

A regional electricity market The Nordic experience

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Almaty 21st April 2009



Agenda

- Development and status of the Nordic power market
- Nord Pool – the Nordic power market operator
- The strenght of the Nordic Market
- Remaining challenges in the Nordic Market
- Nord Pool Consulting

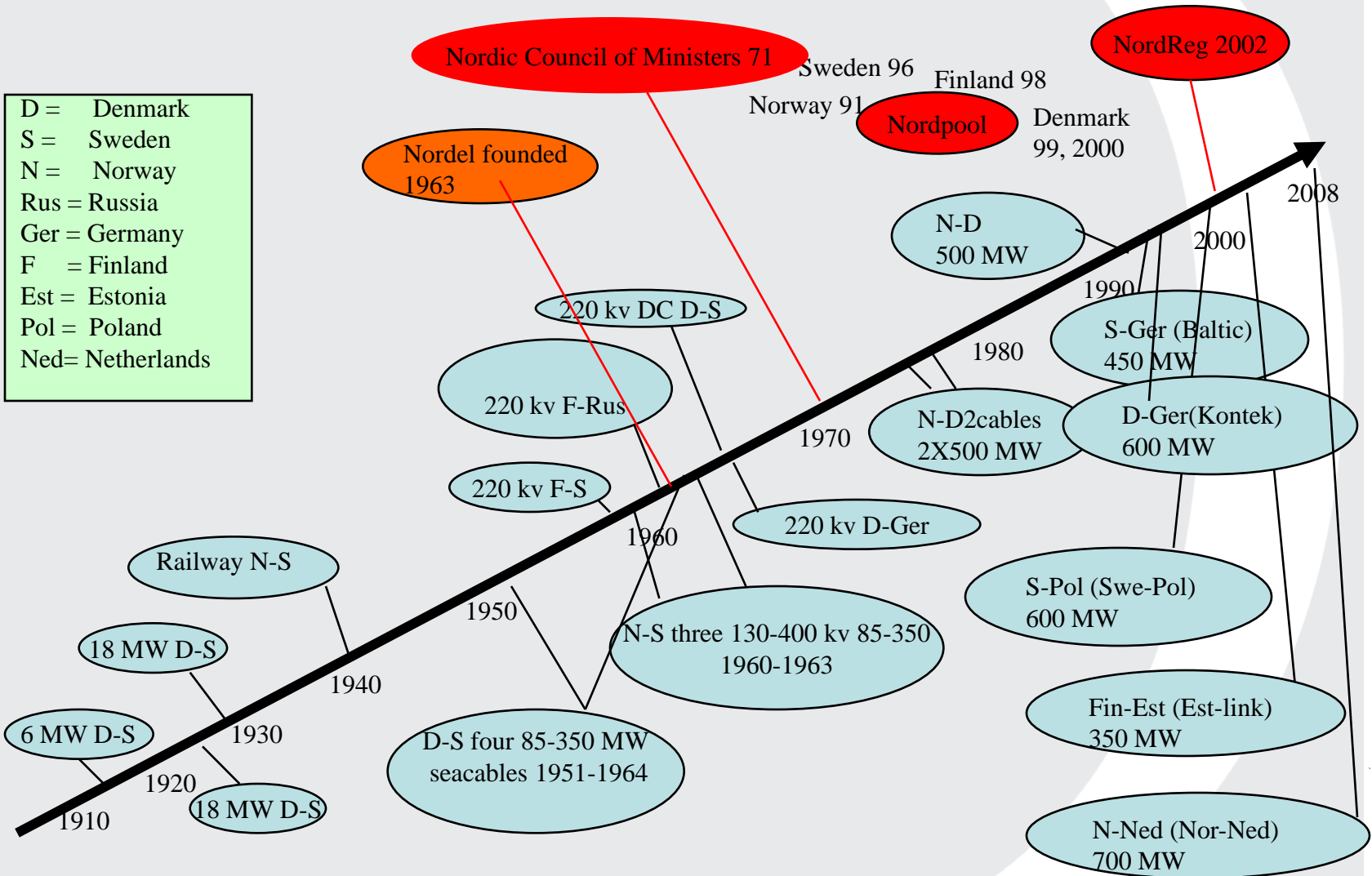
Placing the Nordic

NORD POOL



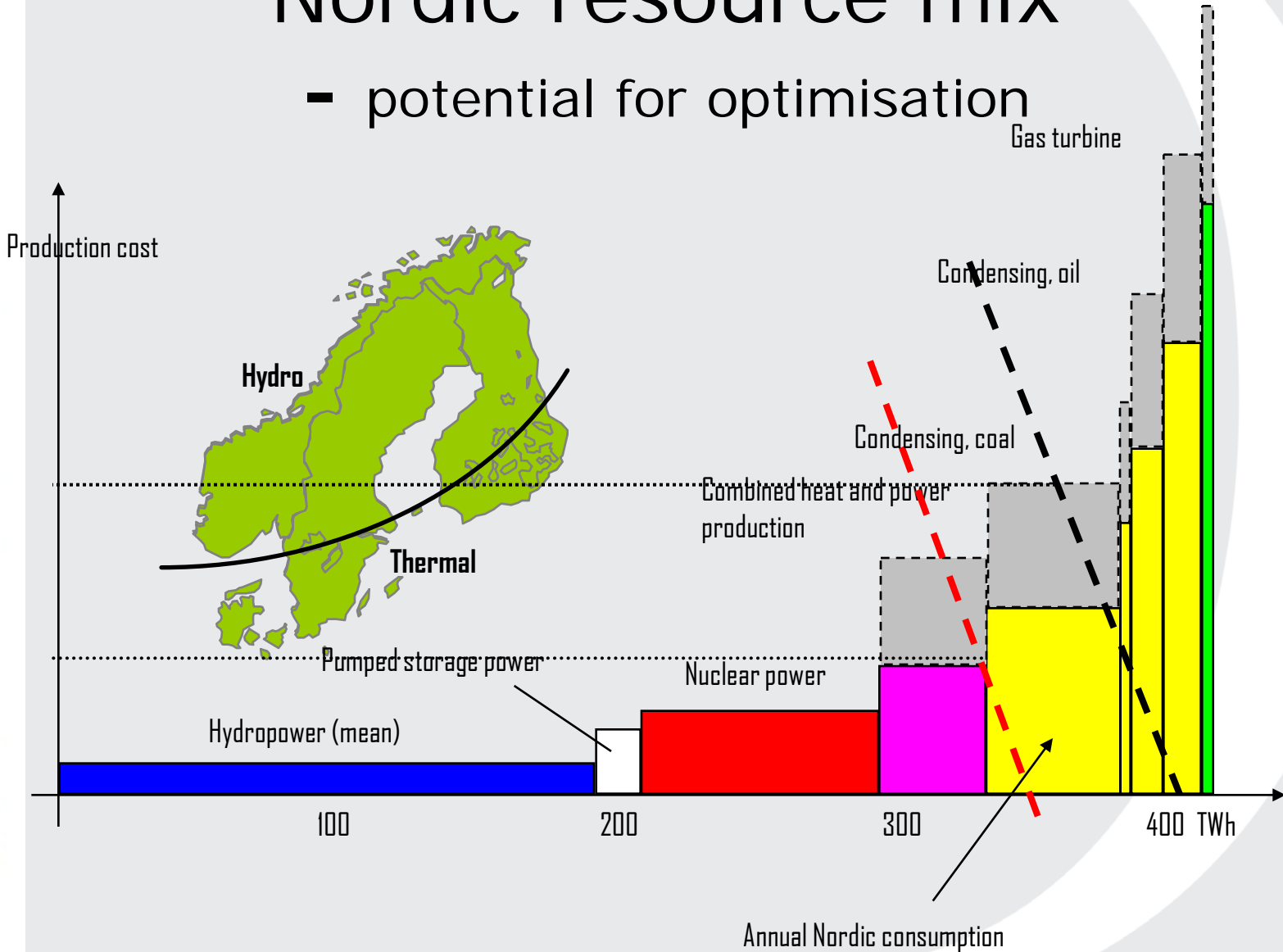
Development of the Nordic Power Market

- D = Denmark
- S = Sweden
- N = Norway
- Rus = Russia
- Ger = Germany
- F = Finland
- Est = Estonia
- Pol = Poland
- Ned = Netherlands



