

MARKET REPORT 2022/23

WEBINAR

PRESENTATION OF KEY FINDINGS



WEBINAR AMPRION MARKET REPORT 2022/23

AGENDA



Host:

Dr Peter Lopion, Advisor - International Regulatory Management and Market Development

1.00 p.m.

Welcome

Dr Hendrik Neumann, Chief Technical Officer (CTO)

1.05 p.m.

Market Analysis: Implications for the Future Market Design

Julia Klammer, Advisor - International Regulatory Management and Market Development

1.15 p.m.

Grid Analysis: Integration Offshore Energy – Key and Challenge for Energy Transition

Julia Watzlawik, Advisor - Transmission System Operation

1.30 p.m.

Interview on the Future of Market and Grid

Dr Carsten Lehmköster, Managing Director Amprion Offshore and Director Economic Grid Management

1.45 p.m.

Q&A Session

2.00 p.m.

Closure

WELCOME

TO THE PRESENTATION OF THE AMPRION MARKET REPORT 2022/23

Dr Hendrik Neumann
Chief technical officer (CTO)



Further information and the report is available
for download on our homepage:
amprion.net/Market/Market-Report/Market-report-2022-2023/



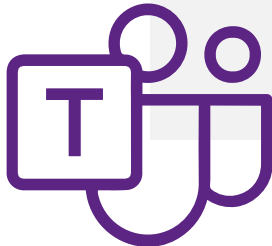
WEBINAR AMPRION MARKET REPORT 2022/23

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

IMPLICATIONS FOR THE FUTURE MARKET DESIGN

Julia Klammer

Advisor – International Regulatory Management
and Market Development

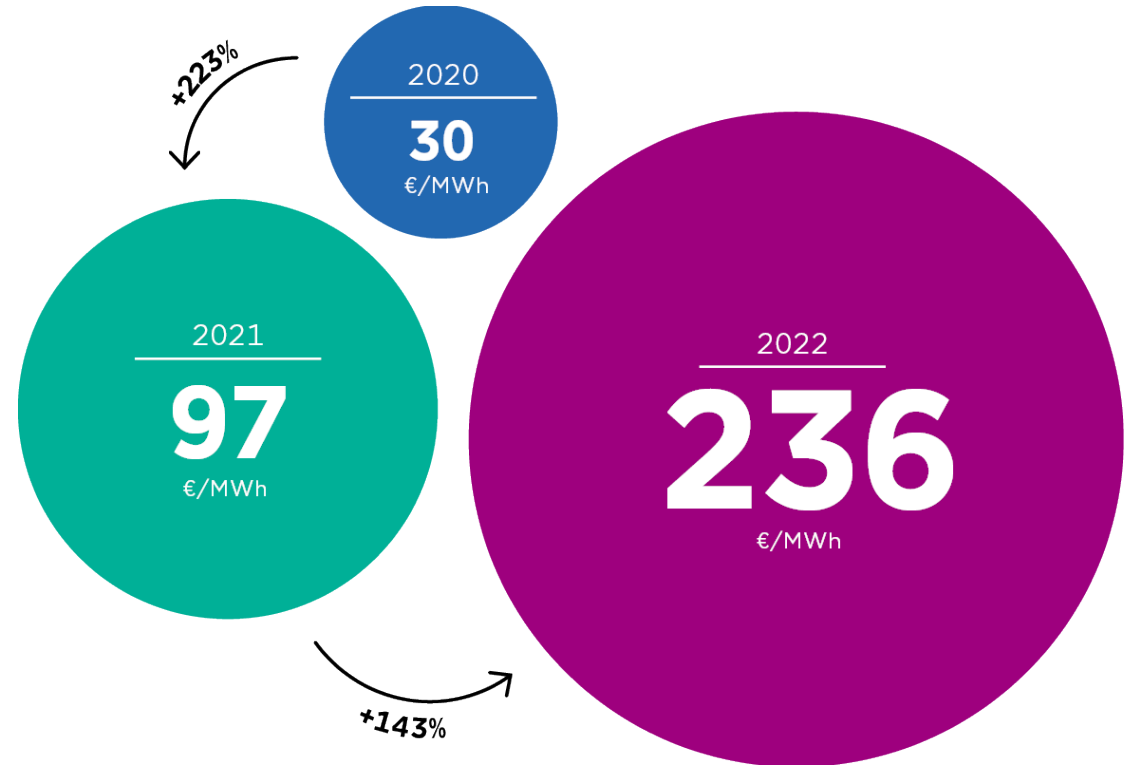


MARKET ANALYSIS

PRICES AT ALL-TIME HIGH

- In 2022 the **electricity market has been extremely influenced by high gas prices** due to the tense political situation in Europe stemming from the Russian war in Ukraine
- The average day-ahead (DA) price in Germany reached about **236 €/MWh in 2022** compared to 30 €/MWh in 2020 (~ +700%)

2022: The third exceptional year in a row

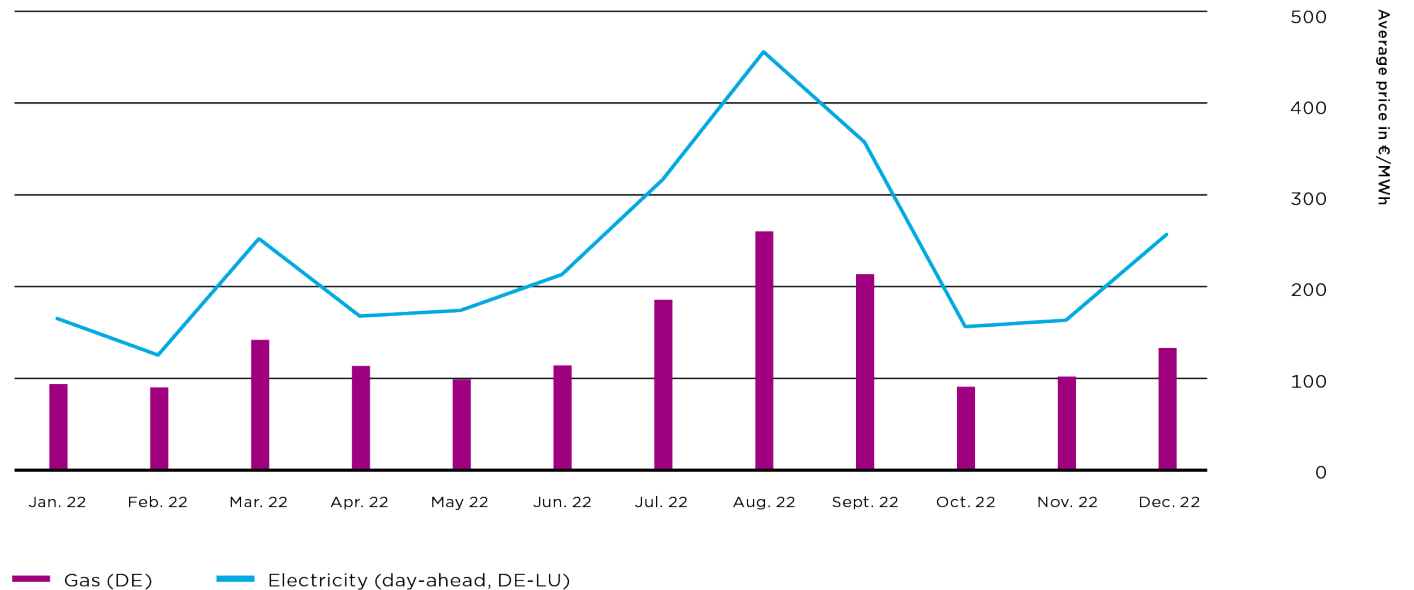


MARKET ANALYSIS

PRICE DEVELOPMENT OVER THE YEAR

- After the start of the war in Ukraine, **gas and electricity prices have increased significantly in March**
- **Reaching an all-time high in August** due to fears of potential gas shortages in the upcoming wintertime

