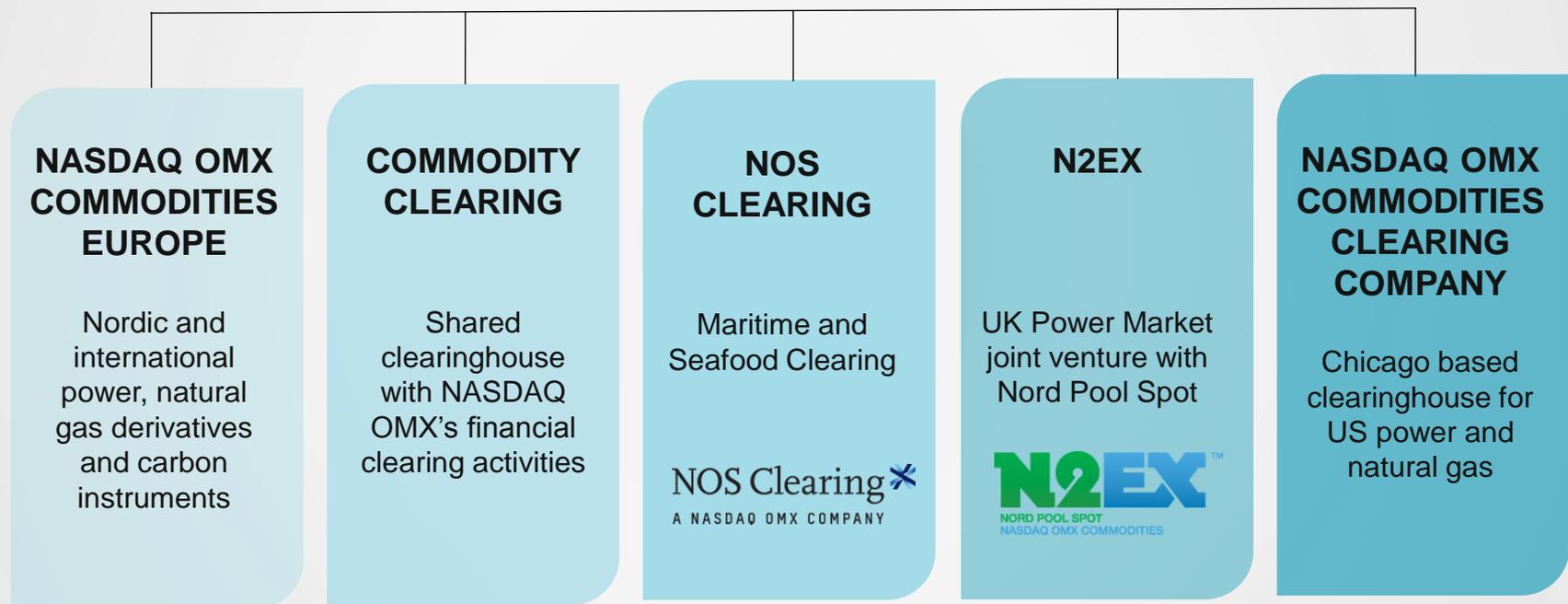

**NASDAQ OMX
BALTIC INITIATIVE TALLINN
8 NOVEMBER 2013**

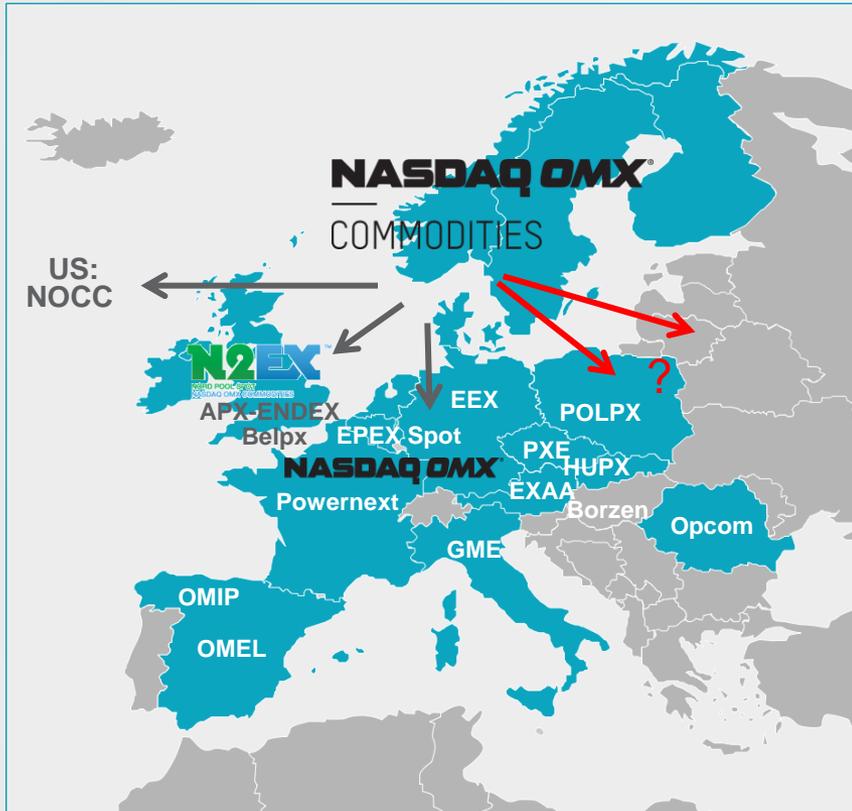
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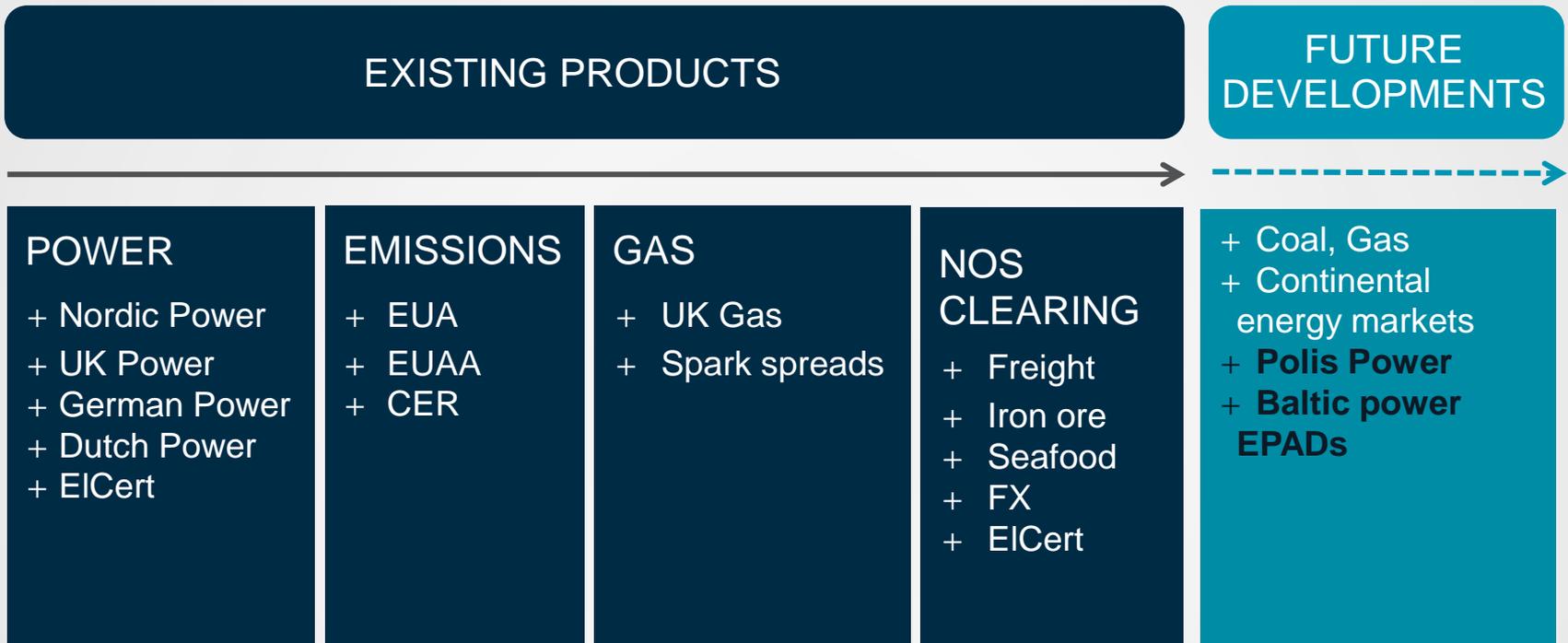


THE LARGEST POWER EXCHANGE IN EUROPE



2012	NASDAQ OMX COMMODITIES
Members	345
Countries	18
Turn over vs Consumption	
Underlying value, €	57billion
Exchange vs Over the counter (OTC)	<p>95% of all power derivatives are cleared</p>

FROM POWER TO MULTI COMMODITY OFFERING



Futures, DS Futures & Options and new continental EPADs (Belgium, France, Czeck and Holland

Exchange and OTC Clearing

THE NORDIC POWER MARKET

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NORDIC POWER – PRODUCT STRUCTURE

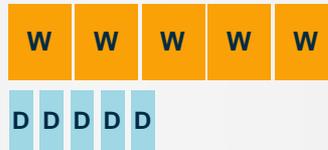
Deferred Settlement Future (DS Future), formerly Forward
Cash settlement, only in delivery period

Note: Years are cascaded to quarters, and quarters to months.

