



Investment signals in electricity markets

MANUS PANDEY, VP ENERGY & CLIMATE
POLICIES
BERGEN, 2. NOVEMBER 2023

Statkraft's activities

Capacity
19 105 MW
60 TWh → 97% renewable

.....

Employees
5 700



- Hydropower
- Wind power
- Solar power
- District heating
- Bio power
- Gas power
- Market operations

Target picture 2030

A leading international renewable energy company

Provide clean flexibility – leveraging hydropower

Largest hydropower company in Europe, and a **significant player** in South America and India – investing in at least 5 larger projects in Norway by 2030



Accelerate solar, wind and battery storage

Major developer of **solar, onshore wind, and battery storage** with an annual delivery rate of 2.5-3 GW in 2025 and 4 GW by 2030

Industrial offshore wind player in the North Sea and Ireland



Deliver green market solutions to customers

Top-tier provider of market solutions in Europe with a significant global reach



Scale new green energy technologies

Leading developer of **green hydrogen, biofuel, EV charging** and other green technologies – developing 2 GW green hydrogen by 2030

Top 3 customer friendly and profitable district heating player in Norway and Sweden



Sustainable, ethical and safe operations

A structural reform of the electricity market?

“The skyrocketing electricity prices are now exposing, for different reasons, the limitations of our current electricity market design. It was developed under completely different circumstances and for completely different purposes. It is no longer fit for purpose.”

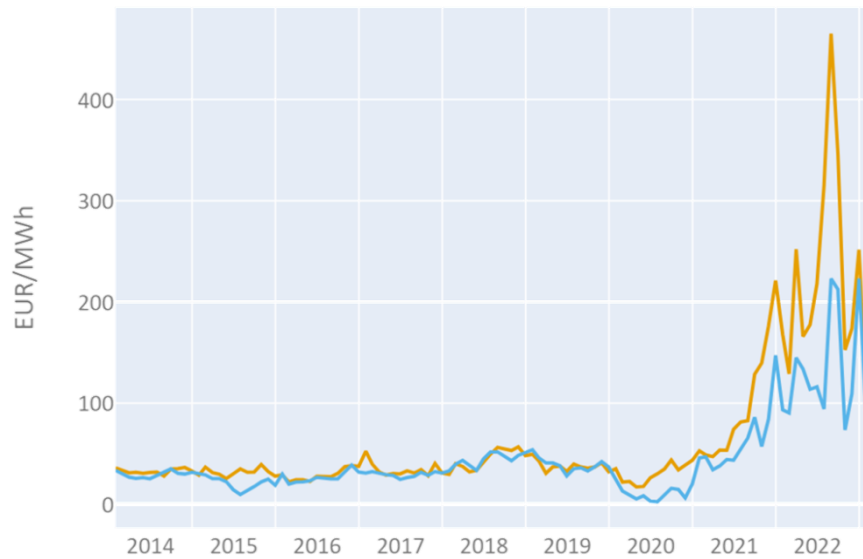
Keynote speech by President von der Leyen at the Bled Strategic Forum August 2022



Today's market design



Power Price
Monthly Average



— German power price
— Nordic power price (system)



The image shows the cover of a communication from the European Commission. It features the European Union flag and the text:

EUROPEAN COMMISSION

Brussels, 1.2.2023
COM(2023) 62 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A Green Deal Industrial Plan for the Net-Zero Age

Two-sided contracts for difference

Two-way Contract for Difference (CfDs) are proposed as mandatory price support scheme for renewable and nuclear power

The authorities conduct auctions to establish new power production
Involves a long-term fixed price with the authorities

Feed-in tariffs

Feed-in premiums

Electricity certificates

One-sided CfDs



Capacity Mechanisms

Capacity mechanisms are temporary support measures that EU countries can introduce to remunerate power plants for medium and long-term security of electricity supply.

Capacity mechanisms provide payments to power plants that are available for generating electricity when needed. Typically, power generation that depends on varying weather condition, like wind and solar will not be eligible for participation in Capacity Mechanisms.

Should capacity mechanisms be temporary?

Can coal fired power plants be part of a capacity mechanism?



Financial markets

Proposal for establishing regional virtual hubs for the forward markets

The aim to overcome the existing market fragmentation and the low liquidity experienced in many bidding zones

Why do we need financial markets and hedging opportunities?

Should financial markets build on the «Nordic» model or the continental model?



Today's agenda

1

The electricity market – investment incentives

3

Capacity mechanisms

2

Support for investments in renewables (and other technologies)

4

Risk reducing mechanisms – financial markets and long-term hedging

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Capacity mechanisms

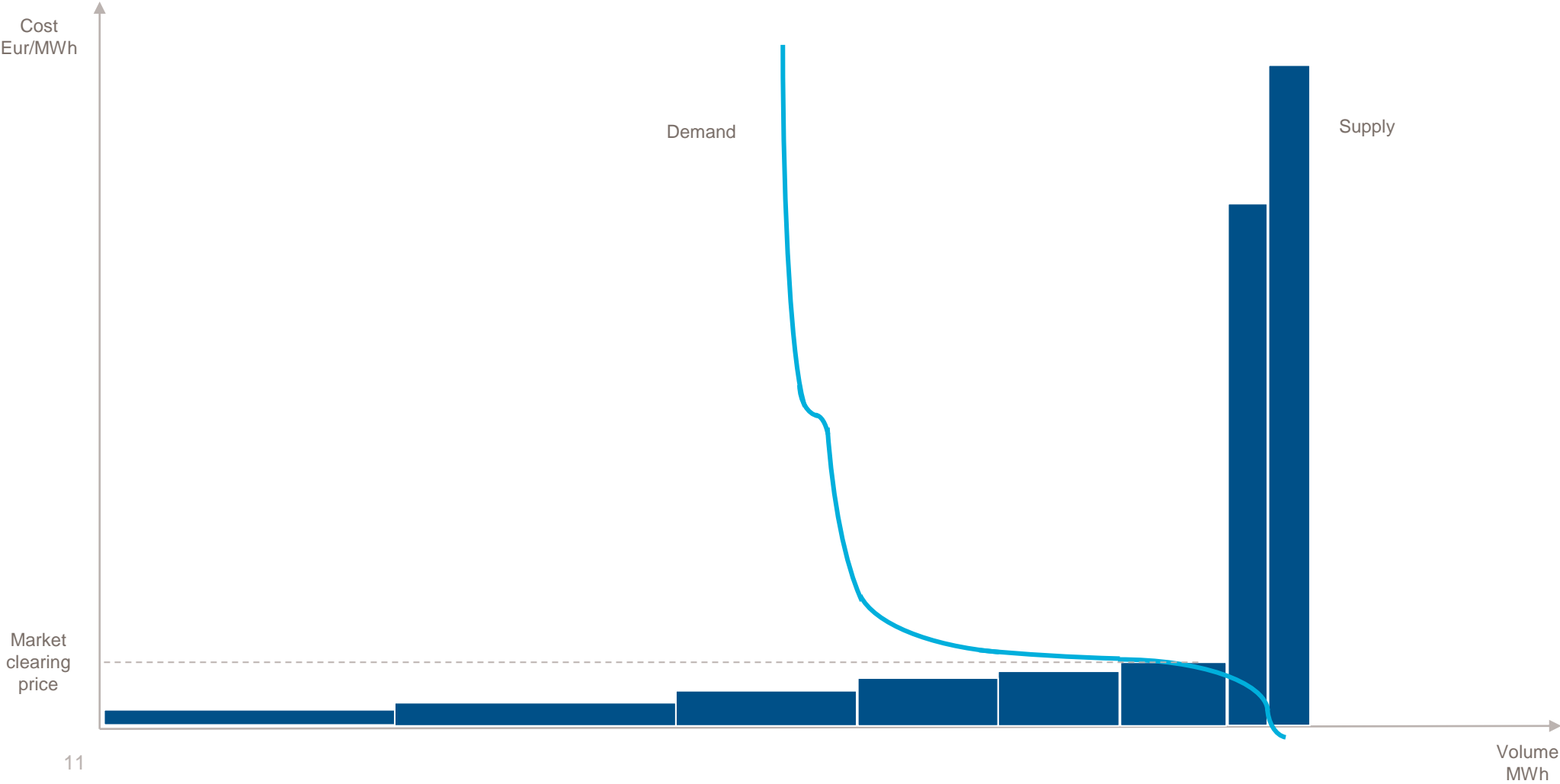
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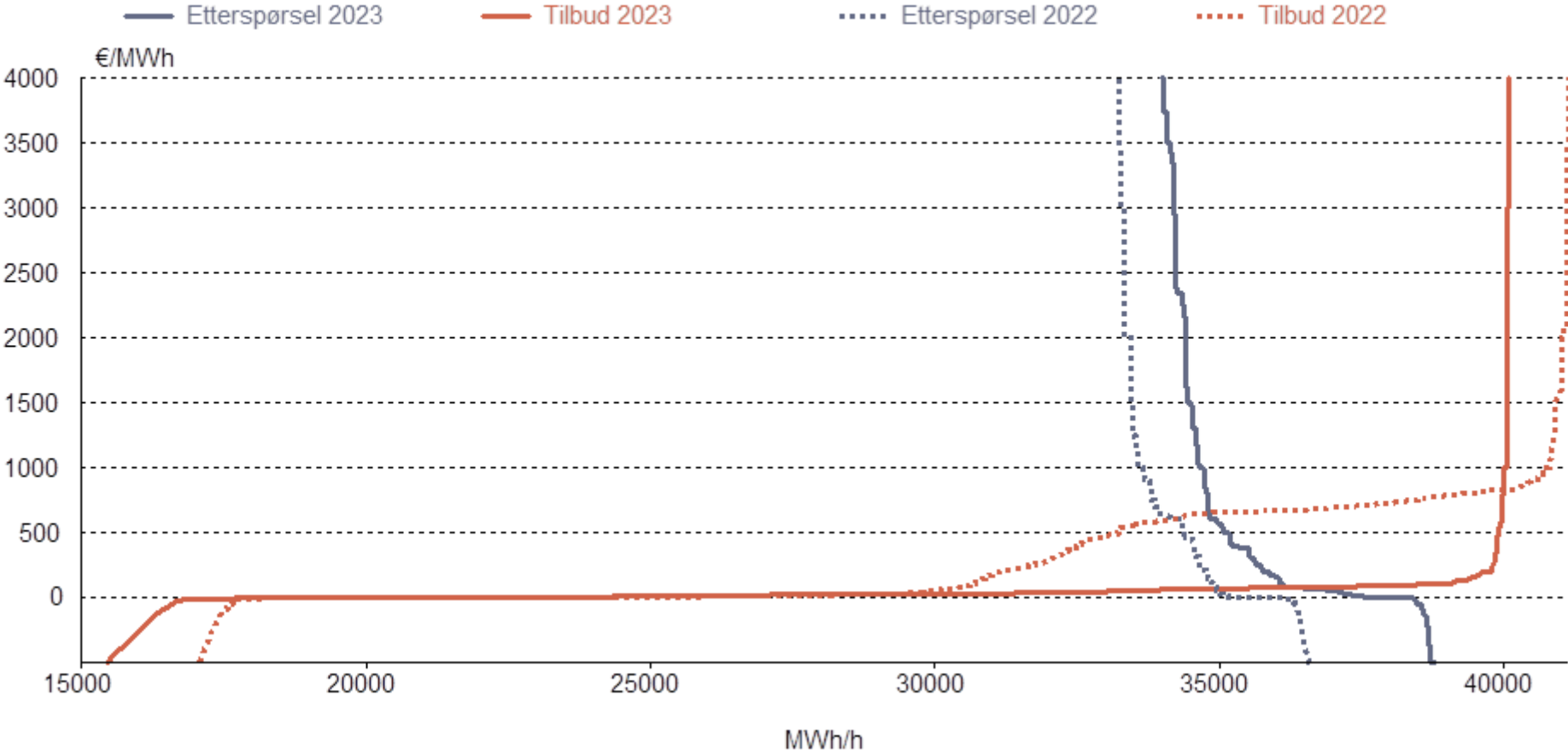
Risk reducing mechanisms – financial markets and long-term hedging

