FINGRID

Financial Transmission Rights in the Nordic Electricity Market

What is the purpose of issuing FTRs

FTRs allow market parties to hedge the area price spread risk

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This makes it potentially easier for market participants to compete in the longer-term market

(Physical and Financial) products to hedge the area price risk

- **Physical Transmission Rights (PTRs)**
  - Physical transmission right to the trader (market participant) entitling her to use a physical capacity (MW)
  - ISO/TSO issues

- **Financial Transmission Right (FTR)**
  - Purely Financial product for area price difference
  - Different versions of the FTR product (Obligations vs. Options)
  - TSO typically issues

- **Contracts for Differences" (CfDs)**
  - CfD products hedge price difference between system and area price
  - Market participants issue the product
  - Payoff profile is that of an obligation

The Nordic TSOs have long ago decided not to issue physical transmission rights explicitly; instead all physical transmission capacity is made available to the market implicitly

Current premise for planning

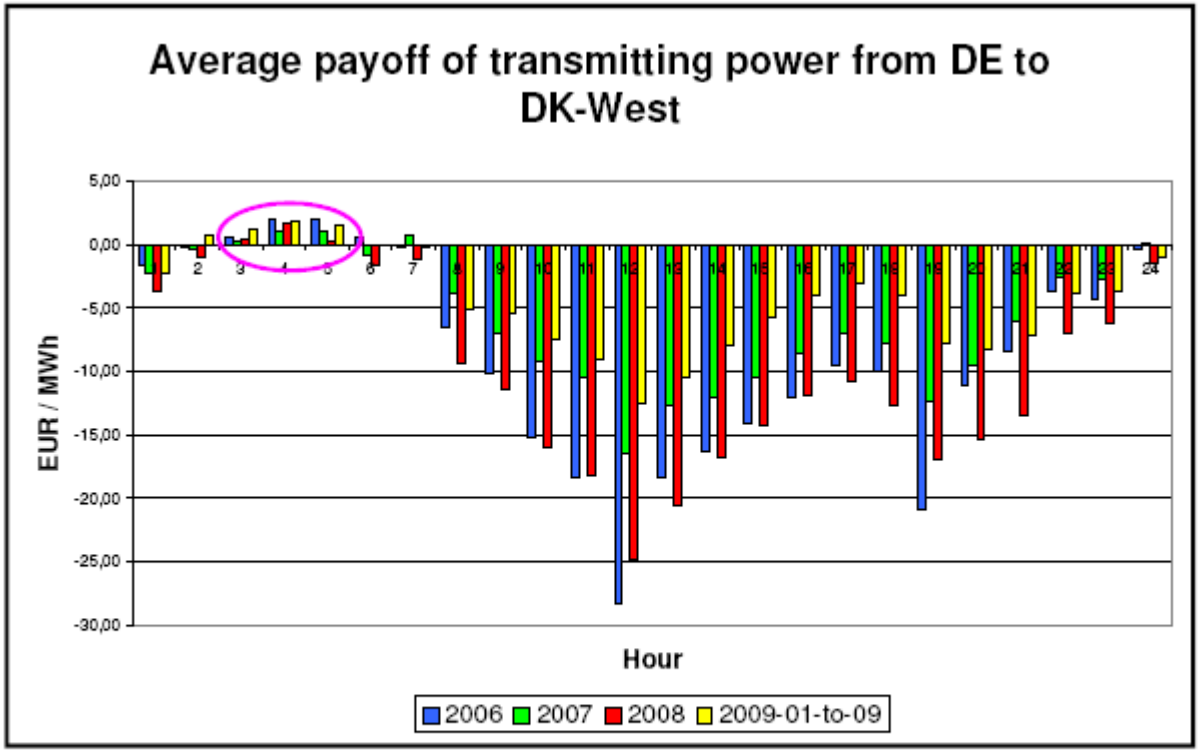
- Zonal market model
- 100% of physical capacity between bidding areas allocated implicitly D-1
- TSOs obtain 100% of congestion revenue

