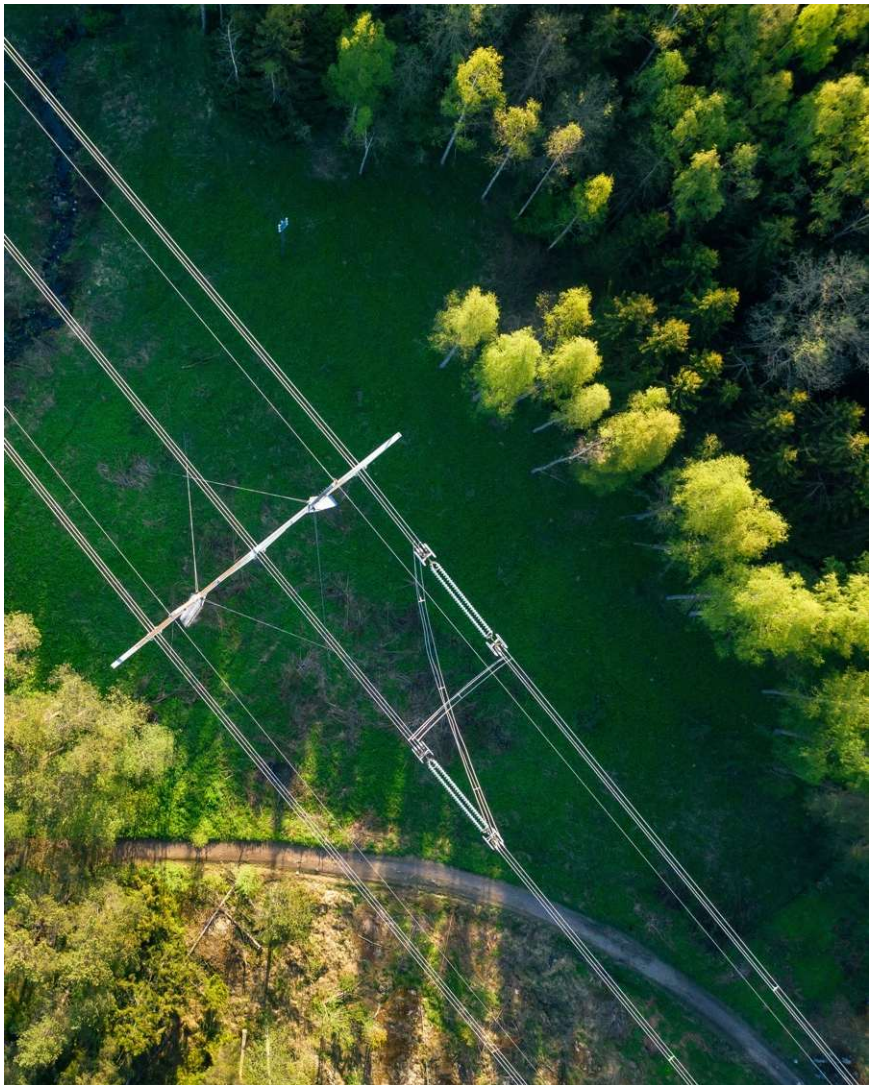

04.12.2025

Market Surveillance Team

Market Surveillance Webinar

FINGRID

Agenda

- Introduction to REMIT Obligations for Market Participants
  - Inside information and insider trading
  - Market manipulation
  - Algorithmic trading
- Case Studies
  - Batteries
  - Boliden Odda case
- Market Surveillance on Fingrid markets
  - Legal requirement under Article 15 in REMIT
  - Fingrid monitoring setup
  - Markets covered
- Q&A

FINGRID

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- **Introduction to REMIT Obligations for Market Participants**
  - Inside information and insider trading
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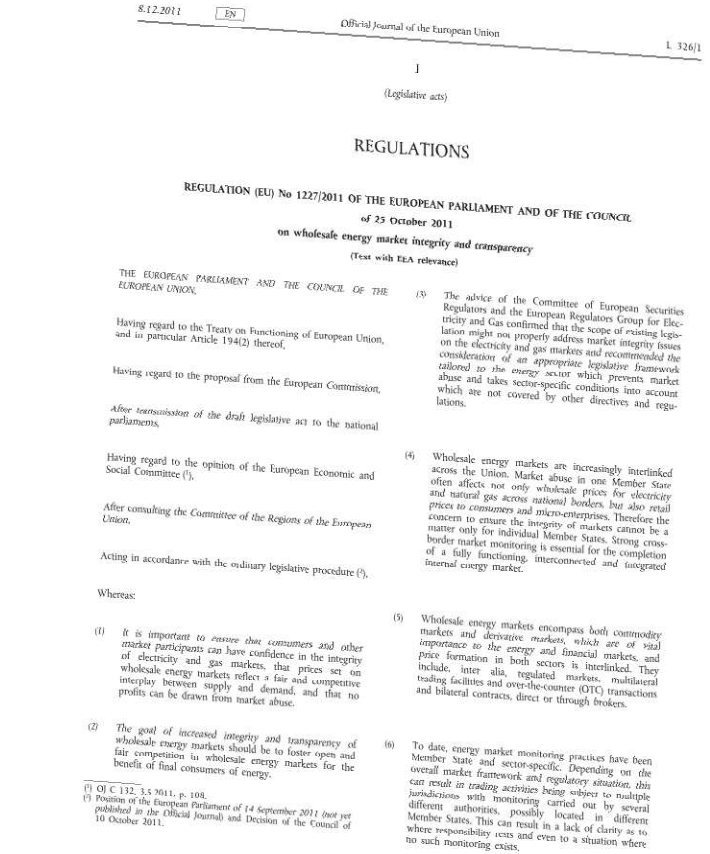
REMIT defines the roles and responsibilities of market players