YEAR*											
Q1*			Q2*			Q3*			Q4*		
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Futures

Daily cash settlement
mark to market



Underlying Reference Price for futures and DS Futures:

NORDIC SYSTEM PRICE

Currency: EUR

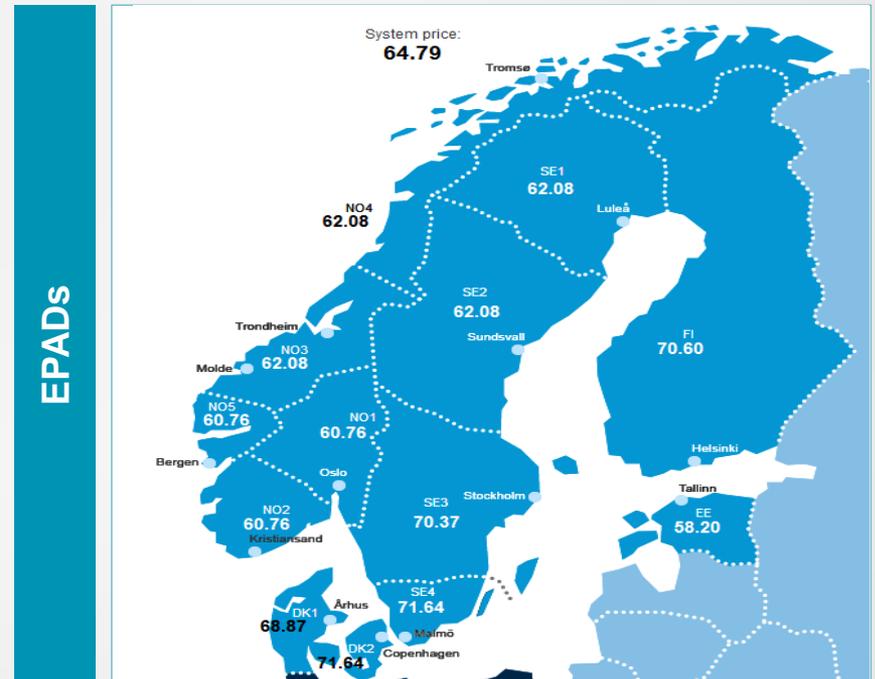
Tick size: 0,01 EUR/MWh

Min contract size: 1 MW * h in the contract

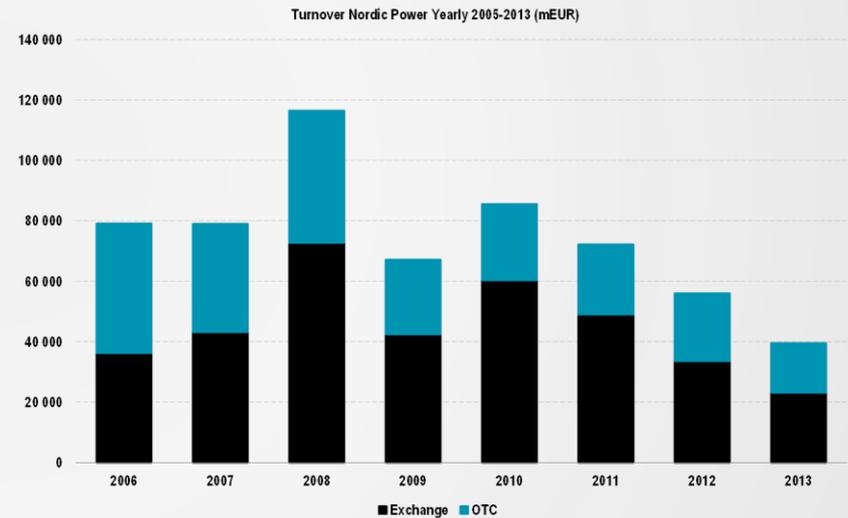
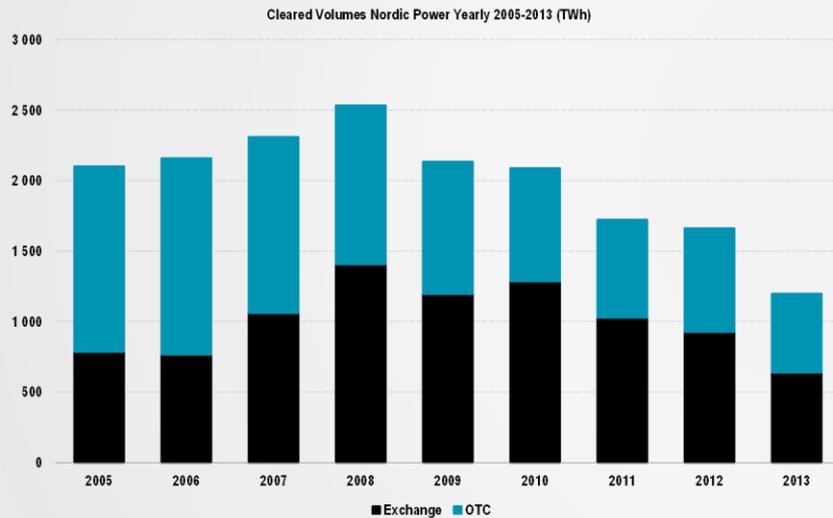
Electricity Price Area Differential (EPAD), formerly CfDs