Free price formation and marginal pricing

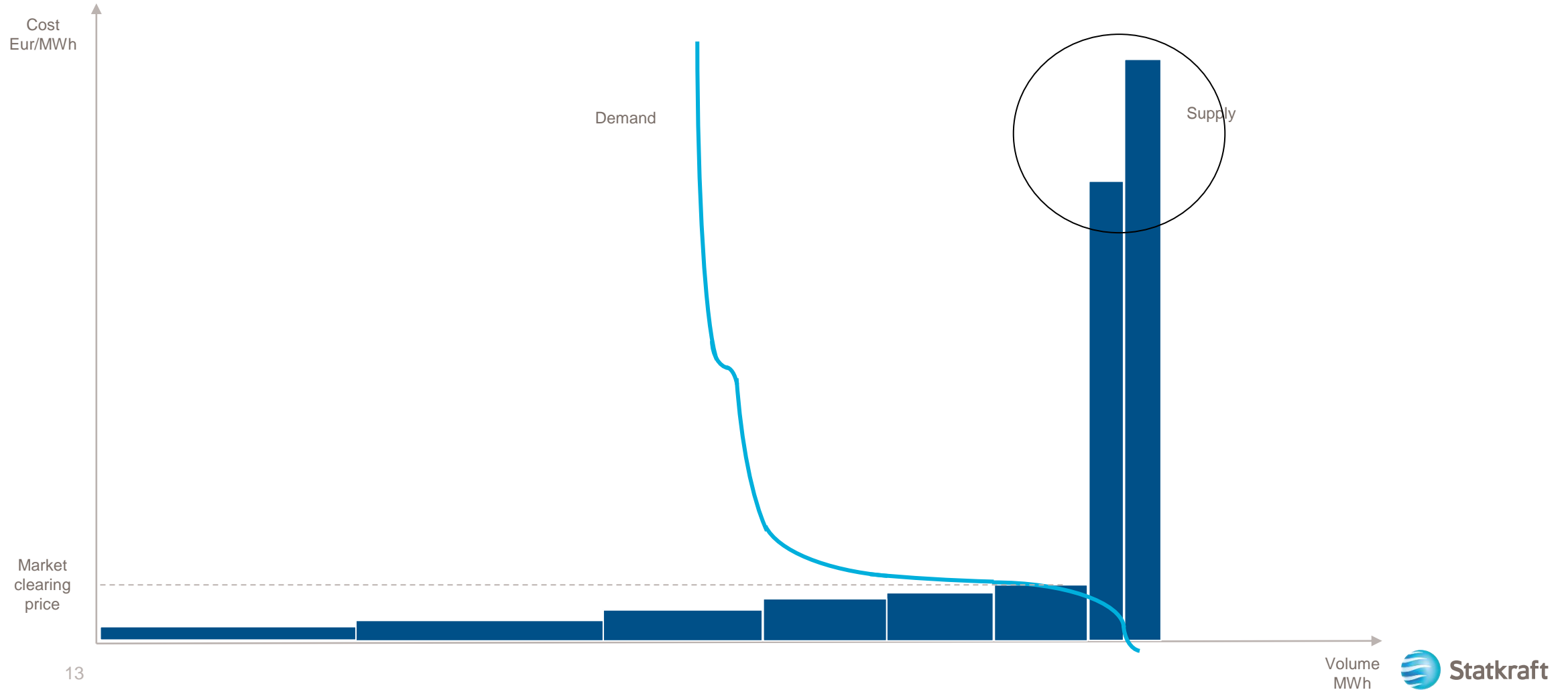


How does supply and demand actually look like?

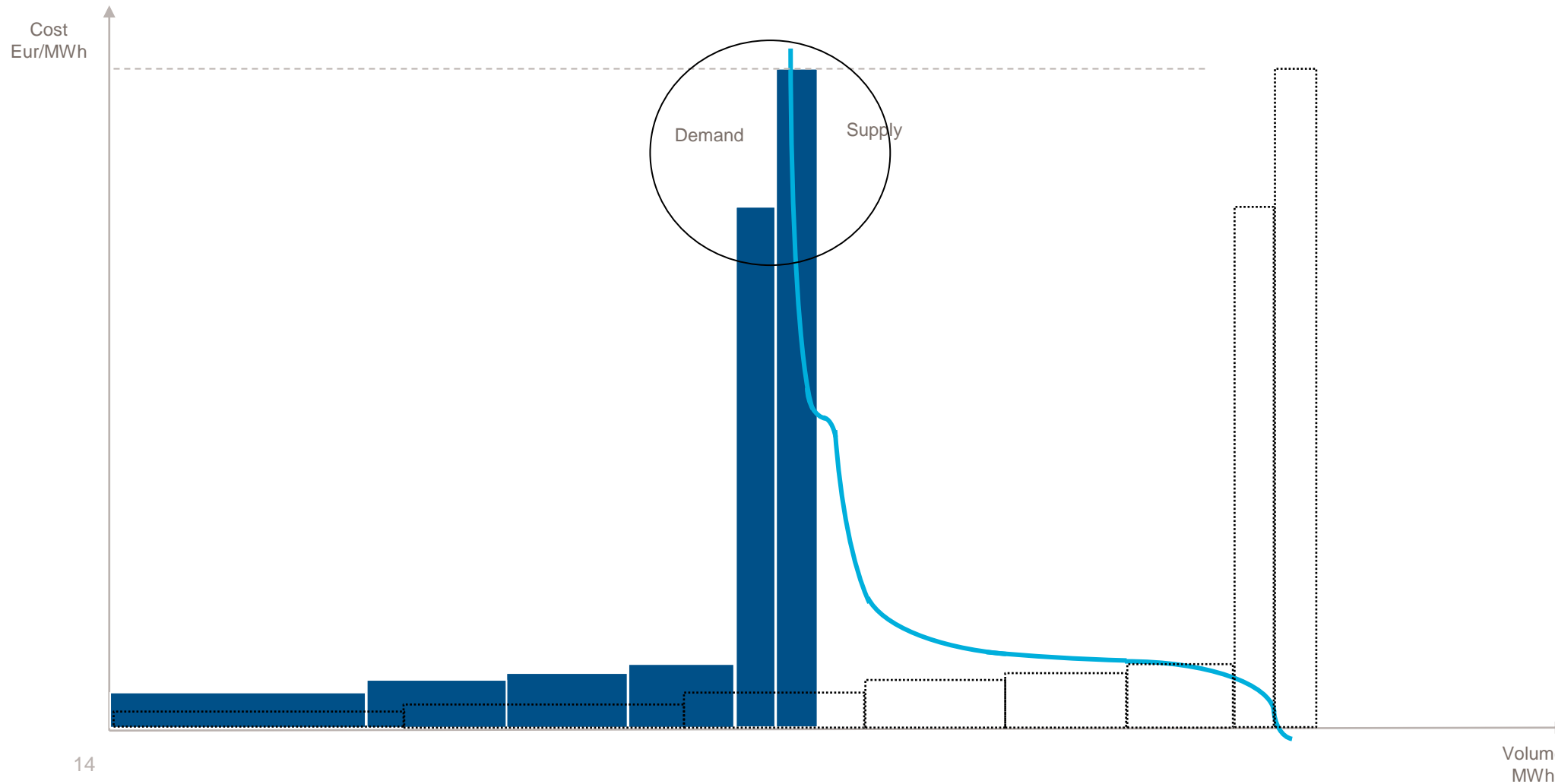
Budkurver (NordPool) time 9 den 31. august 2022 og 2023



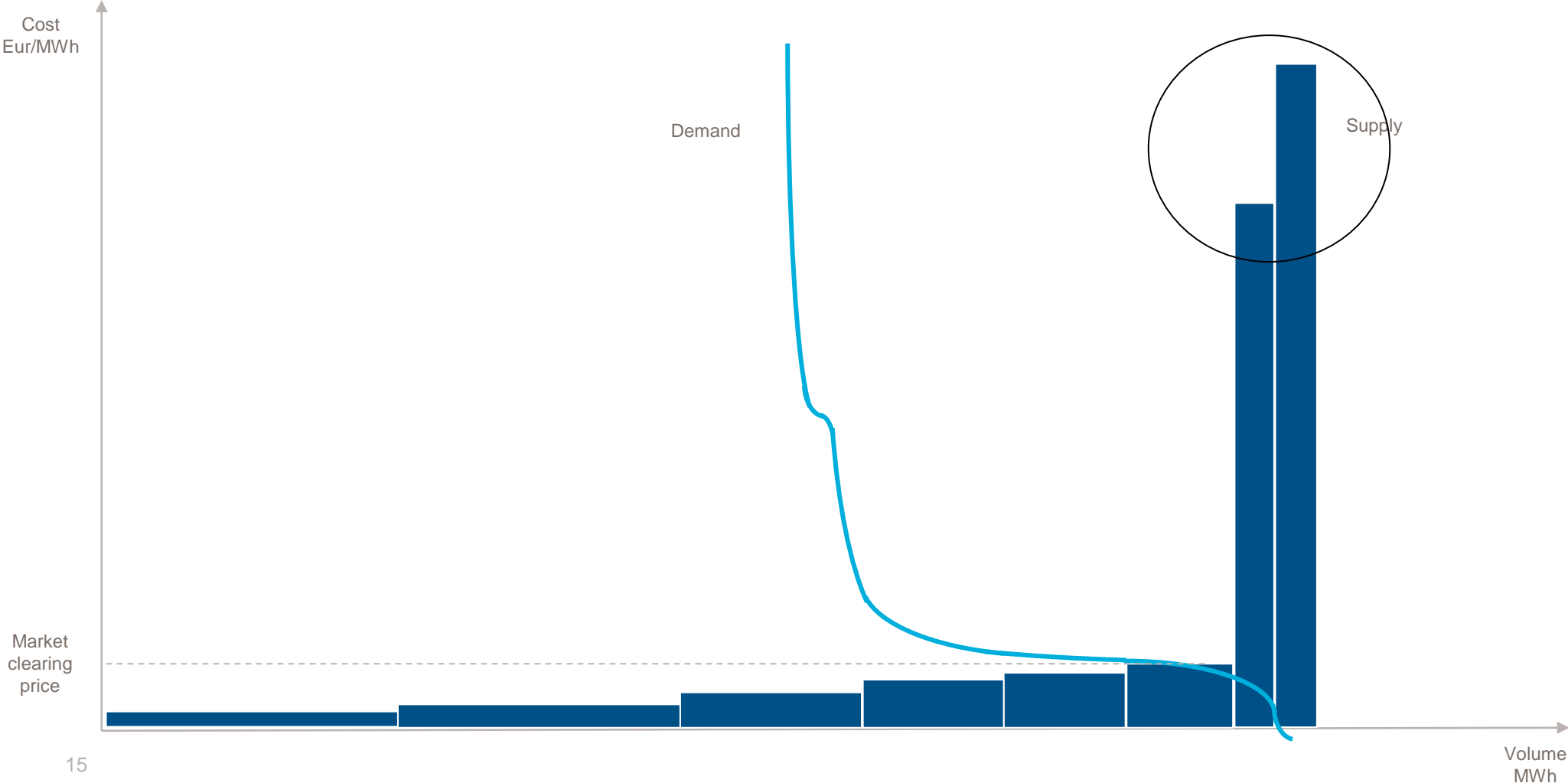
Why invest in these plants?