REMIT (**R**egulation on wholesale **E**nergy **M**arket **I**ntegrity and **T**ransparency) aims to ensure:

1. Confidence in the market
2. That prices represent a fair and competitive interplay between supply and demand
3. No profits drawn from market abuse



8.12.2011 EN Official Journal of the European Union L 326/1

I

(Legislative acts)

REGULATIONS

REGULATION (EU) No 1227/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 25 October 2011
on wholesale energy market integrity and transparency
(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on Functioning of European Union, and in particular Article 194(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee (1),

After consulting the Committee of the Regions of the European Union,

Acting in accordance with the ordinary legislative procedure (2),

Whereas:

(1) It is important to ensure that consumers and other market participants can have confidence in the integrity of electricity and gas markets, that prices set on wholesale energy markets reflect a fair and competitive interplay between supply and demand, and that no profits can be drawn from market abuse.

(2) The goal of increased integrity and transparency of wholesale energy markets should be to foster open and fair competition in wholesale energy markets for the benefit of final consumers of energy.

(3) The advice of the Committee of European Securities Regulators and the European Regulators Group for Electricity and Gas confirmed that the scope of existing legislation might not properly address market integrity issues on the electricity and gas markets and recommended the consideration of an appropriate legislative framework tailored to the energy sector which prevents market abuse and takes sector-specific conditions into account which are not covered by other directives and regulations.

(4) Wholesale energy markets are increasingly interlinked across the Union. Market abuse in one Member State often affects not only wholesale prices for electricity and natural gas across national borders, but also retail prices to consumers and micro-enterprises. Therefore the concern to ensure the integrity of markets cannot be a matter only for individual Member States. Strong cross-border market monitoring is essential for the completion of a fully functioning, interconnected and integrated internal energy market.

(5) Wholesale energy markets encompass both commodity markets and derivative markets, which are of vital importance to the energy and financial markets, and price formation in both sectors is interlinked. They include, inter alia, regulated markets, multilateral trading facilities and over-the-counter (OTC) transactions and bilateral contracts, direct or through brokers.

(6) To date, energy market monitoring practices have been Member State and sector-specific. Depending on the overall market framework and regulatory situation, this can result in trading activities being subject to multiple jurisdictions with monitoring carried out by several different authorities, possibly located in different Member States. This can result in a lack of clarity as to where responsibility rests and even to a situation where no such monitoring exists.

(1) OJ C 132, 3.5.2011, p. 108.
(2) Position of the European Parliament of 14 September 2011 (not yet published in the Official Journal) and Decision of the Council of 10 October 2011.

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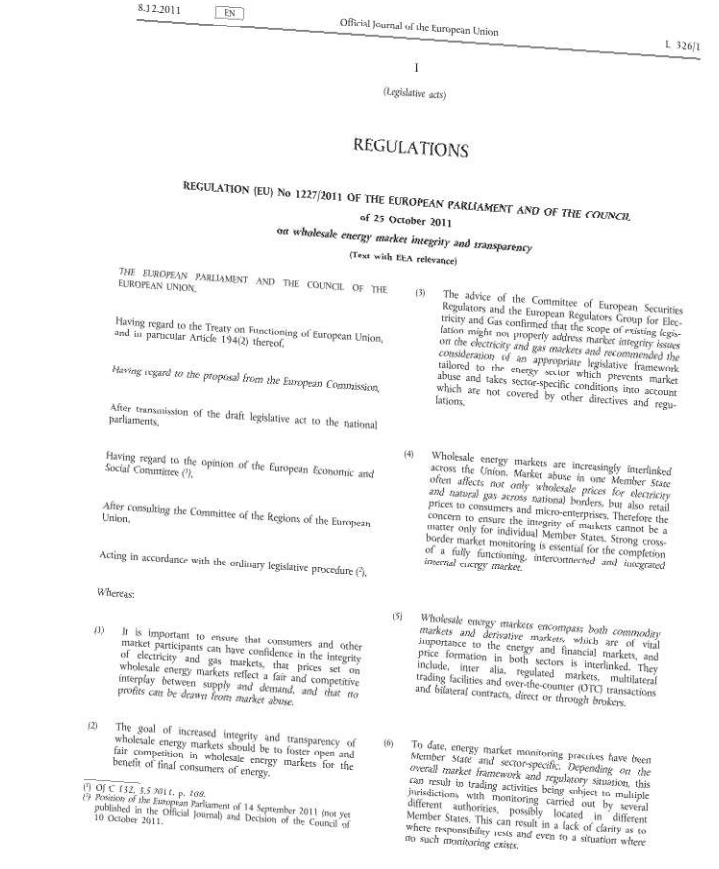
Key requirements in REMIT

