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EnergyWeek

Clean energy choices for reaching a resilient and carbon neutral Nordic region

By:

Nordic Energy Research

22.3.2023

2023 MARCH 20–24 VAASA, FINLAND

Moderator

Helena Sarén

Head of Zero Carbon Future mission at Business Finland

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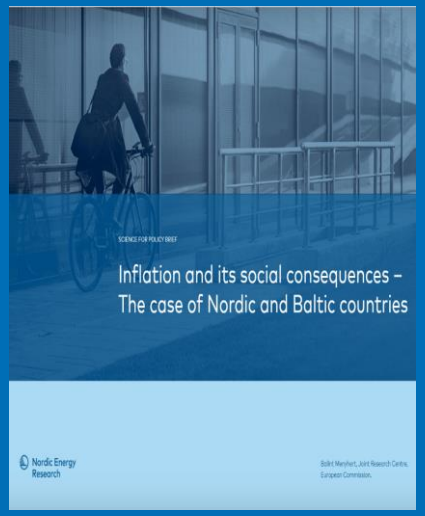
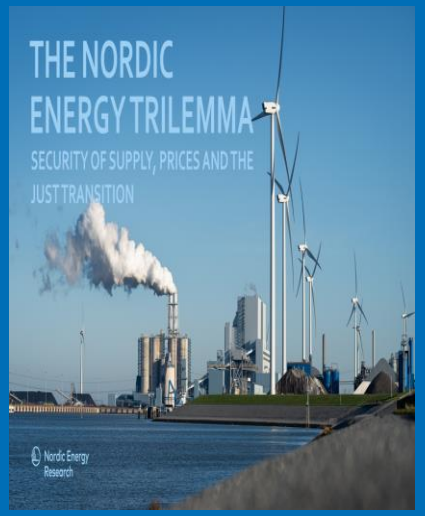
A troubled world calls for stronger Nordic cooperation

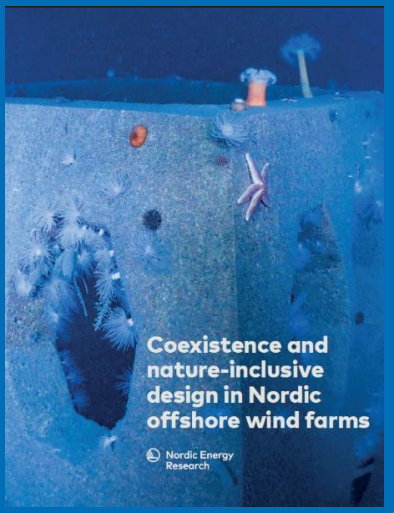
Klaus Skytte,
CEO, Nordic Energy Research

Nordisk Energiforskning

www.nordicenergy.org







The social effects of inflation in the Nordic and Baltic countries

Bálint Menyhért
Research Economist

European Commission

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“The social effects of inflation in the Nordic and Baltic countries”

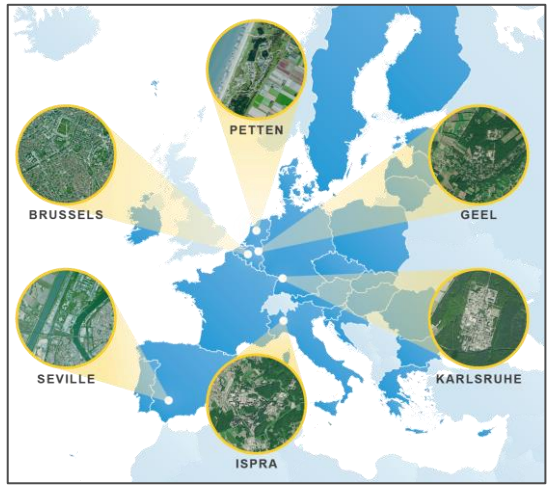
Bálint Menyhért
Joint Research Centre, European Commission

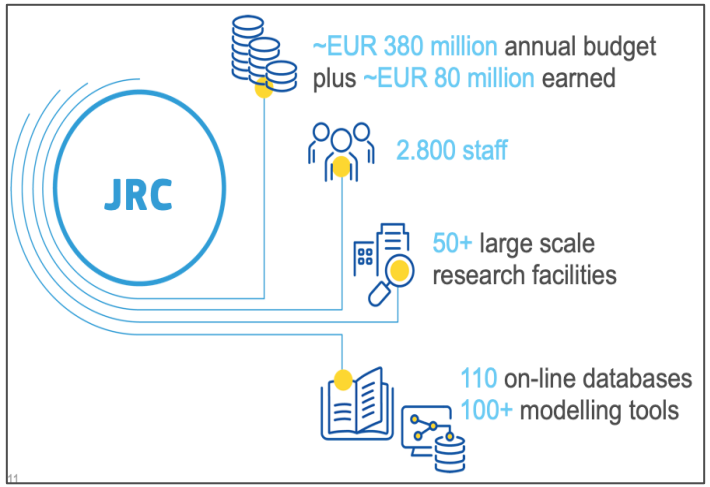
Vaasa Energy Week,
22 March 2023

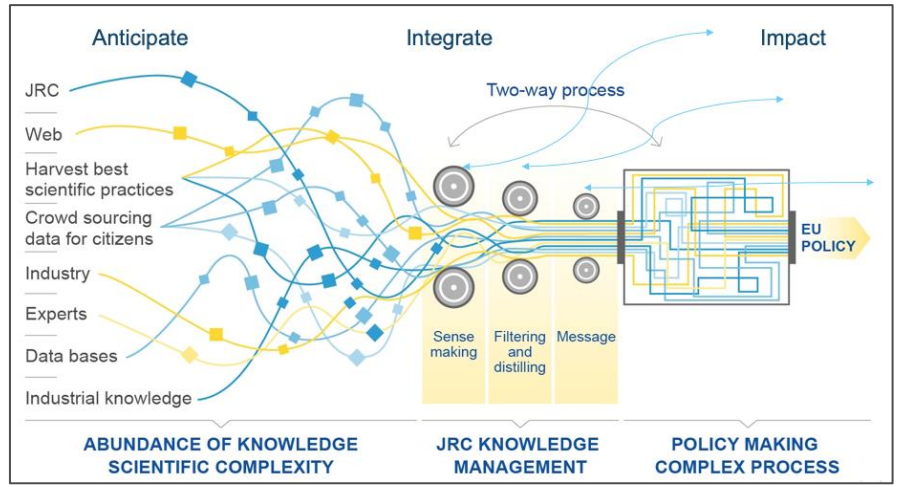
The Joint Research Centre of the European Commission

