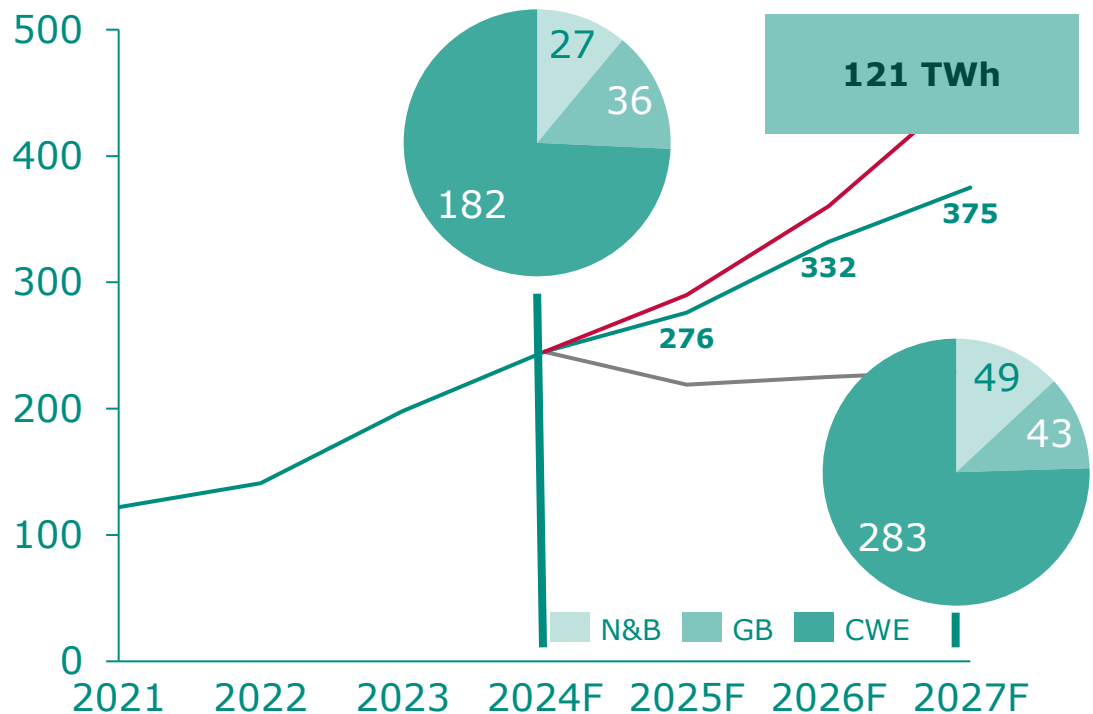
- Post-crisis demand recovery
- Electrification of economies
- Market-based mechanisms
- Interconnections and power balance (imports/exports)

Downsides:

- Other means of contracting physical power (PPAs, OTC, ...)
- State intervention
- Horizontal integration and net bidding (production/supply)
- Relevance of day-ahead prices vs regulated prices in retail

Intraday markets: outlook

ALL NEMOS DAY-AHEAD VOLUMES (TWH SINGLE-SIDED 16 COUNTRIES IN WHICH NORD POOL OPERATES)



Upsides:

- Renewables penetration
- Volatility resulting from fluctuating demand and supply
- Flexibility and arbitrage opportunities
- Technology: algorithmic trading

Downsides:

- Impacts of FB in the Nordics
- Saturation of the intraday arbitrage value (crowd effect)
- Regulation/limitation of trading
- Impact of Intraday auctions
- Performance limits of XBID

Nordic Flow based: why are we doing this:

From physical limitations to exchange capacity

- Exchange capacities provides limitations for the electricity market, in terms of linearized constraints on cross zonal exchanges.
- According to the CACM, there are two options for providing exchange capacities for the European electricity market:
 - FB: The electricity market receives a linearized "security domain" described by power transfer distribution factors (PTDFs) on critical network elements (CNEs). The flow on each individual CNE is limited by a MW margin representing the secure physical capacity of the component(s), while the PTDF gives the flow on each CNE from a one MW injection in each BZ
 - CNTC: The electricity market receives a MW limit on bilateral exchanges between any two bidding zones. The MW limits are derived from the "security domain" (bidding zone configuration is applied in order to capture all relevant limitations)

Nordic Flow-based: why are we doing this:

Requirements for the flow-based parallel runs

❖ Article 20(8) of CACM Regulation provides that:

“To enable market participants to adapt to any change in the capacity calculation approach, the TSOs concerned shall test the new approach alongside the existing approach and involve market participants for at least six months before implementing a proposal for changing their capacity calculation approach.”