- **Prohibition of insider trading (Art. 3)**
- **Obligation to publish inside information (Art. 4)**
- **Prohibition of Market Manipulation (Art. 5)**
- **Specific requirements for algorithmic trading (Art. 5a)**
- Obligation to report orders and transactions (Art. 8)
- Obligation for market participants to register with national regulatory authorities (Art. 9)
- **Obligation for persons professionally arranging or executing transactions to do Market Surveillance (Art. 15)**



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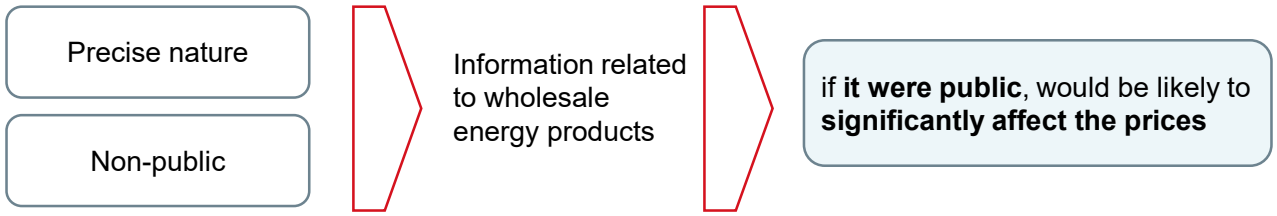
Definition of inside information

*'Inside information' means information of a **precise nature** which has **not been made public**, which **relates**, directly or indirectly, to one or more **wholesale energy products** and which, **if it were made public**, would be likely to **significantly affect the prices** of those wholesale energy products.*

- REMIT recital 12:

  "*Information regarding the market participant's **own plans and strategies** for trading should not be considered as inside information.*"

- An **intermediate step in a lengthy process** is considered to be inside information under REMIT if it, in itself, satisfies the definition of inside information outlined above.



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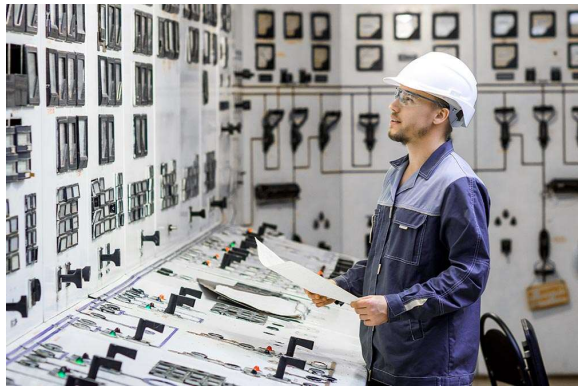
Disclosure of inside information



Gets inside information about e.g. outage

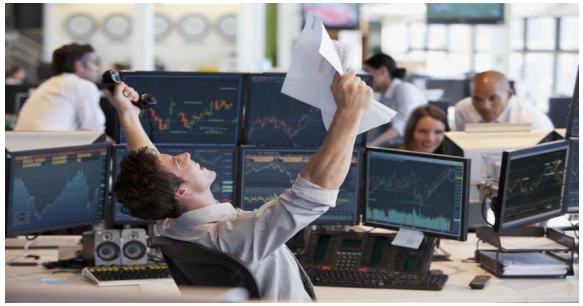
Article 4

Obligation to publish inside information

- In an effective and timely manner
- Regarding facilities owned/controlled, or for whose operational matters is responsible

UMM has to be published on an approved inside information platform

NORD POOL REMIT UMM NUCS



Trader can react on the information

Article 3

Prohibition of insider trading

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Case: Trading based on inside information

- TSOs' activation **signals** to activate **balancing energy** are **not publicly disclosed in real-time** in Germany. Nor is the state of imbalance on the grid.
- This information about an activation in the balancing market provides a lucrative insight into the imminent direction of the intraday market.
- **Those aware** their company is requested to provide balancing energy **know the state of the system**.
- They have a head start of sometimes 30 minutes to buy up electricity before everyone else in the intraday market.

Solutions for BSPs:
- Operating intraday and balancing activities separately
- TSO publishes real-time data wrt activations in balancing markets
- Disclose information in regular updates posted on an Inside Information Platform (IIP)

ELECTRICITY 7 min read

Whistleblowers sound insider trading alarm on German power

(Montel) Companies permitted to help balance Germany's electricity grid are abusing this privilege to trade in the electricity market with inside information worth perhaps tens of millions of euros, whistleblowers have told Montel.

Reporting by: Nathan Witkop
27 Jun 2024 | 12:42

Share:

ELECTRICITY | TRADING 3 min read

German power regulator launches probe into insider trading claim

(Montel) Germany's electricity network regulator, the BNA, is scrutinising allegations of insider trading in the country's power market first reported by Montel in June, it said in an interview.

Reporting by: Nathan Witkop
18 Sep 2024 | 11:00

Share:

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Definition of market manipulation (1/2)

(a)

- Entering into transaction
- Issuing, modifying or withdrawing any order to trade
- Engaging in any other behaviour

→ Relating to wholesale energy product, which:

→
- (i) gives or is likely to give, **false** or **misleading signals** as to the supply of, demand for, or price of wholesale energy product
- (ii) secures or is likely to secure <…> **the price** <…> **at an artificial level**
- (iii) employs a fictitious device or any other **form ofdeception** <…>

Note that the definition does not say anything about the intent.

