

MARKET REPORT 2024

# WEBINAR

PRESENTATION OF KEY FINDINGS



# WEBINAR AMPRION MARKET REPORT 2024

## AGENDA



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1.00 p.m.	<b>Welcome</b> Dr Hendrik Neumann – Chief Technical Officer (CTO)
1.05 p.m.	<b>Market Analysis – Impact of the German electricity mix on European trade</b> Julia Klammer, Advisor – International Regulatory Management and Market Development
1.15 p.m.	<b>Grid Analysis – Congestion management in the light of upcoming projects</b> Dr Peter Lopion, Advisor – International Regulatory Management and Market Development
1.30 p.m.	<b>Future Developments – Outlook congestion management</b> Dr Carsten Lehmköster – Managing Director Amprion Offshore and Director Economic Grid Management
1.35 p.m.	<b>Q&amp;A Session</b>
2.00 p.m.	<b>Closure</b>

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# WELCOME

## TO THE PRESENTATION OF THE AMPRION MARKET REPORT 2024

**Dr Hendrik Neumann**  
Chief Technical Officer (CTO)



Further information and the report is available  
for download on our homepage:  
[amprion.net/market/market-report](https://amprion.net/market/market-report)



# WEBINAR AMPRION MARKET REPORT 2024

## HOUSEKEEPING RULES



### Information for the webinar

- All participants are automatically muted
- Questions can be asked at any time via Teams-Chat
- Time will be provided for comprehension questions directly after the presentations
- Q&A session for in-depth discussion at the end





# MARKET ANALYSIS

## IMPACT OF THE GERMAN ELECTRICITY MIX ON EUROPEAN TRADE

**Julia Klammer**

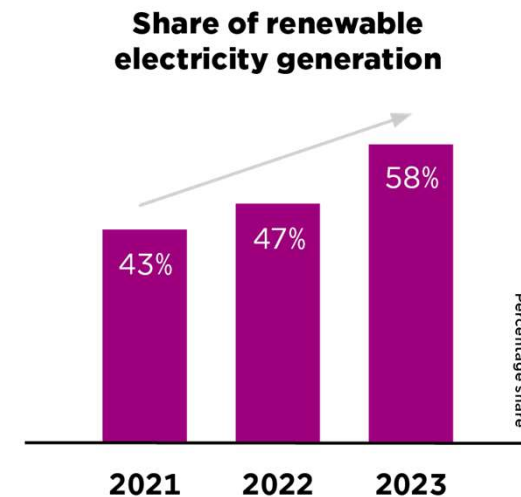
Advisor – International Regulatory Management  
and Market Development



# MARKET ANALYSIS

## RENEWABLE ENERGIES SHARE AT ALL-TIME HIGH

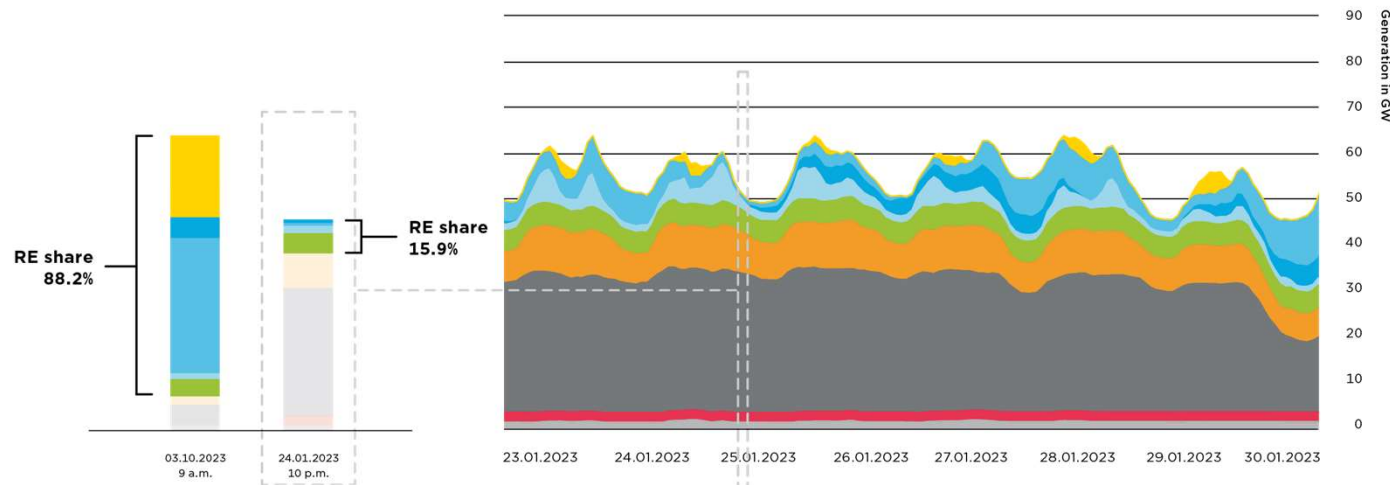
- In Germany in 2023, ...
    - ... more than 14 GW of photovoltaic and 3 GW of wind power were installed
    - ... the last three nuclear power plants were decommissioned in April
    - ... the overall electricity consumption decreased
    - ... electricity imports increased substantially
    - ... domestic electricity production decreased
- As a result, the relative share of renewable energies increased overproportionately



**Renewable electricity generation increased from around 242 TWh in 2022 to around 260 TWh**

# MARKET ANALYSIS

## RENEWABLE ELECTRICITY GENERATION IN GERMANY



	Solar	Wind onshore	Wind offshore	Hydro	Bio-mass
<b>2021</b>	9%	18%	5%	5%	8%
<b>2022</b>	11%	20%	5%	5%	8%
<b>2023</b>	12%	26%	5%	6%	8%

	Natural gas	Coal	Nuclear	Others
<b>2021</b>	10%	30%	13%	3%
<b>2022</b>	11%	33%	6%	2%
<b>2023</b>	11%	26%	2%	3%

Hours with highest and lowest share of renewable energies in 2023 show a range of 15–88%

“Dunkelflaute” in January 2023

- Increase in renewable electricity generation with a share of almost 60%
- Record feed-in from onshore wind

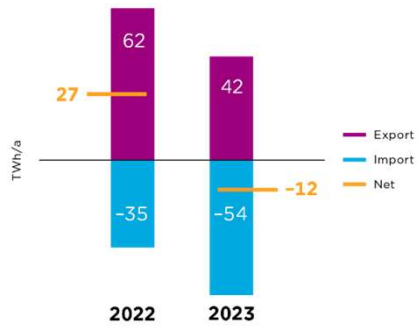
**New records in the expansion of renewable energies as well as in renewable electricity generation – the need for appropriate flexible generation capacities during times of low renewables infeed remains.**