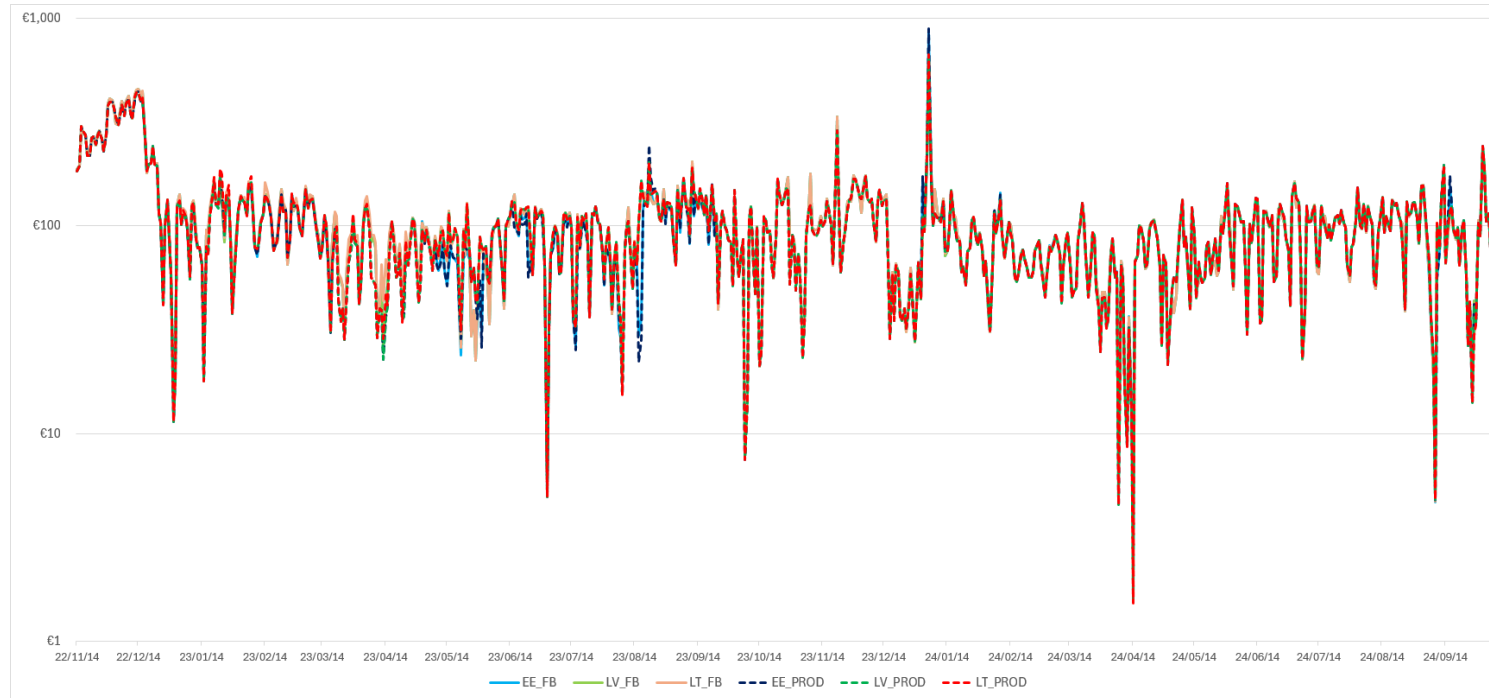
❖ Article 26 of the Nordic CCM provides that:

“Parallel runs are performed in TSO and NEMO systems (being the simulation facility or market operations system for single day-ahead coupling) and capacity calculation parameters are submitted to NEMOs’ systems daily as with current NTC approach; [...]”