Long-term FTR gives the holder a right for the congestion rent, TSO gets the auction price of FTR as a compensation

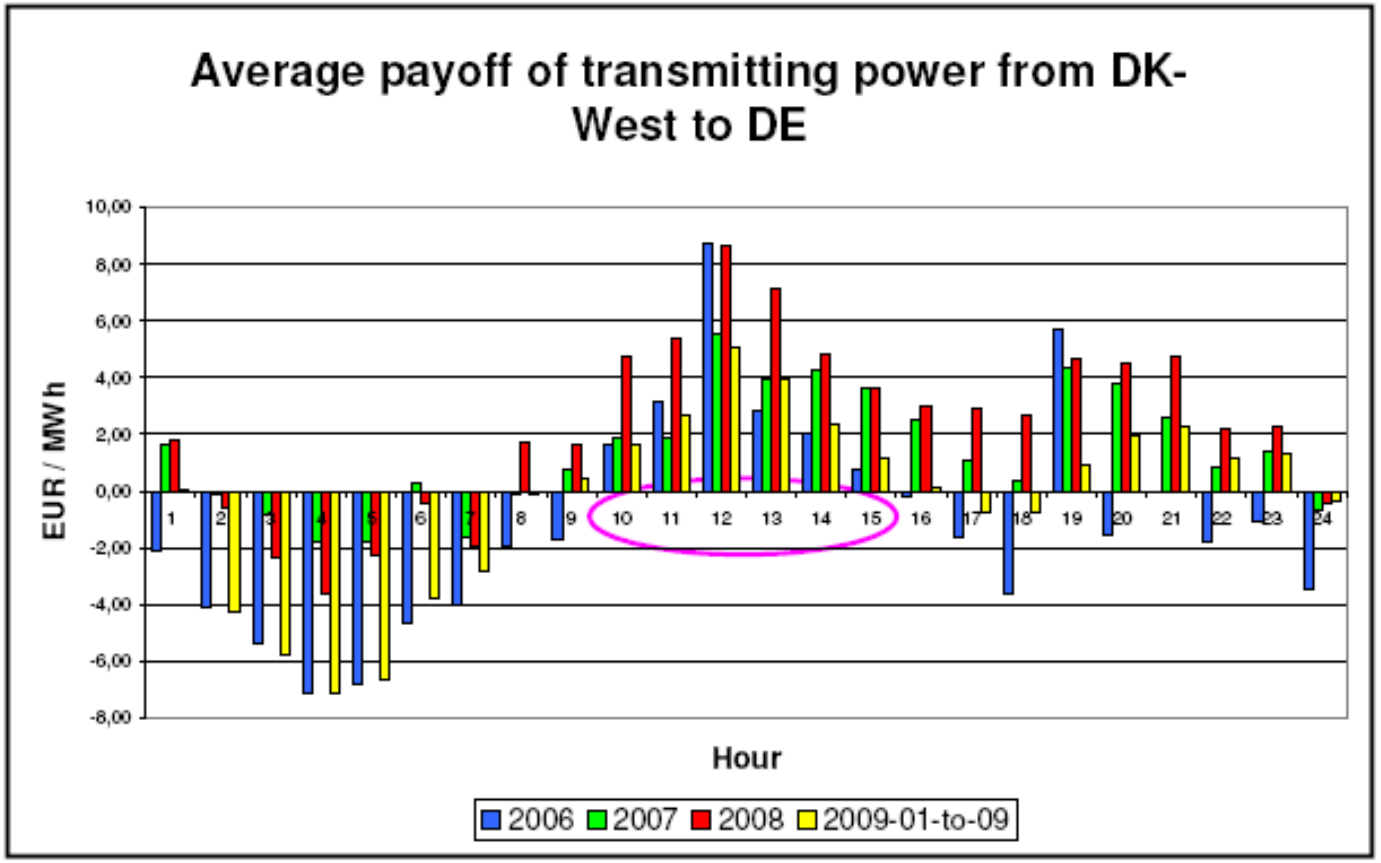
- FTR price and congestion rent may be equal or different
- If FTR underpriced at auction, FTR holder will win and TSO lose, and vice versa
- Compared to current Nordic regime, FTR would shift risks from trader to TSOs

Can systematic undervaluation at auction occur?