- The Joint Research Centre (JRC)
  - is the science and knowledge service of the European Commission
  - its mission is to support EU policies with independent evidence throughout the whole policy cycle

- JRC and the Research Council of Norway (RCN)
  - JRC-RCN cooperation was formalised in 2012 and extended in December 2017 with the signature of a Research Framework Arrangement
  - cooperation and collaboration extend to innovation, climate, environmental, maritime and energy related topics

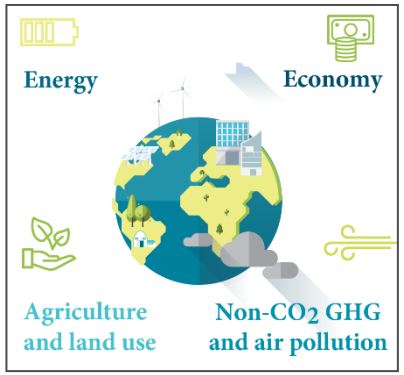


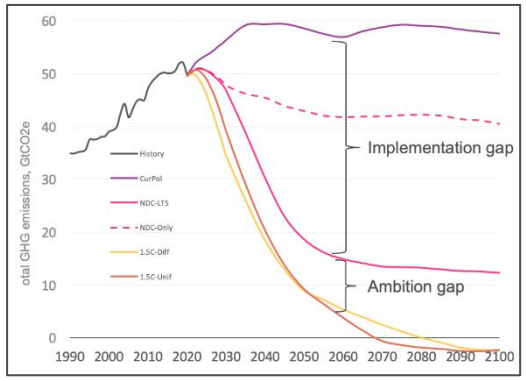


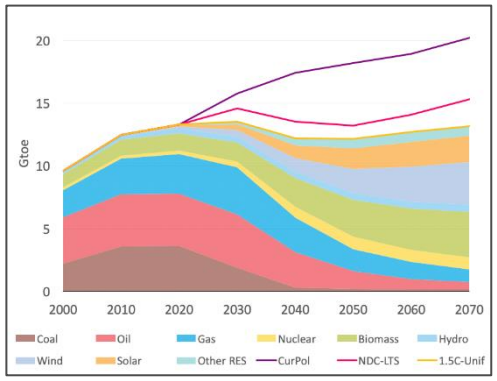


JRC work on global energy modelling

- Annual Global Energy and Climate Outlook since 2015
- Latest 2022 edition focuses on energy demand and energy trade shifts
- A multidimensional framework of models is used to assess policies on emissions & NDCs, climate & energy transitions, macroeconomic and social outcomes







European Commission

Recent JRC Science for Policy Brief and NER Bulletin

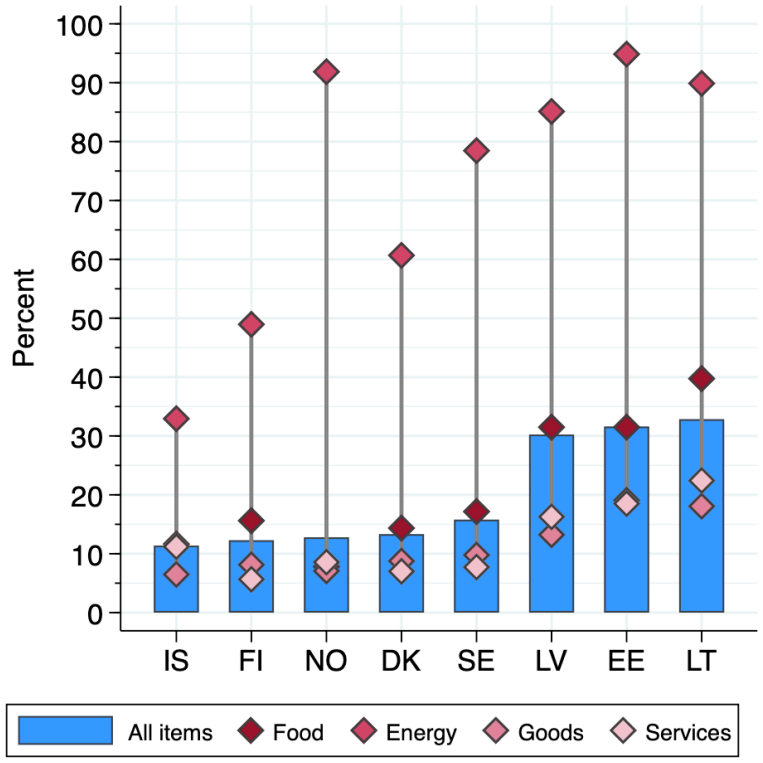
- Empirical analysis and modelling based on microdata on European household surveys (EU-SILC, EU-HBS)

- Two main questions are explored:
  - Which are the households that are most affected by inflation?
  - What are the potential effects of inflation on poverty, material deprivation and the social situation?

- The relevant JRC Brief and NER Bulletin are available online:
  - https://publications.jrc.ec.europa.eu/repository/handle/JRC132805
  - Inflation and its social consequences – The case of Nordic and Baltic countries – Nordic Energy Research

