

# **Gestión del riesgo y posibilidades financieras del mercado eléctrico**

**NORD  
POOL**

Jueves 2 de noviembre 2017  
Cartagena, Colombia  
Haakon Reiersen LEKNES  
Nord Pool Consulting



# Statkraft



**Friday 27. October 2017 in DN.no:**

**«Statkraft's aim for long term contracts in Latin-America, Asia and Europe, due to new renewable energy»**

**Christian Rynning-Tønnesen, CEO  
Statkraft**

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...ingen sa han trekk  
kapene for tredje kvartal,  
tkraft tok tap på 2,35 milli-  
roner på sine vannkraft-  
sle. Det ene vannkraftsel-  
om ble skrevet ned med  
nder kroner, ble kjøpt av

verk i Tyskland, Albania, Sverige  
og Norge med 4,7 milliarder kroner.  
Det kommer i tillegg til tidligere  
års milliardnedskrivninger.

**Mindre ny vannkraft**  
Rynning-Tønnesen tror prisen for

knyttet til langsiktige kraftkon-  
trakter, sier Rynning-Tønnesen og  
kaller seg nå mer selektiv.  
Helst vil han se kraftkontrakter  
på 15-20 år, men i hvert fall ikke  
under syv år.  
Statkraft er i ferd med å selge

tal som solide og sterke, med et  
underliggende driftsresultat på  
492 millioner kroner og et resultat  
før skatt på nærmere to milliarder  
kroner, opp fra minus 352 millio-  
ner kroner i samme periode i for-  
rige år.

ansatte og sammenbrudd i vep-  
hvilten mellom tyrkiske myndig-  
heter og den kurdiske PKK-grup-  
jaen gjorde at Statkraft til slutt  
stanset hele prosjektet.

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New energy  
a healthy po

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Spain's mooted coal exit won't affect prices – traders

Green markets Financial Weather Sources My page

### GERMAN – Cal 18 rises as coal firms, eyes on coalition talks

(Montel) The German/Austrian 2018 contract edged up on Wednesday amid a buoyant coal market, while participants were looking for price signals ahead of German energy policy talks between potential coalition partners.

Monday 23 October 2017

07:47

### Energy groups urge UK to renew CO2 tax pledge

(Montel) UK energy groups – including SSE – and think-tank Sandbag have called on the government to renew its carbon tax when it expires in 2021 or risk allowing a revival of coal-fired power, the Financial Times reported this weekend.

Friday 20 October 2017

14:32

### Dutch CO2 price floor likely to get go-ahead – academic

“They say they want to introduce it and it is not very disputed,” said Huygen, a professor and energy expert at the University of Amsterdam



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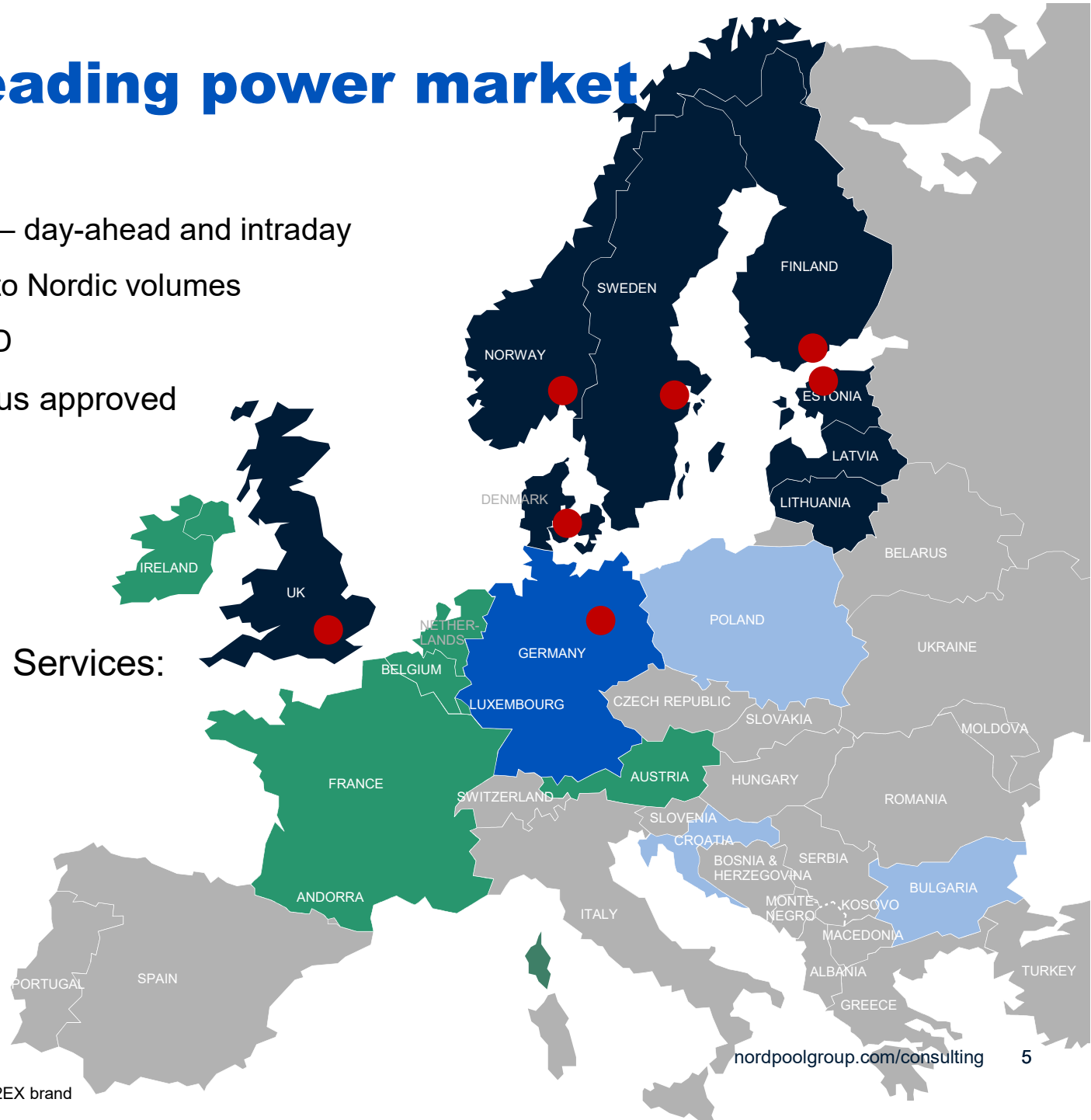
# Do's and don'ts



- ▶ First a physical market:
- ▶ A reliable and transparent reference price (index) is key to success
  
- ▶ Start with physical players, then the financial players will follow
  
- ▶ Market regulation must be fair and predictable:
- ▶ Market surveillance of both physical and financial markets
  
- ▶ Robust collateral and settlement routines
  
- ▶ Customer advisory board
- ▶ Relevant products -> liquidity

# Europe's leading power market

- Nord Pool offices
- Nordic/Baltic and UK – day-ahead and intraday
- Intraday with access to Nordic volumes
- Serviced markets YTD
- ■ ■ ■ NEMO status approved