Auctioning transmission rights may not be sufficient to avoid mispricing



Average daily profit per MWh from aquiring the transmission capacity in the daily auction, buying in DE, selling in DK-West, for an entire year
This trade was consistently profitable in hours 3, 4, 5!



Average daily profit per MWh from aquiring the transmission capacity in the daily auction, buying in DK-West, selling in DE, for an entire year
This trade was consistently profitable in hours 10 to 15!

Key concern of TSOs:

Safeguard appropriate valuation of capacity

Benchmark: without FTRs, TSOs obtain 100% of congestion revenue on behalf of society; if they issue FTRs, then

- the revenue from auctioning FTRs may be less than the congestion revenue (undervaluation)
- ex post reductions in capacity may lead to very sizeable financial risk because TSOs would still have to pay out the price difference without being hedged by the congestion revenue

Trader/producer view

- The Financial Transmission Rights should be auctioned on time horizons supporting long-term forward contracts. The capacity to be auctioned should be based on the underlying liquidity structure on the specific forward market
  - TSOs shall auction the maximum of available capacity over appropriate time frames.
  - Auctioning at least one year ahead two thirds of the available capacity (and most of the remainder monthly or quarterly) would be in line with common term-sales arrangements, and would thus help develop liquidity in a traded secondary capacity market.
- FTRs would increase competition in the CfD market and make it possible to get a balance between fundamental buyers and sellers in each price area
- Transmission rights must be firm
- Secondary market for FTRs

Summary on FTRs

- Long-term FTRs allow market parties to hedge the area price risks
- If TSOs issue FTRs then use obligations instead of options (attachement example)
- The potential FTR risks need to be managed
  - Maximum payment to FTR holders should not exceed the realised congestion revenue
- Congestion revenues will be used to FTR payments, not to the infrastructure investments or other activities
- There are no reasons why private parties could not issue equivalent hedging products

FTRs in Nordic market?

- Forthcoming EU legislation will allow CfDs as alternative for FTRs, Nordic TSOs are under no obligation to issue FTRs
- However Nordic/Continental border may need to provide PTRs/FTRs
- Whether to introduce internal Nordic FTRs. Would the market be better off?
  - Interactions with existing CfD market at Nordpool
  - Liquidity, better for FTRs than CfDs?
  - Mitigation of market power?
  - Better hedge for trader? Or same as 2 x CfD?
  - New risks for TSOs, to be socialised in grid tariffs
  - possible shift of liquidity from system price to area price?

Appendix 1: Finnpower sells Swedload at €25/MWh

Finnpower (connected to Finnish network) can sell into NPS in Finland and put in an unlimited bid to procure power in the Swedish bidding area

Payoff without hedging (cost assumed to be zero for simplicity)

€ (25 - NPS_SE + NPS_FI) / MWh

Finnpower worried about high price in Sweden and/or low price in Finland

If Finnpower could buy a security that pays exactly [NPS_SE] - [NPS_FI)] against a cost of C (resp. K) its payoff per MWh would be:

25 - NPS_SE + NPS_FI + [NPS_SE] - [NPS_FI)] - C = (25 - C)