AREA PRICES – NORDIC SYSTEM PRICE

Year, Quarters, Months

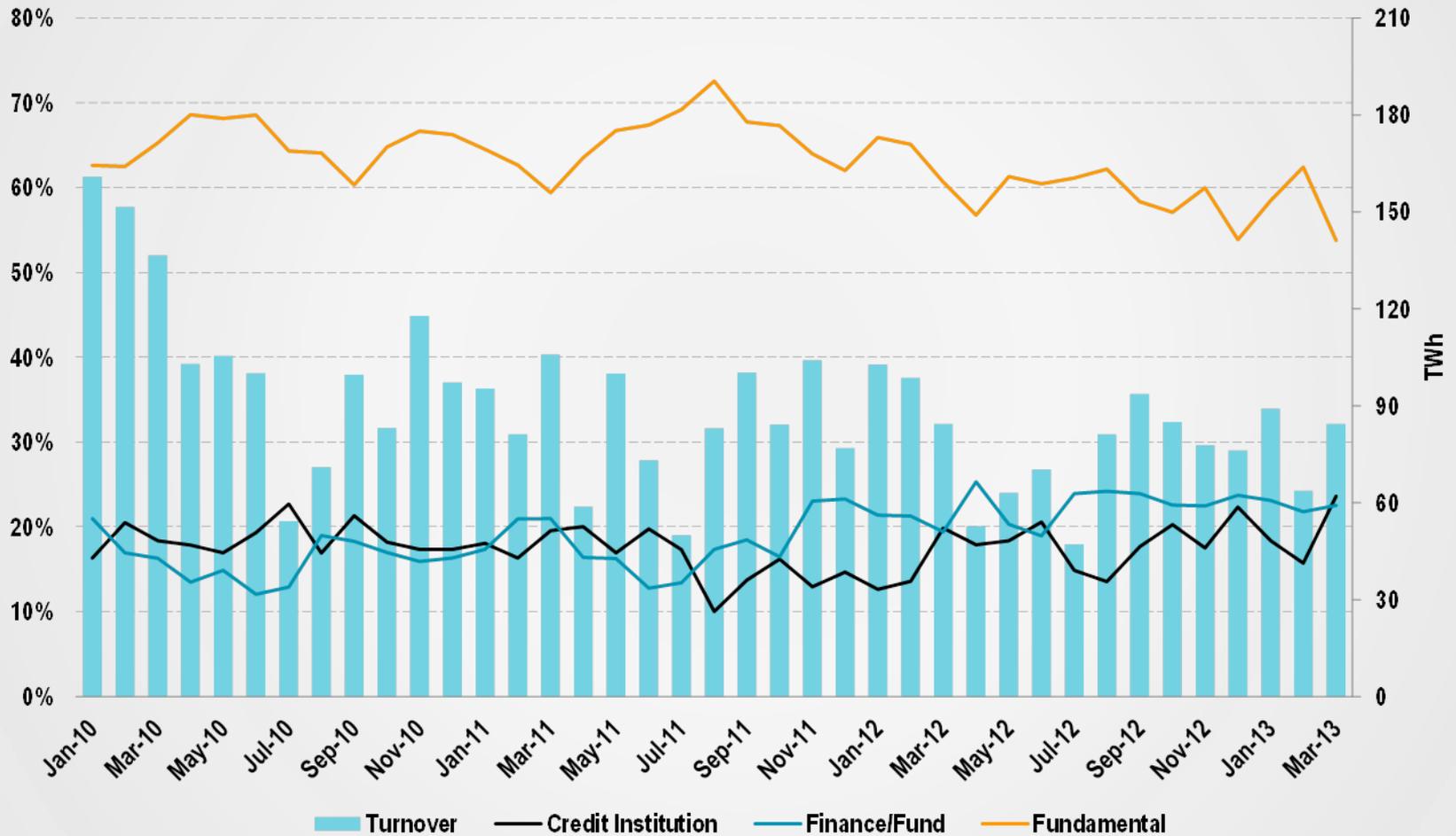


TRADED AND CLEARED VOLUMES NORDIC POWER



MARKET SHARE PER CUSTOMER CATEGORY

Market Shares per Customer Category
Monthly 2010-2013



ELECTRICITY PRICE AREA DIFFERENTIAL (EPAD), FORMERLY CFD

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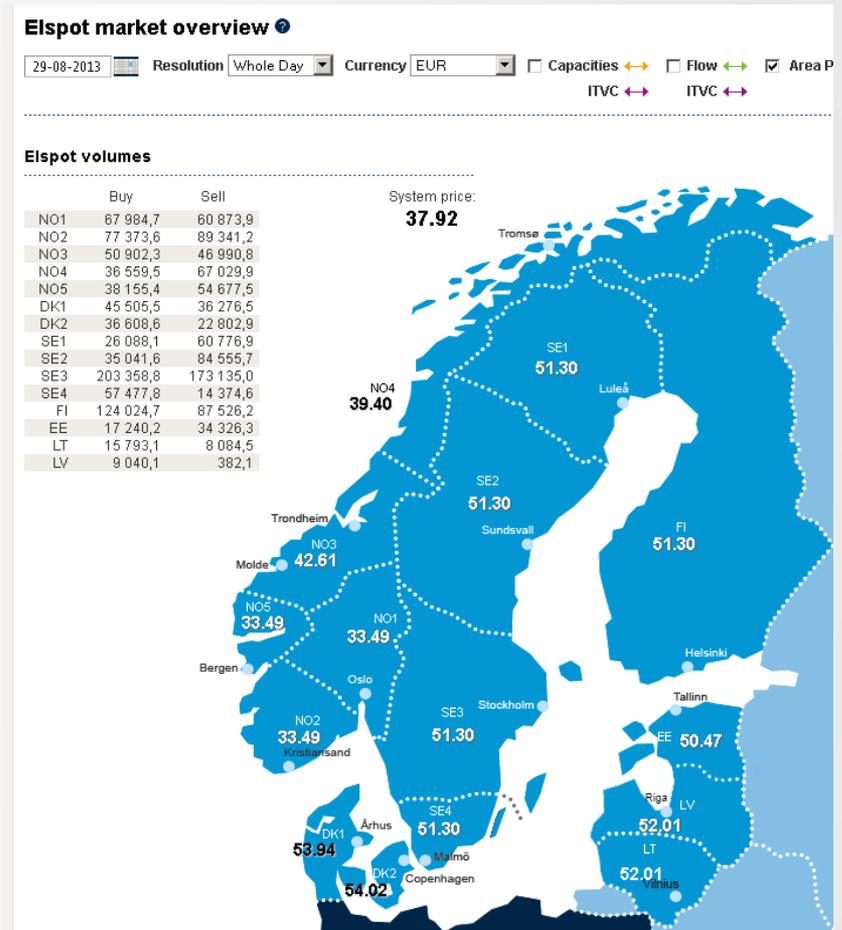
ELECTRICITY PRICE AREA DIFFERENTIAL (EPAD)

Congestions between different areas can result in different area prices.

Nordic financial Futures and DS Futures contracts ensure against movements in the system price, but do not take into account the different prices in the areas for actual purchase/sell of physical power.

This could lead to a poor matching between compensation from the DS Future and the real power price.

There is an price area risk for the Nordic market players in addition to the system price risk. Market players use the EPAD market to hedge against deviations between the local area price and the common Nordic system price, which is used as a reference for financial Nordic power contracts.



NOMX EPAD PRODUCT OFFERING

EPAD:

An EPAD is a DS Future contract with reference to the difference between the area price and the Nordic system price. Only exception is the weekly contracts which are futures.

Example: SYHEL= Helsinki ΔP = Helsinki area price - system price

Price area	Weeks	Months	Quarters	Years
Oslo, Tromsø, Copenhagen, Århus and Tallinn	N/A	2	3	3
Stockholm, Luleå, Sundsvall, Malmö, Helsinki	5	4	4	4

- Curve was only extended on Helsinki and the Swedish areas due commitments from market makers.
- Fundamental players in the norwegian areas use System as a proxy for hedging as the price difference tend to be small against the area price + lack of natural buyers (Oslo)

THE BALTIC INITIATIVE

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THE BALTIC INITIATIVE

Linking to the Nordic region

MARKET NEED:

Market need from both the Baltic market players and the Baltic TSOs to get well functioning financial products to hedge the price area risk.

TIMING:

Including the Baltic countries into the Nordic financial market model is a strategically interesting opportunity for NOMXC. This will support the well functioning Nordic EPAD market instead of implementation of FTRs/PTRs.