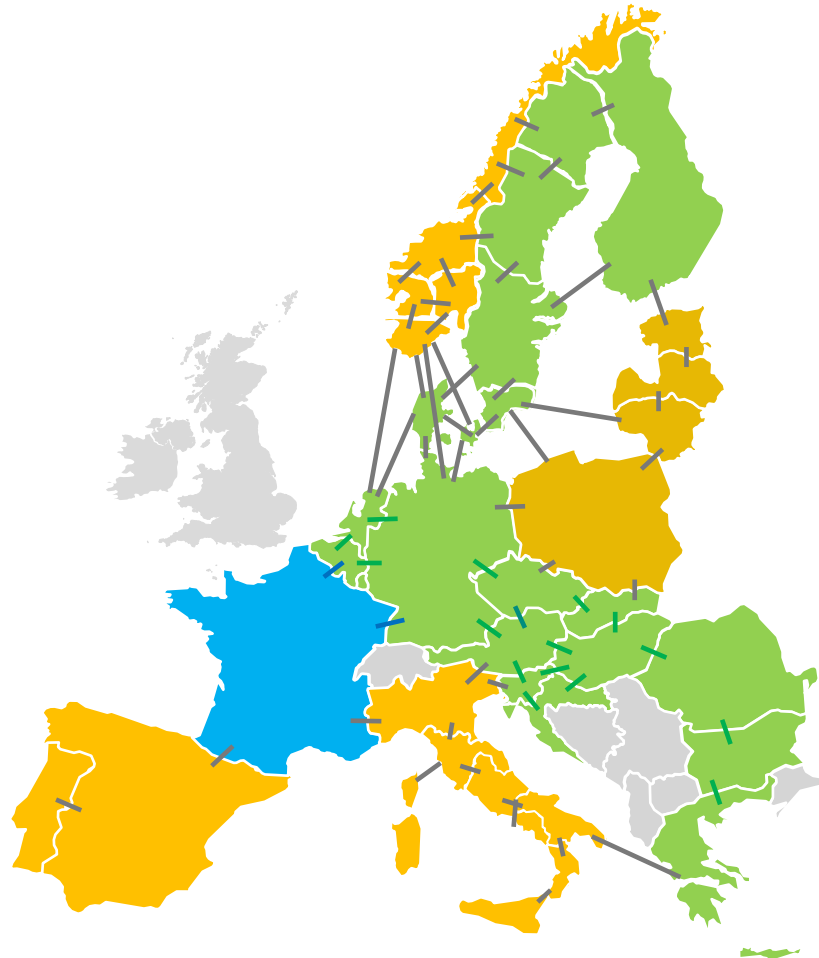
“Results of the market simulations of the parallel runs for each trading day are published as soon as possible”

Baltic Prices under EPRs

EPR: External Parallel Run



MTU MAP



- BZB on 15 min MTU
- BZB on 30 min MTU
- BZB on 60 min MTU

- BZ on 15 min MTU
- BZ on 30 min MTU
- BZ on 60 min MTU
- Not part of SIDC coupling

Cross-resolution matching is supported by EUPHEMIA i.e. 15min orders placed in a Bidding Zone with 15 min resolution match with 60min orders placed in a BZ with 60 min resolution