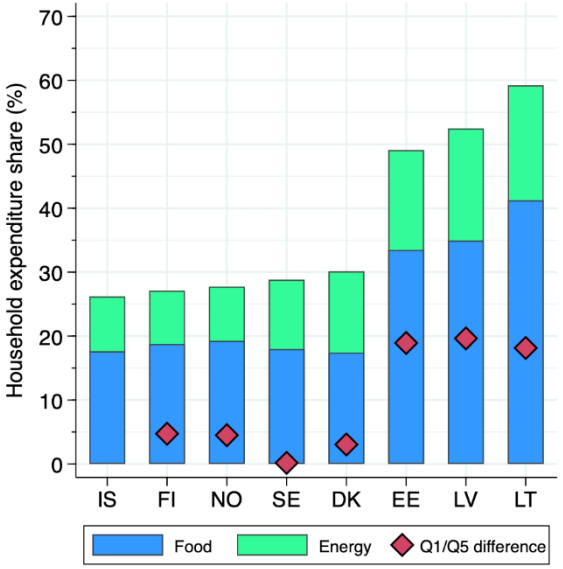
European Commission

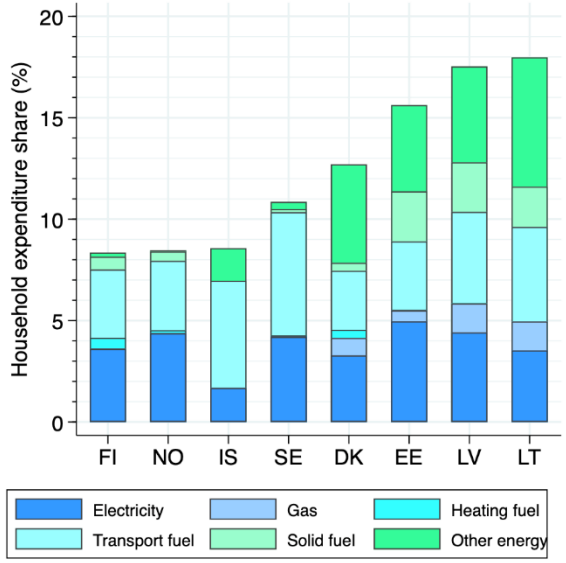
Main patterns of inflation across Northern Europe



- Headline inflation over 2021 and 2022 was 20% on average in Northern Europe and ranged btw. 11.4% - 32.8% at the country level
- Energy prices are the main driver of inflation and have increased by 72.8% on average (btw. 32.9% - 94.8% at the country level)
- Food prices have also increased at above-average rates, while goods and services inflation remained relatively contained
- Common patterns but marked differences in levels between Nordic and Baltic countries

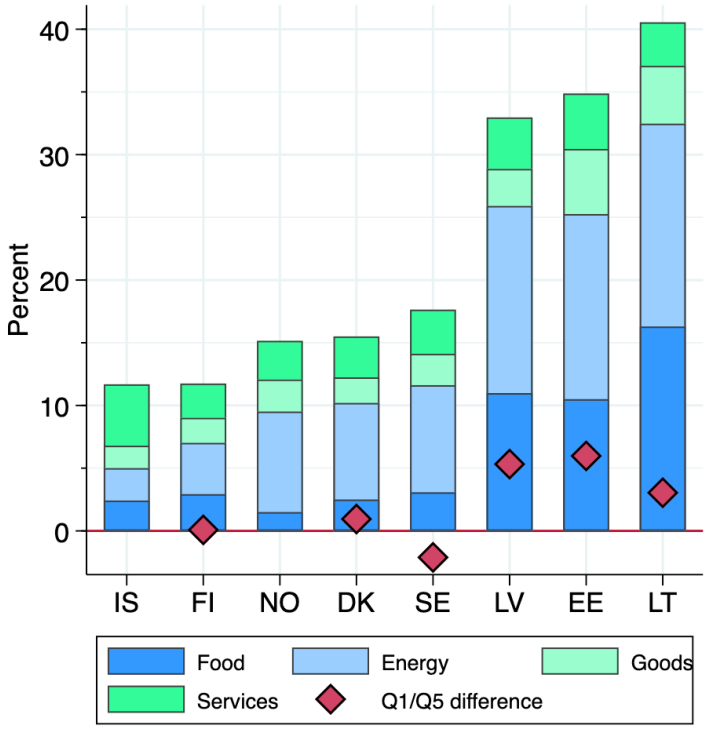
Structure of households' consumption expenditures





- A substantial part of the variation in inflation is explained by households' consumption structure - both within and between countries
- Large cross-country variations in the combined food and energy (F&E) expenditure shares (28% in Nordics vs. 54% in Baltics)
- Large within-country variations in some countries (Q1/Q5 gaps in F&E are 3.1 p.p. in Nordics vs. 18.9 p.p. in Baltics)
- Differences are driven mostly by the food expenditure share, but energy consumption and composition also varies substantially

Cost of living adjustments due to inflation



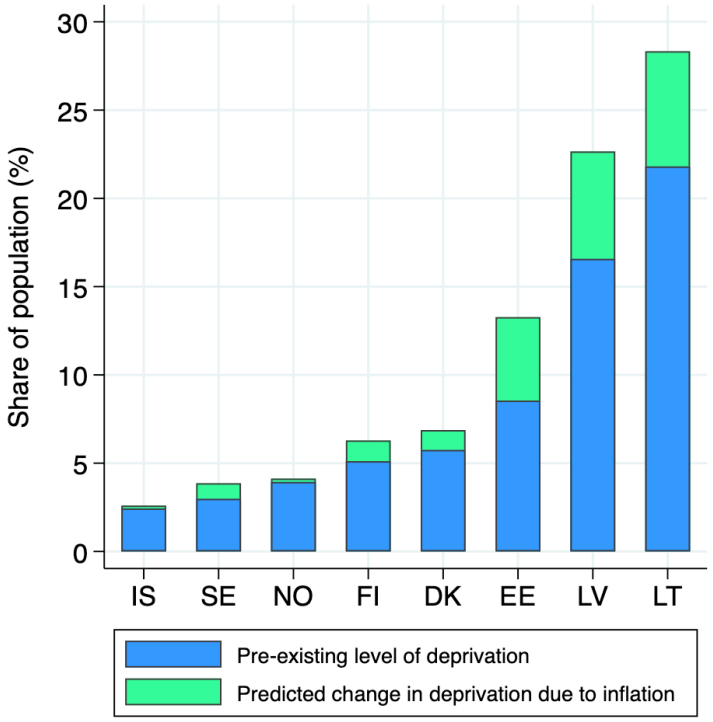
- The resulting change in HHs' living costs during 2021-2022 is very uneven – 14.3% in the Nordics vs. 36.1% in the Baltics
- Energy is the most important but not the only driver of increases in living costs – its relative contribution is 22.1% in Iceland vs. 52.9% in Norway
- The Q1/Q5 gap in living cost adjustments is negligible in the Nordics but 3 – 6 p.p. in the Baltics – putting low-income HHs at a double disadvantage