This security is the equivalent of an FTR obligation

If the FTR were defined as an **option**, the payoff would be

X - NPS_SE + NPS_FI + max {0, NPS_SE - NPS_FI} - K =

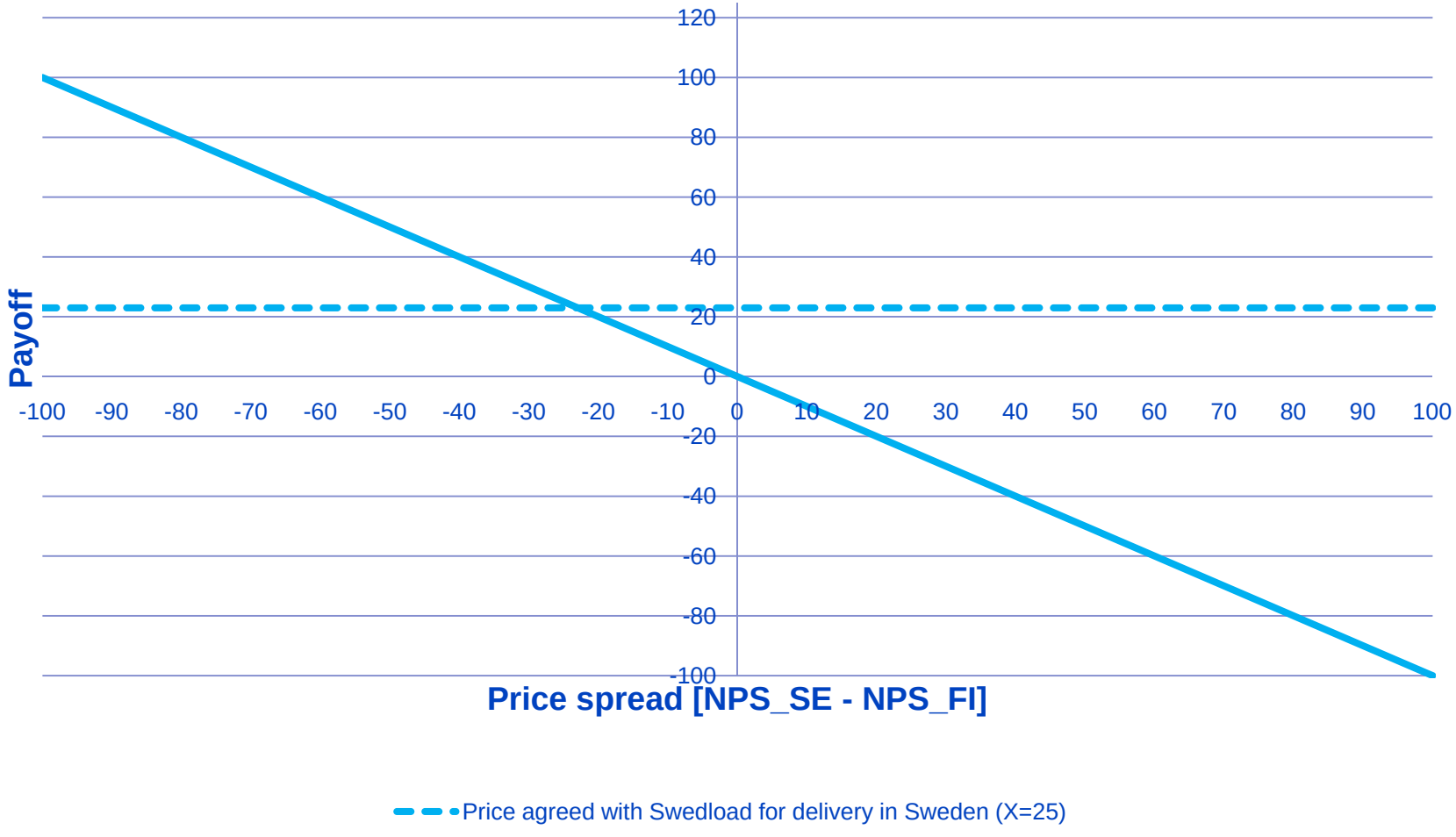
IF (NPS_SE - NPS_FI) ≥ 0 : X-K

IF (NPS_SE - NPS_FI) < 0 : (X-K) - NPS_SE + NPS_FI > (X-K)