EXTENSION OF NOMXC PRODUCT OFFERING:

NOMXC evaluate to list Baltic EPADs for trading and clearing (June 2014)?

MARKET SUPPORT:

Commitment from the Baltic market players and TSOs (indirectly) to support trading and clearing of financial instruments.

“Sandor Liive, CEO Esti Energia, said “The main problem today was a lack of financial hedging instruments, with price area difference contracts used in the Nordic region not yet being introduced for all Baltic price areas,” according to Montel news 17 September 2013 “Baltic cross-border price differences unbearable – Esti”.

TSOS CAN INCREASE LIQUIDITY IN THE SECONDARY
EPAD MARKET

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NOMX EPAD COMBO=FTR (FINANCIAL TRANSMISSION RIGHT)

EPADs can be used as FTRs (obligations) between two different price areas. The EPAD COMBO obligation will be settled against the price difference regardless of the flow in the right or wrong direction.

Lithuania/Vilnius = high price area (congestion between Estonia and Latvia) Riga price=Vilnius price
 Estonia/Tallinn = low price area

<u>Congestion rent/ Financial Transmission Right</u>	<u>EPAD COMBO</u>
	Area price VIL - Area price TAL = (EPAD VIL + System price) - (EPAD TAL + System price)
	= EPAD VIL + System price - EPAD TAL - System price
	= EPAD VIL - EPAD TAL
= Area price VIL - Area price TAL	= Area price VIL - Area price TAL

- By selling an EPAD in one bidding area and buying an EPAD in another bidding area, a FTR is created.
- The amount of contracts are not limited to the physical transmission capacity
- EPADs can be traded on the NOMXC exchange/OTC and cleared on NOMXC Clearing

TSO AUCTION OF EPAD COMBO WILL INCREASE LIQUIDITY

Electricity Price Area Differential (EPAD) Obligation

TSO auctions of EPAD COMBO:

More liquidity and transparency to the existing secondary market.
The TSO will **ONLY** participate in the primary auctions.
Always a secondary market ref. price for EPAD COMBO auctions.
Only one counterparty NOMX Clearing

Financial Transmission Rights (FTRs) Obligation

TSO auction of FTRs/PTRs:

No secondary market available.
More bilateral trading and less transparency.
No reliable reference price for FTR/PTR auctions.
Many counterparties.