Potential effects of inflation on the social situation

- Despite detailed information on living costs, it is not easy to assess the social consequences of inflation
  - Lags and limitations in available HH survey data
  - Leading social policy indicators are often non-monetary / not directly affected by changes in HHs' real income
  - The effects of government support and households' behavioural response are hard to predict

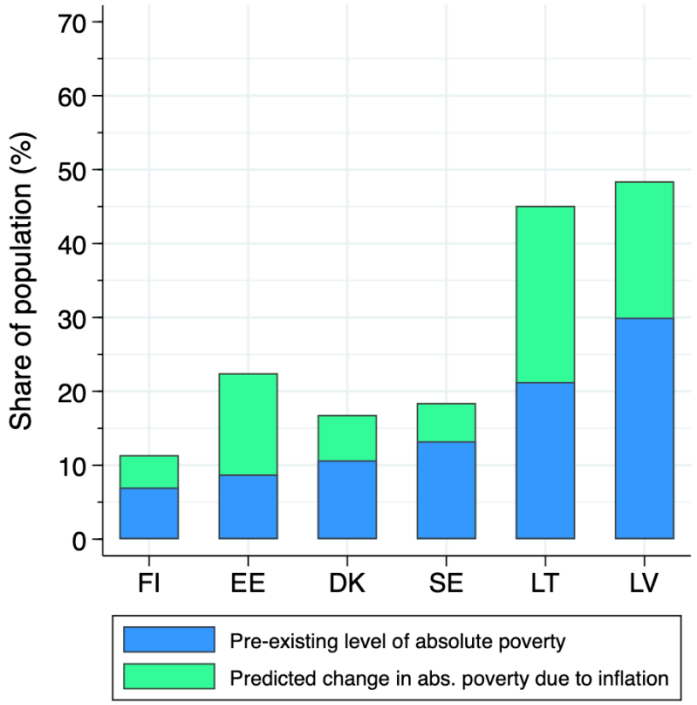
- Current analysis quantifies the mechanistic effects of inflation in absence of income or behavioural adjustments
  - Material and social deprivation (MSD)
  - Absolute monetary poverty (ABSPO)
  - Energy poverty

Material and social deprivation



- Material and social deprivation (MSD) is a non-monetary composite indicator of enforced inability across 13 deprivation areas
- Using historical correlations in the EU-SILC microdata, one can quantify the potential inflation effects on MSD through the implied change in real income
- Estimated income elasticities are low, and the predicted deprivation effects are moderate – 0.7 p.p. in the Nordics and 5.8 p.p. in the Baltics

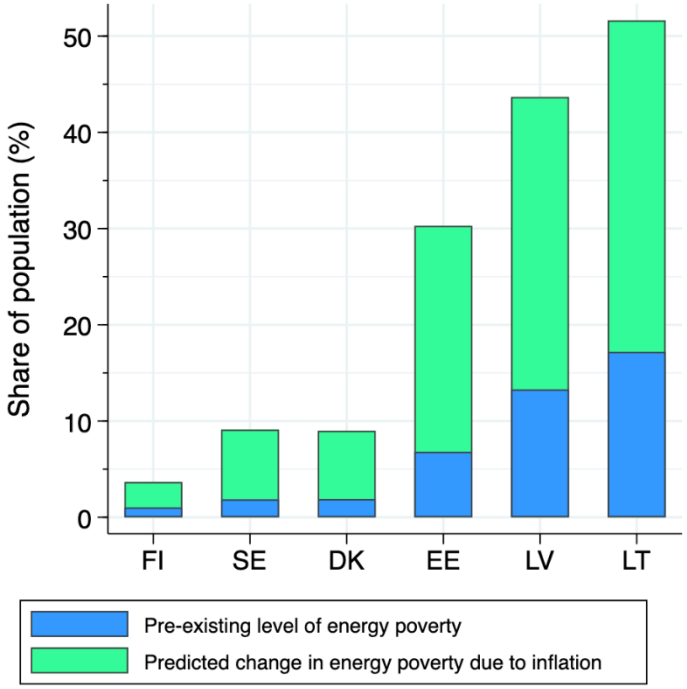
Absolute poverty



- The recent JRC project "Measurement and monitoring of absolute poverty (ABSPO)" produced cross-country comparable absolute monetary poverty thresholds based on the minimum cost of decent living for all EU countries
- To capture the effects of inflation, one can easily update the ABSPO thresholds and re-calculate the poverty rate with EU-SILC data
- The predicted increase in absolute poverty are alarming – 5.2 p.p. in the Nordic EU countries and 18.7 p.p. in the Baltic countries

Energy poverty

- Energy poverty is defined as a situation in which HHs are unable to access essential energy services
- The Commission's Recommendation on energy poverty (EU 2020/1563) provides guidance on definitions and indicators
  - Potential measurement based on energy spending ratios / self-assessment / direct indicators / indirect indicators



- Using EU-SILC microdata on self-reported enforced inability predicts relatively low effects – below 1 p.p. in the Nordics and 3 p.p. in the Baltics
- Using EU-HBS microdata on household spending and a fixed energy expenditure share threshold (e.g. 30%) yields relatively large increases – 5.7 p.p. in the Nordics and 29.4 p.p. in the Baltics
- Due to restrictive assumptions (i.e. no relative price effects or energy saving), these should be considered as lower-bound and upper-bound estimates

Conclusions and policy recommendations

- The social situation is rather serious and calls for a strong and coordinated policy response
  - Nordic countries are relatively insulated with limited inflation inequality and moderate social costs
  - Baltic countries are highly exposed with substantial inflation inequality (3-6 p.p.) and potentially double-digit increase in poverty
- Potential policy recommendations include
  - short-term emergency price measures (e.g. through VAT reductions)
  - strengthening redistribution and increasing the effectiveness of social protection systems (e.g. through income support)
  - aligning protective measures with the strategic priorities of the climate / energy / digital transitions
- Improved data collection and indicator development could support sound evidence-based policy-making
  - harmonisation and integration of European household surveys
  - collection of new microdata on HHs' self-perceived basic needs / living and housing conditions / consumption patterns
  - improvements in social indicators and measurement of energy poverty, affordable housing, essential services

Thank you for the attention!