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Definition of market manipulation (2/2)

(b) Disseminating information → through the media, including internet, or by any other means →

- (i) which gives, or is likely to give, **false or misleading** signals <…>
- (ii) including the dissemination of rumours and false or misleading news,
- (iii) where disseminating person knew, or ought to have known, that the information was false or misleading

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Capacity withholding

Based on ACER's guidance:

Electricity generation capacity withholding refers to the practice of keeping available generation capacity from being competitively offered on wholesale electricity market, even though offering it competitively would lead to profitable transactions at the prevailing market prices

Physical withholding

When capacity is not offered at any price

Economic withholding

When capacity is offered above the market price and the bid does not reflect the marginal cost (including opportunity cost)

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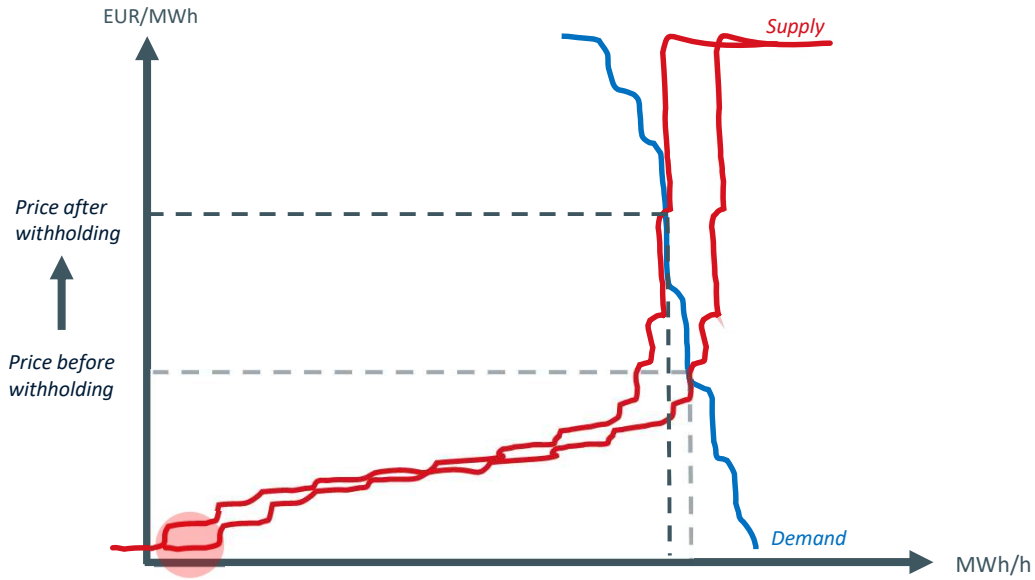
Capacity withholding



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Capacity withholding

Based on ACER's Guidance, there is a 2-step approach for determining if bidding can qualify as capacity withholding:

1. Is the market participant able to **influence the price** or the interplay by its behaviour in the case-specific circumstances?
2. Does the market participant have **no** legitimate **technical, regulatory and/or economic justification** when it does not offer its generation capacity or has offered it above marginal costs?

Legitimate economic reason – expectation of opportunity costs, expected value of producing at a different point in time or in a different market

See also case study on batteries

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Algorithmic trading definition

“Algorithmic trading” means

- trading, including high-frequency trading, in wholesale energy products
- where a computer algorithm automatically determines
  - individual parameters of orders to trade such as whether to initiate the order, the timing, price or quantity of the order or
  - how to manage the order after its submission,
- with limited human intervention or no such intervention at all,
- not including any system that is only used
  - for the purpose of routing orders to one or more organised marketplaces or
  - for the processing of orders involving no determination of any trading parameters or
  - for the confirmation of orders or the post-trade processing of executed transactions

Balancing markets are included !

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Obligations related to algorithmic trading

REMIT Article 5a (Algorithmic trading)

- REMIT introduced obligations towards the use of algorithmic trading under Article 5a.
- Requiring market participants to:
  - **(1) Implement effective systems and risk controls**
    - Thresholds and limits, prevent sending erroneous orders, systems should be tested and monitored, ..
  - **(2) Notify authorities**
    - Via ACER CEREMP platform
  - **(3) Provide** relevant **documentation** upon request from National Regulatory Authorities
    - Trading strategies, parameters and limits, compliance and risk controls, details of testing and monitoring, ..

Note that none of the new Article 5a requirements regulate market conduct.

- The same old REMIT Article 5 (Market Manipulation) considerations are still valid.

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Batteries

Batteries

- Balancing markets (FCR, aFRR and mFRR) are very attractive markets for batteries
- Multiple participants that operate batteries are currently active on the balancing markets (multi-market optimization)
- Significant amounts of revenue come from these markets
- Different MPs can have different pricing/bidding strategies

“But what is now exactly allowed for batteries under REMIT regulation wrt bidding strategies?”

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Batteries

Under REMIT, offering above marginal cost or withholding capacity without **legitimate justification** can be considered market manipulation.

Economic and physical withholding represent high risks in the balancing markets.