# MARKET ANALYSIS

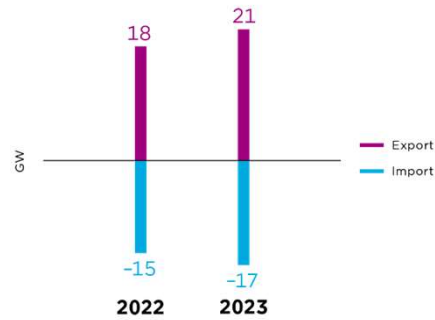
## EXPORTS & IMPORTS



- Germany's **net imports increased** by more than 60%
- Majority of imports from Scandinavian countries
- France and Austria remain Germany's most important trading partners
- After many years of net exports, we have seen **net imports from France in the last year**

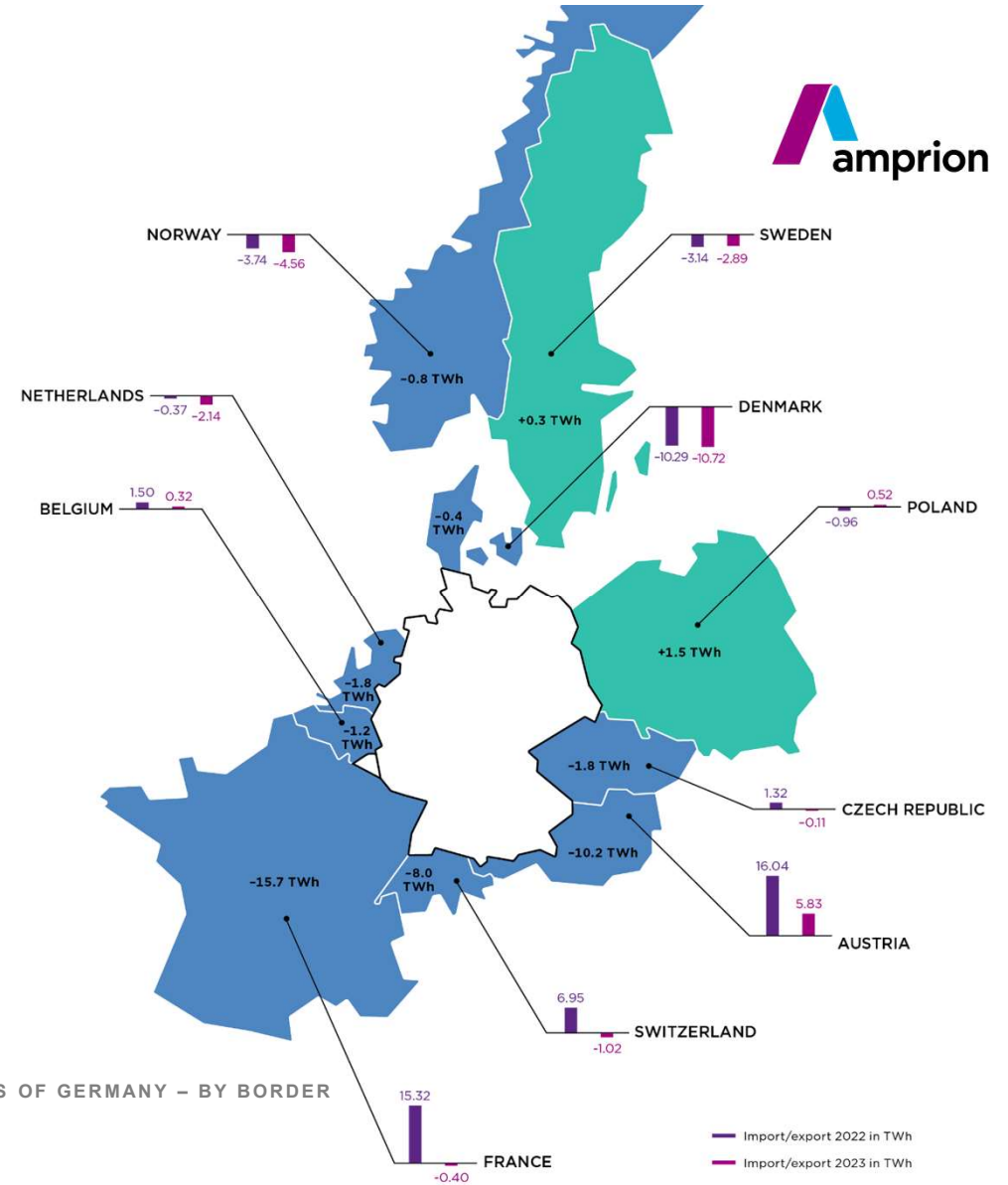


IMPORTS/EXPORTS OF GERMANY – TOTAL



MAX. (DA) IMPORT/EXPORT

**For the first time in 21 years, Germany has become a net importer.**



IMPORTS/EXPORTS OF GERMANY – BY BORDER



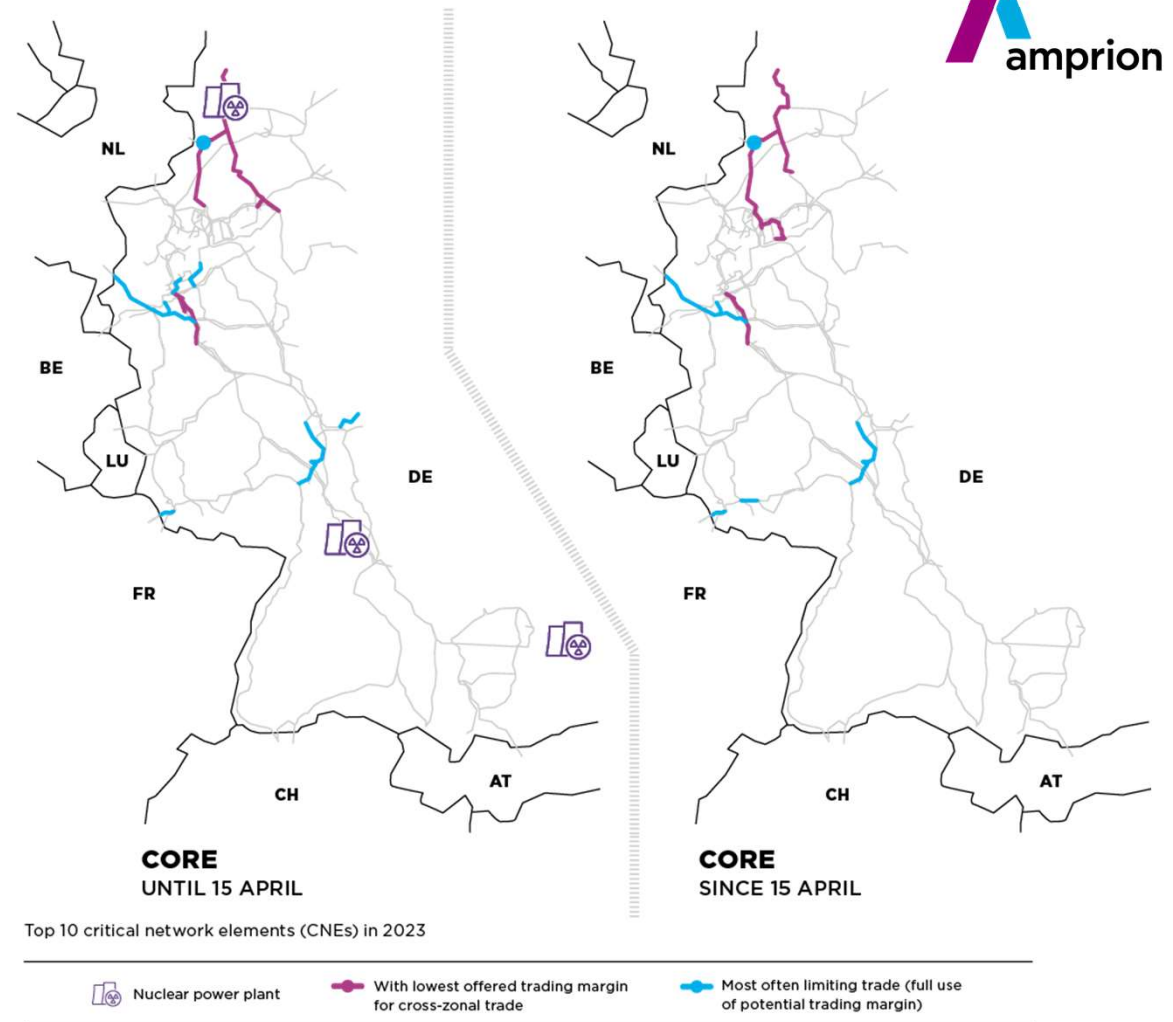
# MARKET ANALYSIS

## IMPACT ON AMPRION'S GRID

### Analysis of Amprion's critical network elements (CNEs):

- TOP 10 of the CNEs with the **lowest offered trading margin for cross-zonal trade on average (red)** and the ones, which **limited trade most often (blue)** in 2023