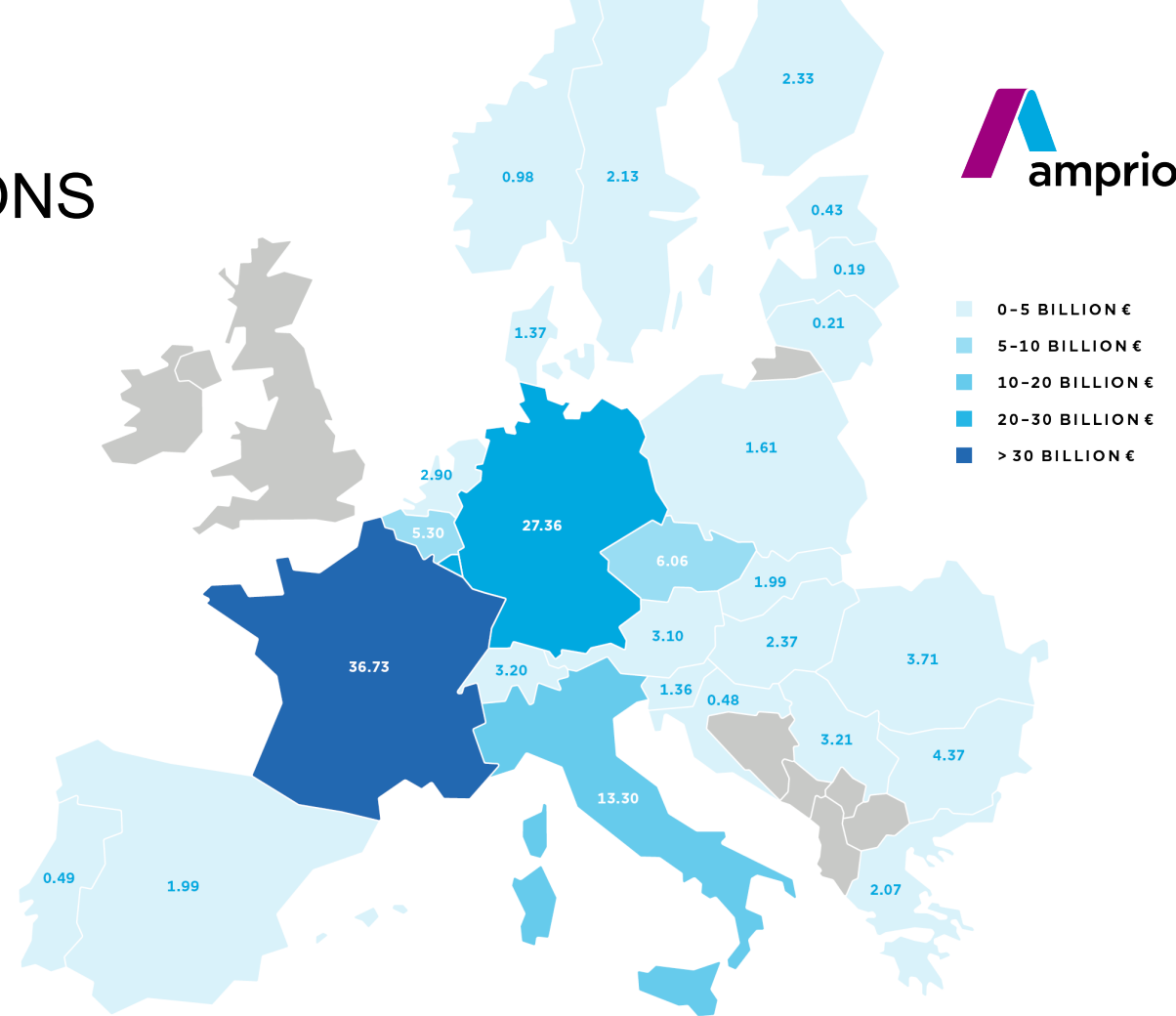
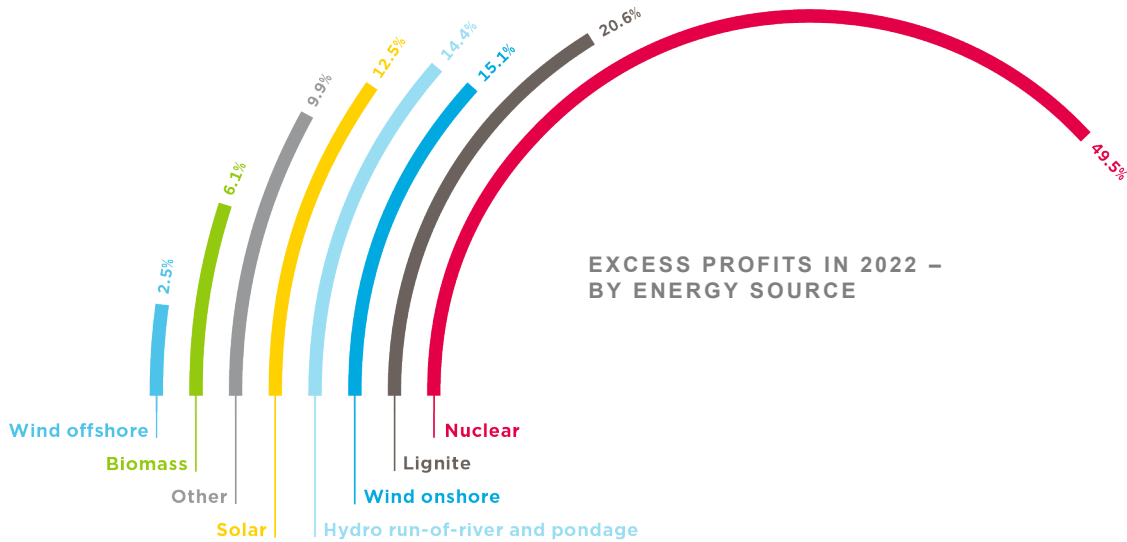
The price development correlates with the turbulent journey regarding all political developments