- **Economic withholding**: pricing up the capacity or energy bids, above your marginal costs
- **Physical withholding**: not submitting the available capacity to the capacity or energy market

Market participant shall have a legitimate **technical, regulatory, and/or economic reason** when offering the asset **above marginal costs or not offering it.**

- See next slide for possible examples for each category

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Batteries

Technical reasons

- State of Charge (SoC) Constraints: Batteries have limited energy and must maintain SoC to meet future obligations (e.g., capacity commitments).
- Degradation Management: Frequent cycling accelerates battery wear, reducing lifespan and increasing replacement costs. Each cycle comes at a cost of battery degradation.
- Warranty Constraints: Manufacturers often impose cycle limits or depth-of-discharge restrictions. Going outside the allowed boundaries, causing you to not have your warranty anymore, comes at a cost.
- Unavailability (maintenance) of the asset
- Ramping restrictions (less relevant for batteries)

Regulatory reasons

- Contractual obligation of the asset to be offered elsewhere

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Batteries

Economic reasons

- Opportunity costs
- Definition in ACER Guidance: *"Opportunity costs represent the expected value of the most valuable choice that was not taken. In wholesale electricity markets, this can, for example, represent offering at a different point in time for energy-limited available generation assets, e.g. reservoir hydropower units. It can also represent offering in a different sequential market (such as forward, day-ahead or intraday markets) for available generation assets, based on said expectations […]"*
- Reasonable expectations of prices in future markets (for which still can be traded) constitute a legitimate opportunity cost and may be used as an input.
  - Ex. Batteries optimize across multiple markets (day-ahead, intraday, balancing). If activation in energy market or reservation in capacity market reduces ability to earn in another market, bids may reflect this foregone revenue from not being able to participate in alternative markets.
- The price of foregone markets (markets in which one cannot trade anymore) does not represent a relevant opportunity cost.

Batteries

Marginal Cost

Definition: The additional cost of producing one more unit of electricity (e.g., 1 MWh).

Components: Includes wear and tear (degradation of battery cells), efficiency losses during charging/discharging, grid tariffs and electricity cost.

Example: If the battery is charged and you discharge 1 MWh, the marginal cost might be a few euros for degradation plus grid tariffs plus the cost of the energy to charge the battery.

Key Insight: **Marginal cost is direct and operational**. It answers: “How much does it cost me to produce one more unit right now?

Opportunity Cost

Definition: The value of the best alternative foregone when using the battery now.

Components: If you discharge now, you lose the chance to discharge later when prices might be higher. If you charge now, you might miss the opportunity to charge later at a lower price.

Example: Suppose the current ID price is €50/MWh, but you expect €150/MWh later today. Discharging now means you give up that extra €100/MWh profit. That’s your opportunity cost.

Key Insight: **Opportunity cost is strategic and forward-looking**. It answers: “What am I giving up by producing/consuming now instead of later or instead of doing something else?”

Batteries

The example is significantly simplified (only some markets are included and the technical details are reduced) for conciseness.

Example: bidding into the aFRR up capacity markets

- Assume battery operator with a 10 MW / 20 MWh battery
- The battery has 10 MW prequalified for aFRR upregulation (capacity and energy)
- Capacity markets take place before the Day-Ahead auction
- Expected profit from participating with the asset in Day-Ahead and Intraday market is €150/MW/MTU (main opportunity cost)
- Expected profit from participating in the aFRR energy market is €140/MW/MTU.

The opportunity cost for the offer to the aFRR capacity market is €150/MW/MTU - €140/MW/MTU = €10/MW/MTU.

This is the price level where the MP is indifferent between being reserved for the aFRR up energy market, or being able to freely participate in the Day-Ahead and Intraday markets.

Batteries

Key takeaways

- If you operate a battery, you might have **Article 5a** (algorithmic trading) **obligations**
  - Implement effective systems and risk controls
  - Notify authorities
  - Keep relevant documentation
- Offering above marginal cost or withholding capacity without legitimate justification can be considered market manipulation.
  - Legitimate justifications can be technical, regulatory, and/or economic
  - **Opportunity costs are legitimate justifications** (economic)
  - **Keep documentation** on how you calculate your capacity and energy bids with respect to price and volume

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Bidding errors, failure to deliver contracted energy bid

Case: Boliden Odda AS

- First market manipulation case in Norway
- Large zink producer in Odda – consumption unit
- October 2021, products for delivery week 40 and 42
- Boliden Odda bid volumes for up-regulation to the mFRR capacity market and got accepted (offers to reduce power consumption).
- Production stop due to maintenance → not able to deliver upon their commitments to the mFRR market.

ENERGIWATCH

POLITIKK & MARKED

RME-sjefen: - Det er første gang noen er tatt for markedsmanipulasjon i Norge

Boliden Odda AS får gebyr på 5 millioner

Reguleringsmyndigheten for energi i NVE (RME) gir Boliden Odda AS overtredelsesgebyr på 5 millioner kroner for brudd på forbudet mot markedsmanipulasjon og forsøk på markedsmanipulasjon i oktober 2021.