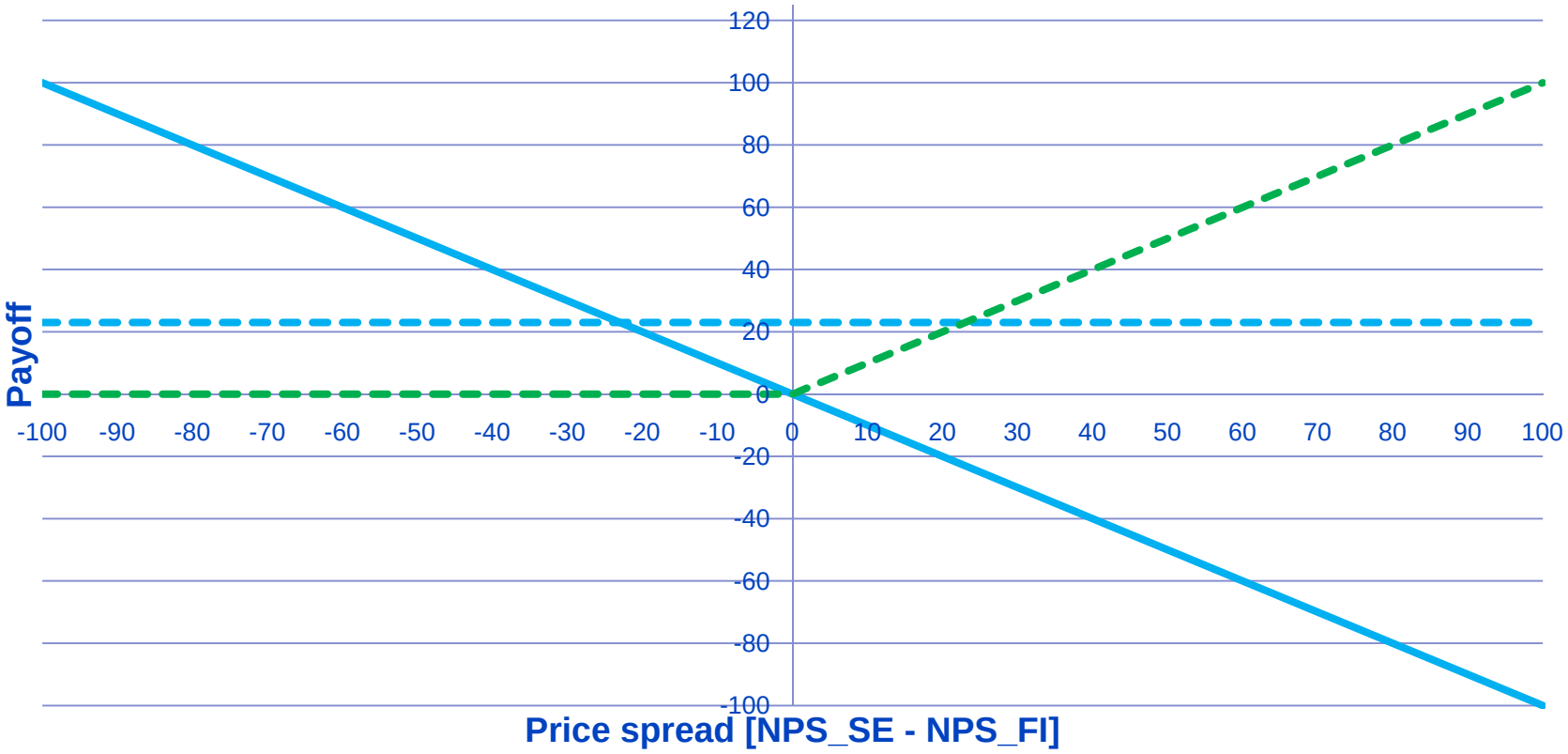
Option seemingly leads to a higher payoff because it leaves some upside
However, all else equal a risk-averse market party would always prefer the obligation

The "upside" is worth less to a risk-averse market party than its expected value
It can be shown that even where capacities are not symmetric, the TSO(s) can break even issuing obligations.