Contact:

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European Commission

THE NORDIC ENERGY TRILEMMA

SECURITY OF SUPPLY, PRICES AND THE JUST TRANSITION

Marton Leander Vølstad

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THE NORDIC ENERGY TRILEMMA

SECURITY OF SUPPLY, PRICES AND THE JUST TRANSITION

Nordic Energy Research

Agenda

1 Introduction and focus of the report

2 Drivers, preparedness and response

3 Risks and mitigation measures

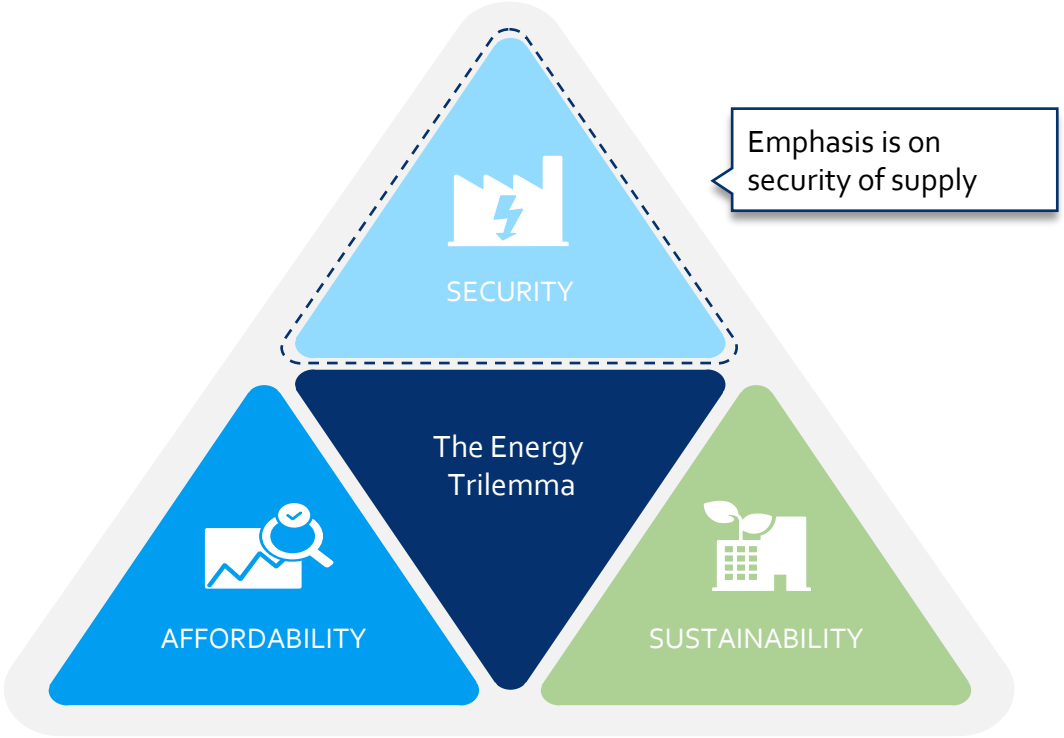
4 Recommendations

01

Introduction and focus of the report

Report focus | The Energy Trilemma is the main analytical tool of the report

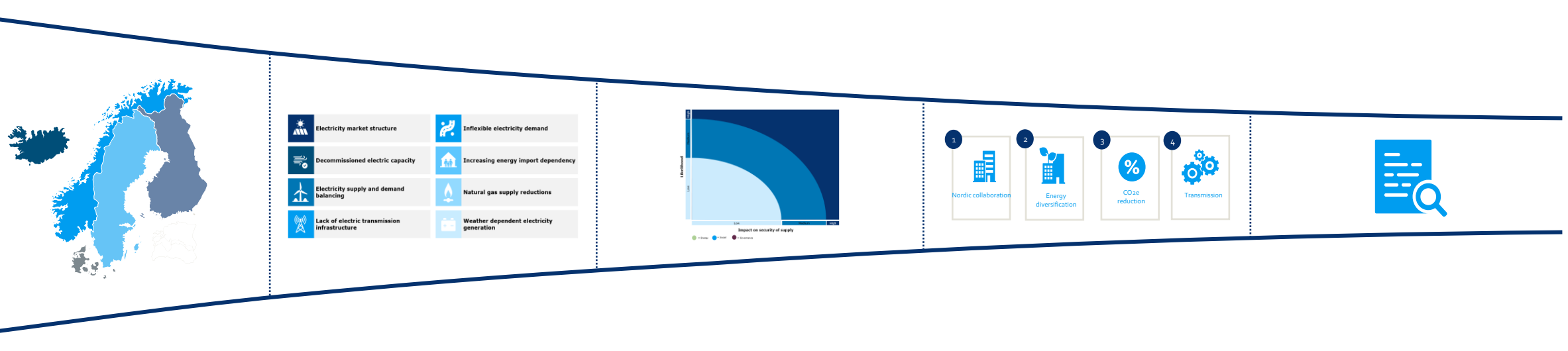
- Emphasis on **security of electricity supply**
- **Unprecedented energy crisis** in Nordics and worldwide
- **Spill-over effects** from **Europe** and **Ukraine invasion**
- **Underlying structural developments** are contributors
- Natural gas, district energy covered to lesser extent



Adapted from World Energy Council Trilemma Index

Method | Analysis based on five-step approach resulting in recommendations

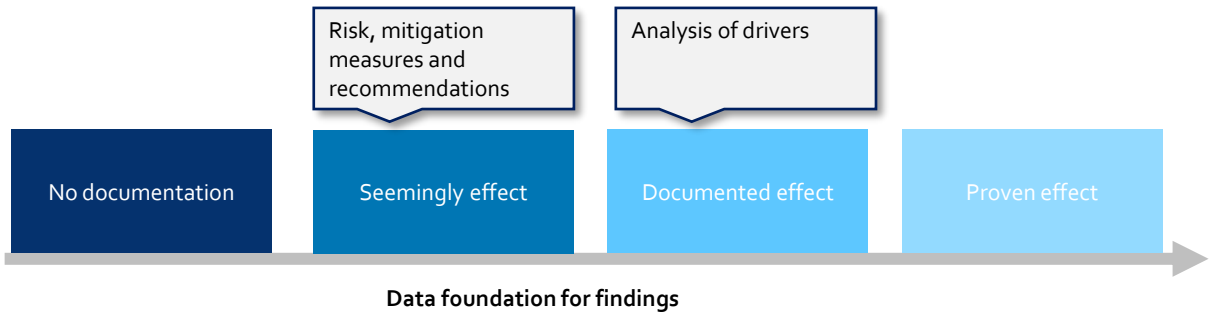
1. Overview of European and Nordic **energy systems**
2. Mapping of **drivers**
3. Identification of **risks**
4. Mitigation measures and **gap analysis**
5. Policy **recommendations** addressing gaps