DEVELOPMENT OF ELECTRICITY AND GAS PRICES IN 2022 IN GERMANY

MARKET ANALYSIS

ELECTRICITY MARKET INTERVENTIONS



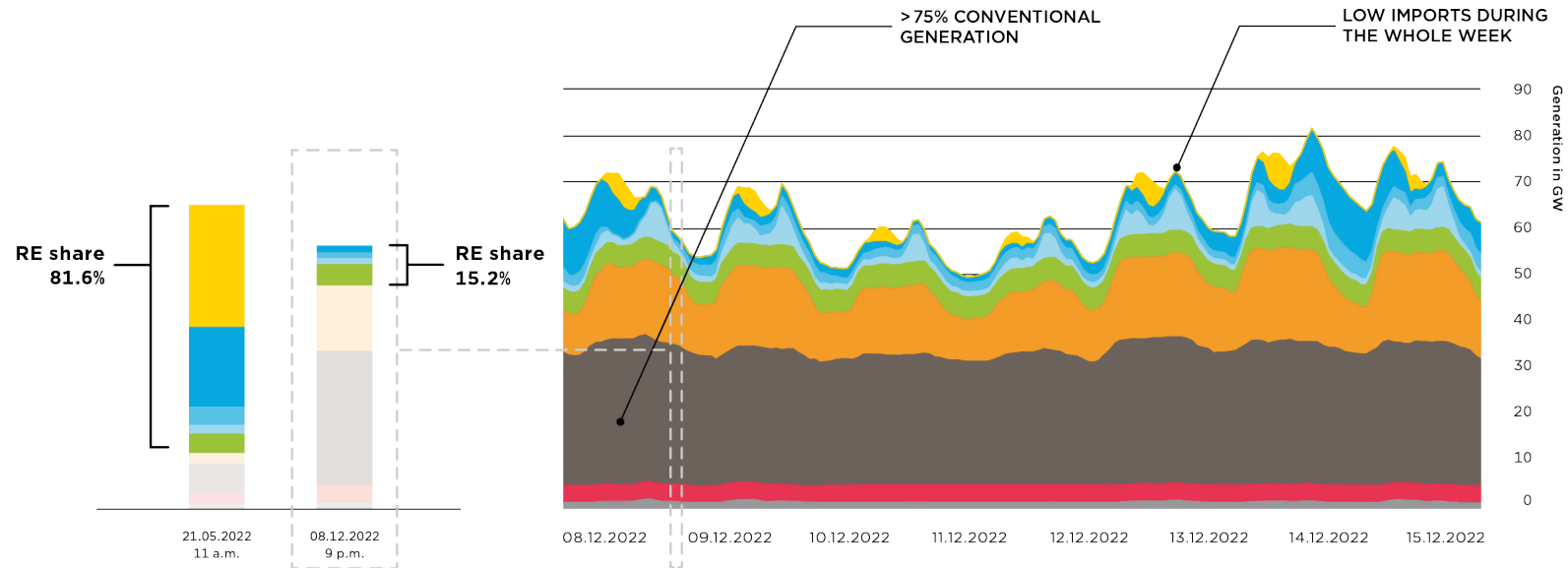
EXCESS PROFITS IN 2022 – BY COUNTRY

Exceptional measures in an exceptional situation

- Proposed European **price cap of 180 €/MWh** to limit excess profits
- In **DE-LU** in around **5400 h** in 2022 DA price **above 180 €/MWh**
- For comparison: before September 2021 in only 2 h (since DE-LU/AT split)
- Highest excess profits (by definition) in FR and DE-LU in particular their **nuclear and lignite power generation**

MARKET ANALYSIS

RENEWABLE POWER GENERATION IN GERMANY



	Solar	Wind onshore	Wind offshore	Hydro	Bio-mass
2020	9%	21%	5%	5%	8%
2021	9%	18%	5%	5%	8%
2022	11%	20%	5%	5%	8%

	Natural gas	Coal	Nuclear	Others
2020	12%	24%	12%	2%
2021	10%	30%	13%	3%
2022	11%	33%	6%	2%

- Increase in renewable power generation
- But also **increase in gas power generation** despite all-time high of gas prices

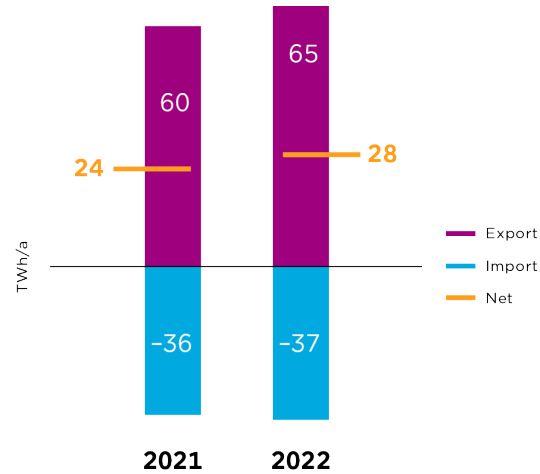
The experience of 2022 illustrates the need for appropriate flexible generation capacities which must be available during times with low renewables infeed

MARKET ANALYSIS

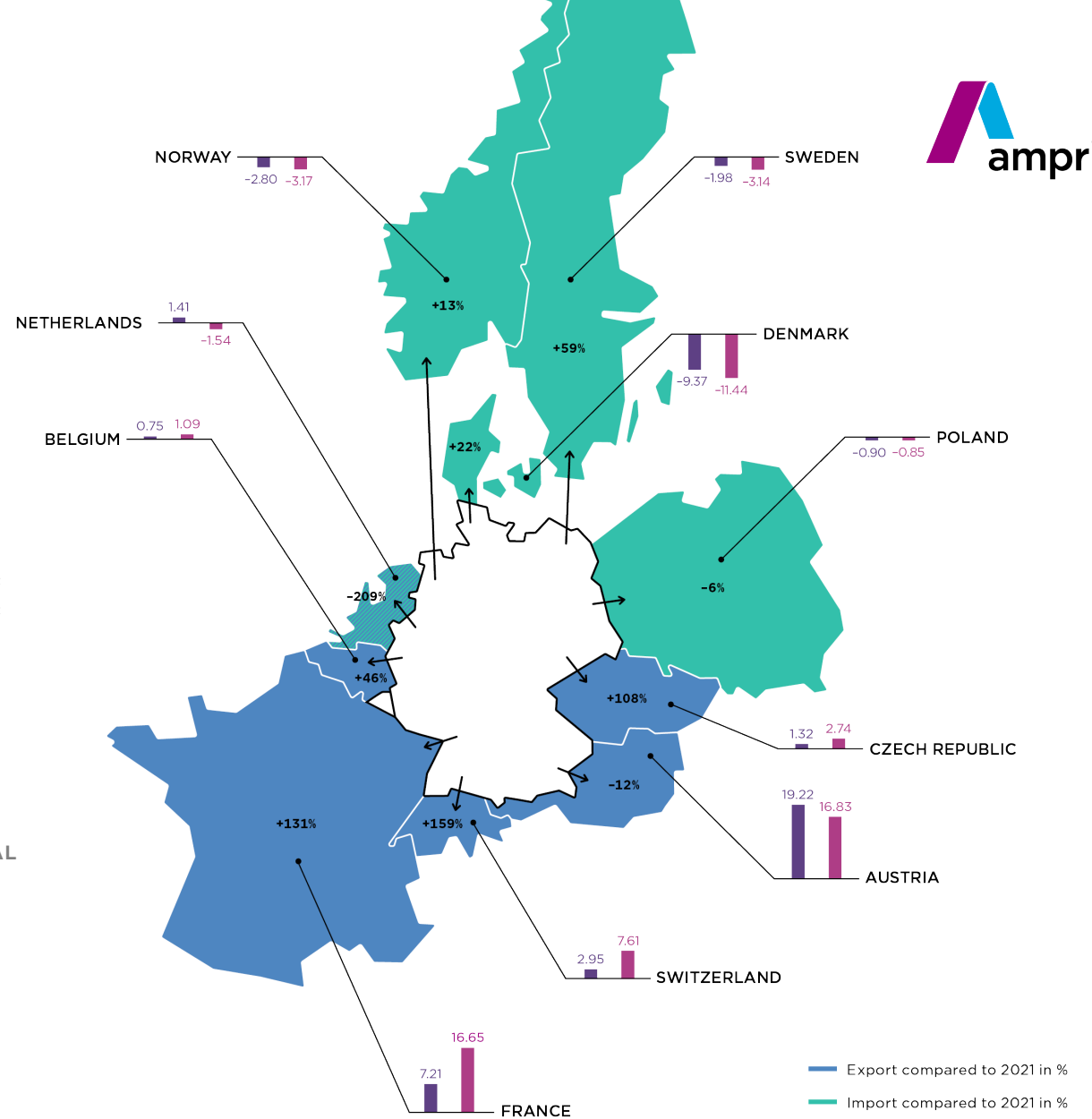
EXPORTS & IMPORTS



- Germany's net exports grew by nearly 20% in 2022
- In particular, there was an increase in exports to France and Switzerland