## Nord Pool Reporting Services:

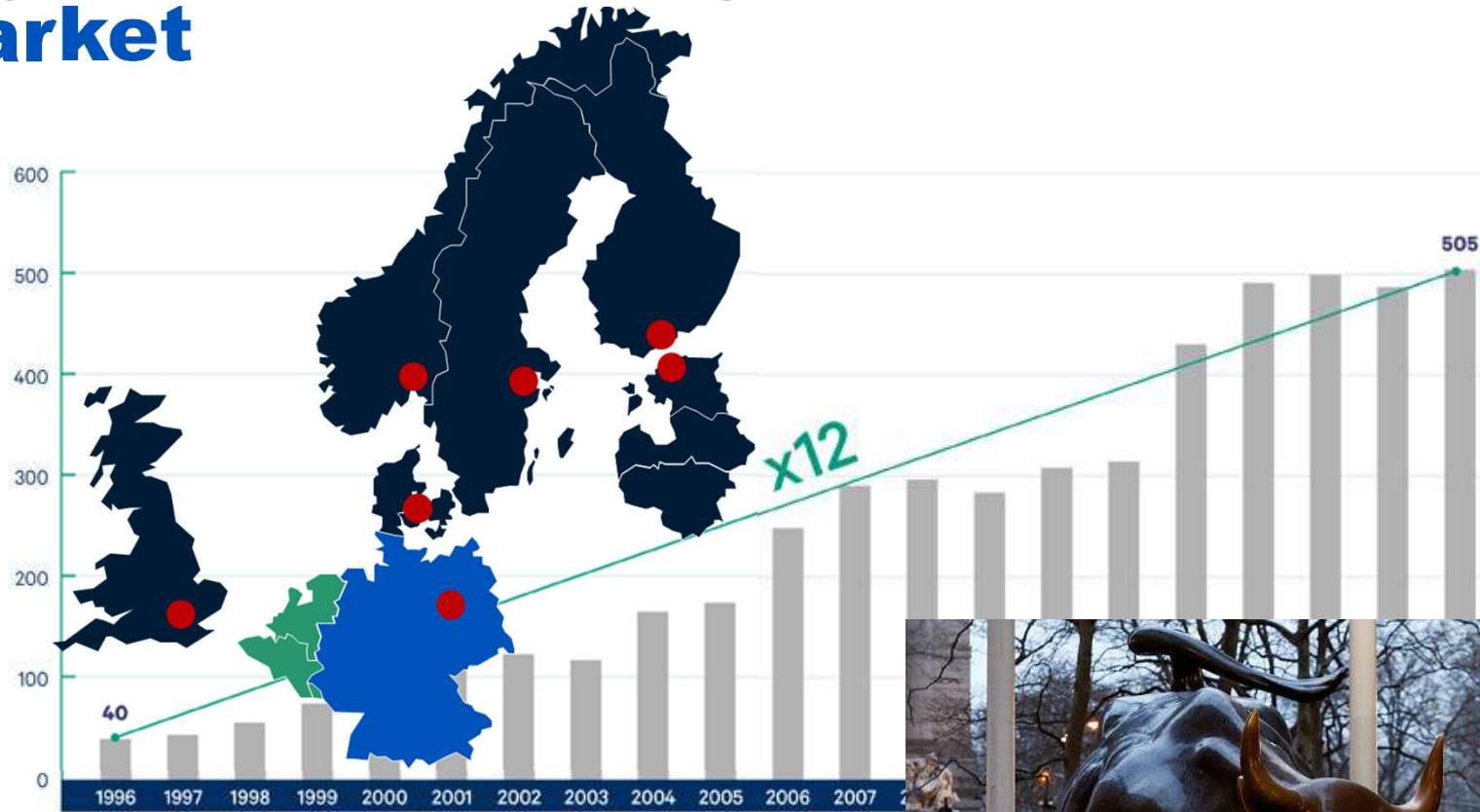
- UMM
- REMIT

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\*) In the UK, Nord Pool operates under the N2EX brand



# Higher volume and market share in the physical market is good for the financial market



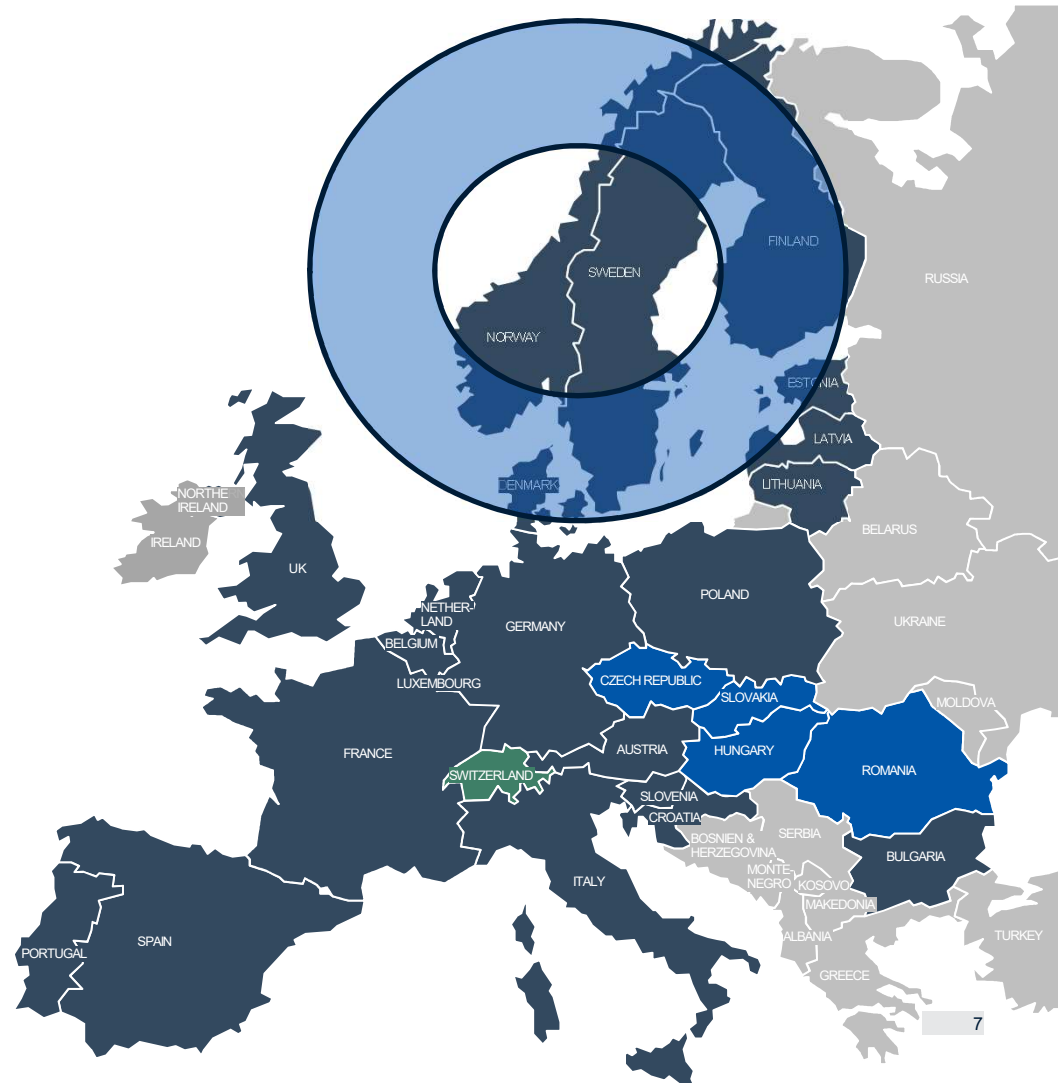
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# European target model: YTD

## Model: Nord Pool

- ❑ Since 2014 a Day Ahead Power Market coupling 23 countries: Common price calculation with Implicit cross border capacity allocation
- ❑ 2.900 TWh pa consumption
- ❑ Nordic: 400 TWh pa consumption
- ❑ >85 % market share of Day-ahead consumption
- ❑ EUR 36.000.000.000
- ❑ The world's largest power market
- ❑ Flow from low priced to high priced areas every hour:
- ❑ The cheapest electricity is sold first: Merit order
- ❑ Facilitates for better competition across Europe and better utilisation of infrastructure
- ❑ Paris agreement: Essential for 2020 goal and future RES ambitions

- Part of PCR initiative today
- 4 MMC
- Independent



# History

# Events



1991

No

No

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**POWER TO THE PEOPLE**  
The first 20 years of Nordic power-market integration

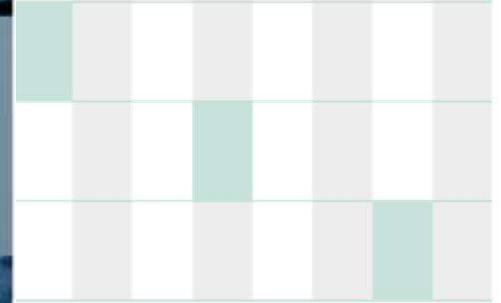


2010

2013

2016

# Nasdaq



# NORD POOL



# The Nord Pool model for power trading

## Financial market

- ▶ Hedging of sell/buy price in advance
- ▶ From 10 years to day-ahead
- ▶ Continuous trading with market makers

## Day-ahead market

- ▶ Hourly price formation for the following day
- ▶ Bids and offers gate closure at 12:00 every day
- ▶ Market results published 12:42

## Intraday market

- ▶ Continuous trading 24/7
- ▶ New transmission capacity opens after the publication Day-ahead prices

## Balancing markets

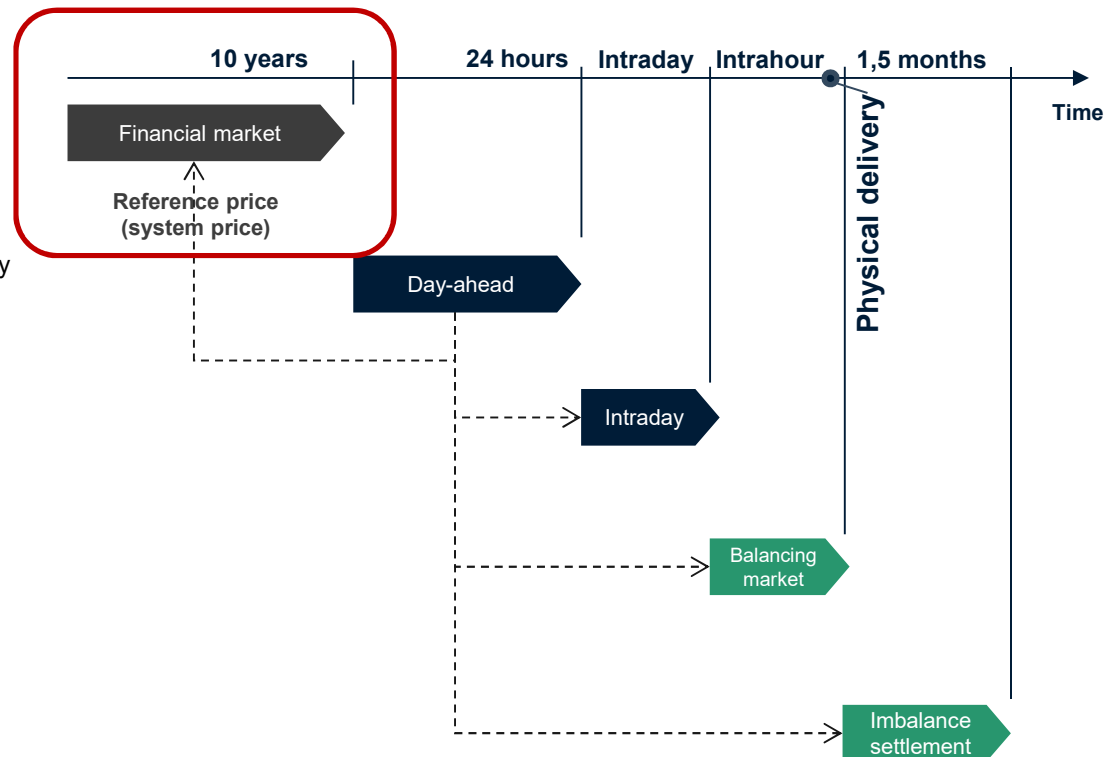
- ▶ Intra-hour market for maintaining the power balance
- ▶ Bids and offers after DAM closure
- ▶ Activated time-15 minutes