Method | Data collected from publicly available reports and expert interviews

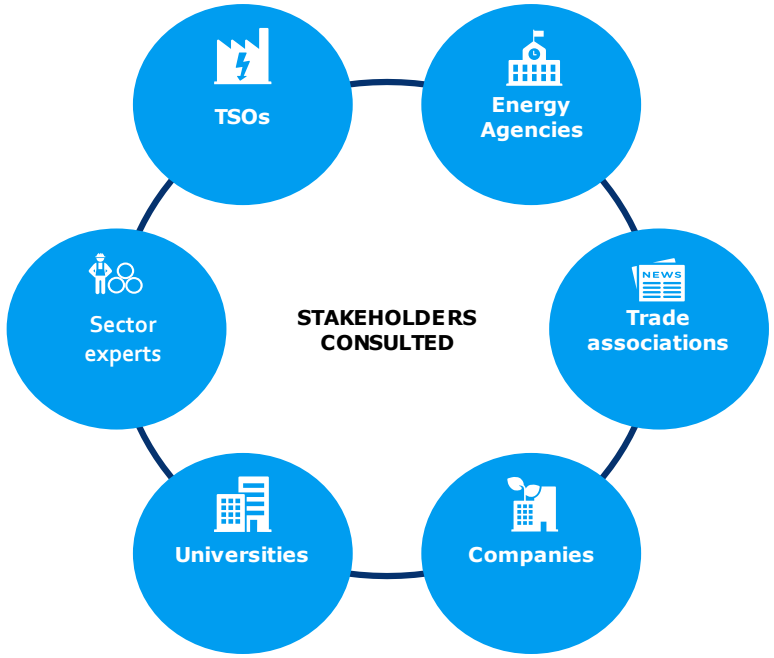
Data collection ended September 30th 2022

- Quantitative data used to analyse drivers of electricity crisis,
  e.g., **ENTSO-E and Eurostat**
- Qualitative data sourced from publicly available reports and articles,
  e.g. **IEA, news agencies, energy authorities, TSOs**
- Quality of **data foundation** varies various for different parts of report (figure below)



Stakeholder interviews

- **25 interviews** covering Energy Trilemma and energy crisis.



02

Drivers, preparedness & response

Drivers | "The perfect storm" leading to higher energy prices

- Electricity market structure
- Inflexible electricity demand
- Decommissioned controllable electric capacity
- Increasing energy import dependency
- Electricity supply and demand balancing
- Natural gas supply reductions
- Lack of electric transmission infrastructure
- Weather dependent electricity generation

Preparedness | Exposure of the Nordic countries toward these drivers varies

Driver	Denmark	Finland	Iceland	Norway	Sweden
Electricity market structure	High	High	No	High	High
Decommissioned controllable electric capacity	High	Low	No	Low	High
Electricity supply and demand balancing	High	Medium	Low	Low	High
Lack of electric transmission infrastructure	Medium	Low	Medium	Medium	High
Inflexible electricity demand	High	Low	Medium	Low	Medium
Increasing energy import dependency	Medium	High	No	Medium	Medium
Natural gas supply reductions	Low	Medium	No	Medium	Low
Weather dependent electricity generation	High	Low	Low	Low	High

Legend: = No effect = Low effect = Medium effect = High effect

Responses | A range of initiatives to help consumers financially

Response	Denmark	Finland	Iceland	Norway	Sweden
Subsidy/grant/cheque	●	●	●	●	●
Lower energy tariffs/taxes*	◐	●	●	●	●
Incentivize energy efficiency/technology change	●	●	●	●	●
Postponements of bills	●	●	●	●	●
Information campaigns	●	●	●	●	●
Public energy savings	●	●	●	●	●
Tripartite negotiations	●	●	●	●	●
Investment in research	●	●	●	●	●

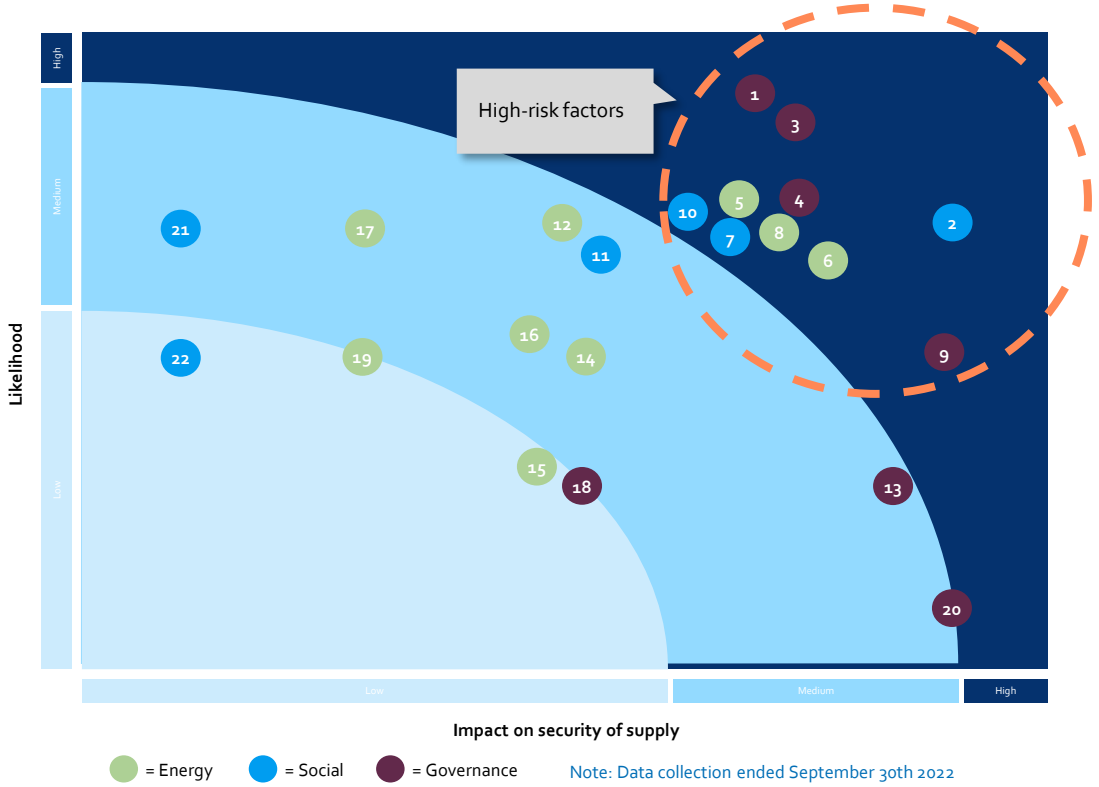
Legend: ● = Implemented initiative ● = Decided but not implemented yet ● = Not decided