Supply can be tight!

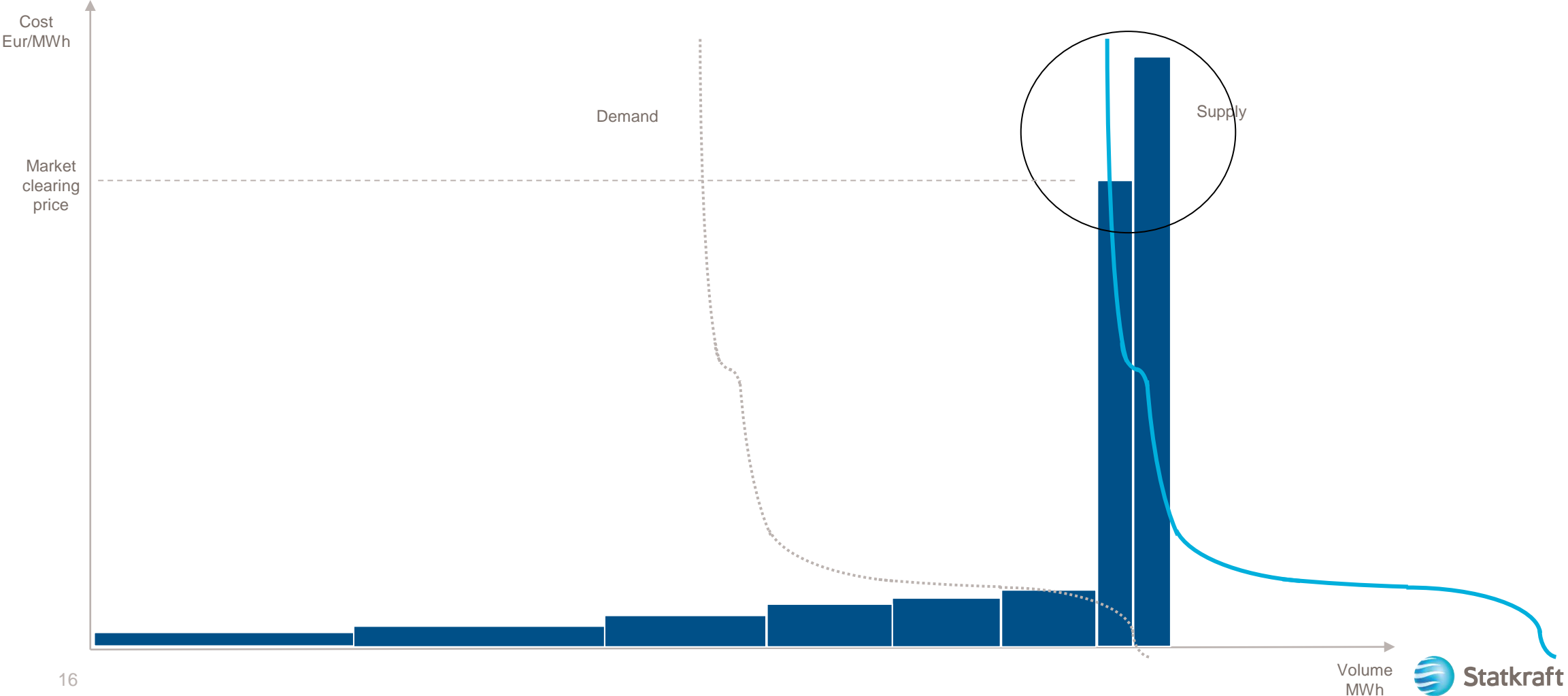


Why invest in these plants?

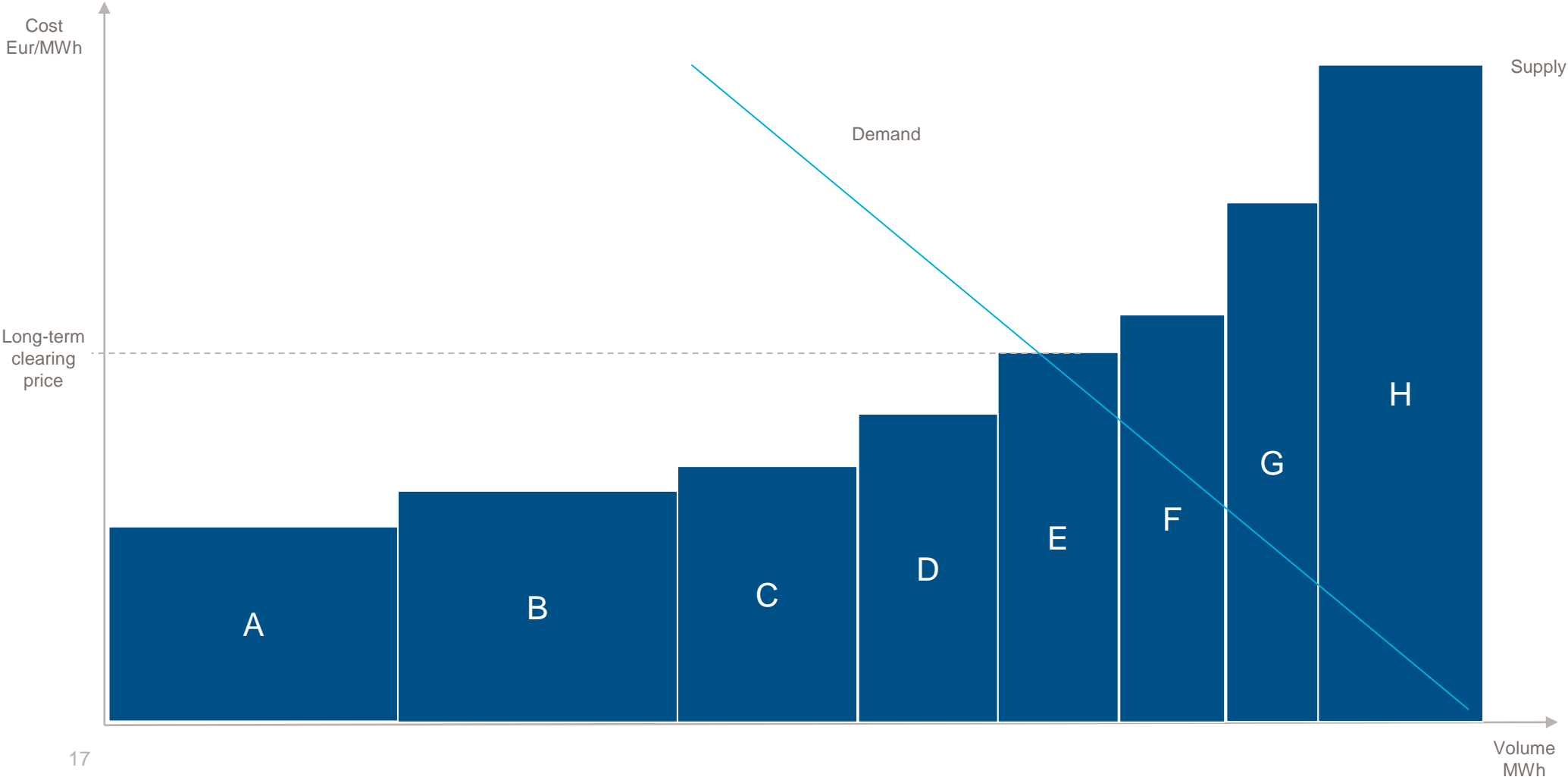


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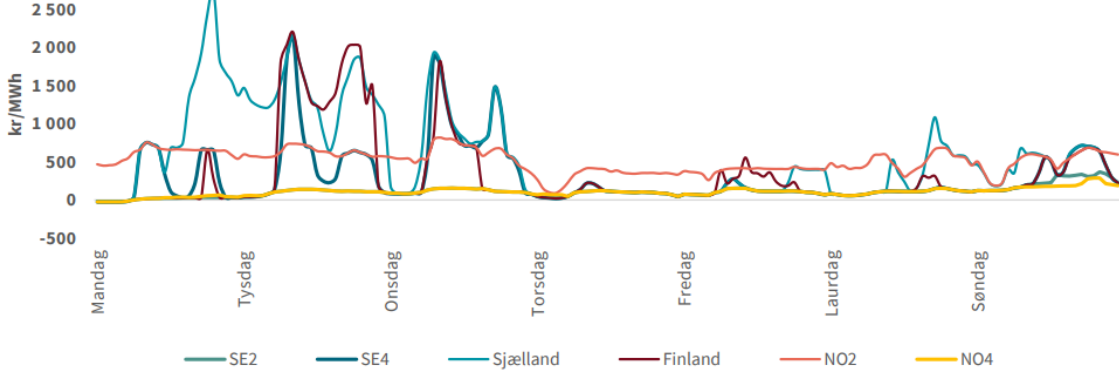
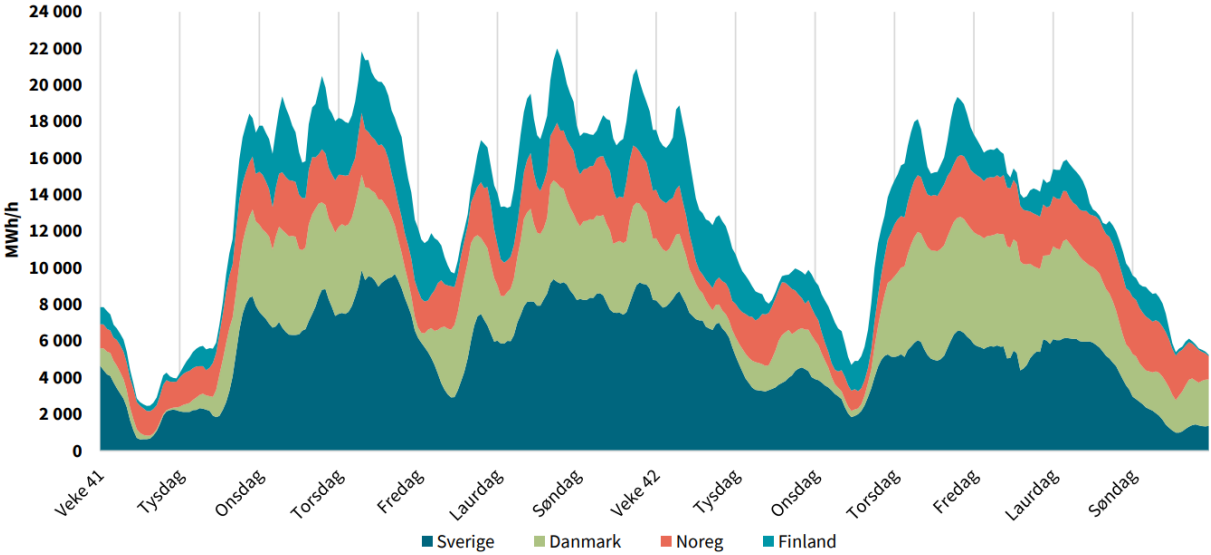
Demand increases at certain times