## Reserves

- ▶ Long term bilateral contracts (typically season based)
- ▶ Primary and secondary reserves including options procured through market based solutions on daily and weekly basis

## Imbalance settlement

- ▶ Post-hour settlement of deliveries between market participants



Financial settlement	Physical delivery	Physical delivery	Financial settlement
Nasdaq	Nord Pool AS	TSOs	

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# Definition of a Derivative

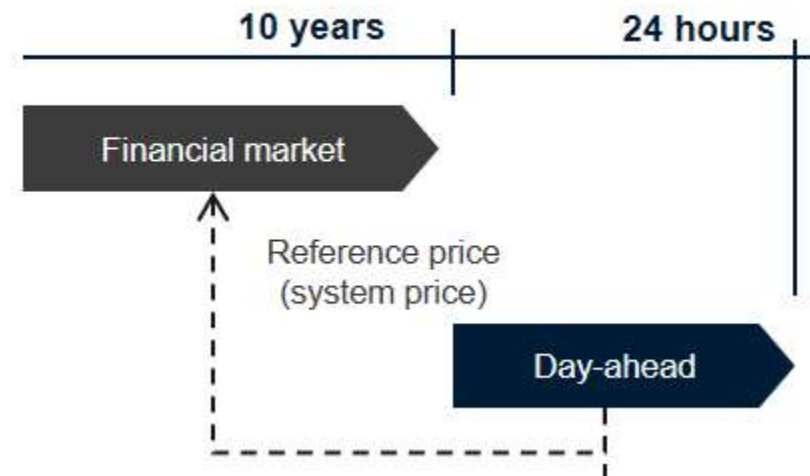
“A financial contract whose value is based on, or derived from, a traditional security (such as a stock or bond), an asset (such as a commodity), or a market index.”

## Financial market: Futures/DS Futures

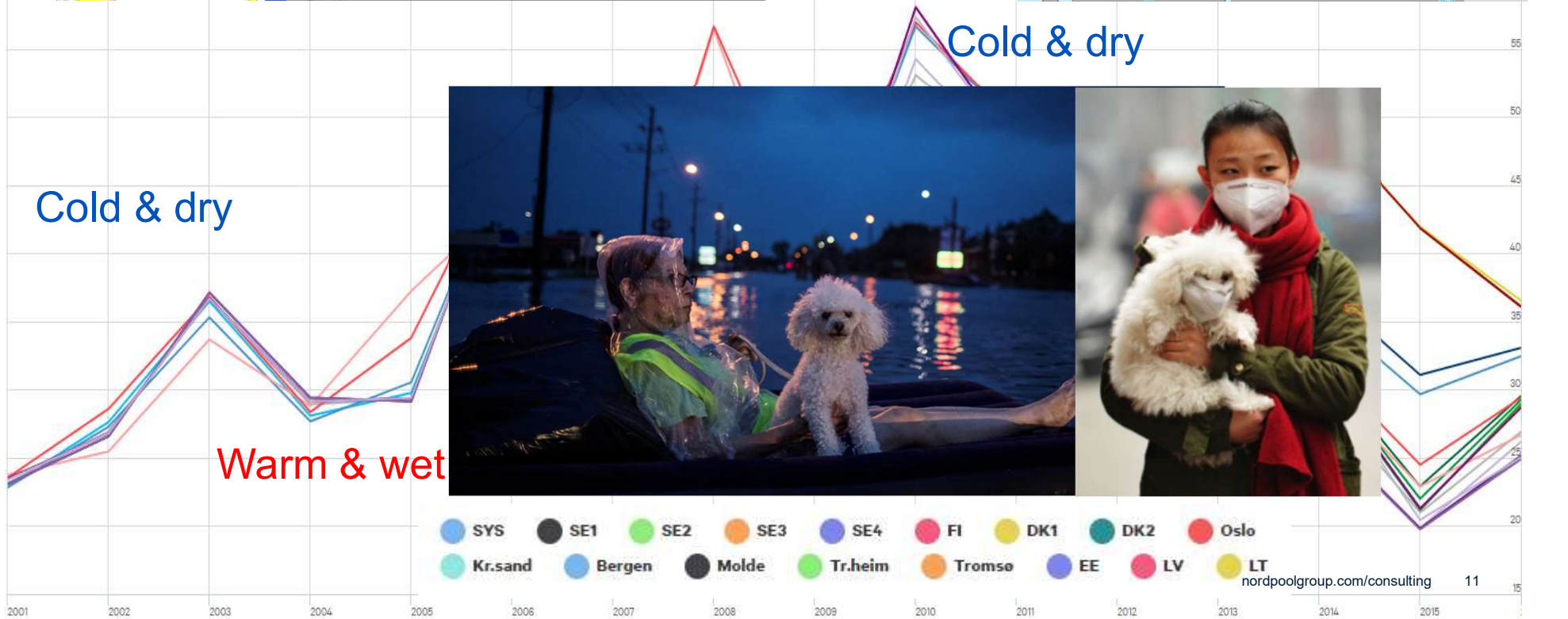
- ▶ Hedging of sell/buy price in advance
- ▶ From 10 years to day-ahead
- ▶ Continuous trading with market makers

## Physical market: Day-ahead market

- ▶ Hourly price formation for the following day
- ▶ Bids and offers gate closure at 12:00 every day
- ▶ Market results published 12:42



# Why the need for a long-term market? Because of the physical market, look at the YR prices:



## Diapositiva 11

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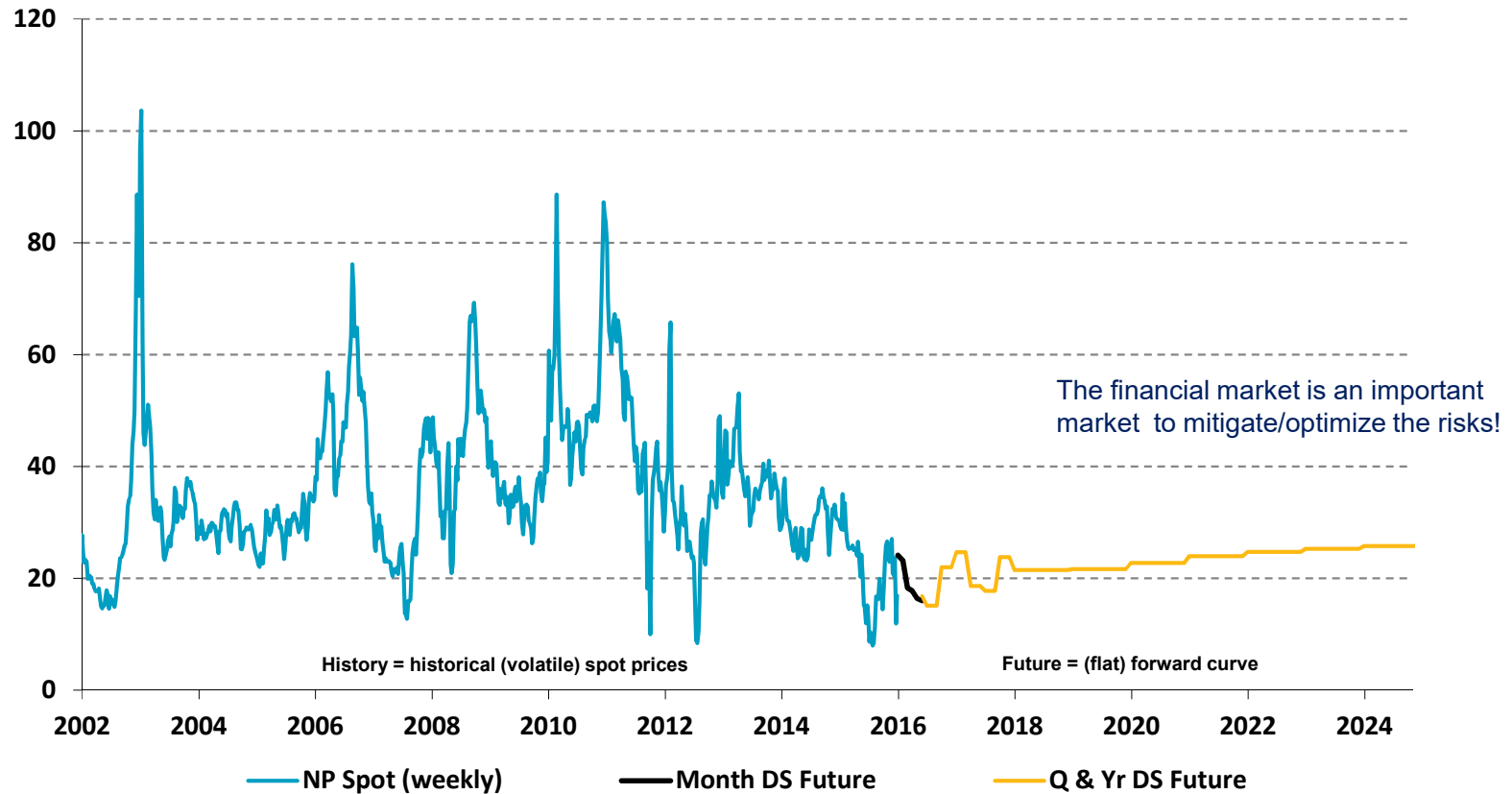
**A1**