IMPORTS/EXPORTS OF GERMANY – TOTAL



IMPORTS/EXPORTS OF GERMANY – BY BORDER

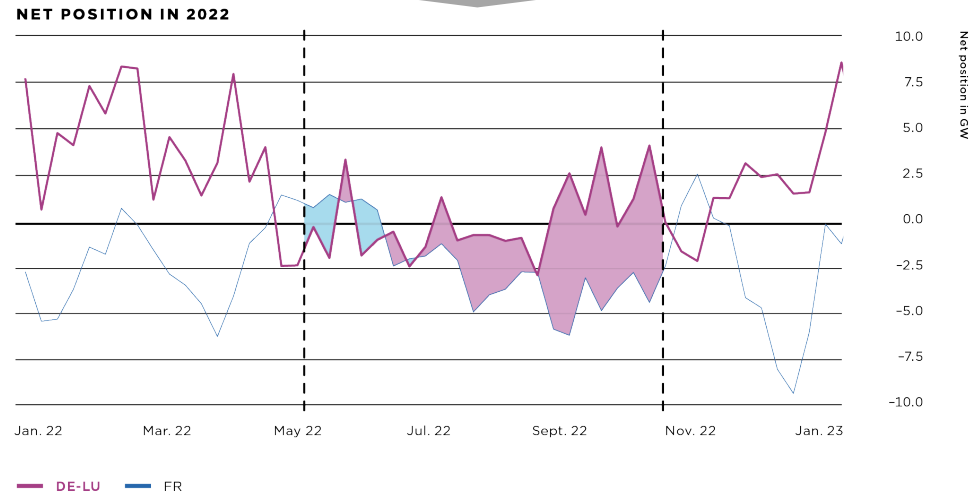
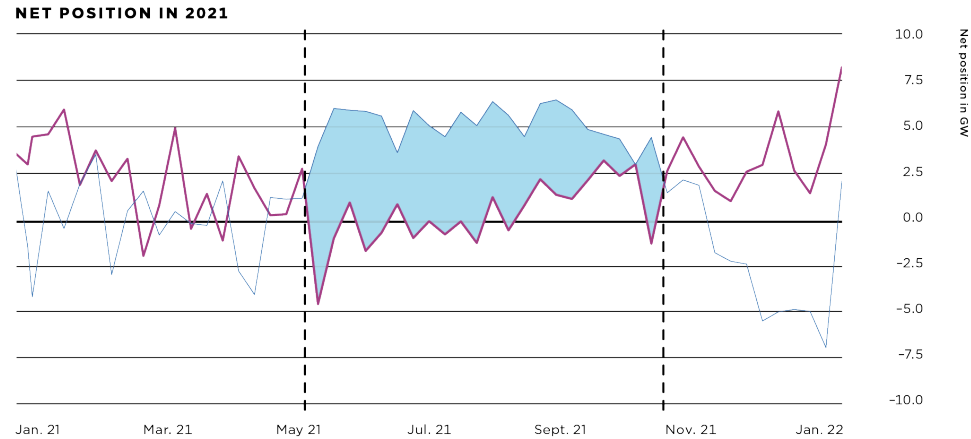
Increase in imports and exports in 2022 shows progress in market coupling as well as further need for grid expansion

MARKET ANALYSIS

FOCUS ON FRANCE

- Domestic power generation in France dropped by around 15% compared to 2021
- The average DA electricity price in France in 2022 was 276 €/MWh compared to 236 €/MWh in Germany
- The situation in France also impacted Switzerland. Normally, Switzerland imports electricity during the winter months, from France and Germany in particular.
 - Due to the shortage in France this had to be compensated by Germany as well

Germany's net exports to France grew by around 130% in 2022 while nuclear-based power generation in France dropped by up to 23% during the summer months



NUCLEAR POWER GENERATION IN FRANCE

Average 2015-2021	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	34.18	29.85	29.20	24.43	23.96	23.89	23.55	23.51	23.52	25.32	25.92	29.60	316.94 TWh
2022	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	35.23	29.48	26.78	21.74	20.46	20.17	18.72	18.08	18.14	20.13	21.54	27.80	278.26 TWh

MARKET ANALYSIS

OUTLOOK EU MARKET DESIGN



On-going discussions and alignments on EC's draft for amendment → finalisation end of 2023 / beginning of 2024

POSITIVE

CRITICAL

Preservation of short-term markets functioning

No review of capacity mechanisms framework

Improved regulatory framework for TSOs:
adaptations of national tariff methodologies

Untested proposal on XB forward transmission rights
(Regional Virtual Hubs) with risks for TSOs

Strengthening of markets due to shorter
gate-closure times and smaller bid sizes

Use of congestion income to compensate offshore RES
for congestions on hybrid interconnectors

...

...