Physical Transmission Rights (PTRs)

PTR (see above).

IMPLICIT AUCTION ON NP SPOT AND EPAD COMBOS ON NOMXC

Status without using EPAD-Combos

- Due to the TSOs attend on NP SPOT on the implicit DA-Auction, they generate a congestion rent (CR) in case there are price area differences
- The CR can only be negative, in case there is an cable outage after a TSO has submitted the capacity to NP SPOT

Status with using EPAD Combos

(pay out the difference in energy prices between 2 price areas)

Example

Area VIL price expectation January 2014 = 40€

Area TAL price expectation January 2014 = 34€

= expected congestion rent = 6€

TSO:

Sell SCSYVIL/TALJAN-14 at +6 €

Short Position EPAD VIL JAN = **+9€/MWh**,

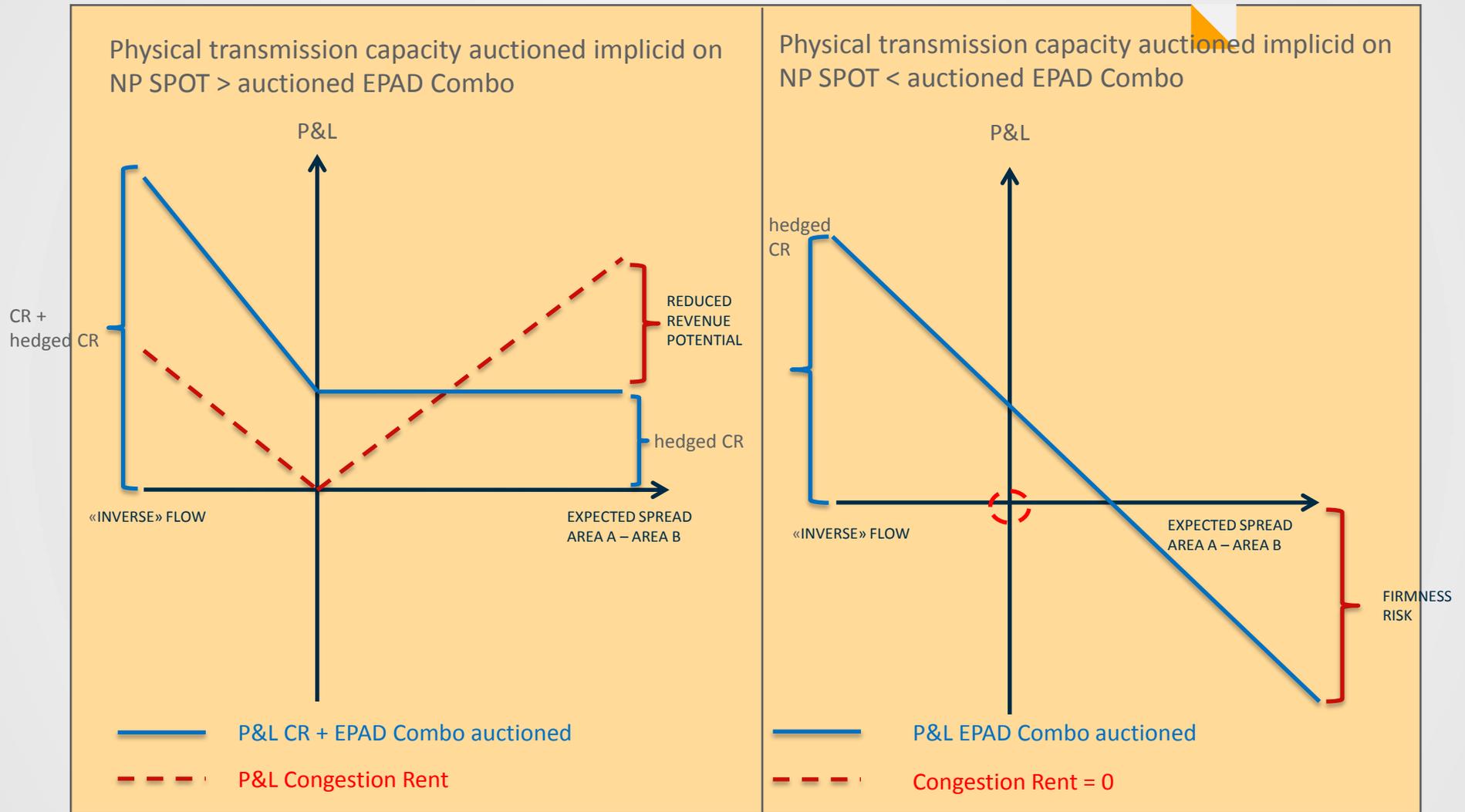
Long Position EPAD TAL JAN = **+3€/MWh**