Moving from 60 min to 15 min trading

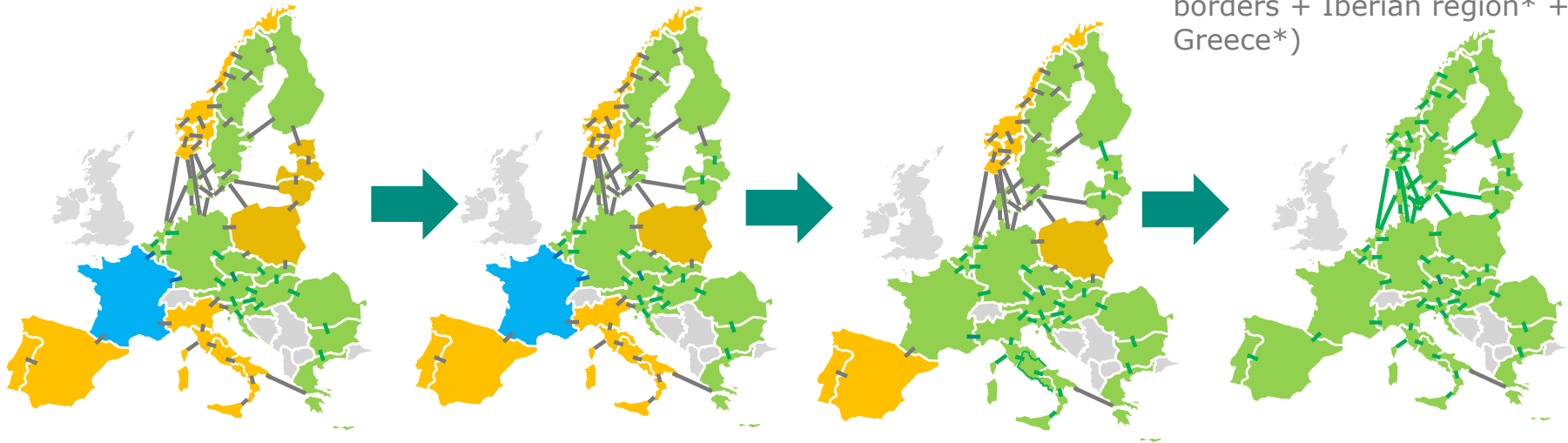
GO-LIVE SEQUENCE FOR BOTH INTRADAY AND DAY-AHEAD

SIDC (CT & IDAs)
Today's situation

SIDC (CT & IDAs)
November 2024
Baltic internal borders

SIDC (CT and IDAs)
January 2025
(Italy, France + EstLink)

SIDC (CT and IDAs)
March 2025
(Nordics + Poland + Baltic external borders + Iberian region* + Greece*)



* Iberian and Greece market to launch SIDC and SDAC 15min MTU separately – under clarification
** SDAC Big Bang project under replanning (details to be presented in November)

SDAC 'Big Bang' Go-Live
March 2025 (?) **

Intraday Auction = IDA

ACER regulated pan-European Intraday auctions

Go-live was on 13th June 2024

Three auctions @ 15:00, 22:00 and 10:00 CET

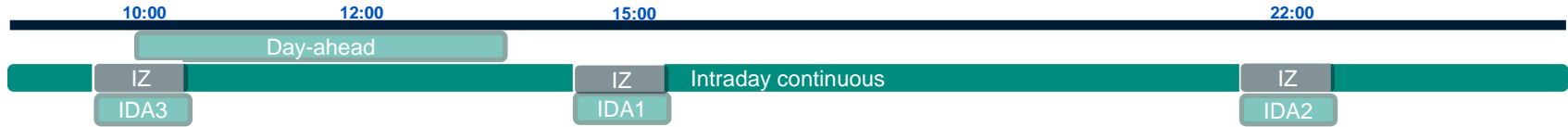
15', 30' or 60' contract resolutions depending on bidding zone

Trading as in the day-ahead auction, same system, same order types

Shared orderbooks (SOB) apply, same liquidity through each NEMO



Summary: Intraday Auctions to complement Intraday Continuous*



# IDA	Auction	Delivery Period
IDA1	D-1 15:00	D 00:00 – D+1 00:00
IDA2	D-1 22:00	D 00:00 – D+1 00:00
IDA3	D 10:00	D 12:00 – D+1 00:00

- IDAs will run in ATC-mode at go live
 - Later FB will be applied
 - No losses applied yet
- XBID cross-border interconnectors will be halted
-> intra-zonal continuous trading continues during an IDA session
- Same order types as in SDAC - Curve and block orders
 - Curve orders in one MTU per BZ (15,30 or 60min MTU)
 - Block orders: Normal, Exclusive groups, Linked Block orders
- Normal IDA process takes 20+20min
- the XBID system has a key-role in the pre-coupling and the confirmation phase of the IDAs
- Same algorithm as SDAC: Euphemia
 - Cross-resolution matching enabled