Nordic resource mix

- potential for optimisation



NORD POOL



Nord Pool
The transmission grid in the Nordic countries

- Hydro Power Plant
- Thermal Power Plant
- Wind Power Farm
- Substation
- Converter station
- AC/DC/AC Back-to-back-station
- 550-750 kV line
- 380-400 kV line
- 300-330 kV line
- 220 kV line
- 132-150 kV line
- DC-line
- Double line system
- Interconnection for voltage lower than 220 kV
- Voltage
- Temporary voltage
- In operation
- Under construction
- Nordel priority cross section

Nordel 1.4.2008 © Nordel 20

NORD POOL



The Nordic power market: Key Figures

Key figures 2007

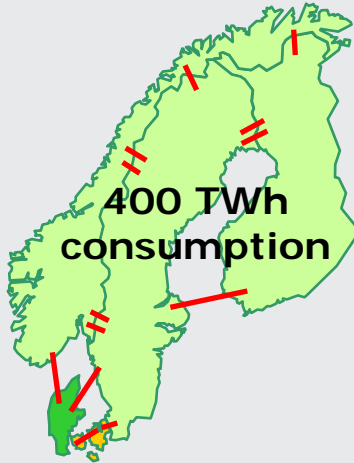
		Nordel	Denmark	Finland	Iceland	Norway	Sweden
Population	mill.	25,0	5,5	5,3	0,3	4,7	9,2
Total consumption	TWh	412,6	36,4	90,4	12,0	127,4	146,4
Maximum load *	GW	61,1	6,1	12,5	1,3	18,6	22,7
Electricity generation	TWh	409,2	37,0	77,8	12,0	137,4	145,1
Breakdown of electricity generation							
Hydropower	%	55	0	18	70	98	45
Nuclear Power	%	21	-	29	-	-	44
Other thermal power	%	21	81	53	0	1	10
Wind power	%	3	19	0	-	1	1
Geothermal power	%	-	-	-	30	-	-

¹⁾ Measured 3rd Wednesday in January



The Nordic Power Market (Nord Pool)