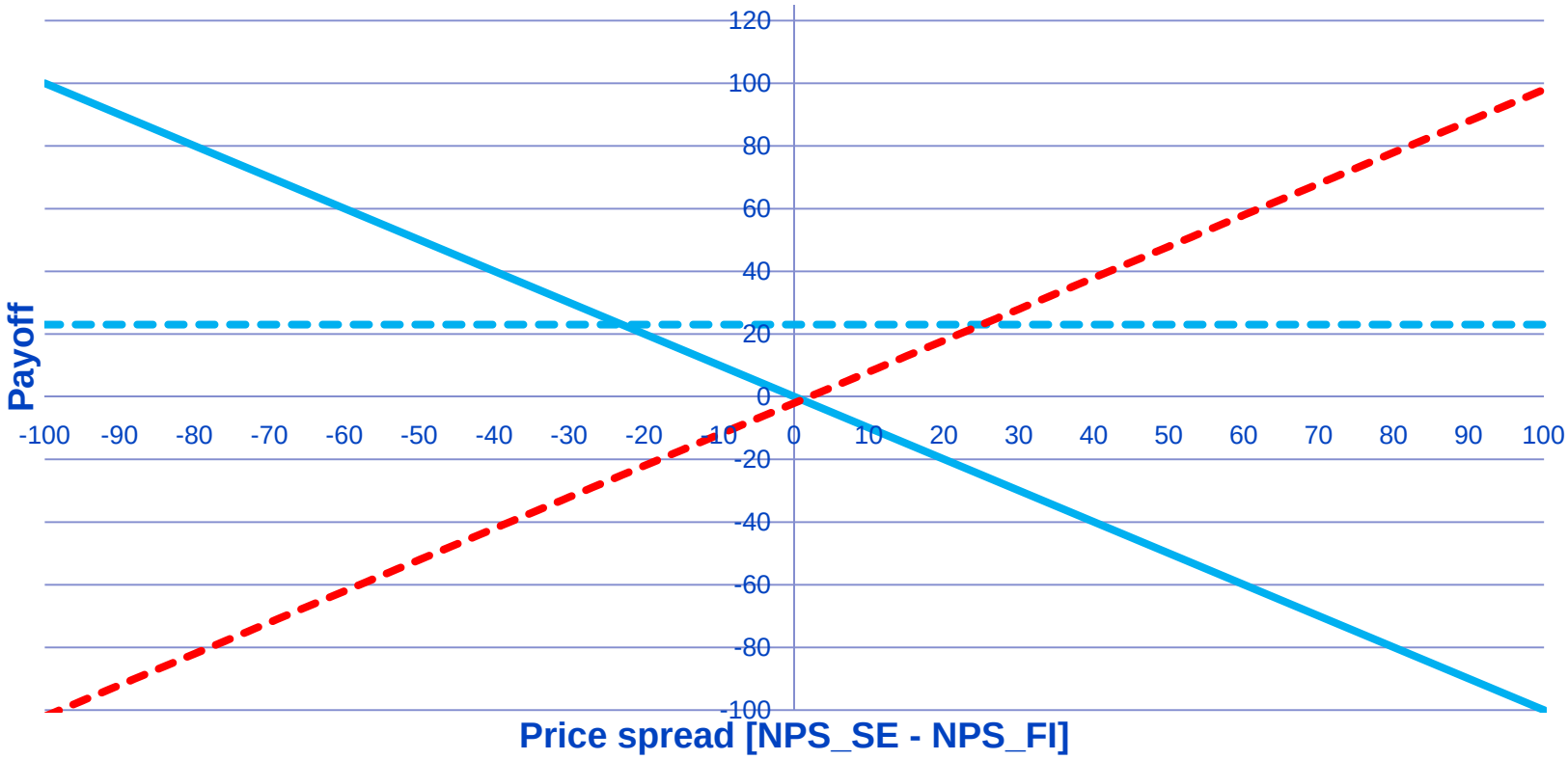
Finnpower's Payoff from covering physical obligation in the spot market [NPS_FI - NPS_SE]



