CURRENT TRENDS AND DEVELOPMENTS OF THE MARKET AND GRID SITUATION

PRESENTATION OF KEY FINDINGS
WEBINAR 28/05/2021
Welcome to the presentation of the Amprion Market Report 2021

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Chief Technical Officer (CTO), Amprion GmbH

Information on the course of the webinar
► All participants are automatically muted
► Questions can be asked at any time via the chat
► Questions that we cannot answer due to time constraints will be answered afterwards via e-mail (registration e-mail)
# MARKET REPORT 2021

## AGENDA

### Welcome and introduction

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### Presentation of the key findings

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| 09:35-10:15 | - Overview  
- Current trends in the electricity generation in Germany  
- Impact of the Covid-19 pandemic  
- Market analysis  
- Grid analysis  
- Future developments  
- Conclusion & outlook |

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Dr Peter Lopion |

### Q & A session

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Presentation of the key findings

Lena Breuer, International Affairs, Amprion GmbH
Dr Peter Lopion, International Affairs, Amprion GmbH
**MARKET REPORT 2021**

**OVERVIEW**

The Amprion Market Report presents the current developments of the European electricity market

- It provides evidence of the **dynamic electricity market environment** in which Amprion operates together with many other institutions in Europe.

- Amprion is strengthening and steadily enhancing the **cooperation with other TSOs, power exchanges and market parties** in Central Western Europe (CWE) and beyond (e.g. in the Core project).

- The focus of the report lies on Amprion & Germany as well as **Flow-Based Market Coupling (FB MC)**

**Amprion**

As a transmission system operator in the heart of Europe, Amprion has an important function for cross-border electricity trading.

Amprion connects electricity markets across borders.
The share of electricity generated from renewable energies (RE) reached almost 50% in 2020.

But availability of RE varies significantly depending on the time of day, season and general weather conditions.

Extreme examples in 2020:

- **Highest share** of RE net electricity generation on 4 July at 12 p.m.: 84% (total), 72% (solar & wind)

- **Lowest share** of RE net electricity generation on 27 November at 6 a.m.: 14% (total), 1% (solar & wind)

Aspects of system stability must be consistently taken into account in system design.
Focus on the energy sector

- Lowest gross electricity consumption (544 TWh) of Germany since 1999
- Highest share of renewable energies in net electricity generation (49%) of Germany ever
- Lowest day-ahead electricity prices (€32/MWh) since introduction of FB MC in CWE in 2015
- Lowest gas prices (€12/MWh) since 2004
- Highest electricity imports (31 TWh of DA SCE*) of Germany since introduction of FB MC in CWE
- Highest price convergence (52% at max. ± €1/MWh) in CWE since introduction of FB MC in CWE
- Highest amount of hours with negative electricity prices in Germany (298 h) since introduction of FB MC in CWE

* Day-ahead scheduled commercial exchanges

2020 – an exceptional year in every respect
The corona pandemic made 2020 an exceptional year difficult to compare with previous years

- Actual total load decreased significantly in Germany (in April & May about -10%; over the whole year: -3%)

- Significant change in the German electricity mix (-23% coal, -14% nuclear, +8% gas, +23% solar & wind)

- Another reason besides RE expansion and low load is the decrease in natural gas prices (-24% compared to 2019, -36% compared to 2018) ➔ shift in the merit order

Exports highly dependent on PV generation

The corona pandemic made 2020 an exceptional year difficult to compare with previous years
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MARKET ANALYSIS

- Exports & Imports in CWE
  - Trend towards net imports of Germany during summer months; net exports during winter months
  - Net position of France during summer 2020 much lower than in the past years
  - ↑ German electricity imports increased to 30.9 TWh\(^1\) (+36.8% compared to 2019)
  - ↓ Decreasing exports to 53.2 TWh\(^1\) (-10.3 % compared to 2019)
  - Consequently, electricity net exports decreased to 22.3 TWh\(^1\) (-39.3 % compared to 2019)
  - Focus on 3 exemplary weeks

\(^1\) Day-ahead scheduled commercial exchanges

- Low NPs of CWE bidding zones and increasing dependency of Germany on imports during summer 2020
Summer 2020 – DE becoming a net importer

General findings ('Import' week 13/07 - 20/07)

► Actual total load about to converge to the level of previous years (Ø -5 % compared to 2019)