Norwegian regulator fines Boliden $450,000 over market manipulation

Reuters | November 10, 2023 | 3:29 pm Energy Europe

The company is expanding the world's most climate effective zinc smelter in Odda, southern Norway. Credit: Boliden

Links:
NVE-RME
Montel
Mining.com

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- In week 42, when Boliden became aware they were not able to deliver upon the commitment, they priced up their offers. In that way, they could avoid being activated
- Did not inform Statnett on the situation before they were requested to activate the volumes
- Boliden Odda’s behavior could have presented operational challenges for Statnett
- Statnett is entirely dependent on trusting that market participants submit bids that are genuine in order to fulfill its responsibility as a system operator
- Boliden Odda’s behavior reduced the earnings of other participants in the mFRR capacity market (unintentionally)

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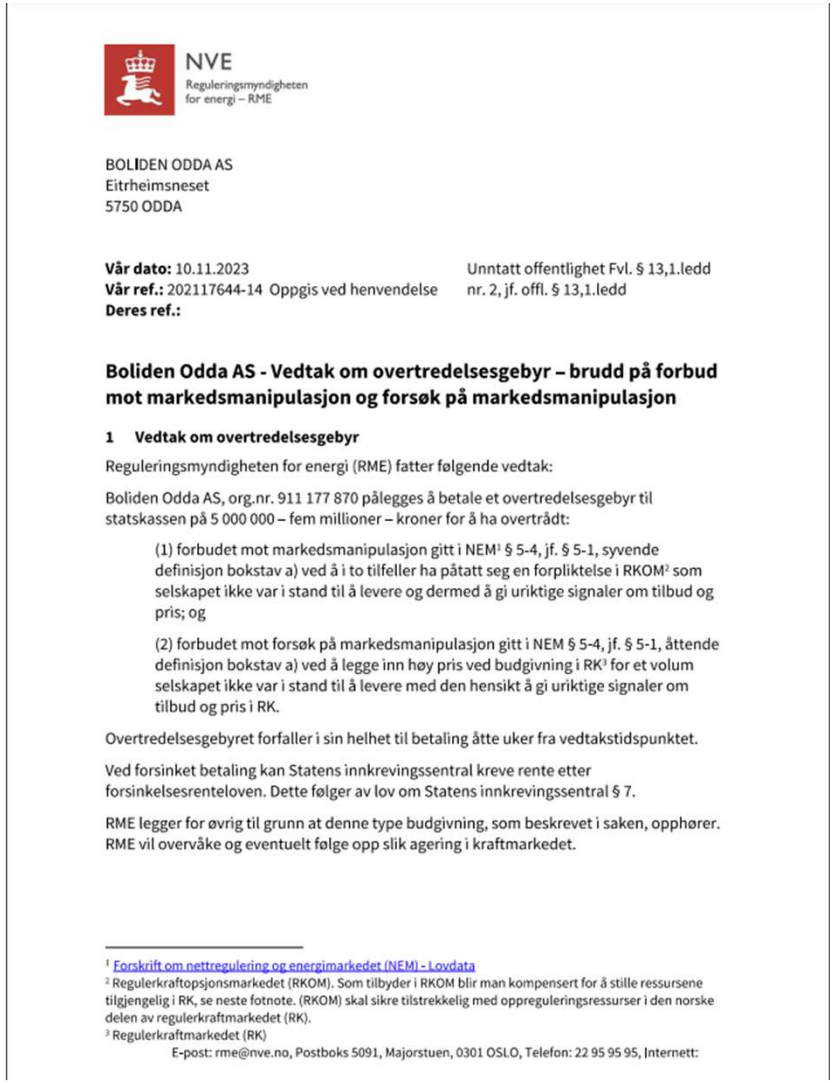
•RME's decision:

- RME imposed s sanction of NOK 5 000 000, approximately 400 000 EUR for
- Violating the prohibition against market manipulation by, on two occasions, incurring an obligation in the mFRR capacity market that the company was unable to fulfill, thereby sending false signals about supply and price.
- Violating the prohibition against attempted market manipulation as outlined in REMIT by submitting high-priced bids in the mFRR market for a volume the company was unable to deliver, with the intent of sending false signals about supply and price in the mFRR market."



NVE
Reguleringsmyndigheten for energi – RME

BOLIDEN ODDA AS
Eitrheimsneset
5750 ODDA

Vår dato: 10.11.2023
Vår ref.: 202117644-14 Oppgis ved henvendelse
Deres ref.:

Unntatt offentlighet Fvl. § 13,1.ledd nr. 2, jf. offl. § 13,1.ledd

Boliden Odda AS - Vedtak om overtredelsesgebyr – brudd på forbud mot markedsmanipulasjon og forsøk på markedsmanipulasjon

1 Vedtak om overtredelsesgebyr

Reguleringsmyndigheten for energi (RME) fatter følgende vedtak:

Boliden Odda AS, org.nr. 911 177 870 pålegges å betale et overtredelsesgebyr til statskassen på 5 000 000 – fem millioner – kroner for å ha overtrådt:

(1) forbudet mot markedsmanipulasjon gitt i NEM[1] § 5-4, jf. § 5-1, syvende definisjon bokstav a) ved å i to tilfeller ha påtatt seg en forpliktelse i RKOM[2] som selskapet ikke var i stand til å levere og dermed å gi uriktige signaler om tilbud og pris; og

(2) forbudet mot forsøk på markedsmanipulasjon gitt i NEM § 5-4, jf. § 5-1, åttende definisjon bokstav a) ved å legge inn høy pris ved budgivning i RK[3] for et volum selskapet ikke var i stand til å levere med den hensikt å gi uriktige signaler om tilbud og pris i RK.