**Nordic
Free Trade Area**



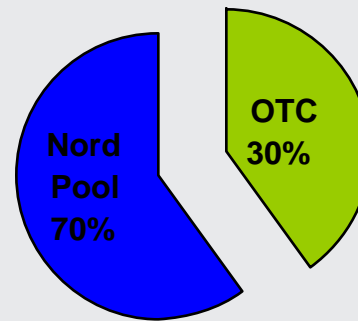
The exchanges

**320+
Members
Spot**

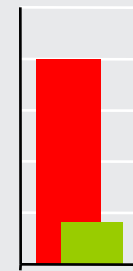
**400+
Members
financial
market**

**121+
EUA members**

**Physically
traded**



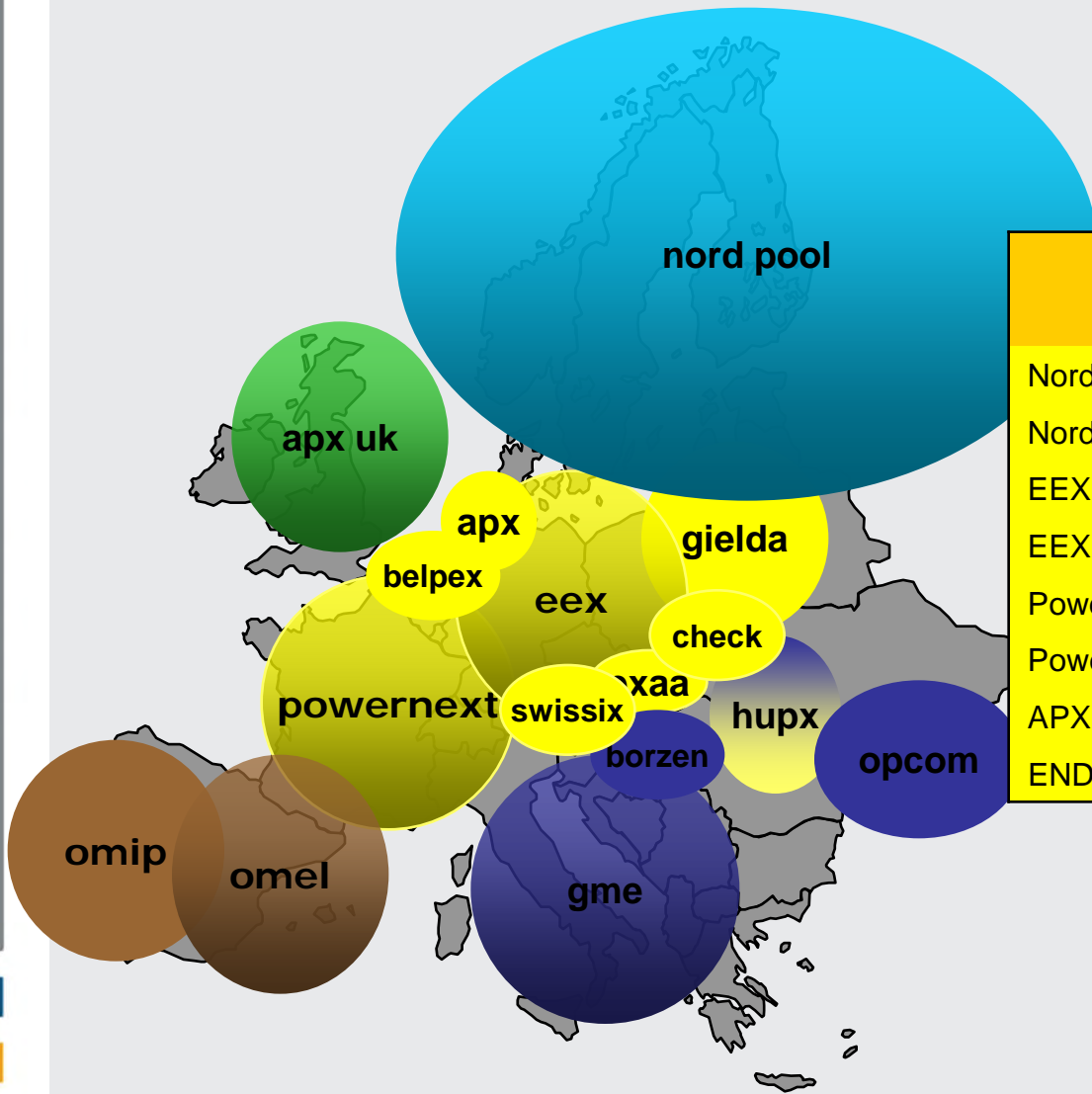
**Financial trade
is 7 times the
consumption**



Efficient wholesale market with adequate products and services for companies competing in the market

European PXs

NORD POOL



PEX	Volume in TWh		
	2006	2007	2008
Nord Pool DAM	250	290	236 (oct)
Nord Pool Financial	766	1060	1215 (oct)
EEX DAM	89	124	120 (sept)
EEX financial	1044	1150	
Powernext DAM	30	44	38 (sept)
Powernext financial	83	79	38(sept)
APX DAM	19	20	18 (sept)
ENDEX Financial	131	101	



Markets

PHYSICAL

- » [ELSPOT](#)
- » [ELBAS](#)
- » [GAS](#)

DERIVATIVES

- » [PRICE NORDIC](#)
- » [PRICE GERMAN](#)
- » [PRICE DUTCH](#)

EMISSIONS

- » [EUA](#)
- » [CER](#)
- » [PRODUCT INFORMATION](#)

Services

CLEARING

- » [RISK MANAGEMENT](#)
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- » [HOW TO BECOME A MEMBER](#)

CONSULTING

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- » [SERVICES](#)
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Market data

System price 15 Apr 2009

€	NOK	SEK	DKK
34.43	302.73	373.38	256.50

Prices last 30 days in €



Market information

Urgent market messages

Last: (Today 13:04) Special information - details given in remarks below: Rana G1, G2, G3, G4

Status: 15 messages today, 2 within last hour. [View list](#)

[View list](#)

[RSS Feed](#)

Exchange information

03 Apr: [no 34/09 Changes to the Clearing Rules](#)

[View list](#)

[RSS Feed](#)

Today's operational messages

12:38: Elspot prices expected at: 12:45

11:28: Capacity DK1<->KT published

09:56: Transmission capacity updated

[RSS Feed](#)

Gross turnover to date in TWh:

	2009	2008
Spot market	97	98
Financial market	349	442
Clearing services	312	350
Total	758	890

Financial market

- [Price power derivatives](#)
- [Price carbon derivatives](#)

Address <http://www.nordpoolspot.com/>

NASDAQ

last quote

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ELSPOT MARKET DATA - Select -

ELBAS - Select -

POWER SYSTEM DATA - Select -

NP GAS - Select -

How to become a participant
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MESSAGES