- The comparison illustrates the differences in **just focussing on a blanket value of 70% (red)** and the **really needed capacities from the market's point of view (blue)**

**Grid expansion remains a top priority and has to be need-oriented.**



# MARKET ANALYSIS

## CONCLUSION



We have seen new records in the expansion and generation of renewable energies in Germany during 2023.

However, for the first time in 21 years, Germany has become a net importer of electricity.

The need for appropriate flexible generation capacities during times of low renewables infeed remains.

Need-oriented grid expansion also still remains a top priority.

# GRID ANALYSIS

## CONGESTION MANAGEMENT IN THE LIGHT OF UPCOMING PROJECTS

**Dr Peter Lopion**

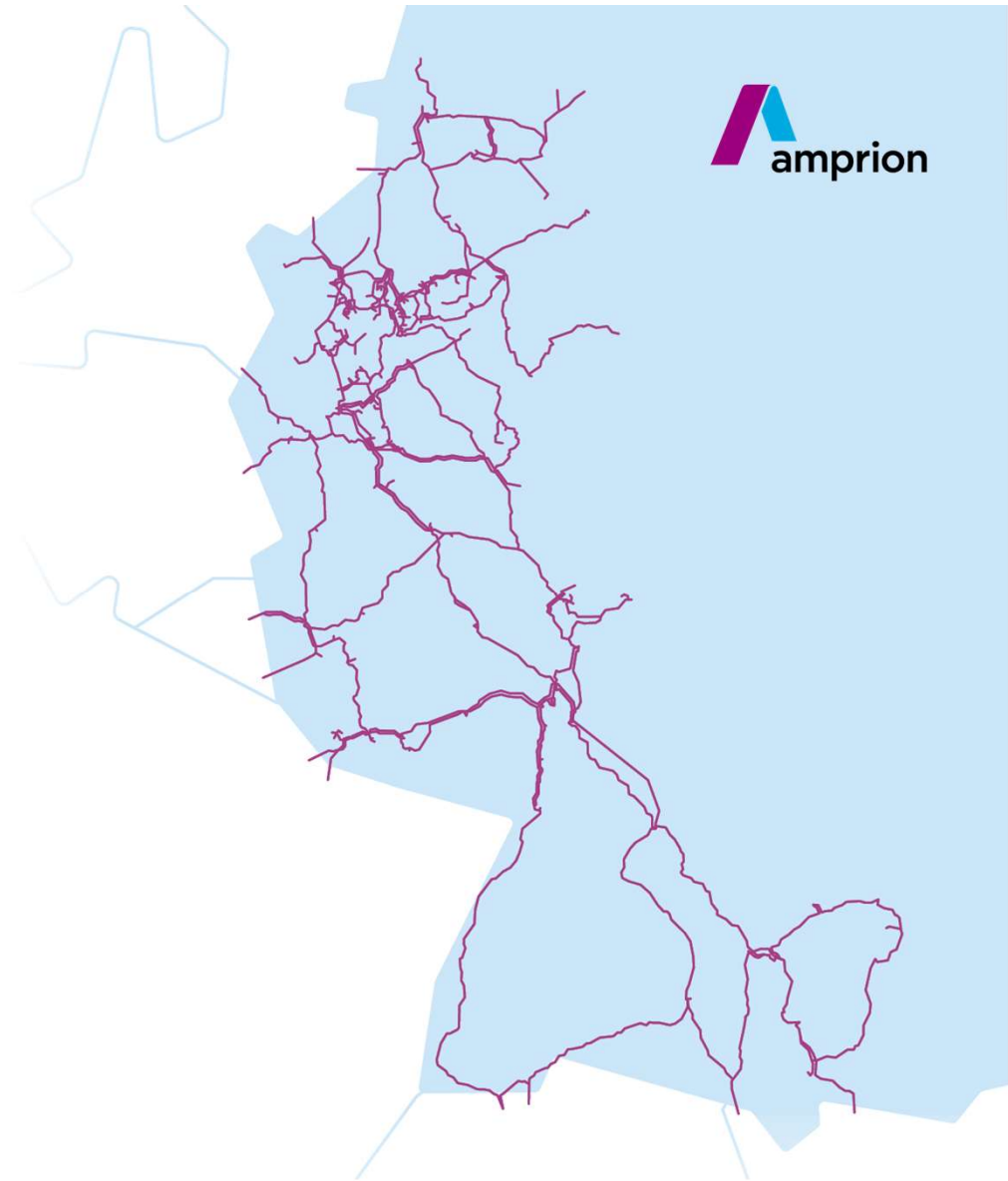
Advisor – International Regulatory Management  
and Market Development