Don't forget capex – long term supply and demand



It is the achieved price that is relevant for the investor



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Carbon neutrality and energy security – RES targets and ambitions

Fit for 55



REPowerEU



Increasing RES deployment and permitting reform



45% (=230 GW)
2030 target for renewable share



Accelerating rollout of solar capacity



x2 (=320 GW)
New solar PV capacity by 2025



Doubling deployment rate of heat pumps



10 mill
Units over the next five years

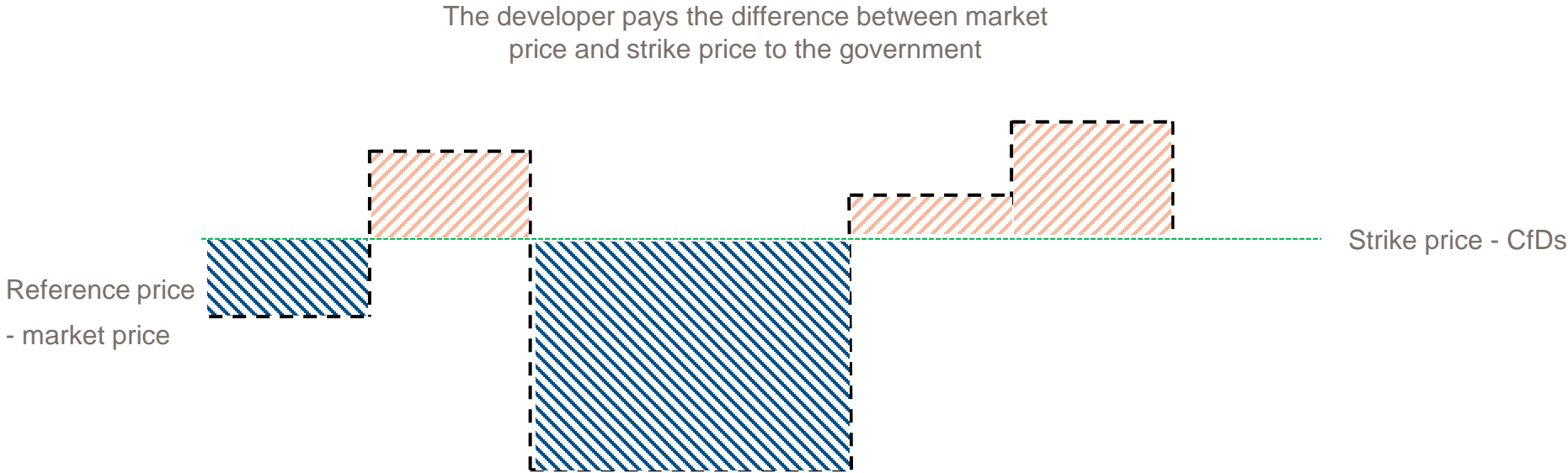


Designated Go-to areas for renewables

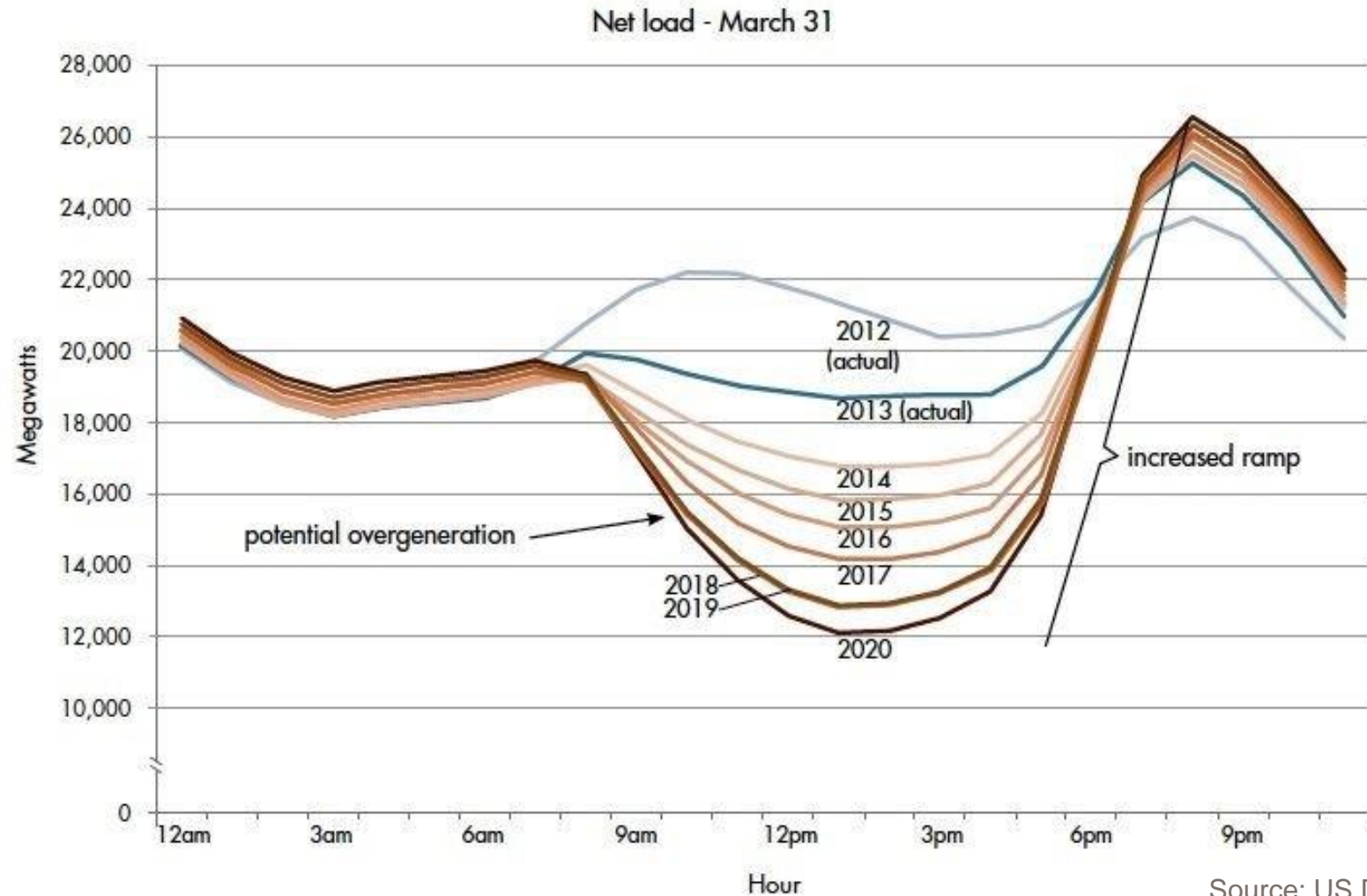


Max 1 year permitting
One-stop, generic environmental impact assessment

A two-way CfD is dynamic and ensures that support is only provided when needed.



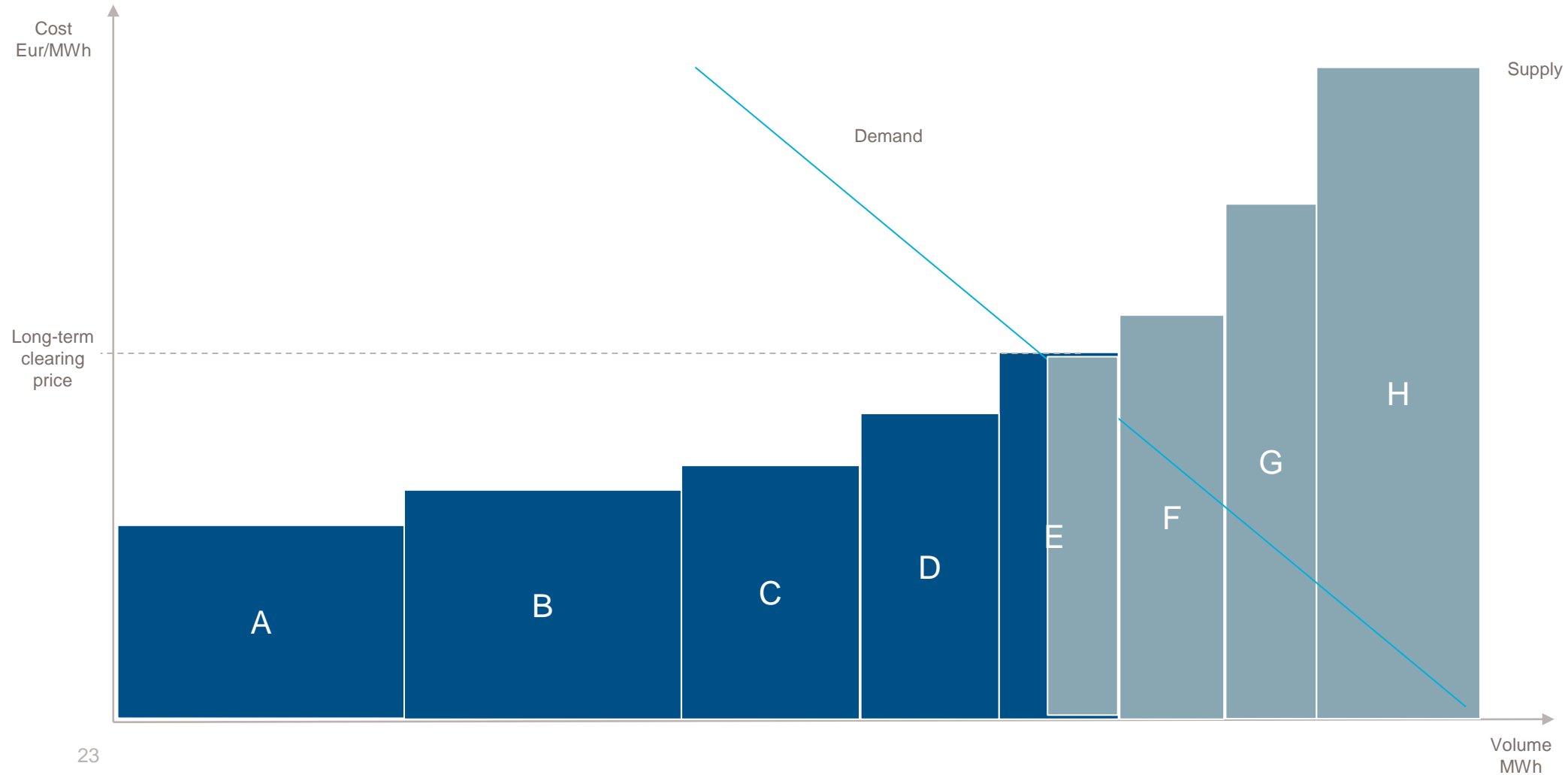
Cfds may give incentives to maximize volume rather than value