03

Risks & mitigation measures

Risk & mitigation | Risk assessment coupled with gap-analysis at Nordic level

Risk assessment



Note: Data collection ended September 30th 2022

Gap-analysis

	Risk	Measure	Documented impact	Gap analysis
1	Long approval processes	Accelerated permitting for electricity generation and grid infrastructure	?	Gap remains
2	Modest infrastructure acceptance	Public inclusion in energy infrastructure	↑	Gap remains
3	Inadequate electricity market design	Analyse adaptation measures for the electricity market design	?	Gap remains
4	High mineral and fossil energy supply dependencies	Strategic sourcing of metals	?	Gap exists
4	High mineral and fossil energy supply dependencies	Strategic sourcing of fuels	↑	Gap remains
5	Lack of electric grid infrastructure	Electric grid infrastructure	↑	Gap remains
6	Absence of sustainable long-term energy storage	Energy infrastructure integration	↑	Gap remains
7	Unchanged consumer behaviour	Information campaigns and digital applications	→	No gap
8	Increased weather dependence	Energy generation diversification	↑	Gap remains
9	Insufficient energy crisis management	Energy crisis management	→	Gap remains
10	Labour shortage	Tripartite negotiations	→	Gap exists

↑ = Positive → = Mixed ↓ = Negative ? = No documentation

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04

Recommendations

National

Recommendations | Increase security and balance the Energy Trilemma

Recommendation	Risk(s)	High-level qualitative impact assessment		
		Security	Sustainability	Affordability
Implement fixed timelines and shorten permitting processes	Long approval processes	↑	↑	→
Ensure a high-quality labour supply to the energy sector by developing long-term national roadmaps	Labour shortage	↑	↑	→

↑ = Positive effect → = Less positive effect ↘ = Negative ? = To be investigated

Nordic

Recommendations | Increase security and balance the Energy Trilemma

Recommendation	Risk(s)	High-level qualitative impact assessment		
		Security	Sustainability	Affordability
Diversify sources of energy generation, carriers, storage, and metals and minerals supply	Increased weather dependence; High mineral and fossil energy supply dependencies	↑	↑	?
It should be studied how the electricity market model can continuously be adapted	Inadequate electricity market design	?	?	?
Strengthen and share the knowledge foundation on addressing the public acceptance of energy infrastructure	Modest infrastructure acceptance	→	→	↑

↑ = Positive effect → = Less positive effect ↘ = Negative ? = To be investigated

Nordic

Recommendations | Increase security and balance the Energy Trilemma

Recommendation	Risk(s)	High-level qualitative impact assessment		
		Security	Sustainability	Affordability
Support flexible demand-side response	Unchanged consumer behaviour	↑	↑	↑
Strengthen Nordic electric grid infrastructure	Lack of electric grid infrastructure	↑	↑	→
Re-emphasise the importance of Nordic collaboration on energy markets and systems	All risks	↑	↑	↑
Share learnings of nationally applied financial support schemes	Unchanged consumer behaviour	→	→	↑

↑ = Positive effect → = Less positive effect ↘ = Negative ? = To be investigated

Download or read online at Norden.org

norden.org/en/publication/nordic-energy-trilemma

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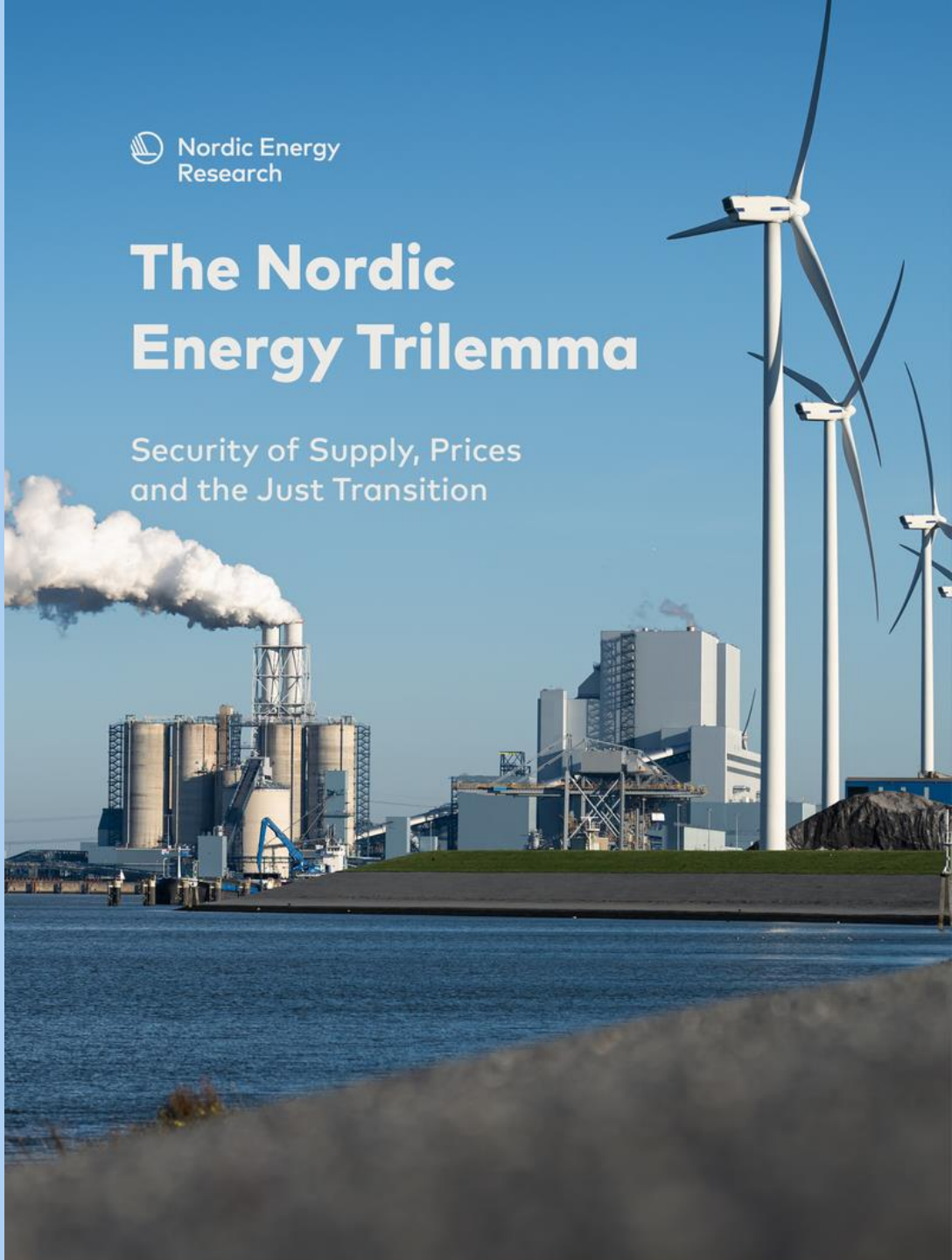