Author, 21/08/2017



# Why the need for a long-term market? What you don't know, might kill your business!

Spot and DS Future Prices (EUR/MWh)  
December 30, 2015



# Simulated Nord Pool prices 2017 – 2035

Year	System	NO1	NO2	Year	System	NO1	NO2	SE4	Finland	Jutland	Zealand
2017	28,2	27,4	27,6	2017	28,2	27,4	27,6				
2018	26,3	25,8	25,7	2018	26,3	25,8	25,7				
2019	25,0	24,7	24,6	2019	25,0	24,7	24,6				
2020	25,7	25,4	25,4	2020	25,7	25,4	25,4				
2021	39,4	39,4	39,3	2021	39,4	39,4	39,3	29,0	32,6	27,7	29,3
2022	40,2	40,1	40,1	2022	40,2	40,1	40,1	26,4	33,2	25,4	26,6
2023	42,0	41,9	41,9	2023	42,0	41,9	41,9	25,0	27,4	24,3	25,4
2024	43,1	43,0	43,0	2024	43,1	43,0	43,0	26,1	27,0	25,3	26,5
2025	42,8	42,9	42,9	2025	42,8	42,9	42,9	39,0	38,8	38,0	39,2
2026	42,4	42,4	42,4	2026	42,4	42,4	42,4	39,8	39,7	39,9	41,3
2027	42,5	42,5	42,5	2027	42,5	42,5	42,5	41,2	41,0	41,5	42,2
2028	44,0	44,1	44,2	2028	44,0	44,1	44,2	42,0	41,8	43,1	43,4
2029	44,7	44,8	44,8	2029	44,7	44,8	44,8	41,1	40,3	43,0	43,3
2030	45,0	45,1	45,1	2030	45,0	45,1	45,1	40,6	39,7	42,4	42,5
2031	45,1	45,2	45,2	2031	45,1	45,2	45,2	40,7	39,5	42,2	42,2
2032	45,2	45,3	45,3	2032	45,2	45,3	45,3	41,7	41,0	42,9	42,8
2033	45,2	45,3	45,3	2033	45,2	45,3	45,3	41,9	41,1	43,0	42,9
2034	45,1	45,2	45,2	2034	45,1	45,2	45,2	42,1	41,5	43,1	43,0
2035	45,1	45,2	45,2	2035	45,1	45,2	45,2	42,3	41,7	43,2	43,1
								42,3	41,6	43,2	43,1
								42,2	41,4	43,2	43,1
								42,1	41,3	43,2	43,1
								42,1	41,1	43,1	43,1

# Main reasons for long-term trading

## Physical players

### Hedge production or consumption

- ▶ The most important and common reason for financial trading
- ▶ Cover the market player from price and financial risks
- ▶ Consumers aim to hedge against increasing electricity prices
- ▶ Suppliers aim to hedge against falling electricity prices

## Physical and financial players

### Arbitrage possibilities

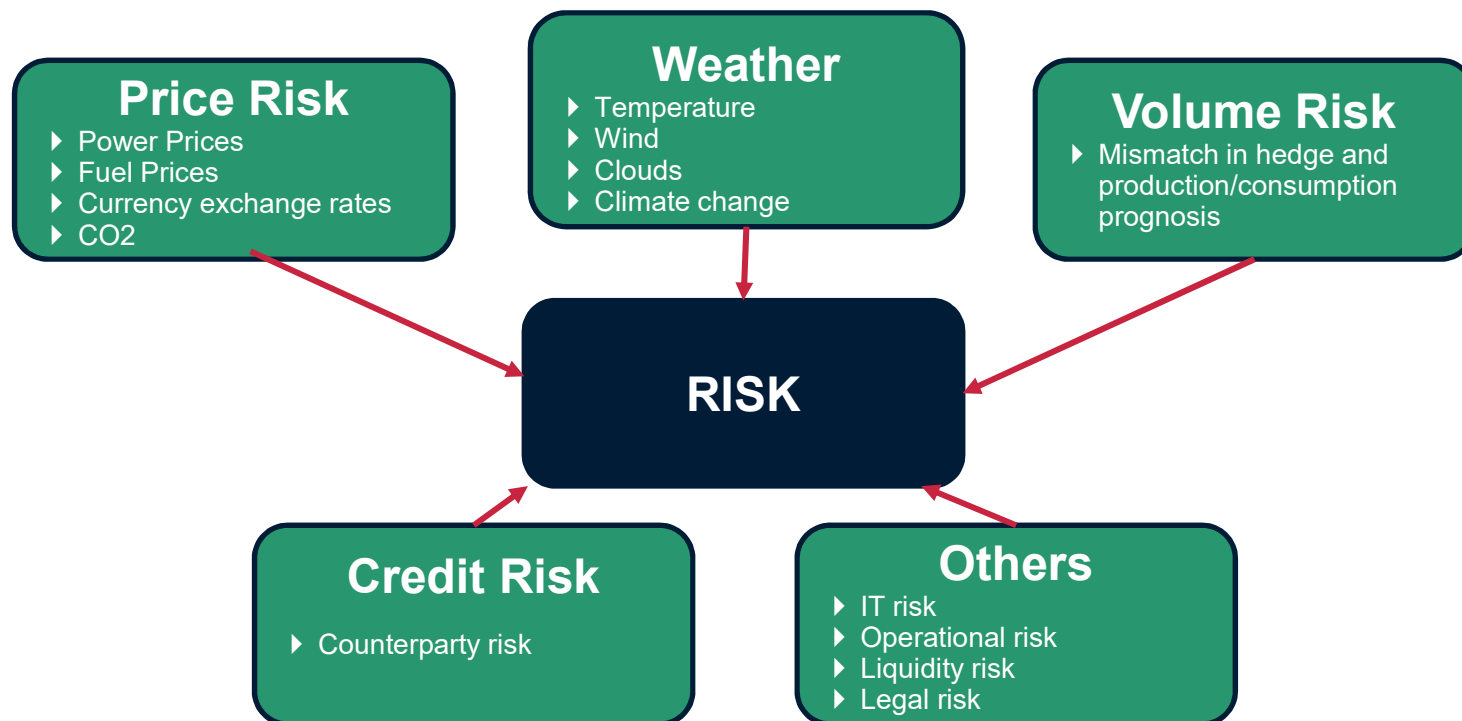
- ▶ Find price difference between different financial instruments or markets
- ▶ Buy and sell at the same time / close interval the same contract

## Financial players

### Speculate with market outcome (proprietary trading (prop))

- ▶ Aim to create profits
- ▶ Speculate with prices and price prognosis -> take risks in the market
- ▶ Create liquidity to the market

# Risk in the power market - overview





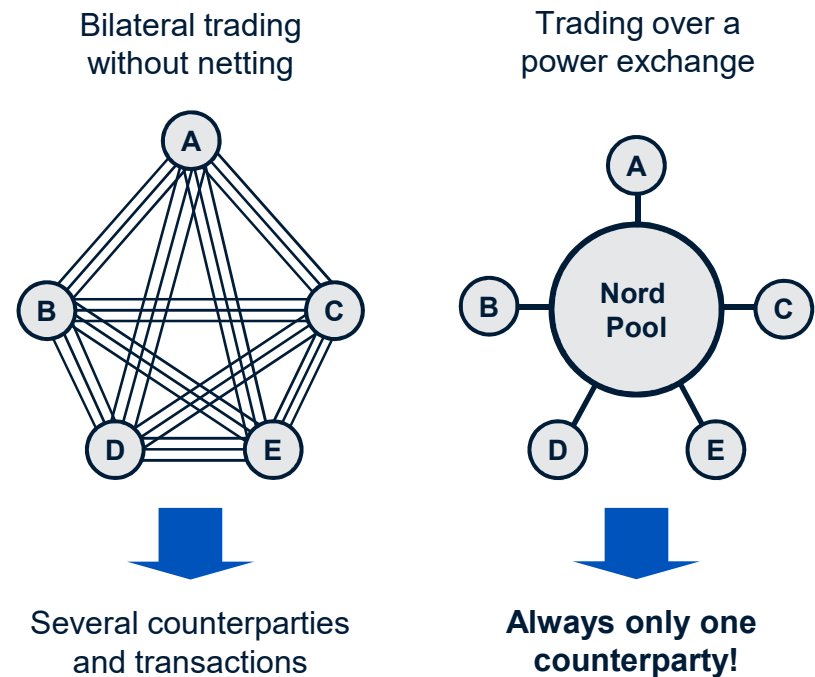
# Less bilateral and more PX trades in both physical and financial market