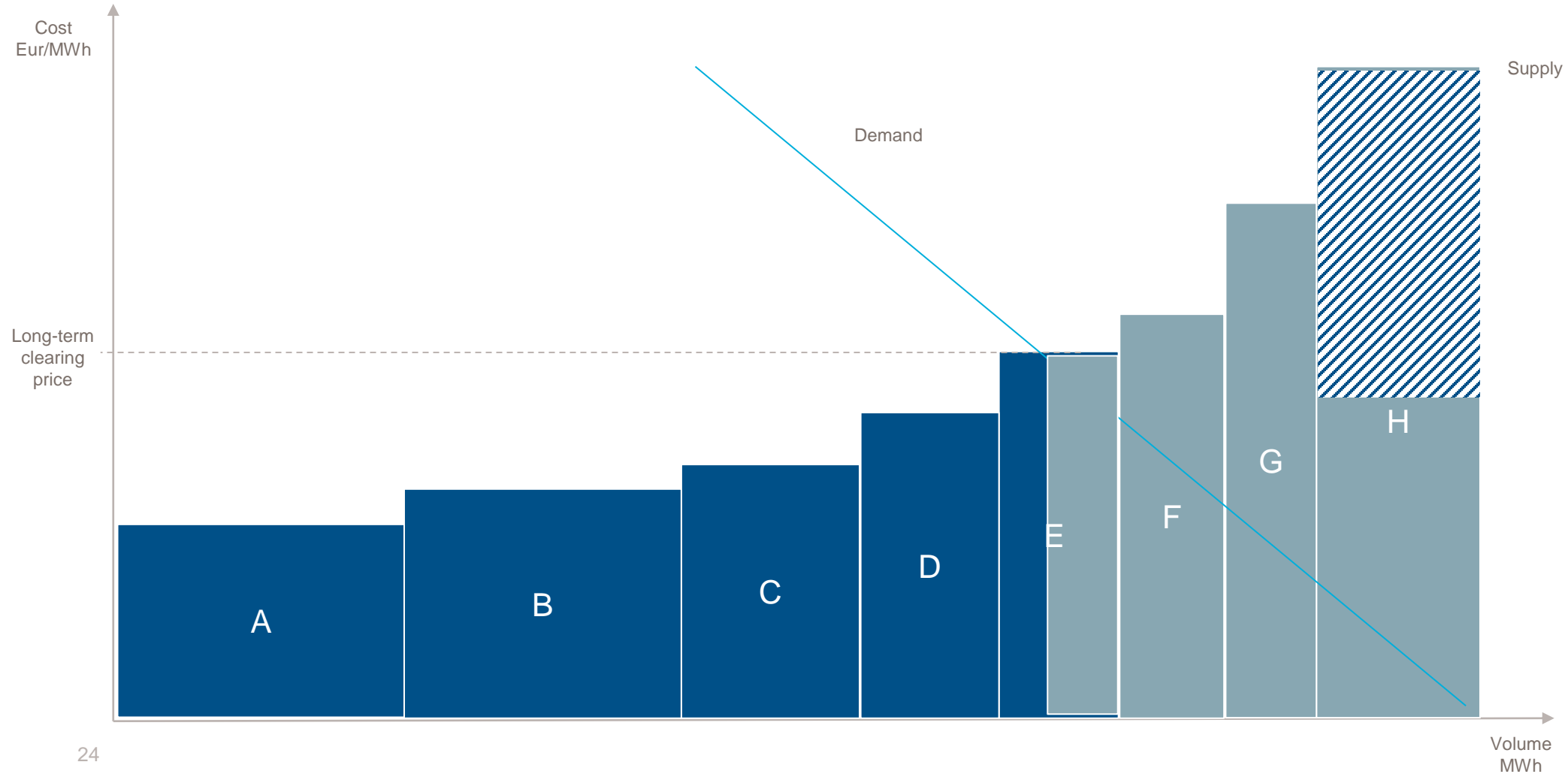
Net load = load –
residential production
(solar)

Source: US Department of Energy

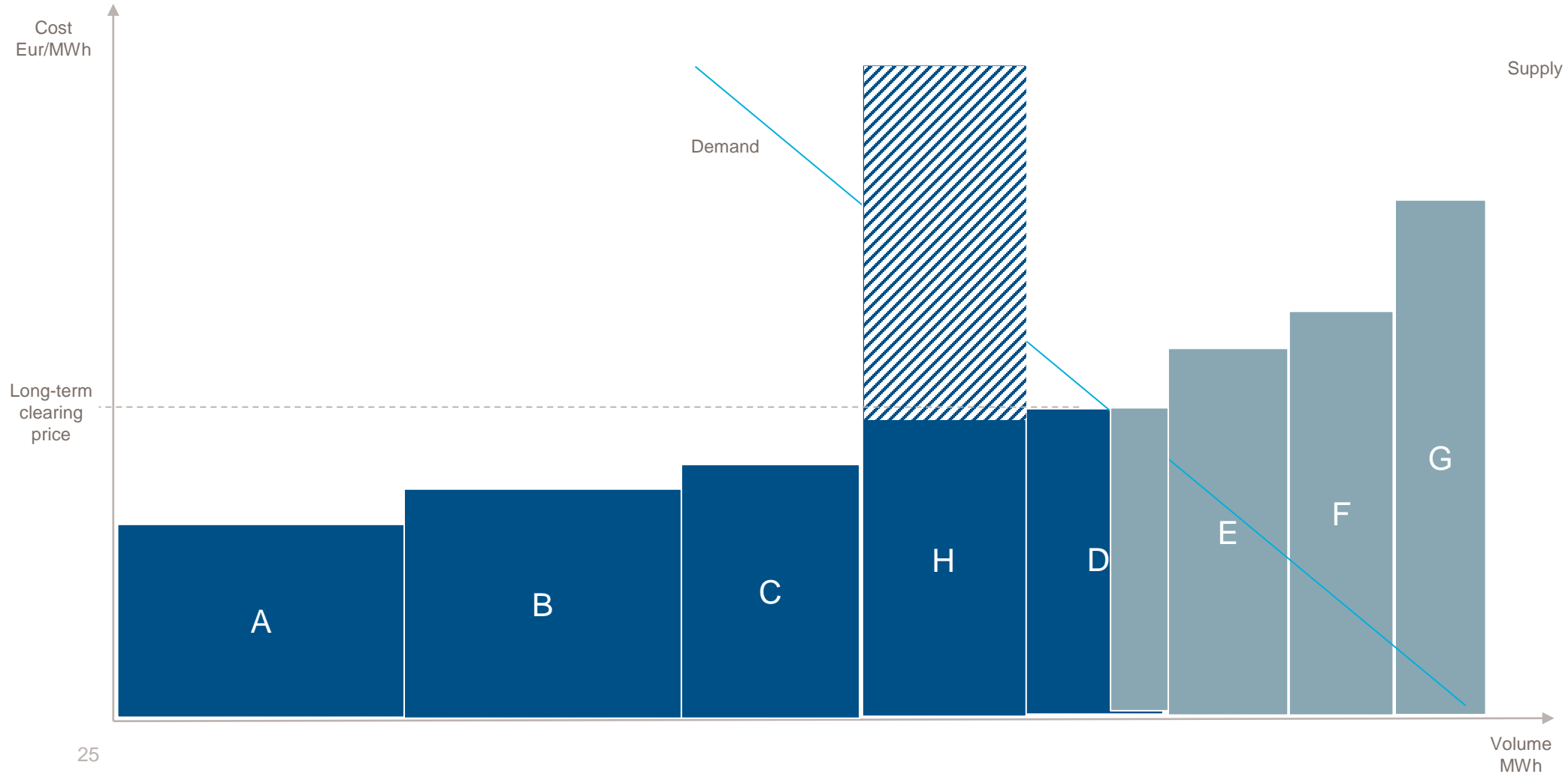
The CfD may displace commercial projects



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The CfD may displace commercial projects