EU Market Design addresses some key issues, but a holistic solution is needed

GRID ANALYSIS

INTEGRATING OFFSHORE ENERGY – KEY AND CHALLENGE FOR ENERGY TRANSITION

Julia Watzlawik

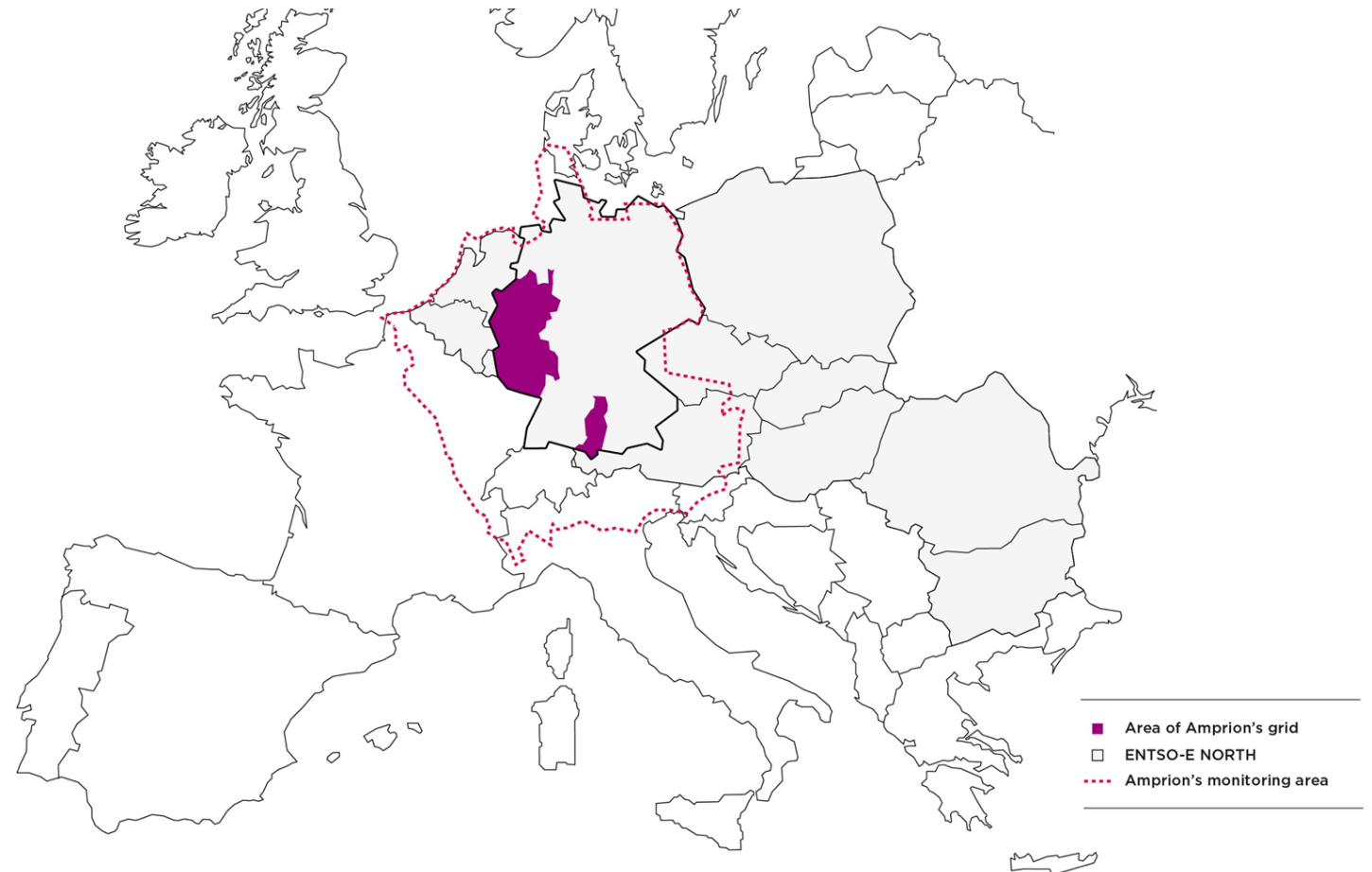
Advisor – Transmission System Operation

GRID ANALYSIS

RELATION GRID EXPANSION AND ELECTRICITY MARKET

- **Amprion's control area is located in the heart of Europe and the CORE Capacity Calculation Region**
- Grid limitations have a huge impact on the resulting flows in the Market Coupling processes
- New grid elements (e.g. HVDC) are necessary to reduce limitations to the market

Grid Expansion has a high relevance on the whole electricity market

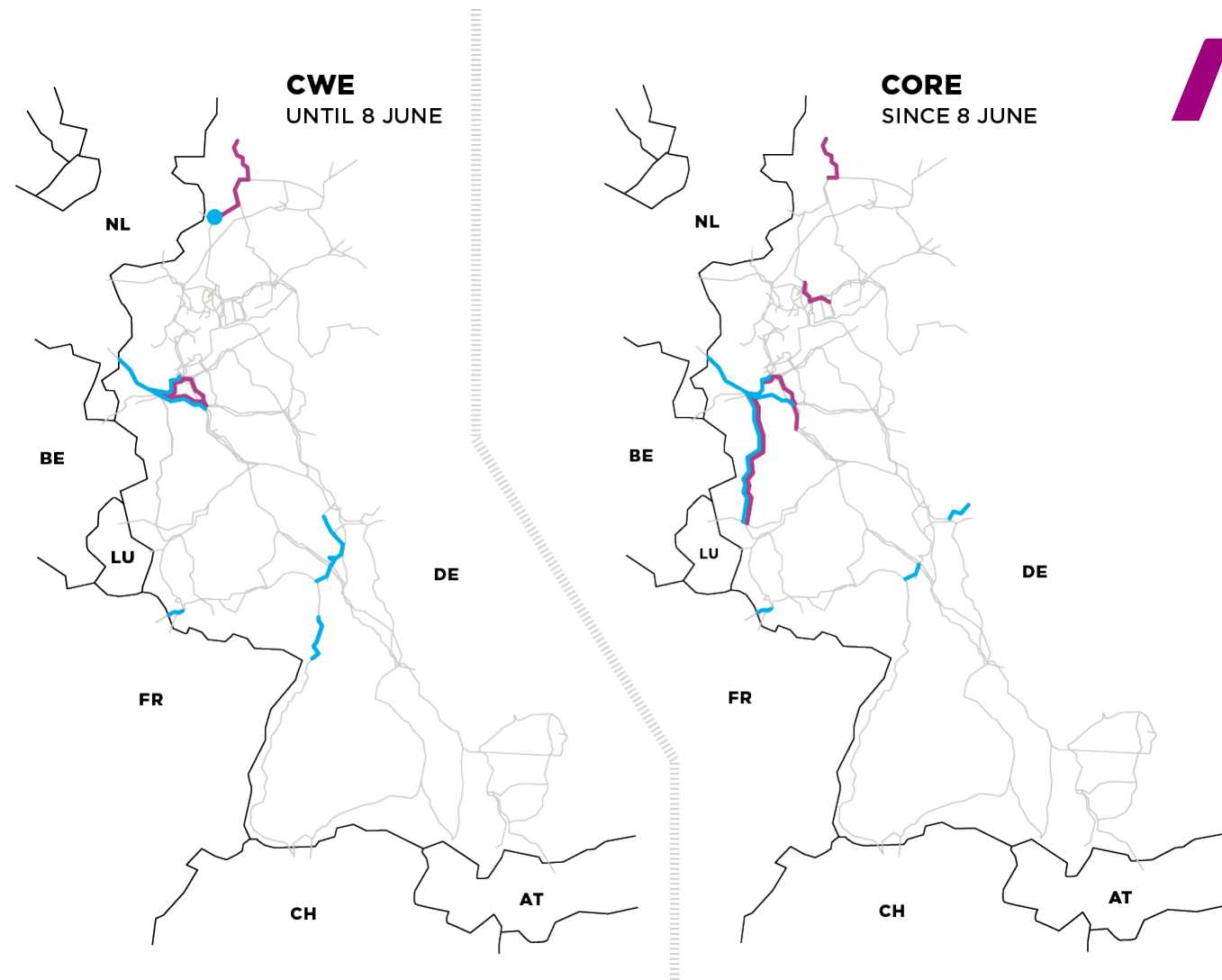


GRID ANALYSIS

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 2022
- 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)

Need-oriented grid expansion remains a top priority

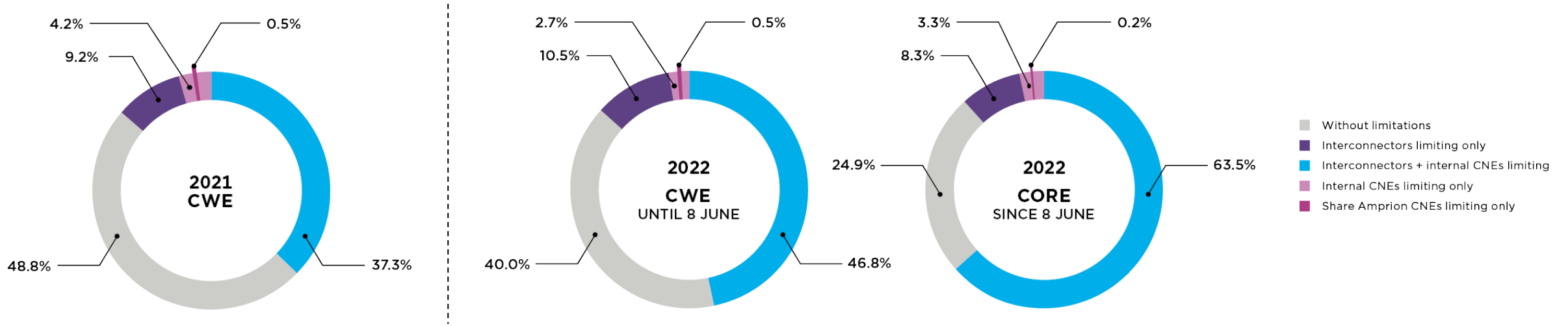


Top 10 critical network elements (CNEs) in 2022

— With lowest offered trading margin for cross-zonal trade — Most often limiting trade (full use of potential trading margin)

GRID ANALYSIS

TRANSMISSION GRID CONSTRAINING TRADE



OVERALL INCREASE OF GRID SITUATIONS WITH TRADE-LIMITATIONS →

← DECREASE OF GRID SITUATIONS WHERE ONLY INTERNAL CNES OF AMPRION LIMITED TRADE →

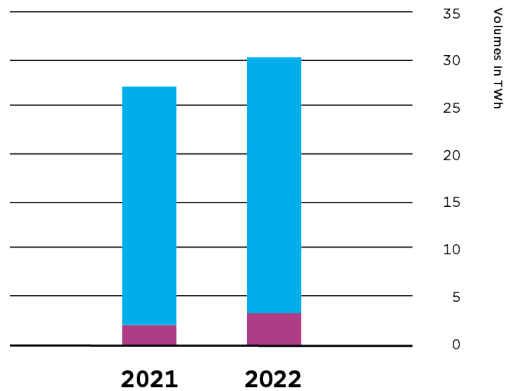
High imports and exports led to a higher utilization of the transmission grid and more complex grid situations – with a high number of market-limiting grid elements occurring at the same time