Overtredelsesgebyret forfaller i sin helhet til betaling åtte uker fra vedtakstidspunktet.

Ved forsinket betaling kan Statens innkrevingssentral kreve rente etter forsinkelsesrenteloven. Dette følger av lov om Statens innkrevingssentral § 7.

RME legger for øvrig til grunn at denne type budgivning, som beskrevet i saken, opphører. RME vil overvåke og eventuelt følge opp slik agering i kraftmarkedet.

[1] Forskrift om nettregulering og energimarkedet (NEM) - Lovdata
[2] Regulerkraftopsjonsmarkedet (RKOM). Som tilbyder i RKOM blir man kompensert for å stille ressursene tilgjengelig i RK, se neste fotnote. (RKOM) skal sikre tilstrekkelig med oppreguleringsressurser i den norske delen av regulerkraftmarkedet (RK).
[3] Regulerkraftmarkedet (RK)

E-post: rme@nve.no, Postboks 5091, Majorstuen, 0301 OSLO, Telefon: 22 95 95 95, Internett:

- Boliden Odda has submitted a complaint on RME's market manipulation sanction decision
- They state that they perceive RME's decision to be unclear
- To Montel, they said that they did a mistake, but that it was unintentional
- RME states that the market manipulation breach could have been avoided if Boliden Odda had notified Statnett upon noticing their mistake.
- Boliden Odda did not succeed with their appeal, and the decision is now final

MONTEL

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Boliden Odda klager på bot for markedsmanipulasjon

(Montel) Sinkprodusenten Boliden Odda klager på RMEs overtredelsesgebyr for markedsmanipulasjon og mener det er uklarheter i beslutningen til RME.

– Vi kan bekrefte at vi har sendt inn en klage, da vi opplever at det er uklarheter i den beslutningen vi har mottatt. Vi ser frem til videre vurdering. Vi ønsker for øyeblikket ikke å gå inn i ytterligere detaljer, men ser frem til en konstruktiv prosess fremover, sier Klas Nilsson, pressetalsperson for Boliden til Energiwatch.

Det var i november RME ga Boliden Odda et overtredelsesgebyr på fem millioner kroner for markedsmanipulasjon og forsøk på markedsmanipulasjon tilbake i oktober 2021. Det var første gang noen ble bøtlagt for markedsmanipulasjon i Norge.

Boliden Odda vedgikk ovenfor Montel at de hadde begått en feil, men fremhevet at den ikke ble begått med vilje.

Ifølge RME påtok Boliden Odda seg en forpliktelse i regulerkraftopsjonsmarkedet som selskapet ikke var i stand til å oppfylle. I tillegg la selskapet inn en for høy pris ved budgivning i regulerkraftmarkedet, for et volum selskapet ikke var i stand til å levere.

Bruddet på markedsmanipulasjon kunne vært unngått hvis Boliden Odda hadde sagt fra til Statnett da de oppdaget feilen, ifølge RME.

Om RME ikke omgjør saken vil den bli sendt videre til behandling i Energiklagenemda.

FINGRID

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Legal requirements under Article 15 in REMIT

'Article 15

Obligations of persons professionally arranging or executing transactions

1. Any person professionally arranging transactions in wholesale energy products who reasonably suspects that an order to trade or a transaction, including any cancellation or modification thereof, whether placed on or outside an OMP, could breach Article 3, 4 or 5, shall notify the Agency and the relevant national regulatory authority without further delay and in any event no later than four weeks from the day on which that person becomes aware of the suspicious event.

3. The persons referred to in paragraphs 1 and 2 shall establish and maintain effective arrangements, systems and procedures to:

(a) identify potential breaches of Article 3, 4 or 5;

(b) guarantee that their employees carrying out surveillance activities for the purpose of this Article are preserved from any conflict of interest and act in an independent manner;

(c) detect and report suspicious orders and transactions.

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Market Surveillance process

Starts with a **risk assessment** of different types of market manipulation and evaluation of effective arrangements

Based on the risk assessment we have created a **Market Surveillance Strategy**:

- Internal routines for monitoring
- Routines for internal training
- Governance
- Handling of conflicts of interest etc.

Monitoring:

- Alerts with associated guidelines
- Thresholds for when to investigate further

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Market Surveillance Strategy

for mFRR energy and aFRR energy markets

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Monitoring guide and thresholds

mFRR and aFRR

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Monitoring flow

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Fingrid custom-built API

Market data: bids, activations, prices

FINGRID | Open Data

Fingrid open data API

Wind power/consumption forecasts, net exchange…

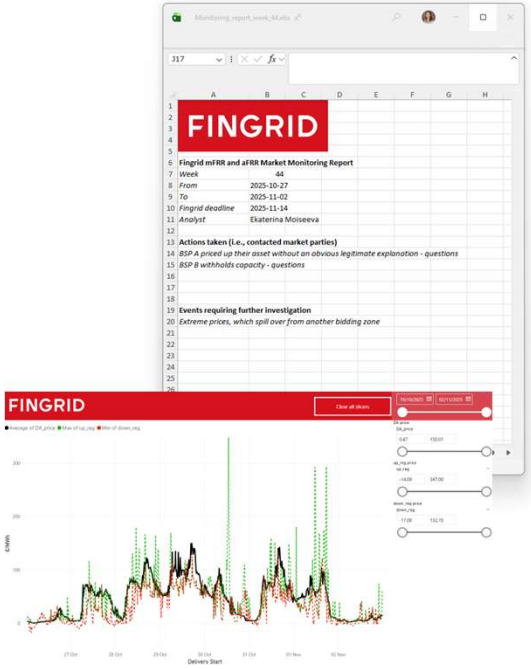
NORD POOL
A EURONEXT COMPANY

Nord Pool API

Day-ahead prices

Monitoring tools

- Downloading the data
- Processing the data
- Running alert patterns
- Writing the master reports