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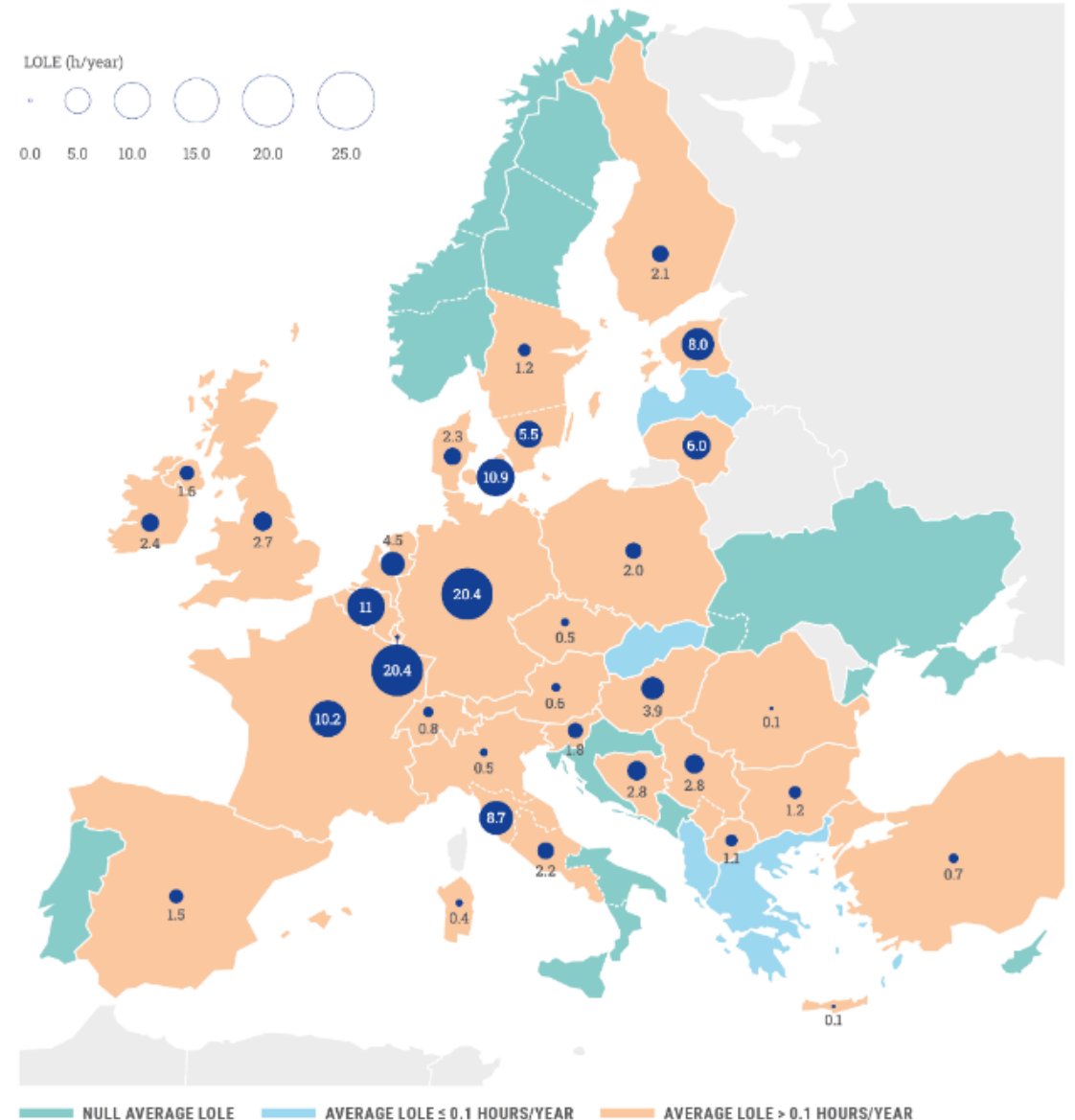
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Risk reducing mechanisms – financial markets and long-term hedging

Central Europe faced with adequacy concerns towards 2030

- LOLE = hours per year when loss of load can be expected
- Represents the expected power deficit, including when reserve power is called upon
- Germany is likely to face the highest level of scarcity by 2030

LOLE values for the Central Reference Scenario Without CM 2030



Expensive capacity markets co-exist with energy only markets in Europe



Renewables depressing energy prices in Europe

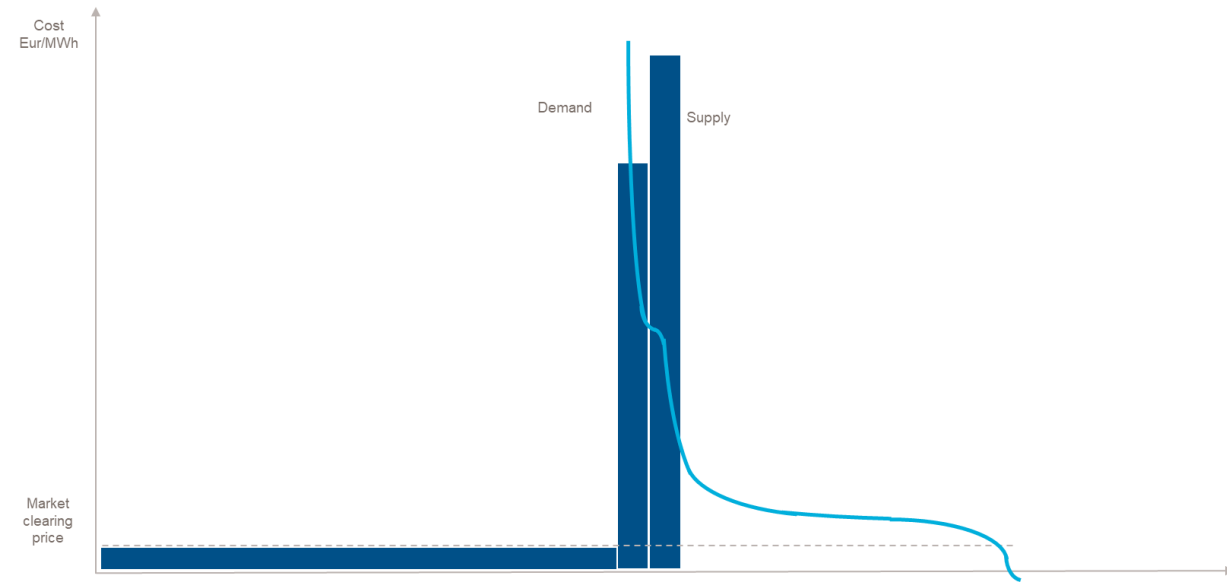
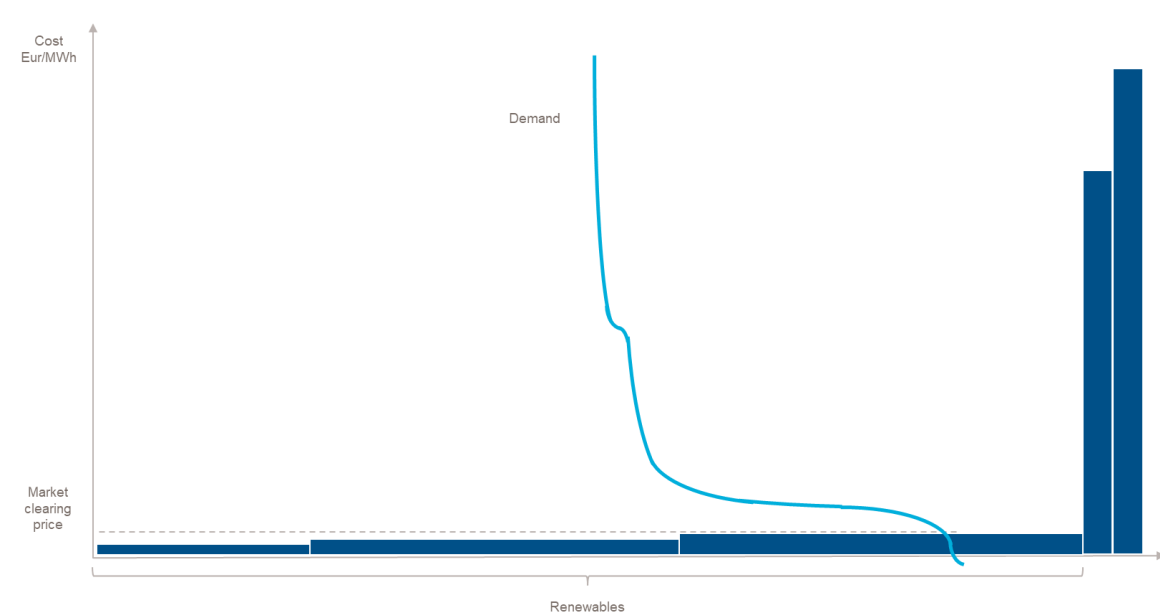