Bilateral trades was the norm, but multiple counterparts increased the risk

One regulated counterpart - the PX - has proven to be a safer way to trade

Now the trend is turning for financial trading - again

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# Nordic Financial Power Market

Standardized financial contracts and clearing of OTC contracts

Index used for settlement: Nordic System price

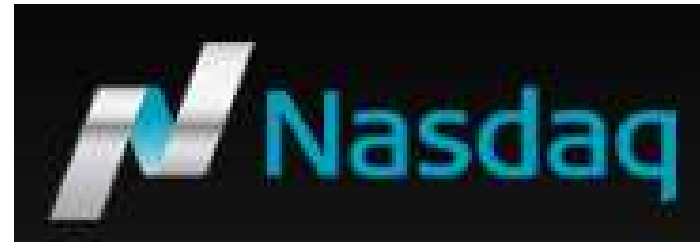
Cash settled - No physical delivery of financial power contracts

"financial delivery" = financial compensation for price differences between the System price and the fixed contract price in the delivery period , but no physical delivery

Contract duration: Next day and up to 10 years

Products traded:

- ▶ Deferred Settlement Futures (DS Futures)
- ▶ Base and Peak load Futures
- ▶ Monthly Average Rate Futures
- ▶ Monthly DS Futures
- ▶ Options
  