* ACER decision 01/2019 of 24 January 2019 establishing a single methodology for pricing intraday cross-zonal capacity

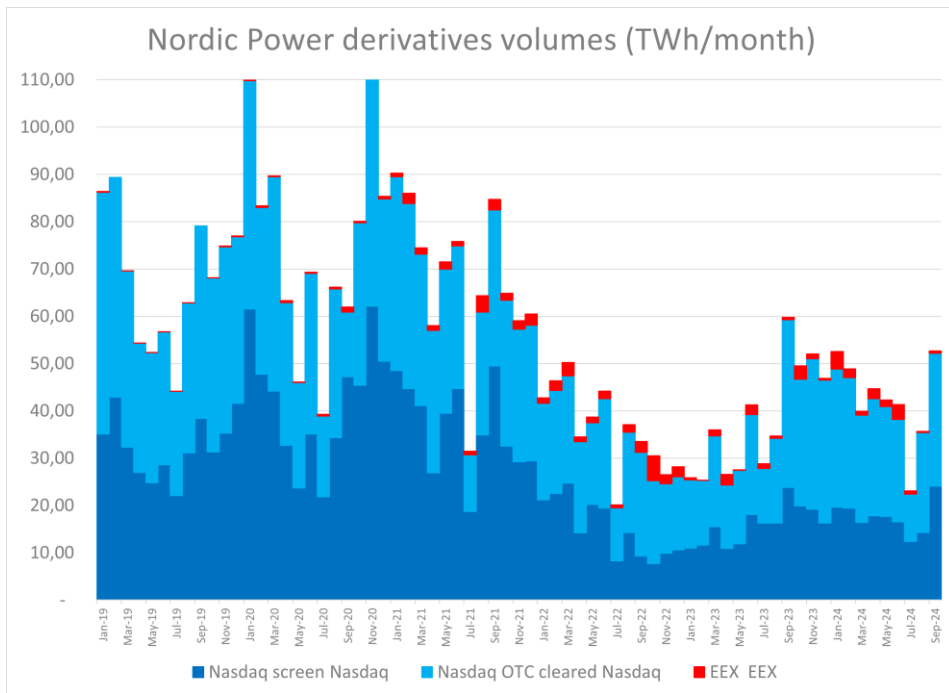
IDA volumes (All contracts)

14TH JUNE - 30TH SEPTEMBER 2024

Sum of Total Volume													
WEEK	AT	BE	DE	FR	NL	PL	DK	FI	NO	SE	LT	LV	EE
24	86	1 885	4 667	1 923	1 589	326	1 392	205	2 700	683	81	-	0
25	189	4 264	17 519	1 041	2 460	1 778	3 146	389	12 562	4 375	1 437	-	79
26	270	3 711	26 525	2 156	3 339	3 872	5 018	247	7 015	2 893	1 767	-	49
27	153	3 491	15 553	2 286	2 761	3 146	8 408	2 704	10 869	3 574	1 225	-	25
28	161	4 358	22 933	1 619	3 871	5 064	4 883	472	6 499	1 935	523	6	40
29	174	3 151	23 524	1 166	9 652	2 372	8 754	774	9 638	5 082	1 032	4	9
30	137	3 448	22 654	2 750	13 511	6 240	8 996	381	14 607	2 219	1 098	-	134
31	136	2 671	24 535	5 539	12 563	6 281	6 457	938	7 343	3 450	919	-	27
32	146	3 107	27 419	1 975	13 877	7 280	9 969	369	8 291	3 709	858	-	36
33	1 014	3 475	20 404	3 256	10 338	4 618	8 635	1 097	7 867	4 158	3 045	-	11
34	1 432	3 810	26 447	3 251	6 480	4 144	9 003	641	11 504	3 133	711	-	3
35	1 091	1 675	21 186	582	11 677	2 952	6 845	515	7 322	2 167	819	-	88
36	1 254	3 774	26 196	1 150	5 485	6 322	6 234	1 694	10 935	4 255	2 117	-	64
37	2 175	4 594	26 894	2 849	7 814	7 151	6 808	1 687	14 646	5 315	881	14	19
38	2 226	2 693	30 983	3 095	4 303	5 088	3 341	1 217	7 427	5 197	2 832	-	57
39	1 873	4 512	28 278	2 016	3 659	5 808	7 868	2 741	13 529	14 651	3 927	257	11
Total	12 517	54 619	365 717	36 654	113 379	72 442	105 757	16 071	152 754	66 796	23 272	281	652