GRID ANALYSIS

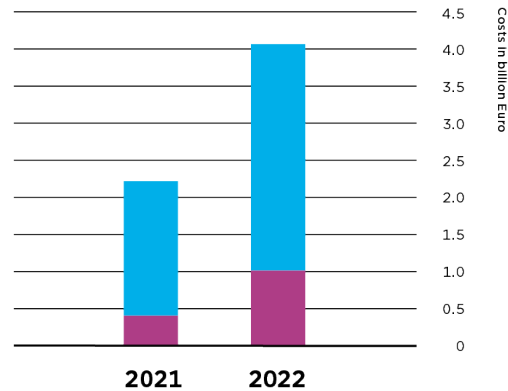
GRID OPERATION ANALYSIS

- High **renewable generation especially in February** led to a significant increase of redispatch volume and corresponding costs in Q1 2022
- As a result of the extremely high electricity prices **during summer**, the **redispatch costs stayed on a very high level** despite the comparatively low volumes

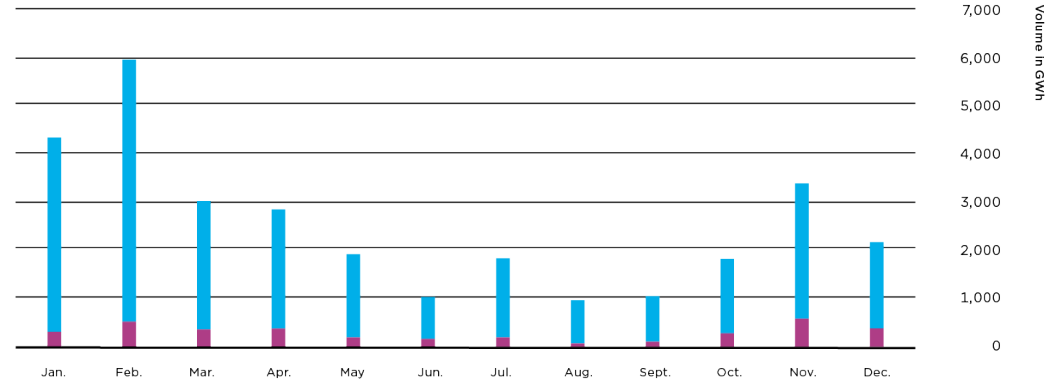
Total redispatch volumes



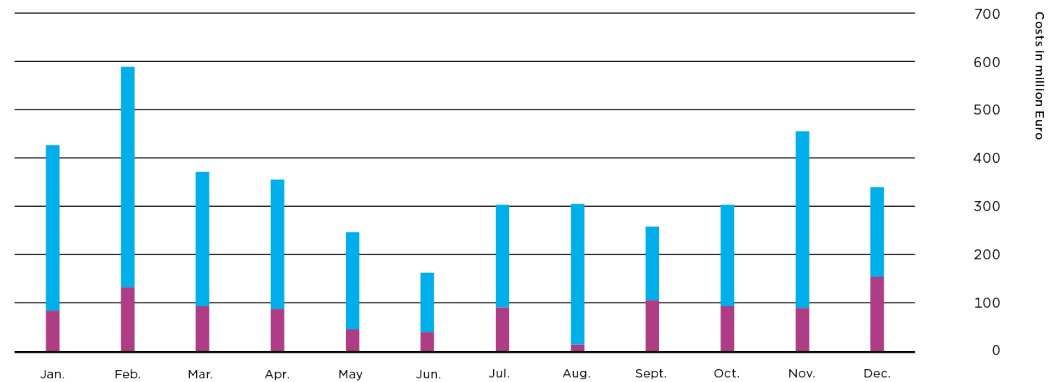
Total redispatch costs



Redispatch volumes - 2022



Redispatch costs - 2022



Redispatch volumes and costs reaching all-time high in 2022

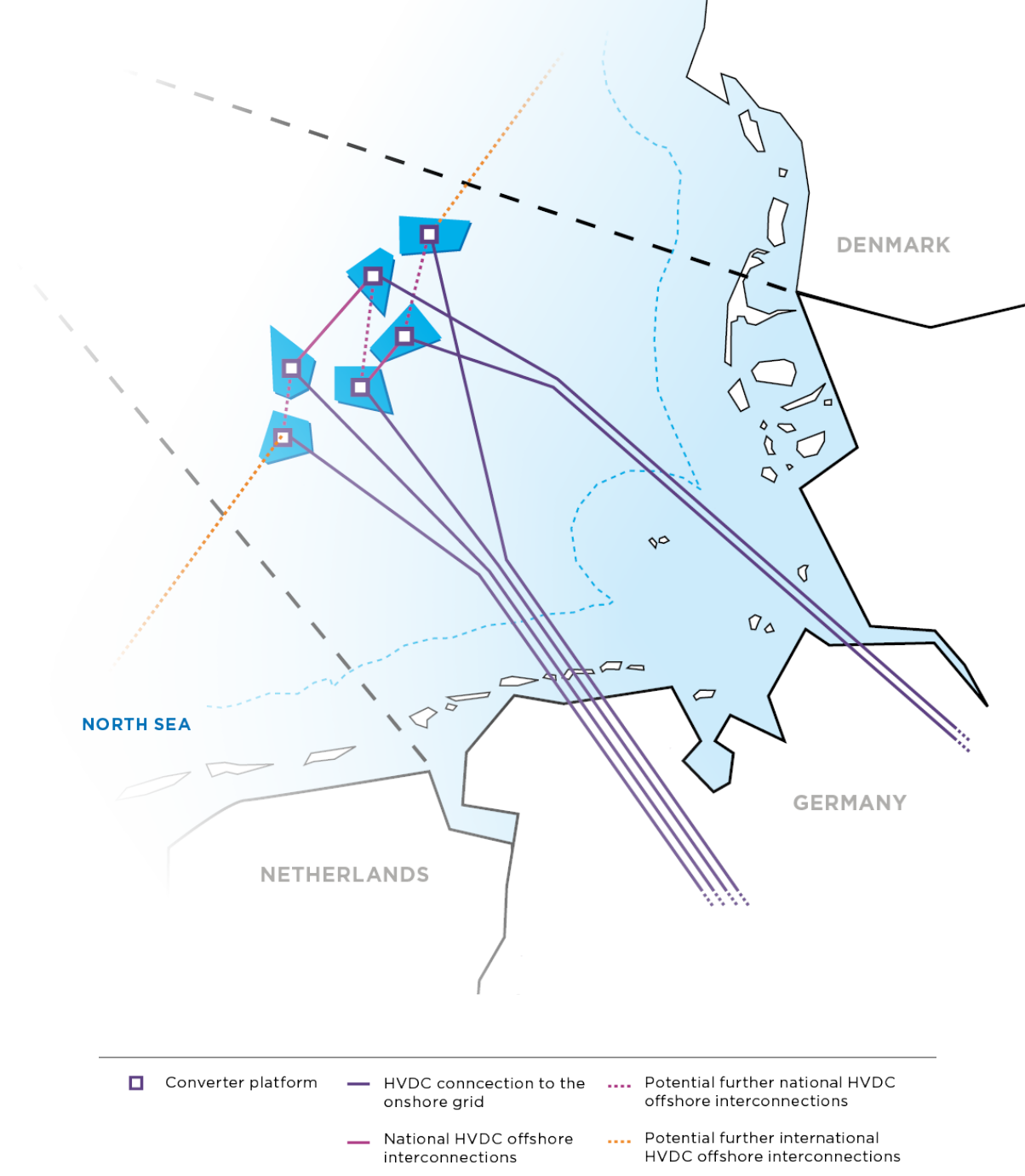
Amprion Other DE TSOs

GRID ANALYSIS

FUTURE DEVELOPMENTS

- For the transformation of the European energy system, **new concepts for the integration of renewable offshore energy are necessary**
- More renewable power generation can be integrated through the **formation of international offshore interconnections**
- In the context of the **Esbjerg Declaration** “**on the North Sea as the green power plant of Europe**”, Belgium, Denmark, Germany and the Netherlands have developed a **first grid topology for the North Sea**
- Grid expansion must be accompanied by an **adequate market design**