- ▶ Electricity Price Area Differentials (EPADs)
- ▶ EUA (CO2)
- ▶ Wind futures



# Product structure – Nordic power

**DS Futures/Futures**  
cash settlement only  
in delivery period



**Cascading**  
From Y-Q. Q-M, M-W

**Futures**

Daily cash  
settlement



**Underlying reference price:**

Nordic system price

**Currency:** EUR

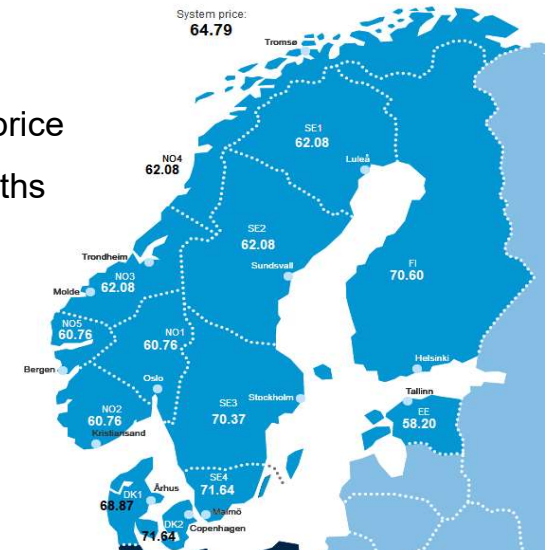
**Tick size:** 0.01 EUR/MWh

**Min contract size:** 1 MW \* h in the contract

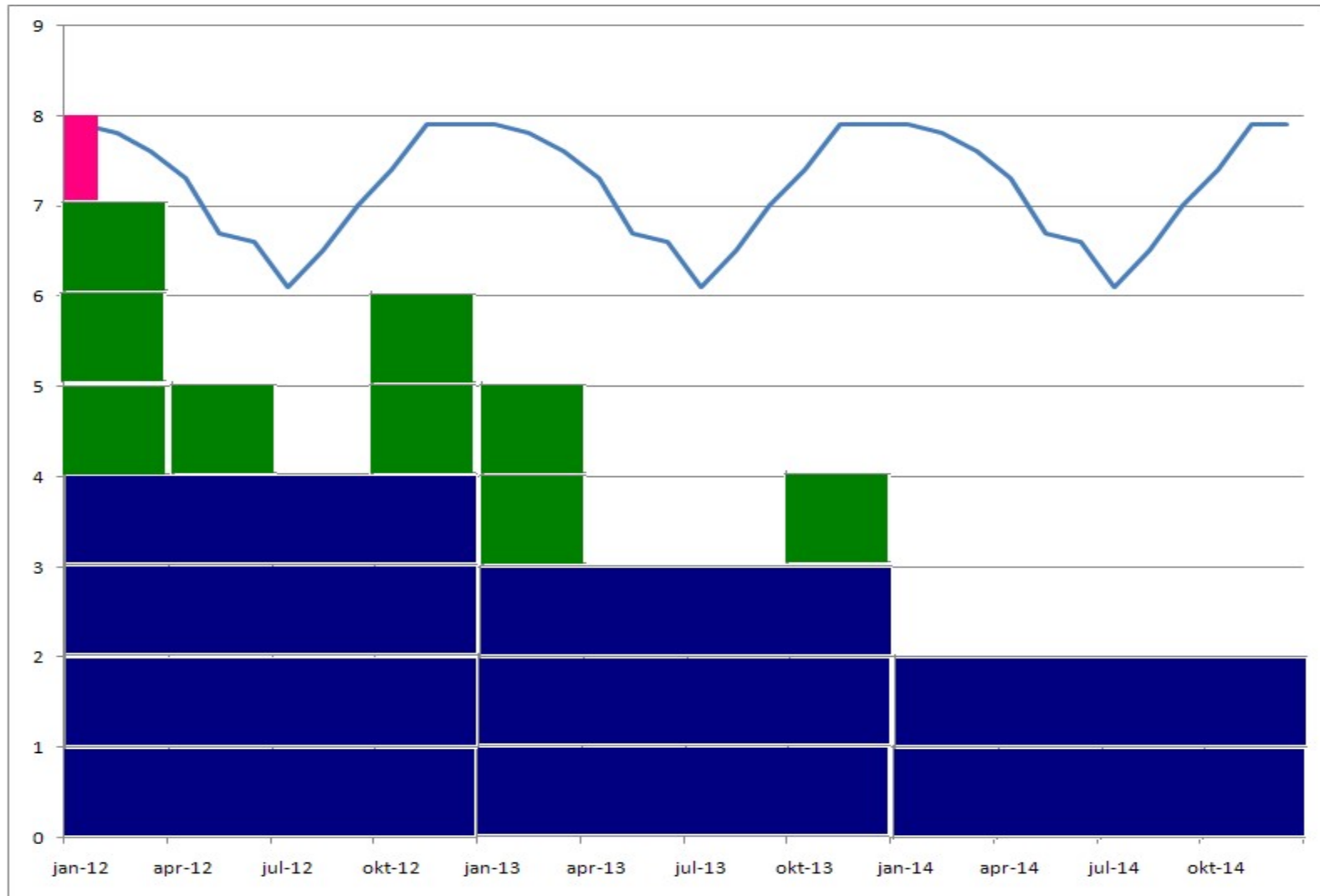
**EPADs**

Area price – system price

Year, Quarters, Months



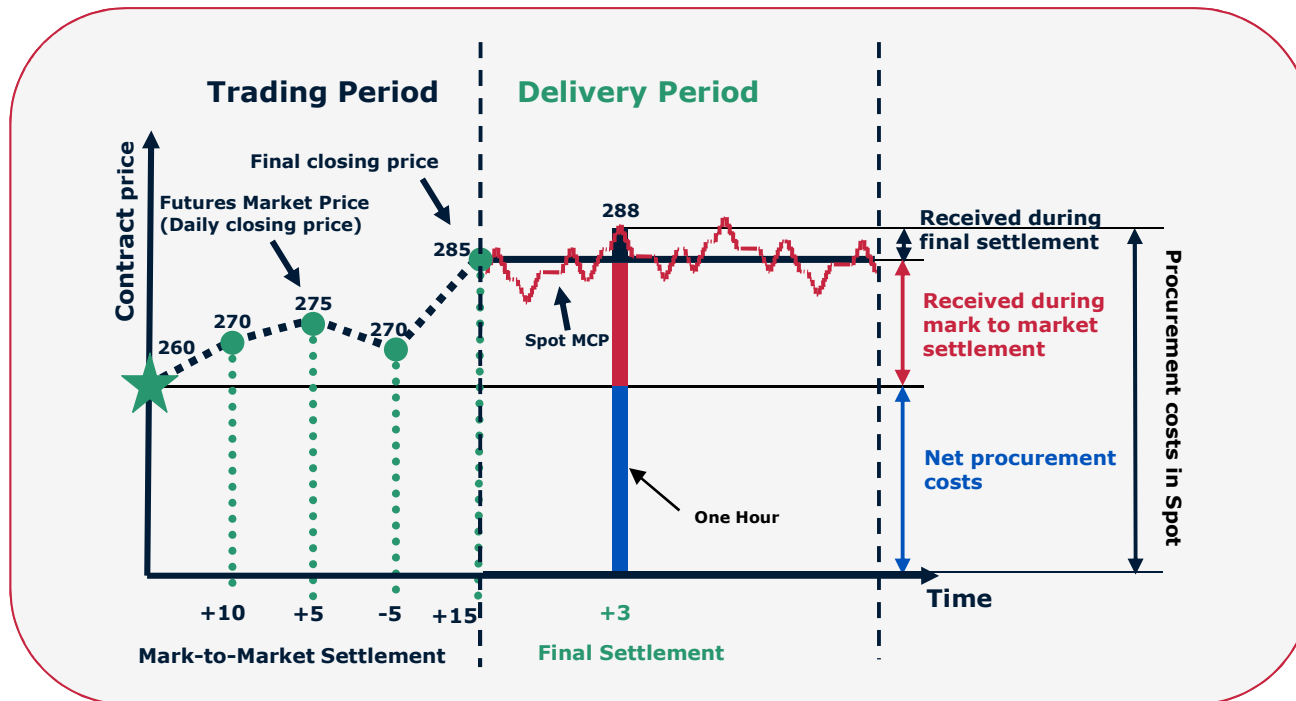
# Hedging with Futures/DS Futures





# Financial market – settlement of futures

- Daily cash settlement (profit/loss) in trading and delivery period



## Vattenfall hedges 2018 Nordic output at EUR 27/MWh

(Montel) Vattenfall had hedged close to **70% of its Nordic power production for 2018** at an average price of EUR 27/MWh by the end of the third quarter, the Swedish utility said in its interim report published on Friday.

The company has also hedged roughly **half of its 2019 production at EUR 28/MWh**.

The hedging ratios were little changed from the figures presented at the end of the second quarter, when it had hedged 68% of its front-year output at EUR 27/MWh and 49% of its 2019 output at EUR 28/MWh.

The hedging levels are down significantly from a year ago, however, when the company had hedged 99% of its front-year power production and 65% of its output two years in the future.

The Nordic power 2018 and 2019 futures contracts last traded at EUR 26.88/MWh and EUR 26.65/MWh, respectively, on Nasdaq Commodities.

Group operating profit fell 3% year on year to SEK 2.17bn (EUR 224m), although profits from underlying operations rose 8% to SEK 2.8bn.

Vattenfall's trading operations posted an Q3 operating loss from underlying operations of SEK 424m, down from a loss of 416m one year ago, while the group's power generation rose from 25.2 TWh in Q3 last year to 27.3 TWh this year.



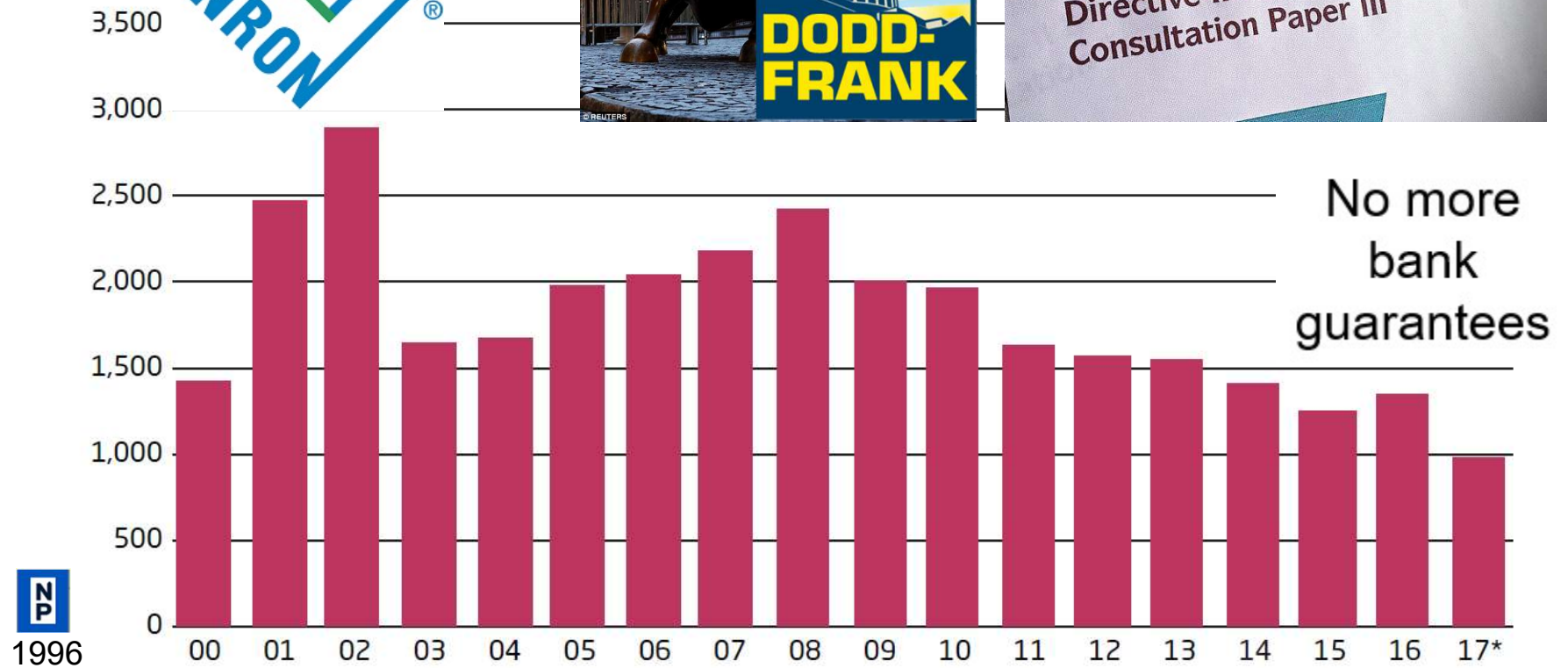
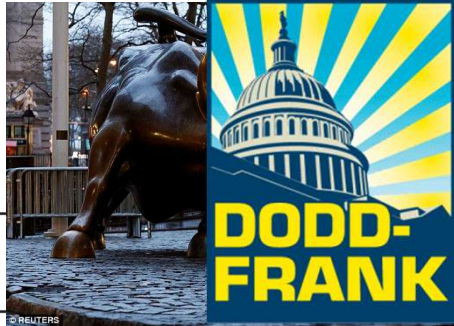
Reporting by:

Olav Vilnes

[olav@montel.no](mailto:olav@montel.no)

09:29, Friday, 27 October 2017

# Nordic power derivatives market volumes since 2000 TWh/year: lessons learned from regulation



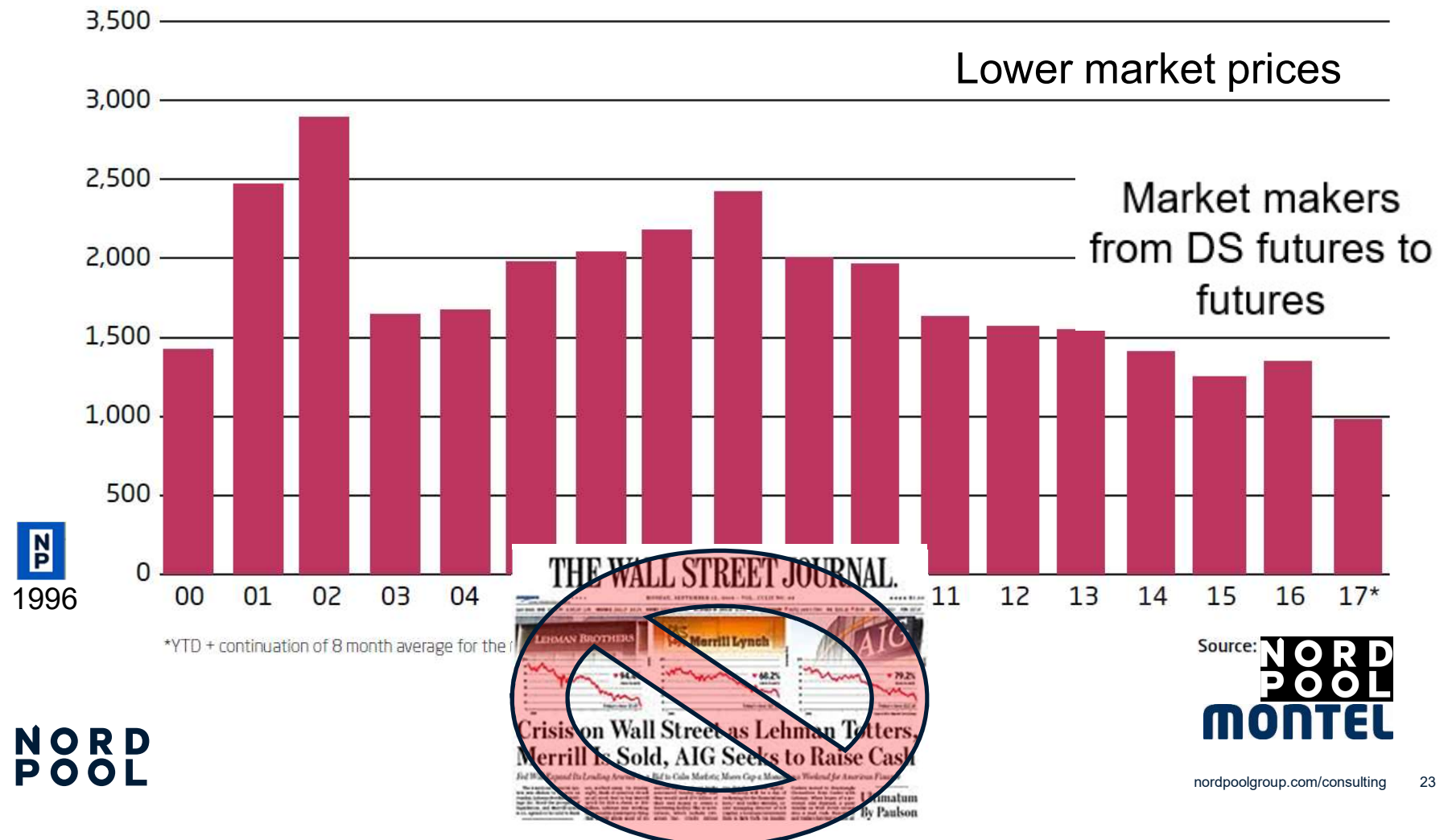
\*YTD + continuation of 8 month average for the rest of the year