Monitoring report +
Visualisation in Power BI

- General data: prices
- Fundamental data: wind, consumption, net exchange, nuclear data
- Alerts visualisation

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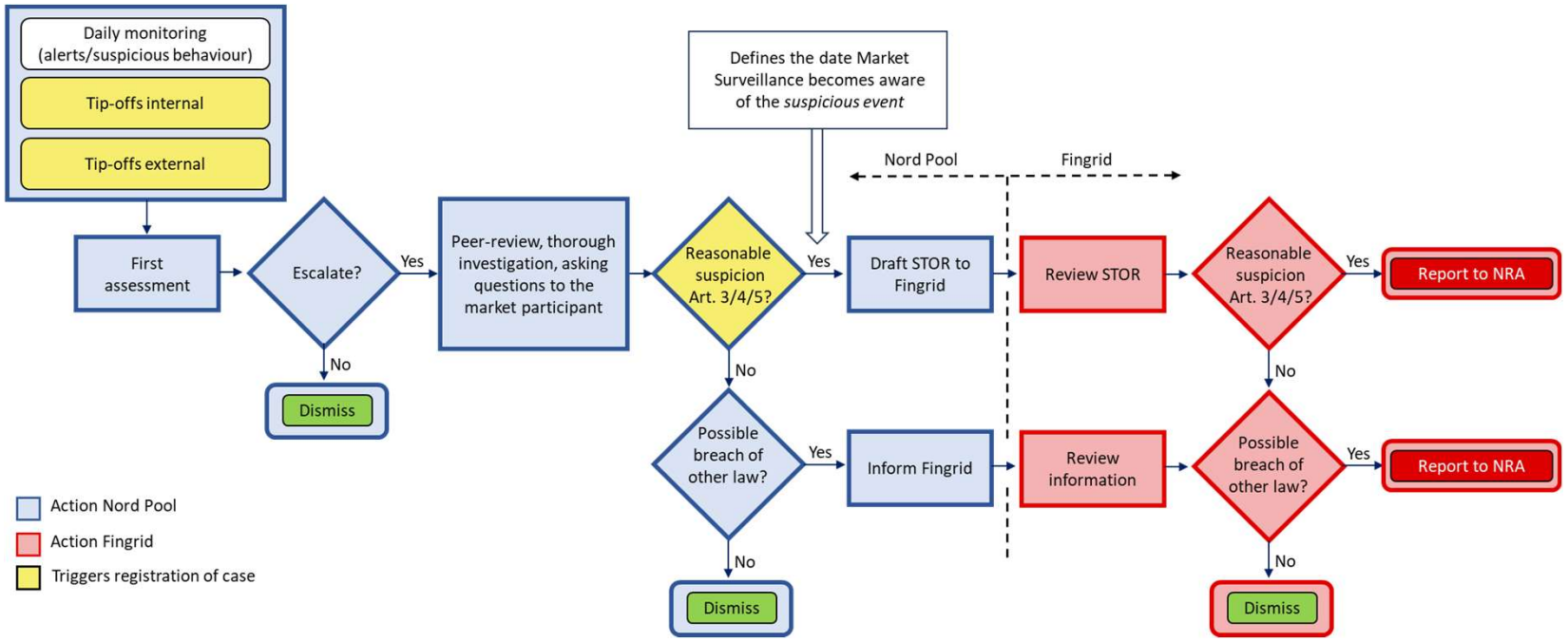
Monitoring Flow



Markets outsourced to Nord Pool

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Agenda

- Introduction to REMIT Obligations for Market Participants
  - Inside information and insider trading
  - Market manipulation
  - Algorithmic trading
- Case Studies
  - Batteries
  - Boliden Odda case
- Market Surveillance on Fingrid markets
  - Legal requirement under Article 15 in REMIT
  - Fingrid monitoring setup
  - Markets covered
- **Q&A**

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Q&A on Batteries

Can I use the following as input for calculating my activation price in the aFRR/mFRR energy markets?

- Price in foregone markets, such as the day-ahead price for the corresponding delivery MTU, or the price at which I charged my battery on Intraday Continuous market.
  - ➢ No, this is a sunk cost.
- Margin to recuperate past investment costs.
  - ➢ No, this is a sunk cost.
- Future price expectation of Intraday Continuous market (which I can participate in).
  - ➢ Yes, this can fall in the category of reasonable expectations of prices in future markets.
- Arbitrary profit margin (premium on top of the bid, for example DA price + 50 EUR/MWh).
  - ➢ No, this is not a legitimate technical, regulatory and/or economic justification for doing so.
- Marginal costs, such as wear and tear of the battery and marginal grid tariff
  - ➢ These are marginal costs, and may be included in the bid, but cannot automatically be added on top of the opportunity cost