PLUS: CR due to implicit auction on NP SPOT

CASH FLOW TSO (NP SPOT AND NOMXC EPAD COMBO)

Scenario:		1 Full hedge (flow TAL-VIL)		2 Bonus hedge (flow VIL-TAL)		3 Cable outage
		TSO		TSO		TSO
SYSTEM Price	28		34		46	
Area Price VIL	50	+50	34	+34	48	+48
Area Price TAL	39	-39	36	-36	35	-35
CR (implicit auction on NP Spot)		+11 (Buy TAL and sell VIL)		+2 (Sell TAL and buy VIL)		0 (Cable outage)
NOMXC Settlement EPAD VIL	$50-28=+22$	-13	$34-34=0$	+9	$48-46=+2$	+7
NOMXC Settlement EPAD TAL	$39-28=+11$	+8	$36-34=+2$	-1	$35-46=-11$	-14
Result with EPAD Combo on NOMXC		-5		+8		-7
Cash Flow (CR + EPAD Combos)		+6		+10		-7

EPAD COMBO PROFIT-LOSS-DIAGRAM FROM A TSO-PERSPECTIVE



CASH FLOW TSO

Example: TSO sells the spread = SELL VIL (High price area) and BUY TAL (Low price area)

Area VIL price expectation January 2014 = 40€

Area TAL price expectation January 2014 = 34€

= expected congestion rent = 6€

- There is a firmness risk for the TSO, if there is a cable outage which results in an area spread higher than the auctioned EPAD Combo
 - the CR is 0 and the EPAD Combo settlement is negative, if area spread > 6

Area Spread	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10
CR	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	10
EPAD Combo	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4
CR + EPAD Combo	22	20	18	16	14	12	10	8	6	6	6	6							
CR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPAD Combo	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4
Firmness Risk	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	-1	-2	-3	-4

MARKET PLAYERS - FULL CROSS BORDER HEDGE
WITH EPAD COMBO PRODUCTS

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TODAYS STATUS IN THE BALTIC REGION

NO CROSS BORDER HEDGING WITH FINANCIAL CONTRACTS

Lithuania
(Highprice-area)

Supplier A



Marginal Costs A: 45€

Bilateral Contract with B: 43 €

100MW with delivery Jan 2014



TSOs



Supply
contract with
B @ 43€

Client B

Estonia
(Lowprice-area)



RISK WITH CROSSBORDER- ACTIVITIES

Settlement in the Delivery period:

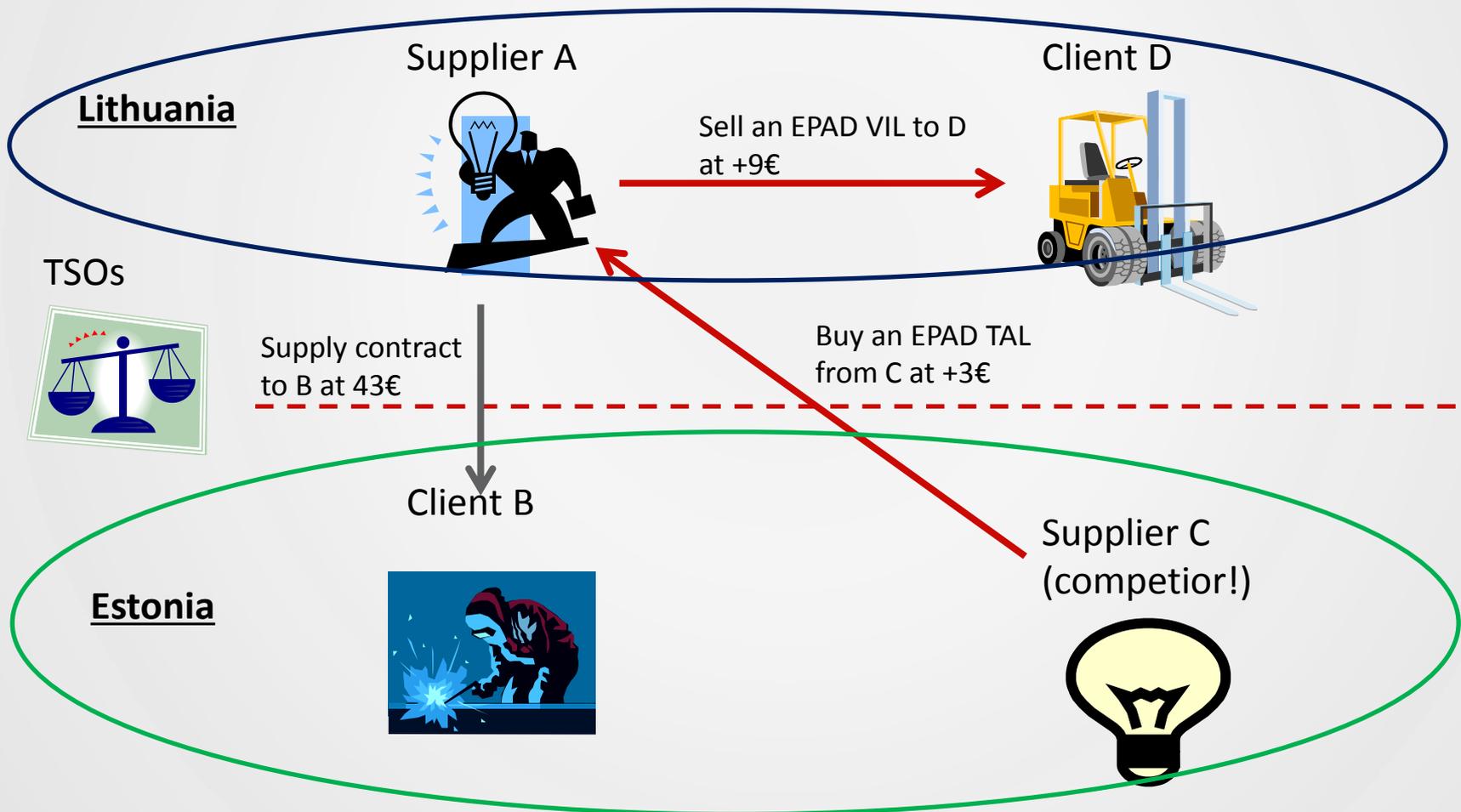
- + Sell - Price Area VIL at NP SPOT
- + Buy - Price Area TAL at NP SPOT