In total, Amprion is planning grid investments of more than 22 billion Euro over the next five years



GRID ANALYSIS

CONCLUSION & OUTLOOK

2022: THE THIRD EXCEPTIONAL YEAR IN A ROW

Market Design

- Electricity markets have been extremely influenced by high gas prices due to the tense political situation stemming from the Russian war in Ukraine
- Leading to unprecedented measures of the EC to intervene in the gas and electricity market
- Grid expansion needs to be accompanied by a future-proof market design
- Amprion's Systemmarkt represents a holistic solution for the future market design

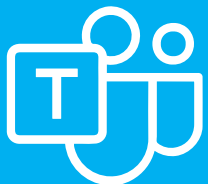
Grid Expansion

- Grid expansion remains top priority and must be need-oriented
- In total, Amprion is planning grid investments of more than 22 billion Euro over the next five years
- More renewable power generation can be integrated through the formation of international offshore interconnections
- Our analyses of the trade-limiting network elements show important indicators for the expansion of Amprion's grid

Now more than ever, a suitable market design able to push the expansion of renewable and new back-up capacities is needed in order to become more independent from energy imports as Europe

QUESTIONS?

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



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INTERVIEW

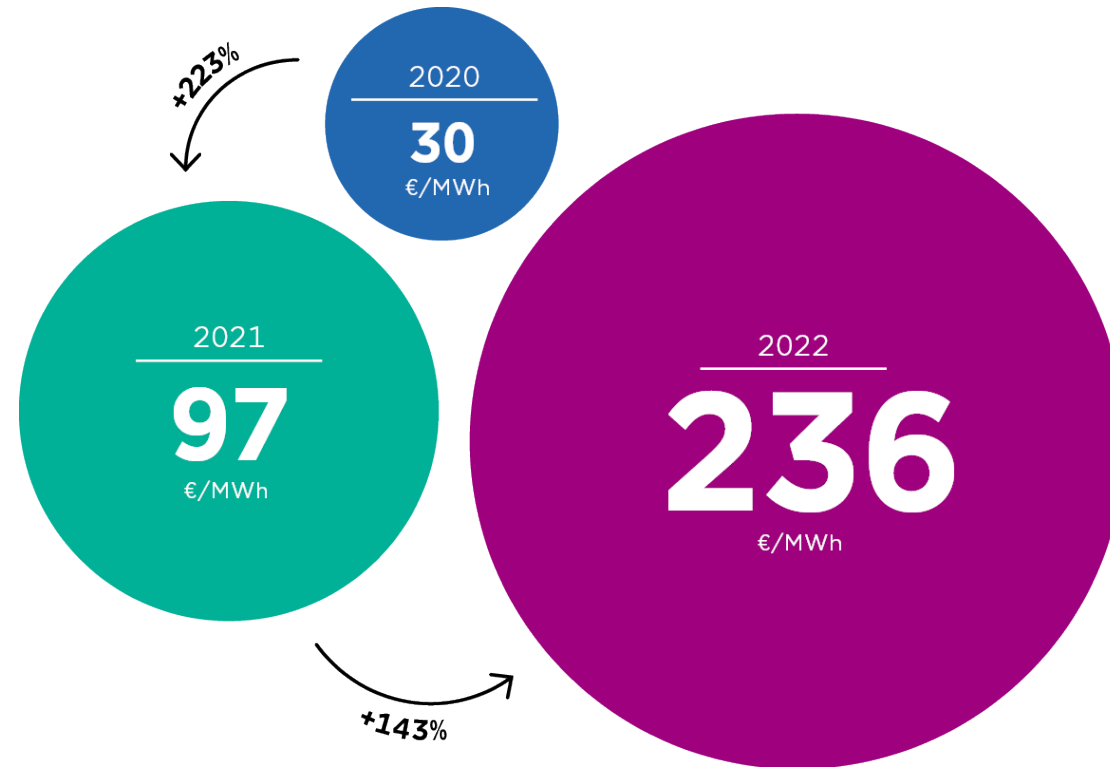
ON THE FUTURE OF MARKET AND GRID

Dr Carsten Lehmköster
Managing Director Amprion Offshore and
Director Economic Grid Management