# GRID ANALYSIS

## RELATION GRID EXPANSION AND ELECTRICITY MARKET

- Amprion's extra-high-voltage network spans 11,000 km, stretching from the Alps to Lower Saxony, with future expansion plans reaching towards the North Sea.
- Grid Expansion has a high relevance on the resulting flows in the Market Coupling processes and on the whole electricity market

**New grid elements (e.g. HVDC) are necessary to reduce limitations to the market**





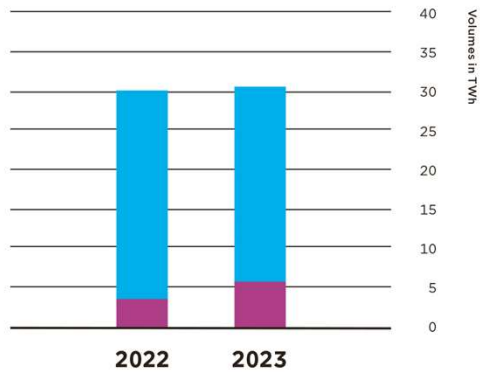
# GRID ANALYSIS

## GRID OPERATION ANALYSIS

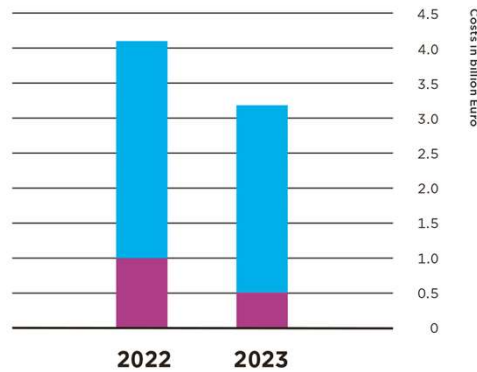


- High **renewable generation** led to an increase of redispatch volume in 2023, while **redispatch costs decreased but still stayed on a high level**
- The grid expansion project "**Enlag2**" was **successfully completed in 2023** and has **significantly relieved Germany's biggest congestion to date**, the so-called Emsland lines

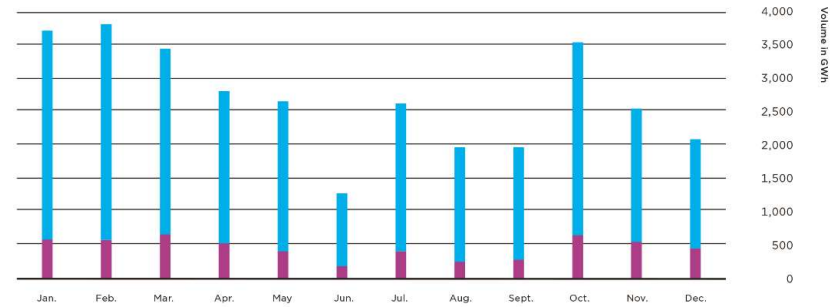
**Total redispatch volumes**



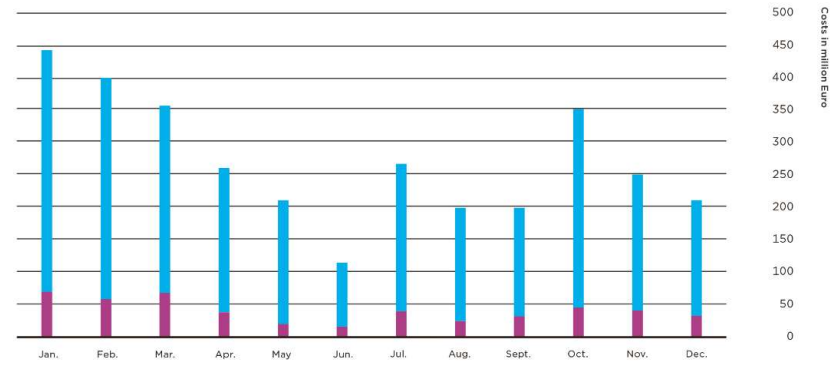
**Total redispatch costs**



**Redispatch volumes**



**Redispatch costs**



Amprion Other DE TSOs

The significant drop in prices for electricity, hard coal, natural gas and CO<sub>2</sub> emissions has also led to a decrease in congestion management costs.