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1996

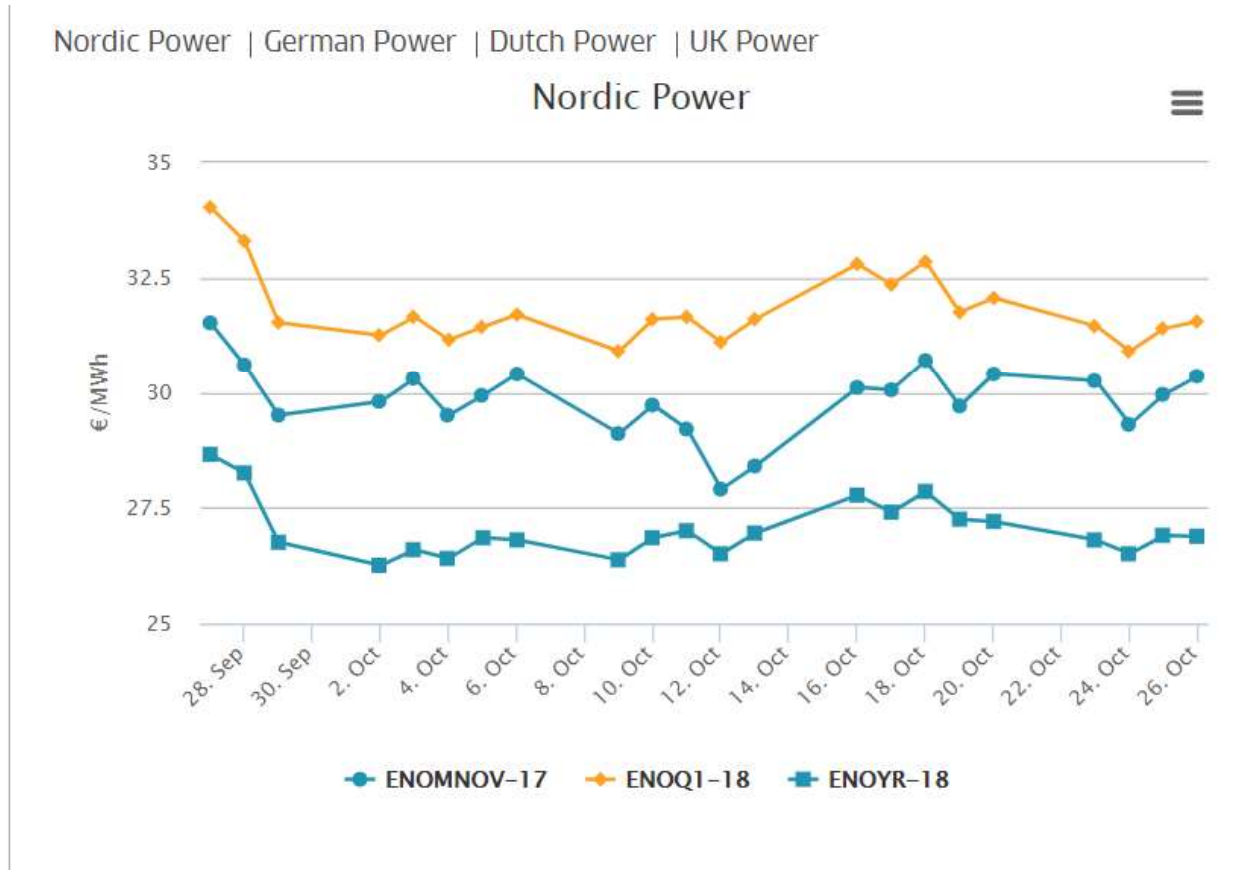
NORD  
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Source: NORD  
POOL  
MONTEL