“Missing money(?)” for expensive, flexible power



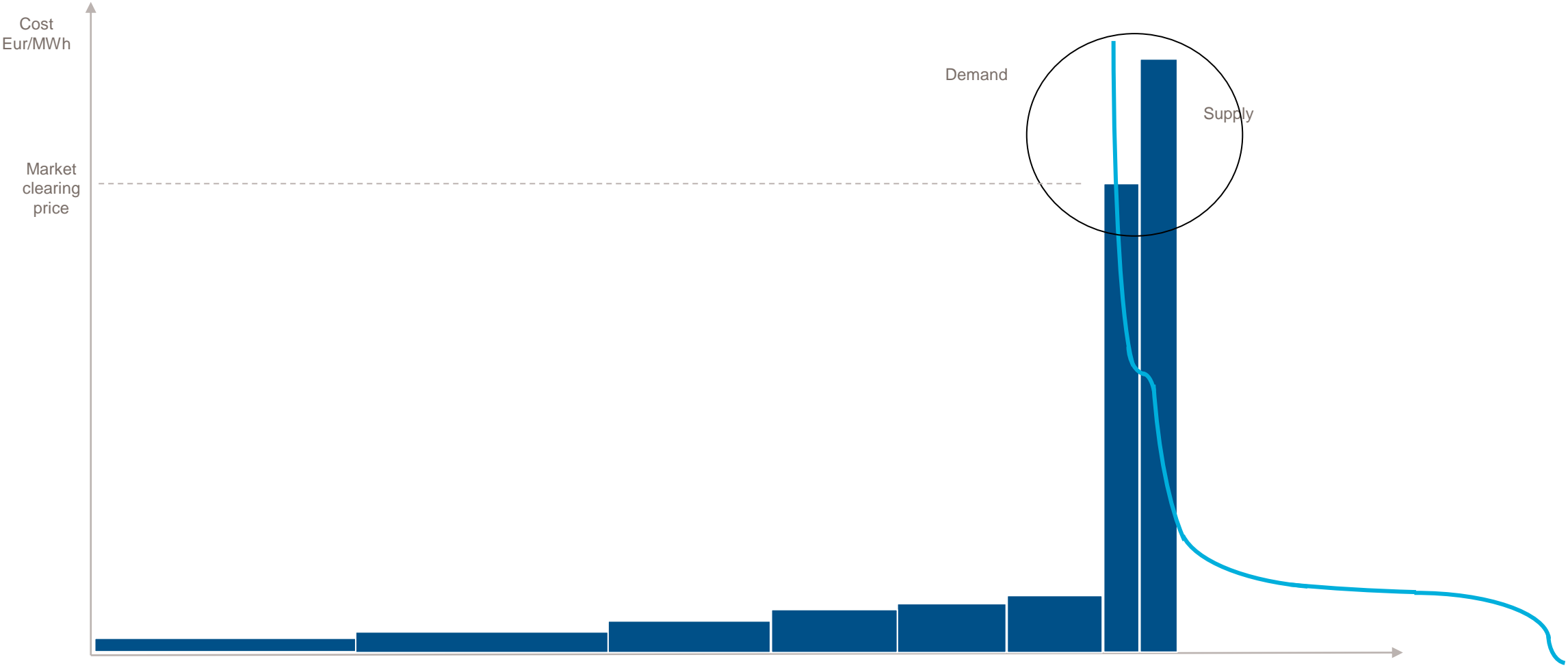
Scarcity pricing politically hard

Renewables depressing energy prices in Europe



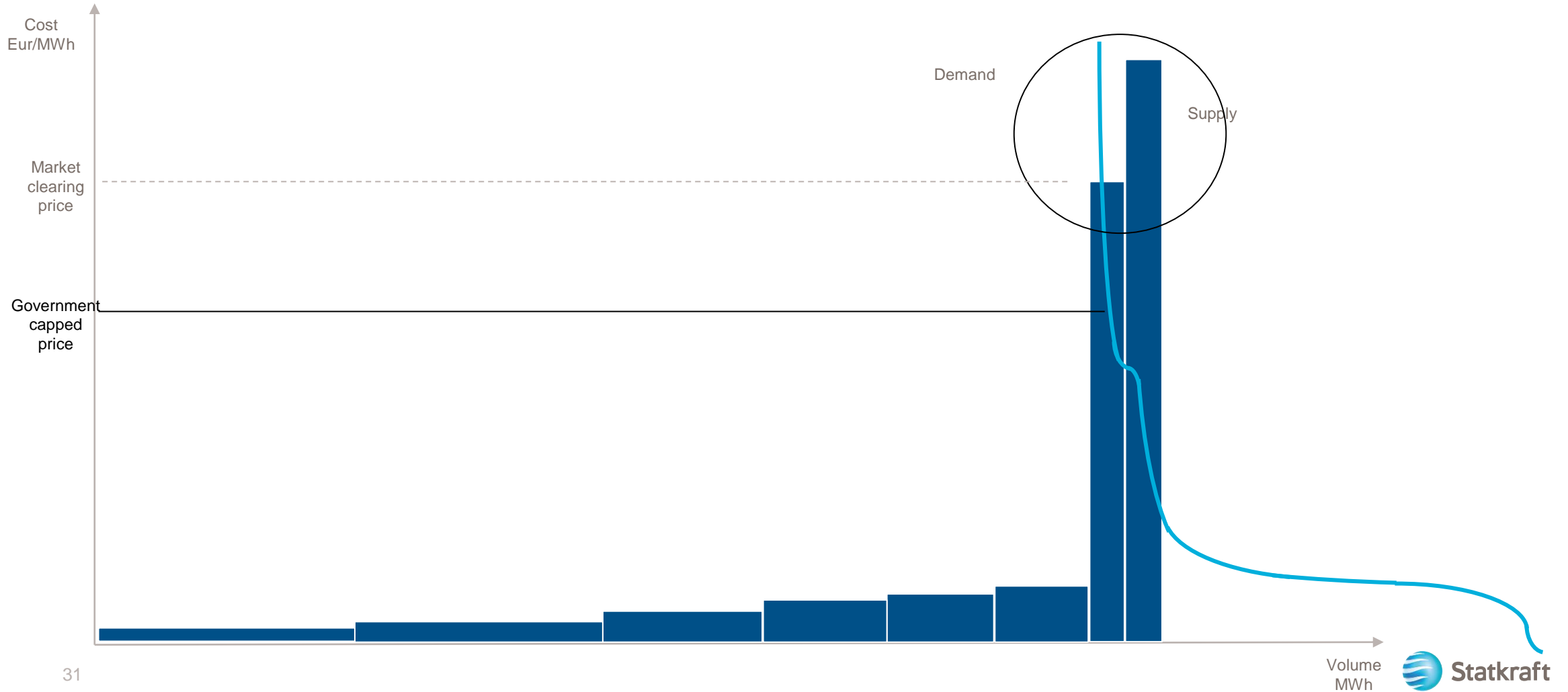
Will there be too few hours of “high prices” to take the risk of investing in long-term capacity?

“Missing money(?)” for expensive, flexible power

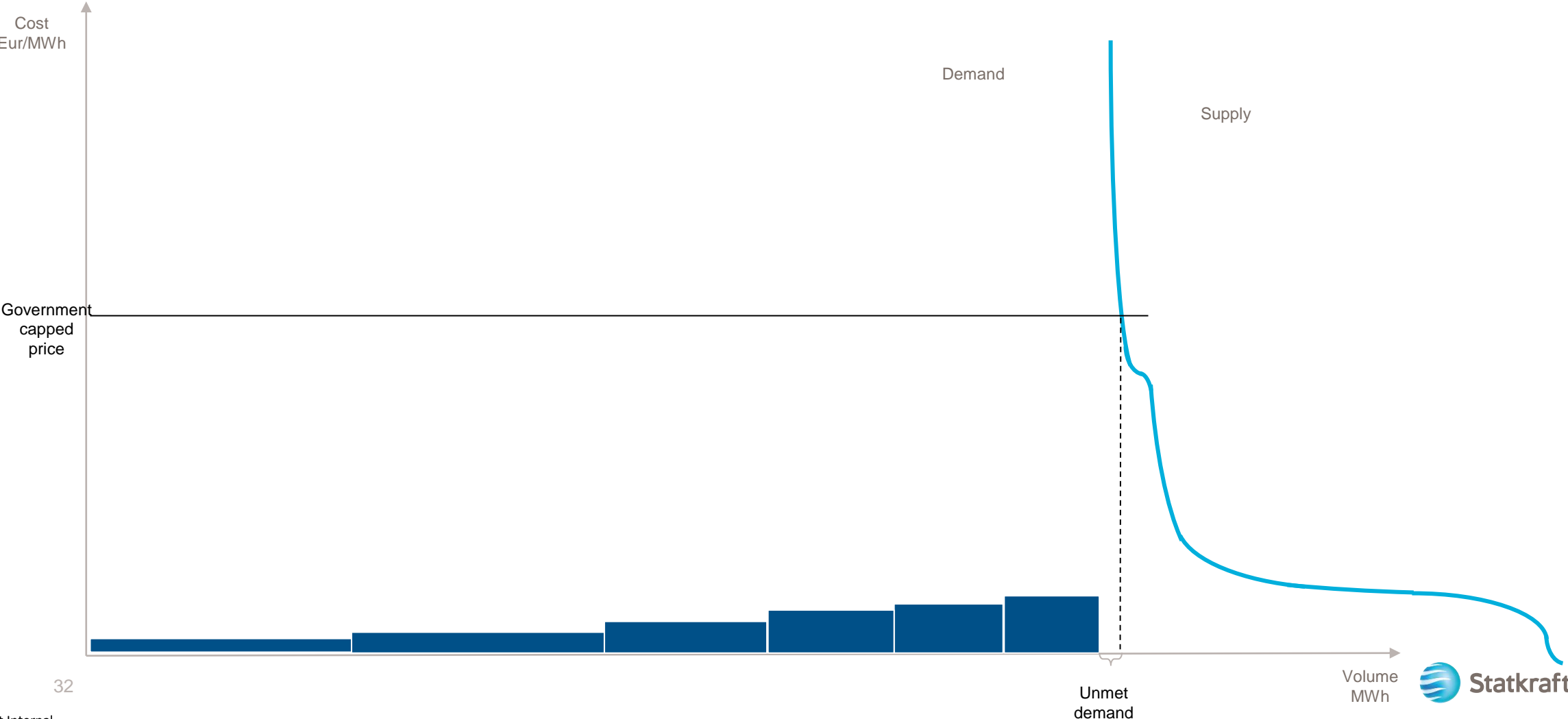


Can income in the «high price» periods cover Capex?

Supply and demand may not meet if prices are capped



Supply and demand may not meet if prices are capped



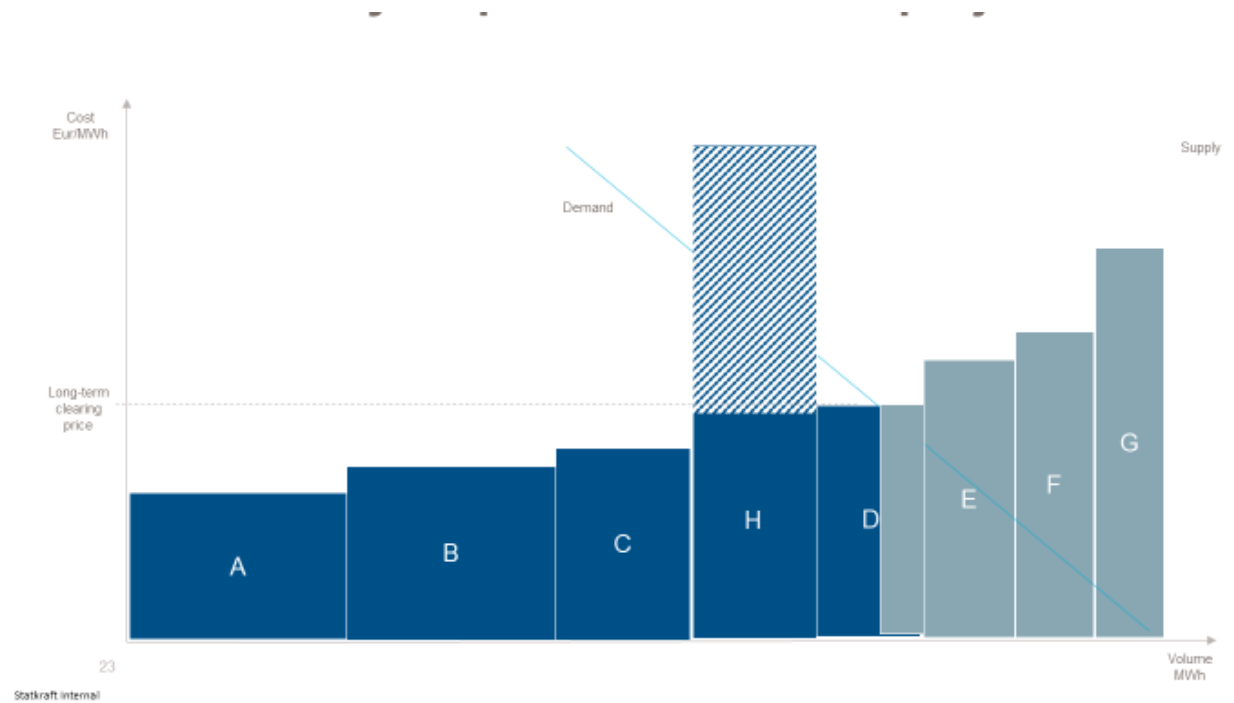
The investors dilemma: Merchant investment now or wait for capacity markets?

- You have a capacity project which is profitable with the current price outlook (volatility)
- With introduction of capacity markets volatility is reduced and your investment is not profitable
- Should you wait for capacity markets or invest now?



Capacity Mechanisms may have similar side-effects as CfDs

- Capacity Mechanisms require eligibility
 - Market signals are not sent to all participants
 - Bias towards existing generators
 - Demand-side response, new flexible or storages may not be incentivised
- How do you determine the demand for capacity?
 - National vs regional issues – how to take into account cross-border capacity?