The Nordic power market is recovering

LIQUIDITY IS STILL FRAGILE, BUT VOLUMES ARE RECOVERING FROM THE ENERGY CRISIS



Volumes are recovering after bottom in 2022

- Nasdaq 366 TWh traded and cleared (Jan-Sep 2024) + 21% compared to same period last year
- EEX Zonal contracts – no liquidity
- Clarity on market design: System + EPAD
- Positive impact on EPAD liquidity with Svk and Statnett EPAD auctions

Uncertainty is limiting the liquidity

- Nasdaq–EEX agreement has been terminated
- An uncertainty has been created about the continuation of the market

There is a need for clarity

- The market need someone to invest in the Nordic power market to accelerate the recovery and commit to long term support

Client consultation and key takeaways

- INTERVIEWED MORE THAN 20 COMPANIES, REPRESENTING OVER 70% OF VOLUMES
- WE HAVE RECEIVED POSITIVE FEEDBACKS TO FORM OUR PRODUCT OFFERING

Participants
wants to see
Euronext-
Nord Pool in
this space

- **The existing exchange** is currently not investing in the Nordic power market, and have a very **risk-averse SPAN margin model/risk framework resulting in high margin requirements**
- **Alternative exchanges have a different view of the Nordic market design** and are introducing a different product set up that does not solve the current liquidity issues
- **Euronext-Nord Pool** are seen as a trusted partners to take-over a leading role in the Nordic derivatives exchange and clearing space with a true Nordic solution

Market
requirements
are clear

- Contract set-up: **keep the existing contract set-up** (cash settled futures with Nordic System Price and Electricity Price Differential (EPAD) contracts) and **bring liquidity back to the exchange**
- A new **margin model** for the initial margin calculation is key for the success
- **Clearing model/Membership set-up** (GCMs, margin model, ...) is key for bringing bilateral/OTC volumes back to the exchange and cleared market, especially **from large and medium-sized participants**
- **Market makers and liquidity providers** are needed, with an appropriate incentive scheme
- The **“Nordic Desk”** (culture, language, proximity) **in all customer-facing activities**

Our commitment: Delivering a sustainable and liquid Nordic and Baltic power derivatives market

Fit-for-purpose product design	<ul style="list-style-type: none">• Power trading across all maturities for Nordic System Price and EPAD power derivatives• Standardised cash-settled contracts – with an option for physical fulfilment soon after go live.• Enhanced spread, synthetic and implied products trading• Introducing a portfolio-based Value-at Risk (VaR) initial margin model for power derivatives
Inclusive of data and reporting services	<ul style="list-style-type: none">• Providing data packages covering both physical and financial power• Compliance and reporting services covering both physical and financial reporting (REMIT, EMIR, MiFID II, MiFIR)
Supported by market players	<ul style="list-style-type: none">• Supported by market makers and liquidity providers willing to build a long-term liquid market• Supported by major brokers who can register Block trades for clearing• Efficient trading and clearing access facilitated for large, medium and small customers
With a high-quality customer experience	<ul style="list-style-type: none">• Seamless and quick on-boarding process, especially for Nord Pool members• Expert staff available to answer your needs with focus and dedication• Support in trading strategy execution with our “Nordic desk”• Voice of the market in regulatory discussions and consultations, to lobby for efficient markets
At a competitive price	<ul style="list-style-type: none">• Competitive offering in terms of fees and capital requirements

High level offering

SERVICING THE NORDIC ECO-SYSTEM WITH A STRONG AND SOLID EUROPEAN FOOTPRINT

A Nord Pool branded market...