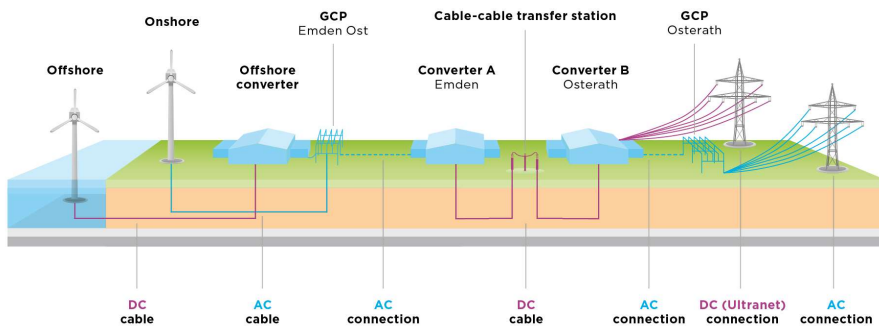


# GRID ANALYSIS

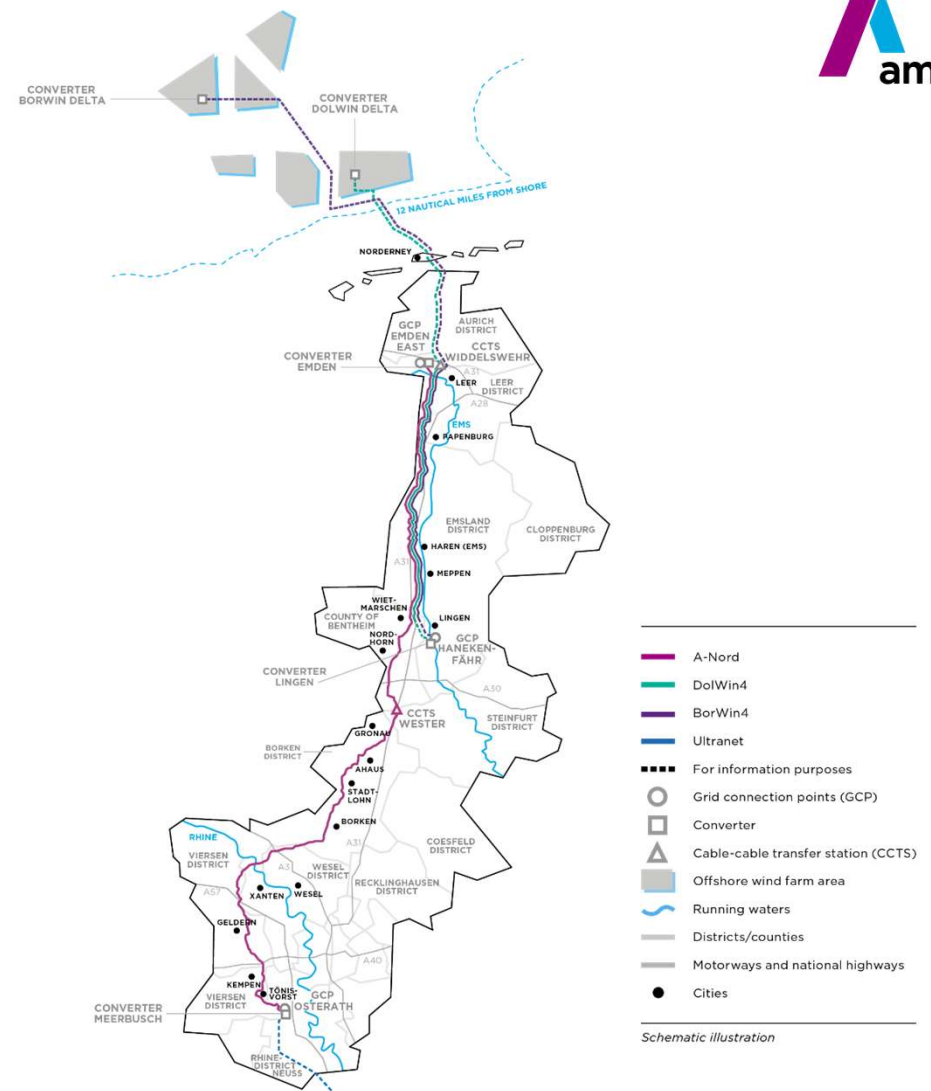
## A-NORD PROJECT



- The **A-Nord project** is planned from **Emden** to **Osterath**, Germany
- Over **300 km** of underground **HVDC cables** transporting up to **2.4 GW** of wind power already in **2027**



**Accelerated grid expansion measures are already paying-off: Construction could start earlier than initially anticipated**

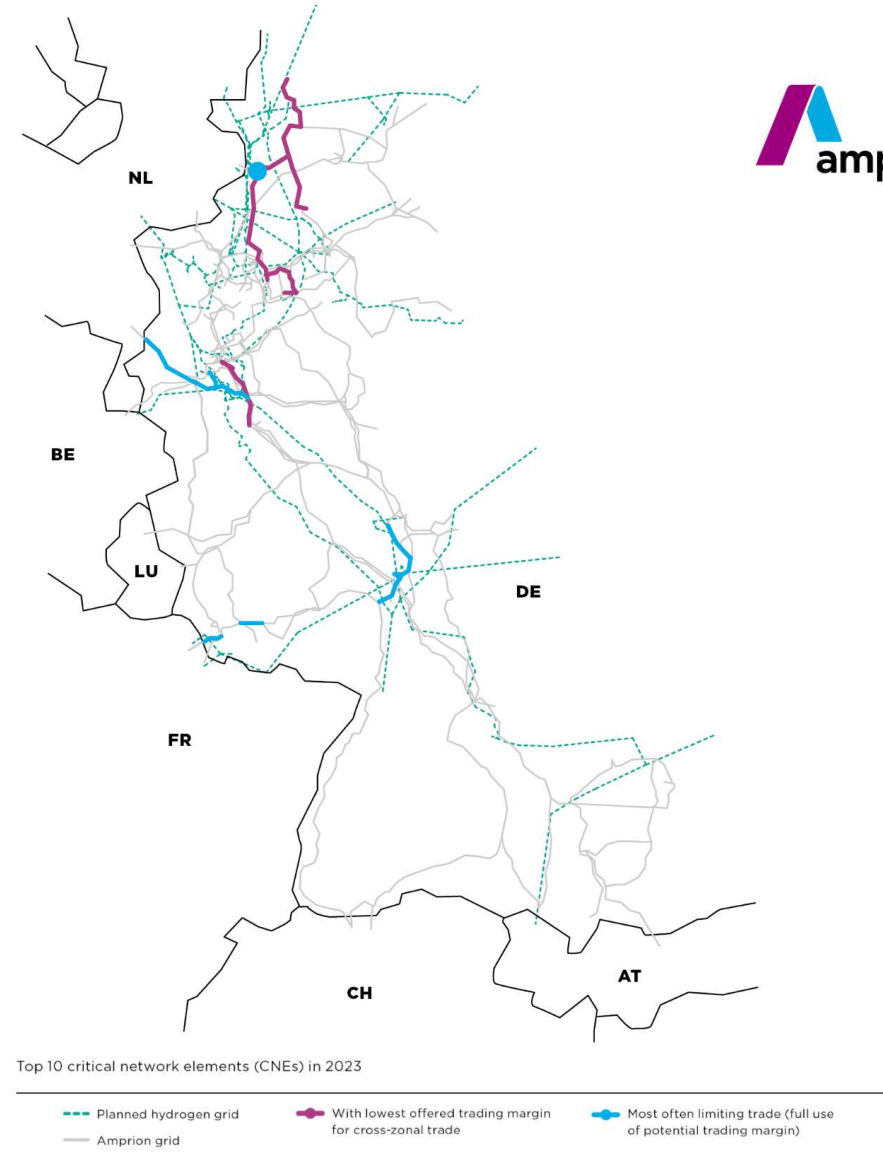


# GRID ANALYSIS

## GERMAN POWER PLANT STRATEGY

- The German Federal Ministry for Economic Affairs and Energy announced its **“Power Plant Strategy”**
- Tenders for **4x 2.5 GW of “convertible hydrogen power plants”** will be planned, starting in 2024
- The overlay of the planned hydrogen grid and the burdened network elements of the Amprion Grid reveals that **some locations for these power plants are more beneficial for the future grid operation than others**
- **This should be reflected in the tendering process**

**New power plants of more than 20 GW are needed if Germany wants to phase out coal in 2030 as far as resource adequacy is concerned.**



# GRID ANALYSIS

## CONCLUSION & OUTLOOK



**Conclusion: No transition without transmission.**

The completion of major grid expansion projects has relieved one of the biggest congestions in the German electricity transmission grid. In addition, the significant drop in prices for electricity has reduced congestion management costs of Transmission System Operators.