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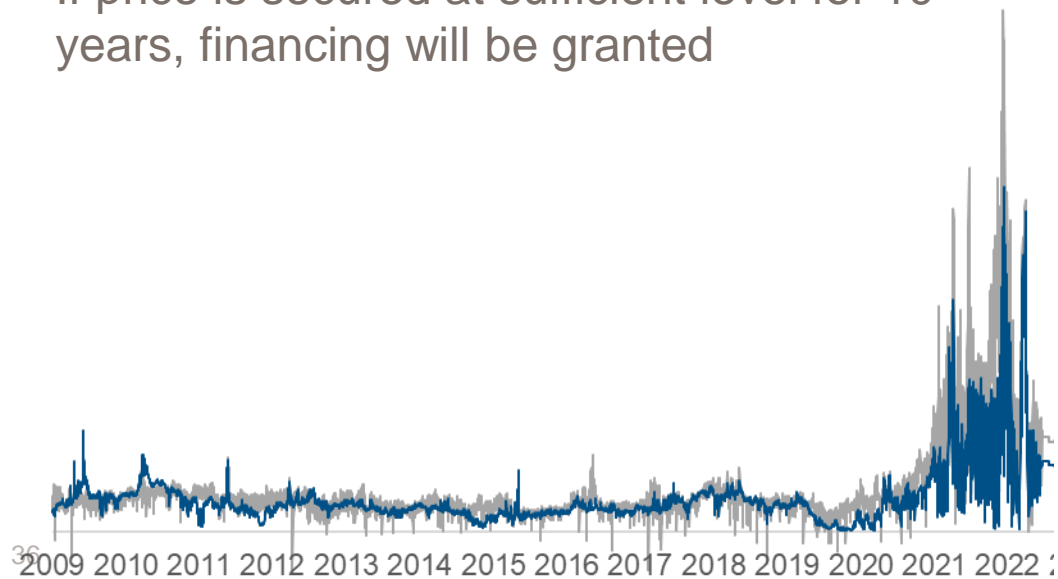
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Risk reducing mechanisms – financial markets and long-term hedging

Case: New production

Why risk reducing instruments?

- A power developer is considering investing in a new Solar project
- Price outlook is promising, but risk of *low* prices and poor income is making investors reluctant
- If price is secured at sufficient level for 10 years, financing will be granted



Risk reducing instruments

A. Commercial risk reducing instruments:

- Long term PPAs (> 5 years, tailor made)
- Futures and Forward markets (< 5 years, standardized products)
- Different commercial instruments often supplement each other
- Availability of providers is fundamental

B. Non commercial risk reducing instruments

- Government CFDs or other support schemes
- Non commercial instruments likely to displace commercial instruments



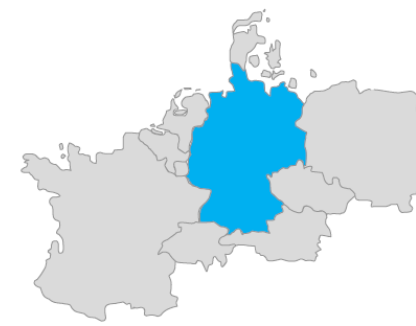
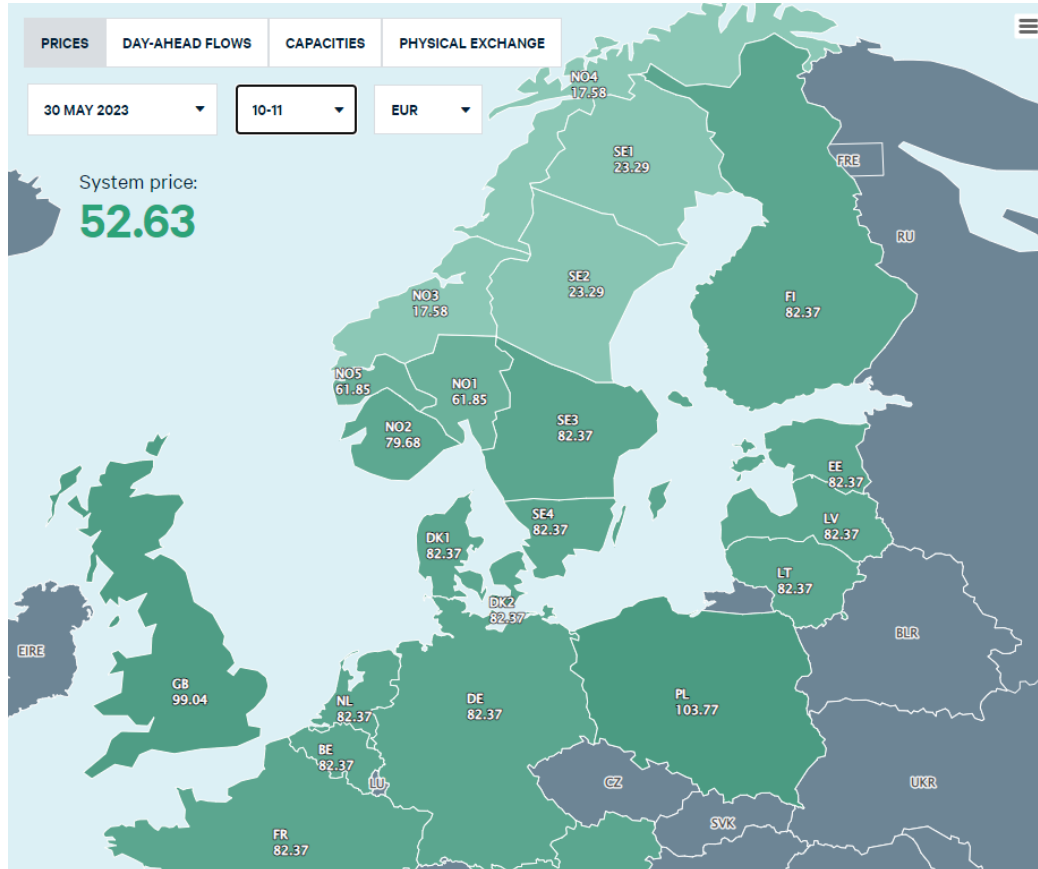
Case: Rebuilding manufacturing plant

Why risk reducing instruments?

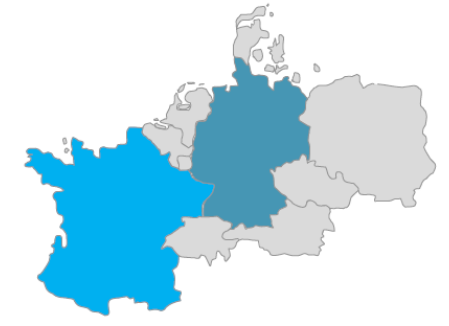
- Before increasing capacity, the plant needs to be rebuilt and modernized
- Rebuilding will take 3 months
- 10-year contract already signed
- Need to manage excess power during refurbishment
- If prices are secured, refurbishment can be planned and executed
 - Contractors, storage management, etc.



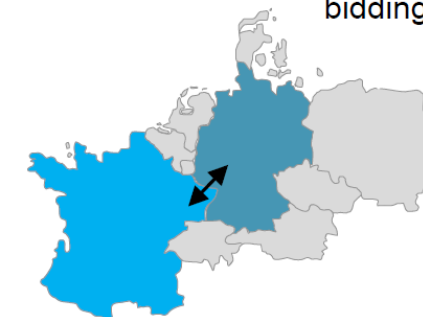
Two different models in the financial market in EU today



Direct hedges (trading the own bidding zone)



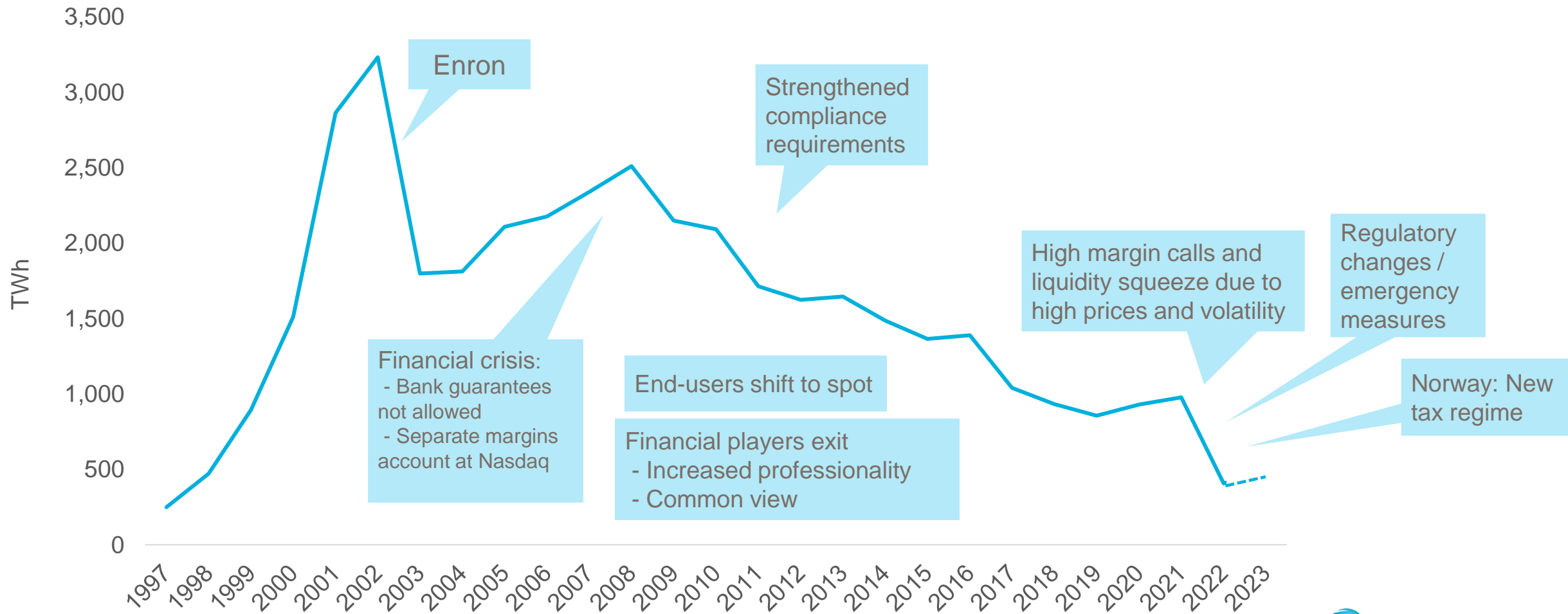
Proxy hedges (trading another bidding zone)



Combined hedges (trading another bidding zone + spread product)

NASDAQ Nordic: Declining liquidity

Nordic Power Derivatives Traded and Cleared (1997 - Q1 2023)



Other interventions have an effect on financial markets

- Government support schemes for households and businesses reduce the incentives for consumers to hedge their risk – reduces liquidity
- Government support schemes for power generation includes «de-risking»
 - Both CfDs and capacity mechanisms will have an effect on financial markets
- Asymmetric taxes – can increase the risks of hedges made in the financial markets
 - EU Revenue income cap
 - Norwegian high price contribution