# Nordic power derivatives market volumes since 2000 TWh/year: lessons learned from Nasdaq' members

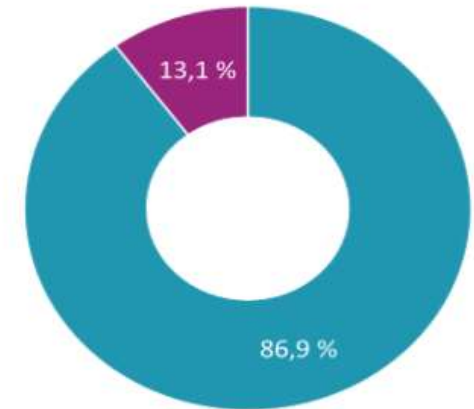


# Futures prices 26.October 2017



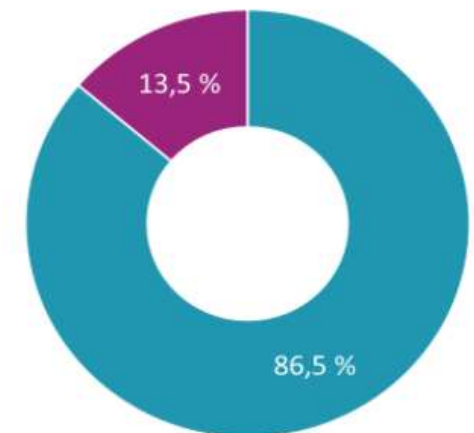
## NORDIC POWER MARKETSHARES

Week 42/2017



Futures DSFutures

YTD 2017



Nordic Electricity: Front Quarter and System Price

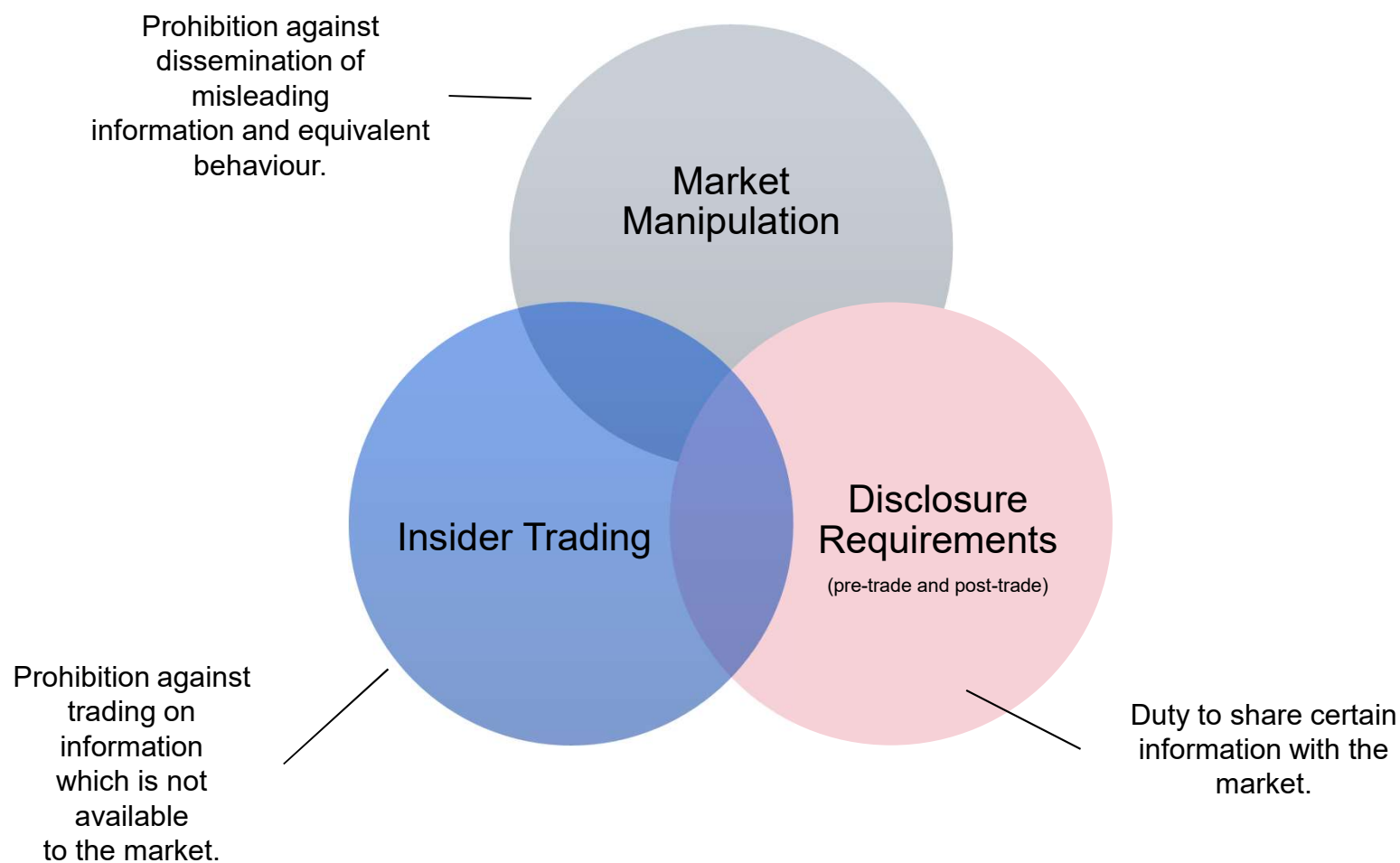
Prices for: 2017-10-26





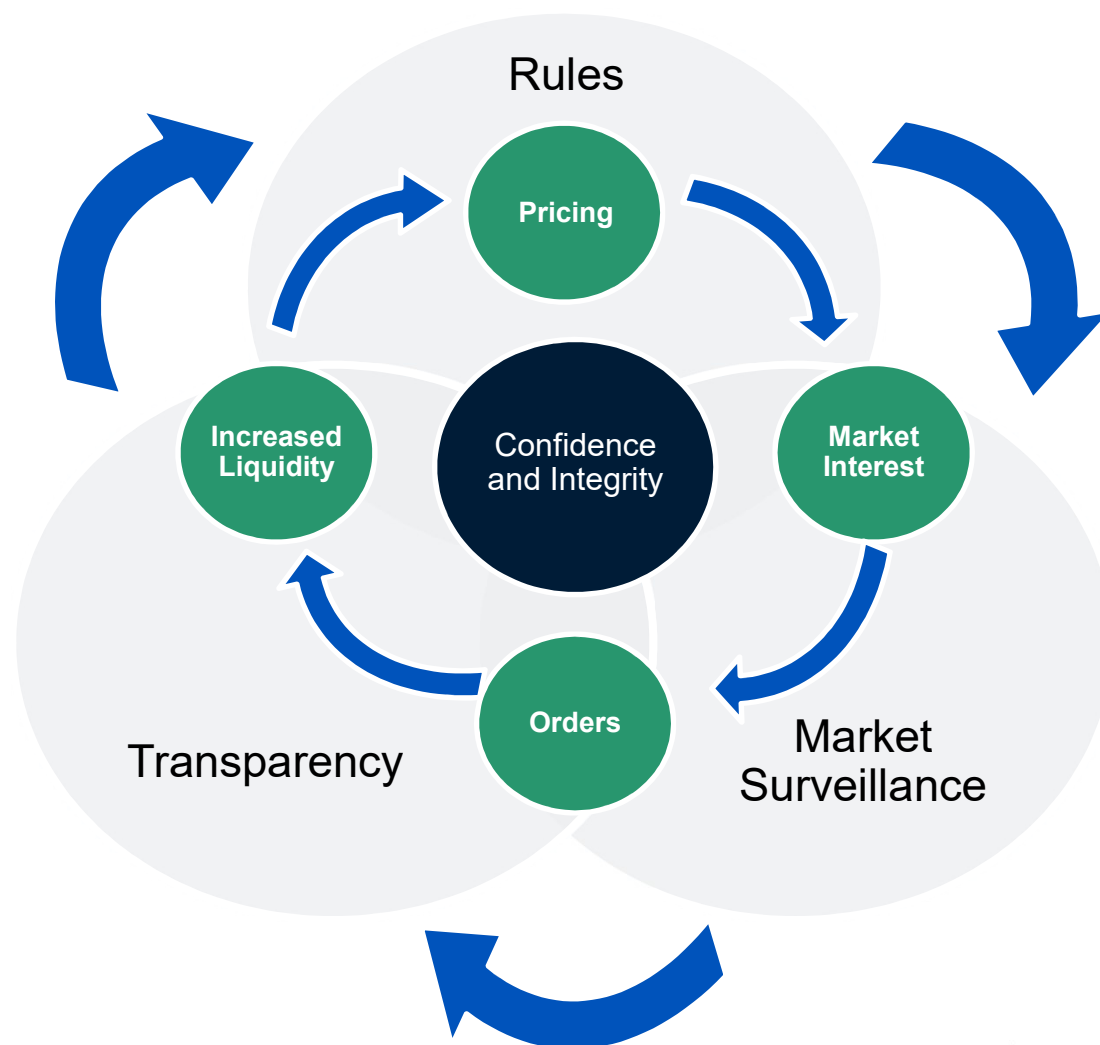


## Organized markets provide Transparency and facilitates Market surveillance



# Transparency and Market surveillance

- No trust, No trade
- Transparency is vital for the market as it builds confidence and trust
- Brings lower risk of misconduct due to increased transparency
- Forward curve price discovery



# How NASDAQ manages risk

## THE COLLATERAL CALL

Pledged cash account or government bonds (EUR). Post Latest 11:00 CET the next trading day.

### BASE COLLATERAL

Covers overnight risk associated with intraday position changes.  
Size depends on: Member category, financial solidness, trading pattern etc.

### DEFAULT FUND

NASDAQ OMX Clearing maintain a guarantee fund or reserve fund to which users contribute and enforce a loss sharing scheme among its members

### DAILY MARGIN CALL

#### VARIATION MARGIN

Marked-to-market value  
(unrealized P&L for the forwards)

#### INITIAL MARGIN

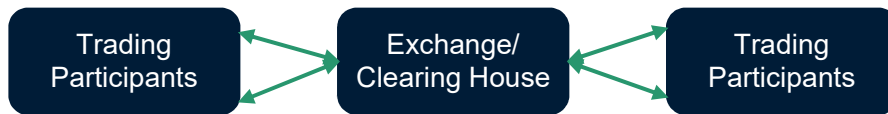
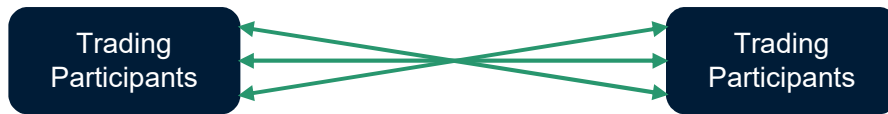
Covers worst case loss during a close out period of  
5 days. Calculated with SPAN risk model.

#### Extra Ordinary Margin Call

According to clearing rules, NOMX may issue an extra margin call with 1 hours notice.

Source: Nasdaq

# Clearing house vs Bilateral



Dimension	Low	Med	High
Market Information	√		
Transaction Cost			√
Matching Efficiency	√		
Counterparty Risk			√
Regulation	√		
Operational Risk			√
Transparency	√		

Dimension	Low	Med	High
Market Information		√	
Transaction Cost		√	
Matching Efficiency		√	
Counterparty Risk		√	
Regulation	√		
Operational Risk		√	
Transparency		√	

Dimension	Low	Med	High
Market Information			√
Transaction Cost	√		
Matching Efficiency			√
Counterparty Risk	√		
Regulation			√
Operational Risk	√		
Transparency			√

Source: Nasdaq

# Do's and do's



- First a physical market:
- A reliable and transparent reference price (index) is key to success
- Start with physical players, then the financial players will follow
- Market regulation must be fair and predictable:
- Market surveillance of both physical and financial markets
- Robust collateral and settlement routines
- Customer advisory board

## Liquidity

- Standardized contracts
- Market Makers

## Transparency

- Bid/Offer-Spreads and volumes are visible for all counterparts
- Urgen Market Messages (UMM)

## Equality for all members

- Information (UMM, prices, trades, other external and internal info)

## Secure counterpart (Clearing)

- a neutral and secure counterpart that guarantees settlement
- no counterparty risk

## Market surveillance

- Regulation/compliance
- Supervise and check transactions to avoid insider trading

# V CIER ENERGY CONGRESS, Medellin, Colombia 28. Nov- 1- Dec 2017

## Sustainable energy for all in the environment of a smart society



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We consult with Governments, Power Exchanges, Regulators, TSOs and other stakeholders on:

- ▶ Market design
- ▶ Rulebook development
- ▶ Market regulation
- ▶ Power market systems
- ▶ Capacity building
- ▶ Competence building





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Telephone: +47 9326 8092

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