► Very low wind power generation during the whole week (Ø 3.1 GW wind power generation in DE)

► On 15/07 and 16/07 also low PV power generation (peak generation of 15 GW – usually about 30 GW)

► Ø DA price of €35/MWh in CWE (Ø DA price in CWE in 2020: €32/MWh)

► Very high price convergence in CWE: maximum price deviation of ± €1/MWh in 75% of the hours

► No trade limiting network elements of Amprion monitored during this week

High imports from France, Netherlands, Switzerland and Denmark during summer 2020
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MARKET ANALYSIS

Winter 2020 – wind power as driver for exports

General findings (‘Export’ week 14/12 - 21/12)

- Actual total load reached level of previous years
- Very high wind power generation in Germany (Ø 19 GW)
- As usual low PV power generation in December
- Ø DA price of €46/MWh in CWE (Ø DA price in CWE in 2020: €32/MWh)
- Very low price convergence in CWE: maximum price deviation of ± €1/MWh in only 23% of the hours
- Overall high amount of trade limiting network elements during this week. Share of Amprion’s internal network elements: 7.2%

Times of low wind power generation…
…directly lead to imports of Germany

High & constant exports to AT

High wind generation led to high exports during winter 2020
Increasing trend of price convergence in CWE

- Significant reduction of Ø DA price in CWE (-19.1% compared to 2019)

- Ø DA price in CWE in 2020: €32/MWh
  (Ø DA price in DE-LU in 2020: €30.5/MWh)

- Increase of price convergence in CWE to 52% of the hours in 2020 with full price convergence (max. deviation of ± €1/MWh)

- Increase in hours with negative prices in DE-LU up to 298 h in 2020 (compared to 211 h in 2019)

- Lowest average DA prices and highest price convergence since introduction of FB MC in CWE

Price convergence in CWE in 2020
Trading possibilities in CWE

- Market situations in which solely Amprion’s internal network elements were limiting trade in CWE only occurred in 2.1% of the hours in 2020.
- In around 74% of the hours in 2020, there were no limitations of trade in CWE related to the grid or only related to the capacity of interconnectors.

Capacity made available to the CWE market remains high, enabling liquidity in the European electricity market.
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GRID ANALYSIS

Redispatch
- Slightly increased redispatch volumes compared to 2019 (again at the level of 2018)
- Voltage induced redispatch increased in the last year (tenfold compared to 2019)

Challenges regarding voltage control
- High power flows due to high wind power generation from Northern to Southern Germany
- Leading to high utilization of the transmission grid and a high reactive power demand
- Amprion is planning to build 22 new reactive power compensation units with a total capacity of almost 5,200 Mvar

Increasing challenge in voltage control due to high share of renewable energies in the grid
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FUTURE DEVELOPMENTS

► Current projects, plans & initiatives
  ► Highlight 2020: ALEGrO go-live in November
  ► Future grid development (e.g. A-Nord)
  ► Power-to-Gas concepts (e.g. “Hybridge” project)
  ► Offshore initiative “Eurobar”

► The massive offshore wind power expansion, PtG concepts and grid expansion need to cope with the requirements related to the Green Deal

► Offshore wind power and PtG plants have to be implemented into the overall energy system in an efficient way

► Amprion is investing 24 billion euros over the next 10 years in order to enable the further integration of renewable energies and to strengthen international trade.
The current dynamic developments in the electricity system and market will continue over the next decade.

- Decreasing trend in conventional, controllable power generation (increasing imports by Germany in summer 2020)
- The electricity market in CWE is already working very well (lowest Ø DA prices and highest price convergence)
- Offshore wind power and power-to-gas are key technologies for a sustainable future power supply
- Expansion of sustainable, flexible and innovative generation capacities is necessary
- Increasingly weather-dependent power generation in Germany requires further strengthening of European electricity trading
- The expansion of these technologies must be in line with the grid and overall energy system in order to set the basis for a sustainable and climate-neutral future

Fundamental transformation of the European energy system due to the objective of being climate-neutral by 2050 – Green Deal.
Q & A session
Thank you very much for your participation in our webinar!

In case you have any further questions, please do not hesitate to contact us at: MarketReport@Amprion.net

We are looking forward to your message.

The report is available for download on our homepage: https://www.amprion.net/Market/Market-Report/Market-Report-2021/