**Outlook: With the EU Grid Action Plan, the EU brings grids to the center of its agenda for the first time.**

We hope that the actions included in the EU Grid Action Plan will be implemented in due time and that the topic of accelerating grid development remains high on the agenda - not only at a domestic but also at European level.

# QUESTIONS?

WE ARE HAPPY TO ADDRESS COMPREHENSION QUESTIONS DIRECTLY  
QUESTIONS ON CONTENT AND FURTHER QUESTIONS IN THE Q&A SESSION



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# FUTURE DEVELOPMENTS

## OUTLOOK CONGESTION MANAGEMENT

**Dr Carsten Lehmköster**

Managing Director Amprion Offshore and  
Director Economic Grid Management



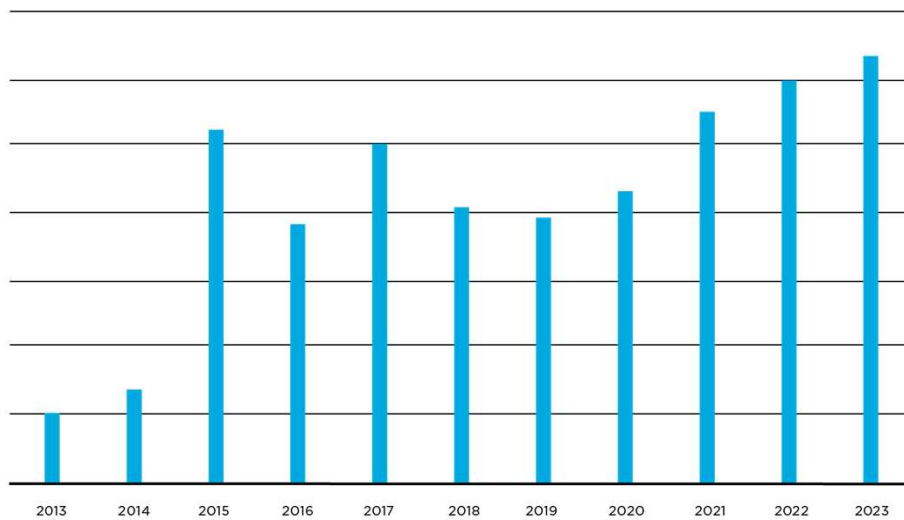


# FUTURE DEVELOPMENTS

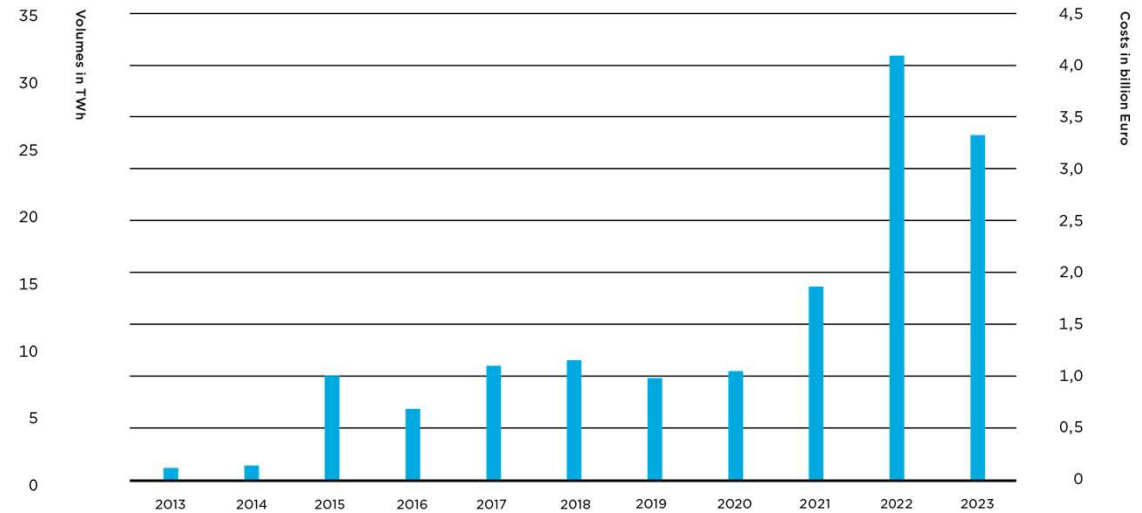
## CONGESTION MANAGEMENT



Redispatch volumes of Germany



Redispatch costs of Germany



- The **drop in prices** for electricity, hard coal, natural gas and CO<sub>2</sub> emissions has also led to a **decrease in congestion management costs in 2023**, despite increasing volumes
- In the upcoming years, there is an **increasing demand for the integration of renewable energies**, which are a driving factor behind the need for redispatching in Germany

- However, planned **HVDC projects** like A-Nord are counteracting this trend. We expect the **first effects on the German redispatch demand already in 2027**.