Urgent Market Message

Last: (Today 10:04) New planned outage (maintenance): Trollheim G1

Status: 13 messages today, 0 within last hour. [View list](#) - [RSS feed](#)

Exchange information

02. Apr: [no 32/09 New bidding area](#) for Elspot/Elbas valid from Monday 13 April 2009

[View list](#) - [RSS feed](#)

Today's operational messages

12:38: Elspot prices expected at: 12:45

11:28: Capacity DK1<->KT published

09:56: Transmission capacity updated

[RSS feed](#)

Prices | Flow | Capacities | Select hour: [Overview](#)

Elspot prices 16.04.09

SYSTEM PRICE
€32.5

€35.29

€35.32

€31.87

€31.87

€31.14

€31.77

€32.03

€31.67

MOVE CURSOR TO MAP FOR LINKS

SYSTEM PRICE PER MWH

15. April 2009

EUR 34.43

NOK 302.73

SEK 373.38

DKK 256.50

NEWS

[Upgrade of ELBAS](#) trading system 4 February 2009

[Elbas Norway](#)

Nord Pool Spot introduces Elbas intraday market in Norway 4 March 2009

[Peak power reserves in Finland and Sweden](#) to be made available for Elspot from 19 January 2009

Nord Pool Spot

Physical Power Markets

ELSPOT Overview

- Product: Hourly contracts, physical delivery.
- Delivery period: All 24 hours through the next day (12-36 hours ahead in time).
- Type of trading: Auction trading. Accumulated bids and offers that form equilibrium point prices via an Implicit Auction that also reflects usage of a available transmission capacities between bidding areas.
- Trading days: All days through the year.
- Bidding: Bids and offers in standard exchange format (internet, EDIEL).
- Trade currencies: Euro, NOK, SEK, DKK.
- Price calculation: 1200 am every day.

ELBAS Overview

- Product: Hourly contracts, physical delivery.
- Delivery period: All hours with Elspot price in present day and following day up to 60 minutes before delivery.
- Type of trading: Continuous
- Trading days: Every day through out the year 24h

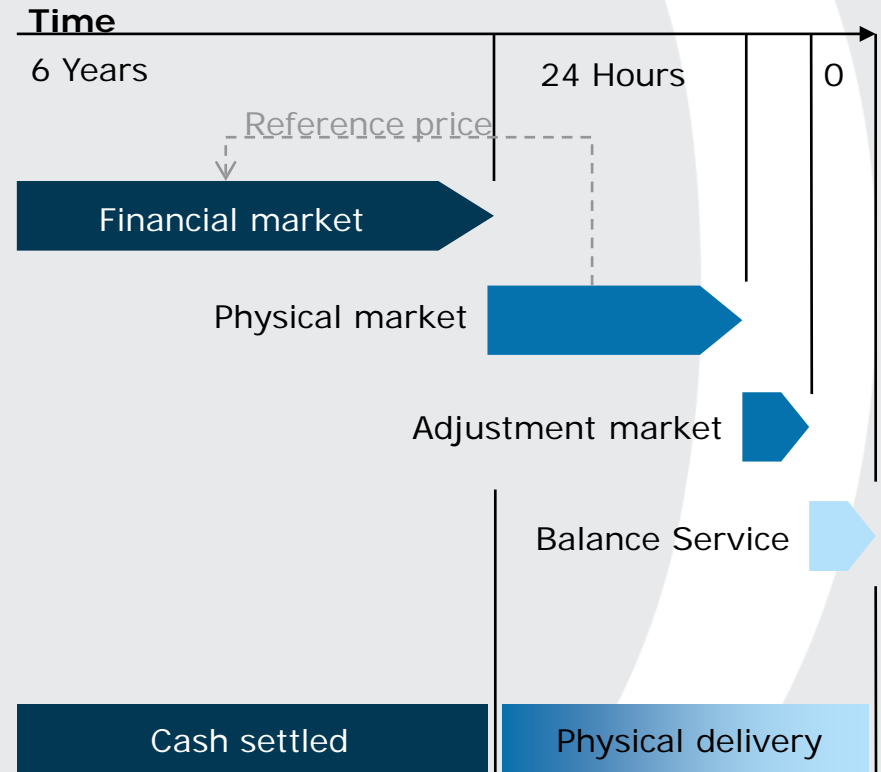
The Derivatives Market

- A market for price hedging and risk management
- Contracts are traded for financial delivery (settlement); time horizon of up to 6 years
- Members can identify profit and loss components in relation to portfolio's market value
- Products:
 - Futures contracts
 - Forward contracts
 - Contracts for Difference (CfD)
 - European-style power options (EPO)
- All matching performed by the exchange's electronic trading system, PowerCLICK
 - Orders entered via distributed PowerCLICK workstations or by telephone to the financial market's helpdesk