- Local Nordic desk
- Industry knowledge
- Nordic presence
- Nordic System Price (index)
- Product management
- Sales and marketing
- Customer relationship
- Onboarding support
- Market data



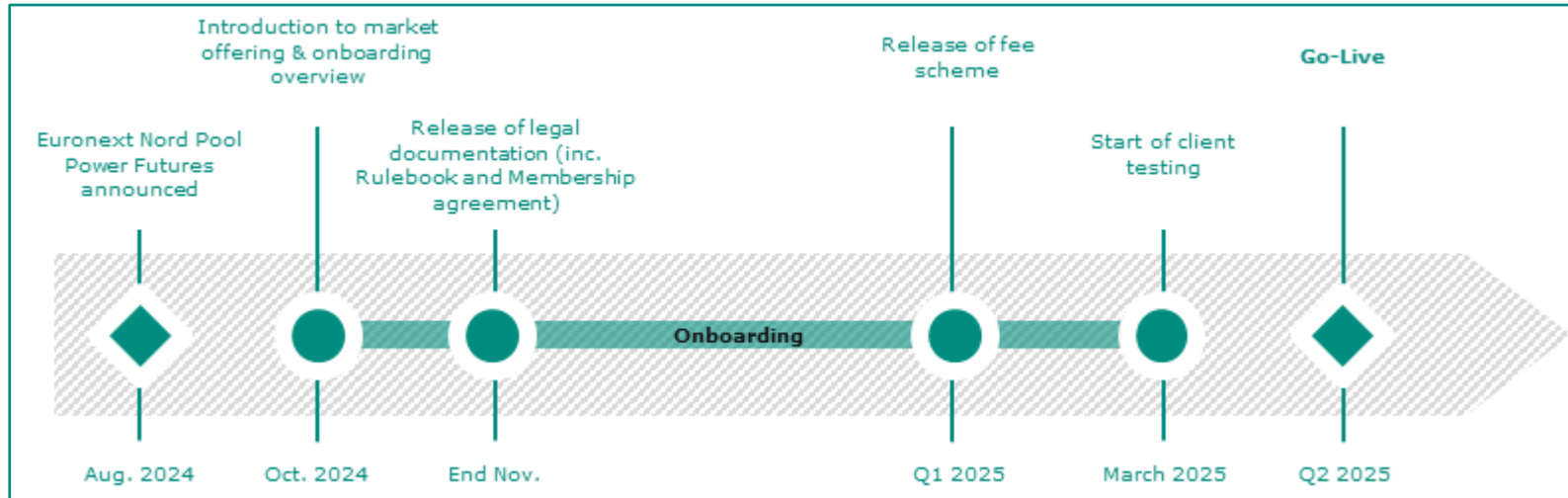
...Operated by Euronext

- Exchange Venue - Euronext Amsterdam
- Financial license
- Clearing Venue – Euronext Clearing
- Rulebook and membership
- Market operation
- Market surveillance
- Trading platform Optiq
- Relevant ISVs connecting (Trayport and TT)
- Block Trade registration clearing platform

Number of Nordic and Baltic series to be listed

Contracts	Number of series listed
Nordic Power Base Future, Year, Quarter	Y: 10, Q: 8-11
Nordic Power Base Future, Month, Week	M: 7, W 7
Nordic Power Base Day	D: 9
Nordic EPAD Base Future, Norwegian, Danish and Lithuanian areas, Year	Y:3
Nordic EPAD Base Future, Swedish and Finnish areas, Year	Y: 4
Nordic EPAD Base Future, Swedish , Finnish, Norwegian, Danish and Lithuanian areas	Q:4 M: 4

Project timeline and next steps



Currently finalizing:

- Contract specs, requirements, technology / connectivity
- Clearing, margining, collateral
- Market making / liquidity provision
- Membership model



**Thank you for your
attention
Questions?**