# FUTURE DEVELOPMENTS

## GERMAN NETWORK DEVELOPMENT PLAN

- For the transformation of the European energy system, **new concepts for the integration of renewable offshore energy are necessary**
- The current Network Development Plan examines a **transmission grid for a carbon-neutral energy sector** of Germany for the first time

The new NDP comprises about **7,400 km of grid expansion** measures compared to the previous one

— ALEGrO in operation



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 — Ultranet, A-Nord

COMMISSIONING  
 2026 + 2027



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- Ultranet, A-Nord
- DolWin4, BorWin4

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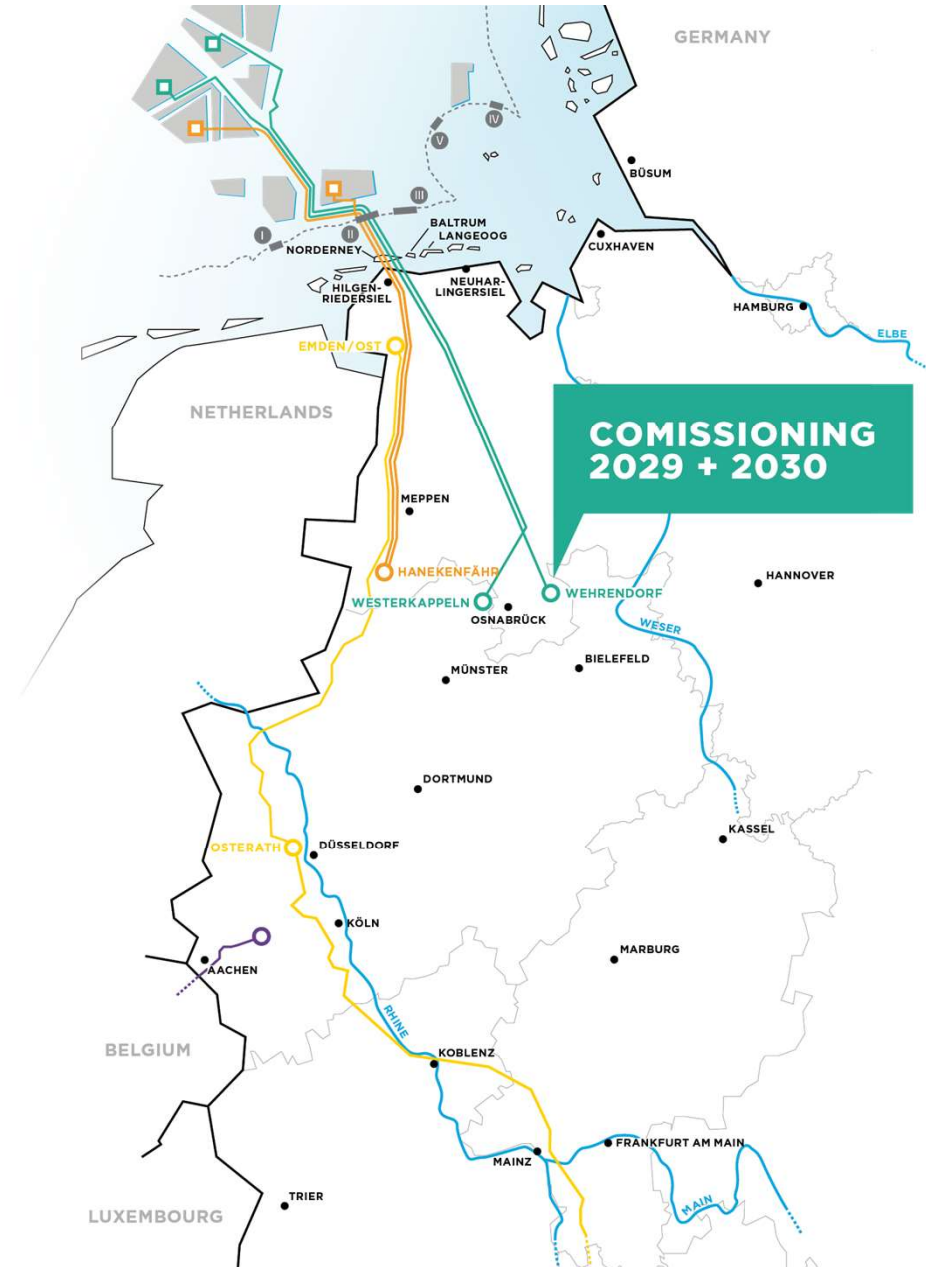
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- BalWin1, BalWin2

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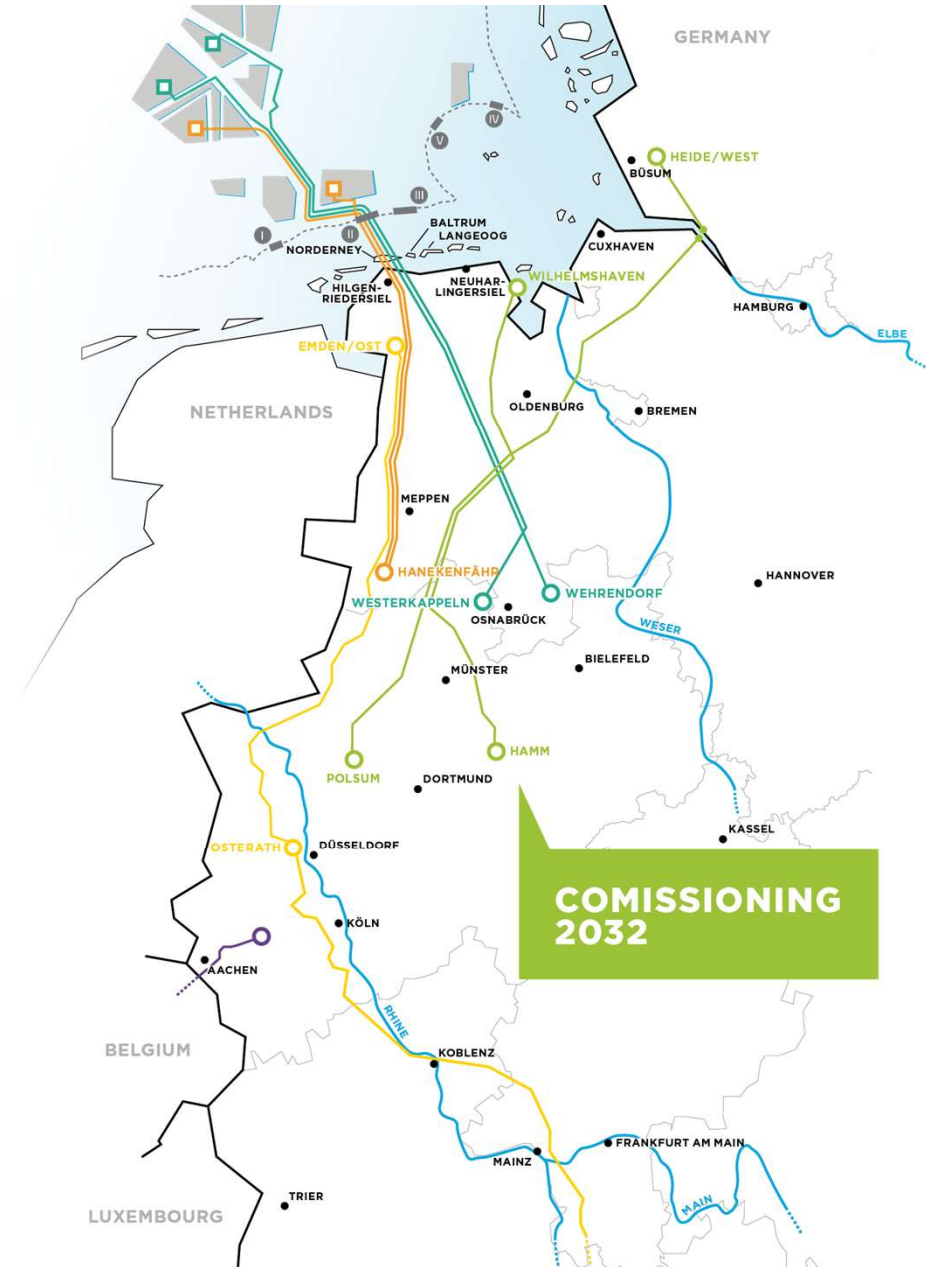
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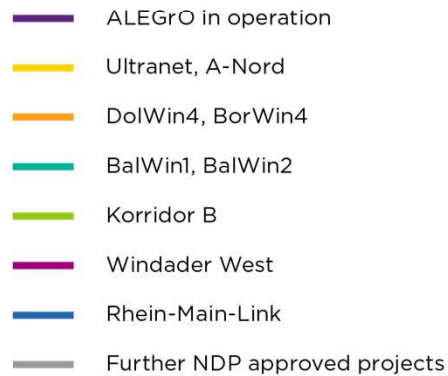