Products in the Nordic market

- **Physical market:**
 - **DAM: Auction - supply and demand cross (system price). Mechanism for handling of constraints. Handled by Nord Pool Spot - Elspot**
 - **IDM: Adjustment market: Continuous hourly market. Handled by Nord Pool Spot – Elbas**
 - ***Balance Service:***
 - ***Operated by Transmission System Operators (TSO)***
- **Financial market:**
 - **Cash settled Futures, Forwards and Options. Handled by Nord Pool ASA**
- **Clearing (financial):**
 - **Exchange trade**
 - **OTC Trade**
 - **Handled by Nord Pool Clearing ASA**
- **Emissions**
 - **EUA and CER**



The Nordic Power Market – success factors

- Geographical, historical, cultural and lingual factors
- Political signals to form a common Nordic power market
- TSOs who co-operate to facilitate market operations
- Appropriate involvement by Regulator
- Appropriate market concentration
- A non-mandatory power exchange
 - A PX in competition with the bilateral market
 - Participants' freedom to choose market
- A simple market concept - simplicity pays
- Transparency in price setting
- Organised distribution of neutral market information
- Market access for medium sized end-users
 - Trade representatives
 - Market analyses services
 - Portfolio management services

The Nordic Power Market – Remaining challenges

- No common legal framework for further integration
- Not always a integrated market (trans border limitations do occure)
- Not a common retail/end-user market
 - Common Nordic balance/imbalance management/settlement
- Uniform regulation of TSO's is lacking
- TSO's – Enhanced joint network planning.
 - Rules/procedures for available transmission capacity, congestion management etc. should be more transparent
 - More capacity should have been available for the Intra Day market
 - National thinking is dominant, not Nordic

- Assists in electricity deregulation processes
- Provides strategic and management consulting services within the electricity business world wide.
 - Feasibility studies
 - Infrastructure & market design
 - Training
 - It implementation
 - Market simulation
- Leverage on specialists from its owner within their core business.
- Extended project co-operation with other selected companies
- Delivery of day-ahead trading platforms for power exchanges (SAPRI)

Power market seminars and training at Nord Pool

Nord Pool Consulting has during a number of years offered client tailor made seminars focusing on the Nordic power exchange – Nord Pool – and the Nordic power market. The seminars are lasting from half a day to four weeks and will be designed in close cooperation with the client. The seminars are based on the seven listed modules but other topics can be added or removed in line with the wishes of the client. A visit to the Nord Pool spot desk and the financial desk will normally be included in the seminars lasting more than one day. For seminars lasting a week or more business visits will be included and participation certificates issued.



Mini seminar "the Nordic power market"

What we call mini seminar is a three hour long presentation, where the client is introduced to the main principles and concepts of the Nordic power market.

The objective is to enable the client to understand the most important features of the Nordic power market.

One-day seminar "power market concepts"

During a one-day seminar the client is introduced to the main principles and concepts of the Nordic power market. In addition, price determination, congestion management, imbalance management, reference price, risk management and hedging/trading with derivatives will/can be treated.

The objective is to enable the client to understand the most important features of the Nordic power market.

Five-days combined seminar and workshop "power market concepts"

The combined seminar and workshops covers all important issues connected to a competitive power market as listed in the 7 modules. If necessary, detailed explanations and case studies will be given for additional understanding.



The client also has the opportunity to - on a simplified basis - simulate participation in day-ahead market and derivatives trading.

The objective is to enable the client to make his own opinion about market developments, regulations and framework. The client shall be able to discuss power market issues on a professional basis after attending this combined seminar and workshop. The client will also receive a certificate proving his/her participation in the training.

Multiple days combined seminar and workshop "comprehensive power market concepts"

The multiple-days seminar lasting from 6-20 days is based on the five-day combined seminar and workshop. However, dependent of number of seminar days there is more time for

in-depth-training, introduction of other topics, practical exercises, discussions, exam etc.

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