Scenario	Price/MWh	1.Profit/Loss MWh	Price/MWh	2. Profit/Loss MWh	Price/MWh	3.Profit/Loss MWh
Area Price Vilnius (NP SPOT)	+50	+5 (50-45)	+34	-11 (34-45)		+48	+3 (48-45)
Area Price Tallin (NP SPOT)	-39	+4 (43-39)	-36	+7 (43-36)		-35	+8 (43-35)
Cash position after power sale in price area Lithuania and power buy in price area Tallin on NP SPOT		+9		-4			+11

➤ **Volatile and unpredictable cashflows = RISK!**

HEDGING WITH EPAD COMBO (2)

Crossborder-Hedging with EPADs including fundamental players



HEDGING WITH NOMX EPAD COMBO

Settlement in the Delivery period using EPAD-Combos = a perfect hedge!

Scenario	1. Price/MWh	2. Price/MWh	...	3 Price/MWh
System Price	28	34		46
Area Price Vilnius (NP SPOT)	+50	+34		+48
Area Price Tallin (NP SPOT)	-39	-36		-35
NOMXC: Cash Settlement P&L in Delivery Period because of the <u>short EPAD Vilnius</u> position Contract price (+9) to area-systemprice deviation	-13 (Area-Sys = +22)	+9 (Area - Sys = 0)		+7 (Area-Sys=+2)
NOMXC: Cash Settlement P&L in Delivery Period because of your <u>long EPAD Tallinn</u> position Contract price (+3) to area-systemprice deviation	+8 (Area-Sys = +11)	-1 (Area-Sys = +2)		-14 (Area-Sys=-11)
Cash position after power sale in price area Lithuania and power buy in price area Tallin on NP SPOT	+6	+6		+6

HEDGING WITH NOMX EPAD COMBO (3)

Settlement in the Delivery period using EPAD-Combos = a perfect hedge!

Scenario	Price/MWh	1 Profit/Loss MWh	Price/MWh	2. Profit/Loss MWh	..	Price/MWh	3. Profit/Loss MWh
Nordic System Price	28		34			46	
Area Price Vilnius (NP SPOT)	50	+5 (50-45)	34	-11(34-45)		48	+3 (48-45)
Area Price Tallin (NP SPOT)	39	+4 (43-39)	36	+7 (43-36)		35	+8 (43-35)
NOMXC: Cash Settlement P&L in Delivery Period because of the <u>short EPAD Vilnius</u> position Contract price (+9) to area-systemprice deviation		-13 (Area – Sys = +22)		+9 (Area–Sys = 0)			+7 (Area-Sys=+2)
NOMXC: Cash Settlement P&L in Delivery Period because of your <u>long EPAD Tallinn</u> position Contract price (+3) to area-systemprice deviation		+8 (Area–Sys = +11)		-1 (Area-Sys = +2) (36-34) +2 kjøpte den på 3			-14 (Area-Sys=-11)
Cash position after power sale in price area Lithuania and power buy in price area Tallin on NP SPOT		+4		+4			+4

HEDGING WITH NOMX EPAD COMBO (4)

➔ SOLUTION FOR CROSSBORDER-ACTIVITIES!



USEFUL LINKS NASDAQ OMX COMMODITIES

Market Prices:

<http://www.nasdaqomx.com/commodities/markets/marketprices/>

Member Process:

<http://www.nasdaqomx.com/commodities/Marketaccess/>

Member List:

<http://www.nasdaqomx.com/commodities/Marketaccess/memberlist/>

Fees:

<http://www.nasdaqomx.com/commodities/Marketaccess/feelist/>

Connectivity:

<http://www.nasdaqomx.com/commodities/itandconnectivity/>

THANK YOU

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