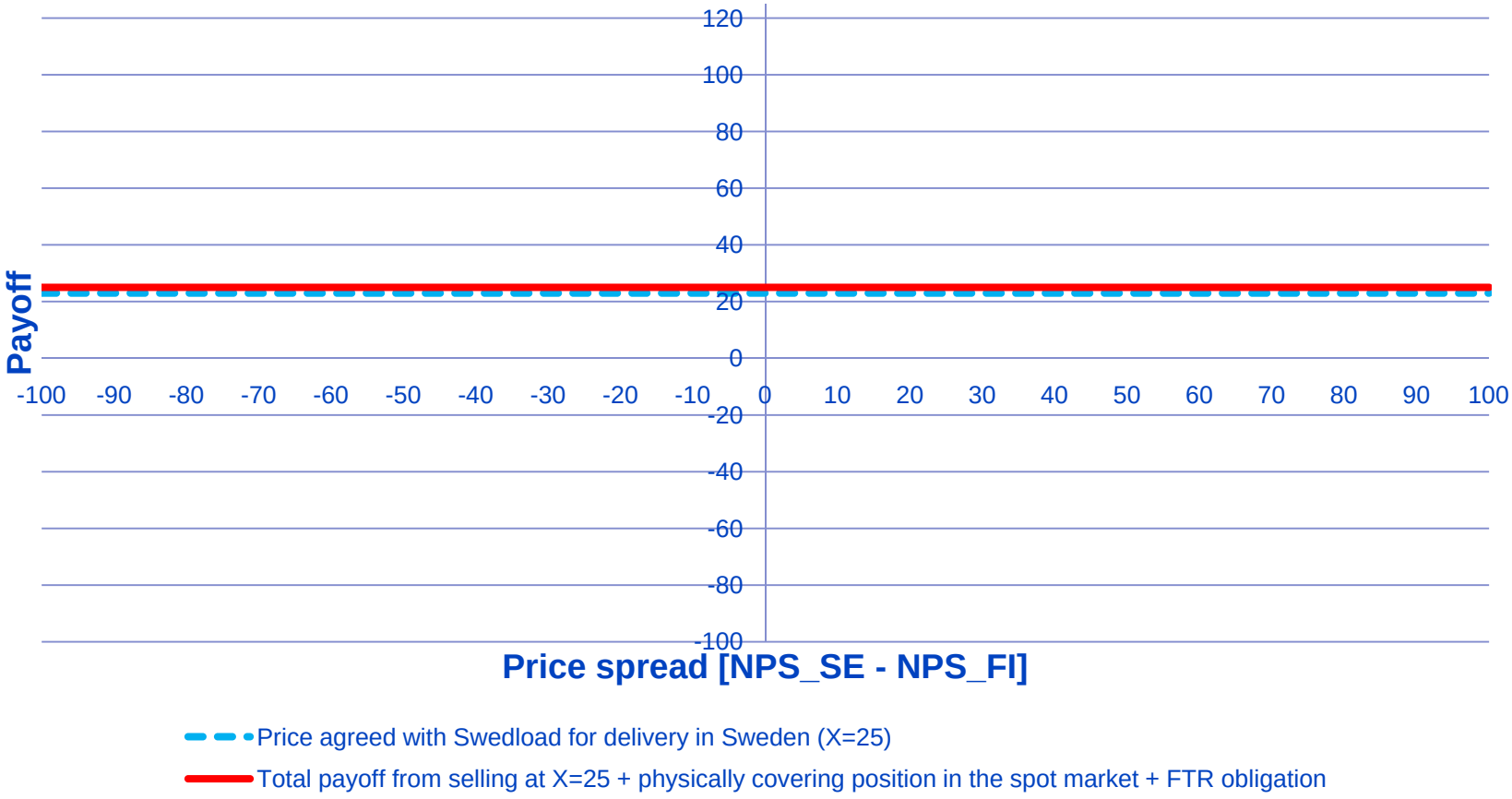
Payoff of FTR option (FI_to_SE)



Payoff of FTR obligation (FI_to_SE)



Total payoff from selling at X=25 + covering physical obligation in the spot market + FTR obligation



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