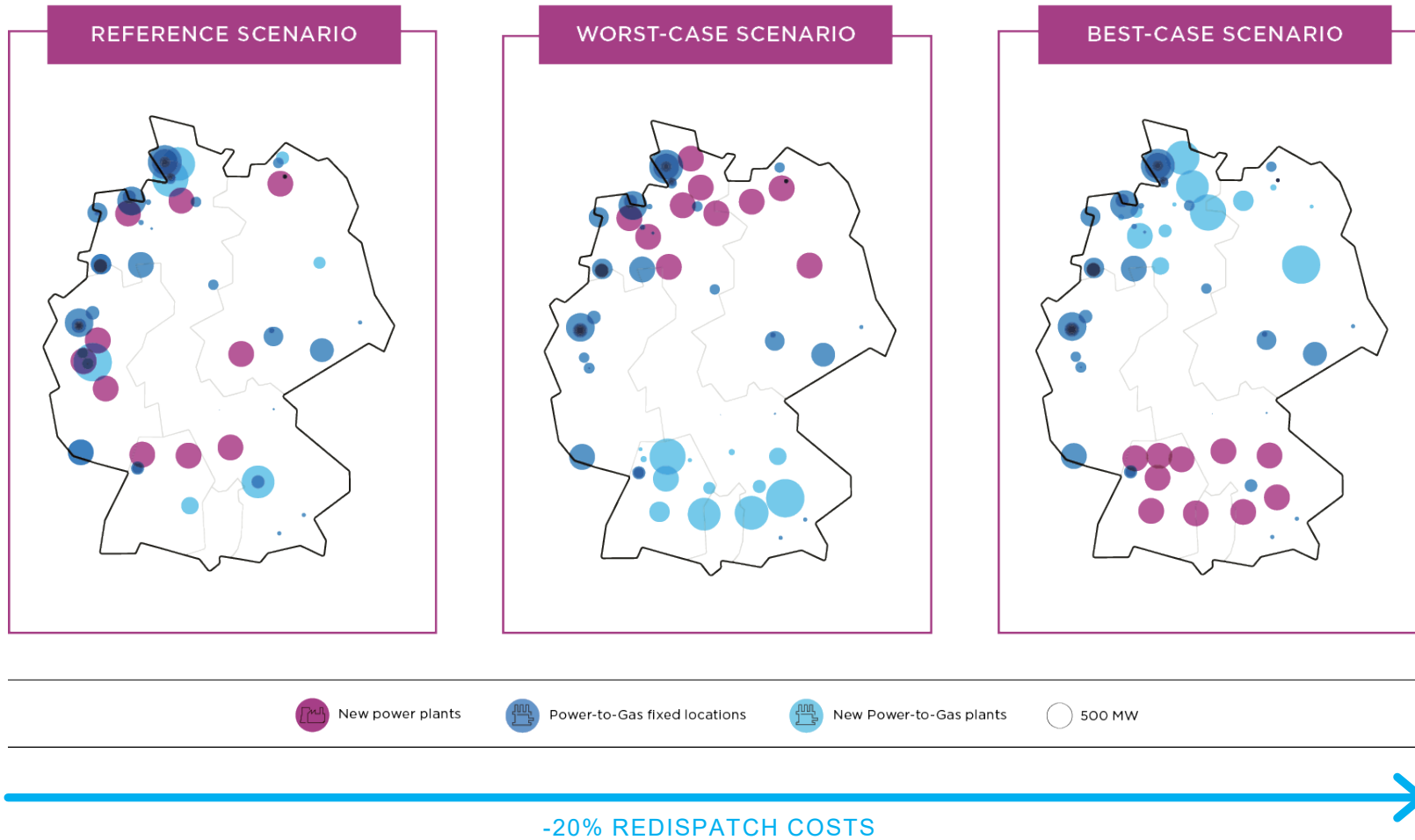


INTERVIEW ON THE FUTURE OF MARKET AND GRID

MARKET DEVELOPMENT

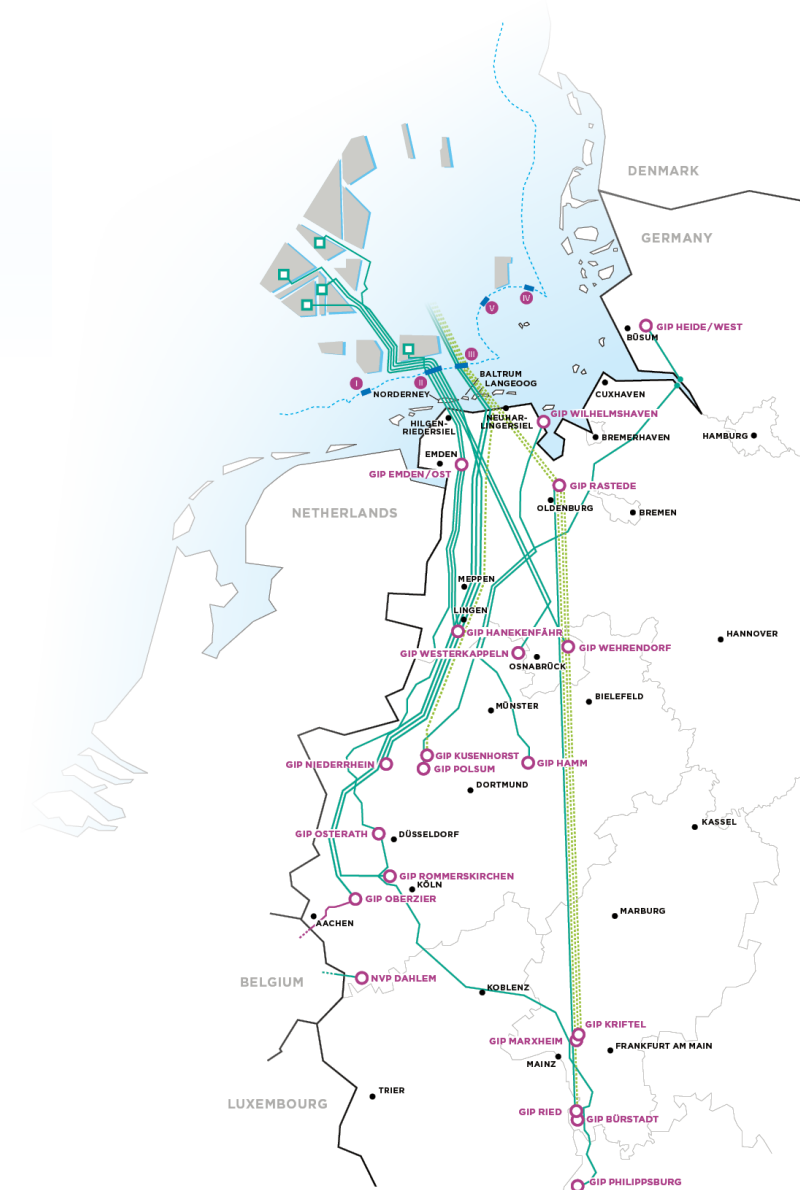
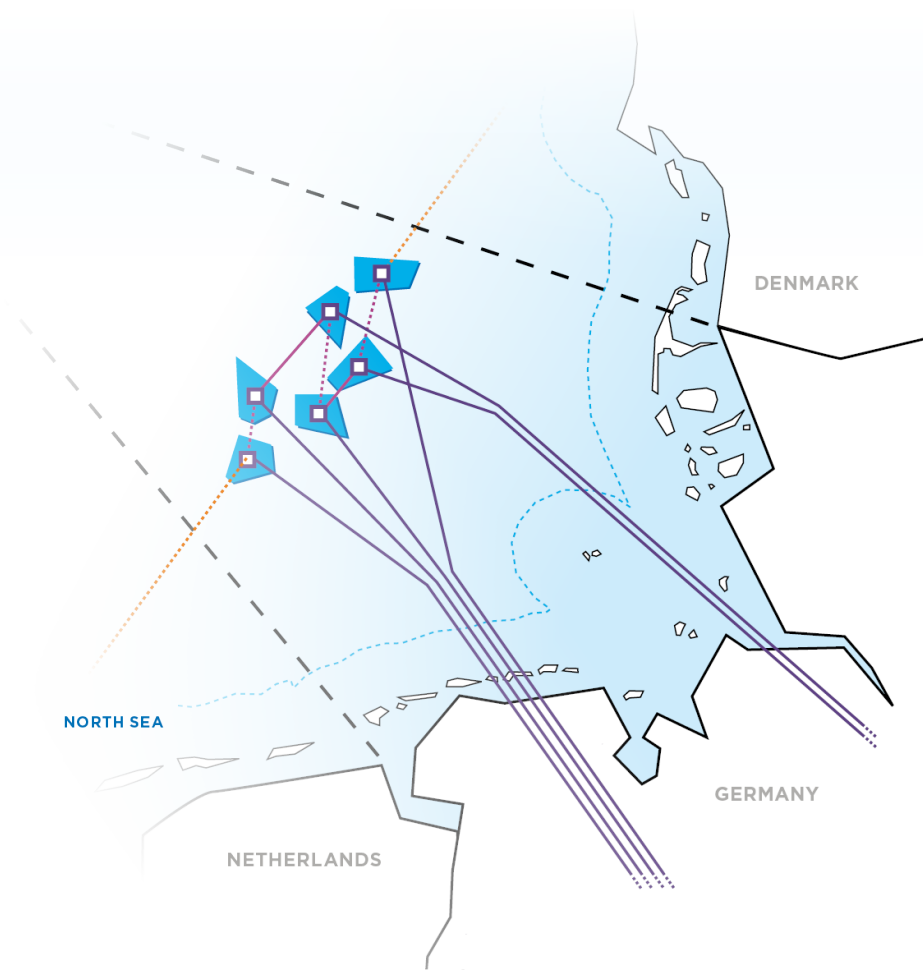


INTERVIEW ON THE FUTURE OF MARKET AND GRID MARKET DESIGN



INTERVIEW ON THE FUTURE OF MARKET AND GRID

GRID DEVELOPMENT



Q&A SESSION

Dr Carsten Lehmköster

Managing Director Amprion Offshore and
Director Economic Grid Management

Julia Klammer

Advisor – International Regulatory Management
and Market Development

Julia Watzlawik

Advisor – Transmission System Operation



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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:
amprion.net/Market/Market-Report/Market-report-2022-2023/