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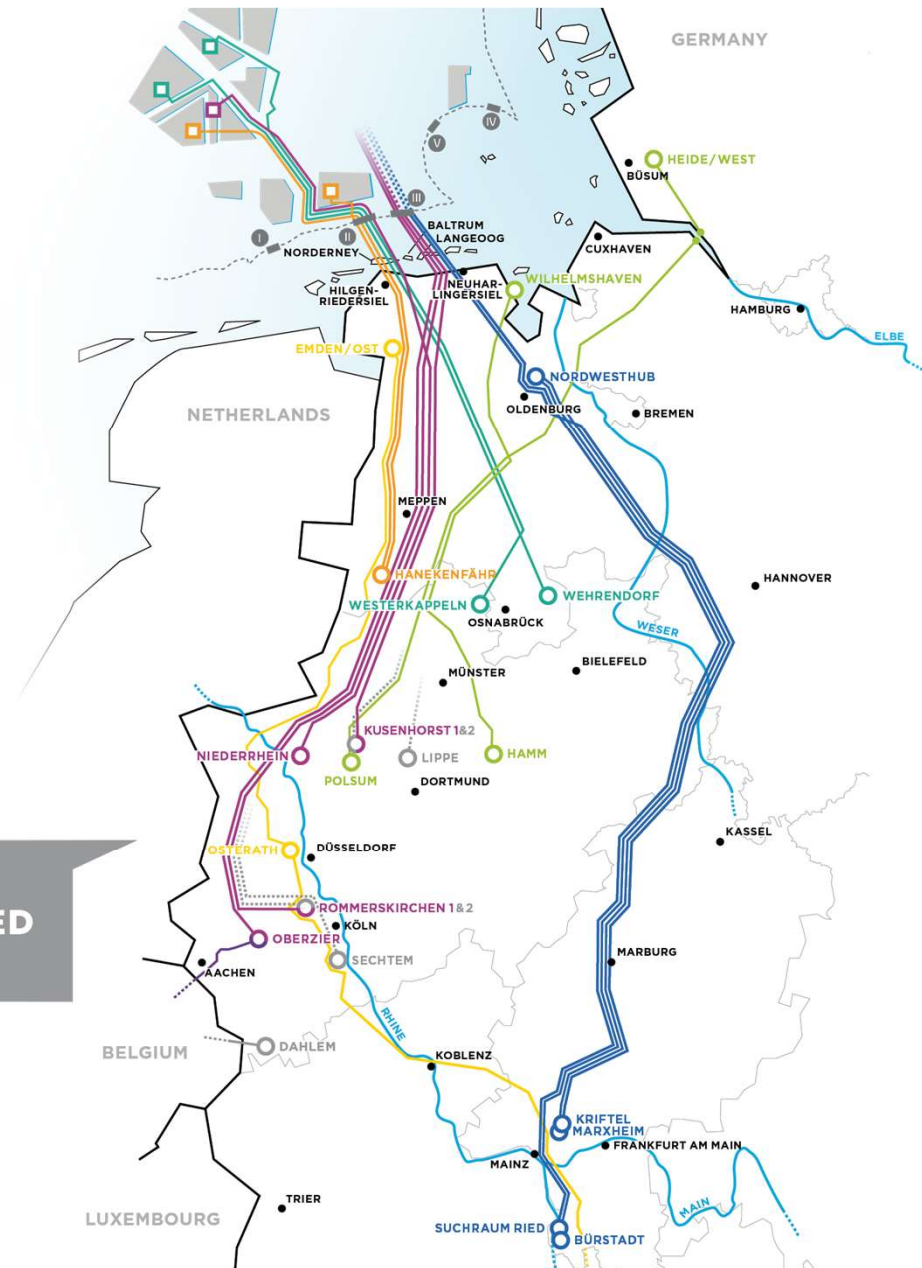
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ALL OTHER PROJECTS WILL BE COMMISSIONED AFTER 2032



# Q&A SESSION

**Dr Carsten Lehmköster**

Managing Director Amprion Offshore and  
Director Economic Grid Management

**Julia Klammer**

Advisor – International Regulatory Management  
and Market Development

**Dr Peter Lopion**

Advisor – International Regulatory Management  
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# ADVERTISEMENT:

## DEVELOPMENT OF A CAPACITY REMUNERATION MECHANISM FOR THE GERMAN ELECTRICITY MARKET

Amprion, Transnet BW, TenneT Germany and 50 Hertz recently published a concept study on the “Development of a capacity remuneration mechanism for the German electricity market”



The study is available for download:

<https://www.netztransparenz.de/de-de/Strommarktdesign/4%C3%9CNB-Studie-zur-Ausarbeitung-eines-Kapazit%C3%A4tsmechanismus-f%C3%BCr-den-deutschen-Strommarkt>



# 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](mailto:MarketReport@Amprion.net)

We are looking forward to your message.



The report is available for download on our homepage:  
[amprion.net/market/market-report](http://amprion.net/market/market-report)