Coexistence and nature-inclusive design in Nordic offshore wind farms

Astrid Bratli
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Coexistence and nature-inclusive design in Nordic offshore wind farms

Nordic Energy Research

Astrid Bratli, Nordic Energy Research

22 March 2023

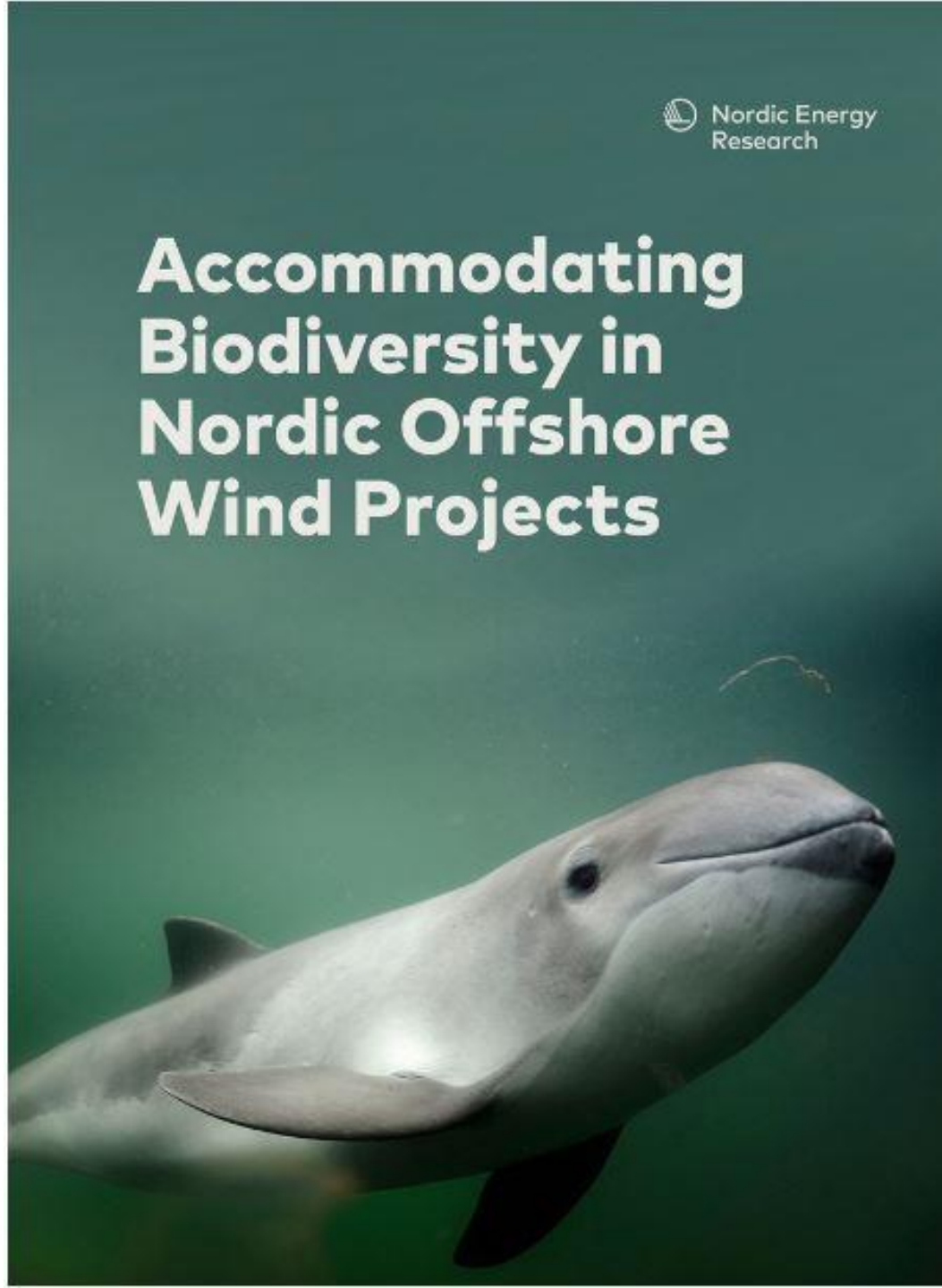
Builds on key takeaways from our previous report

Strategic planning

Initiate Nordic collaboration for marine spatial planning

Stakeholder engagement

Exchange environmental data



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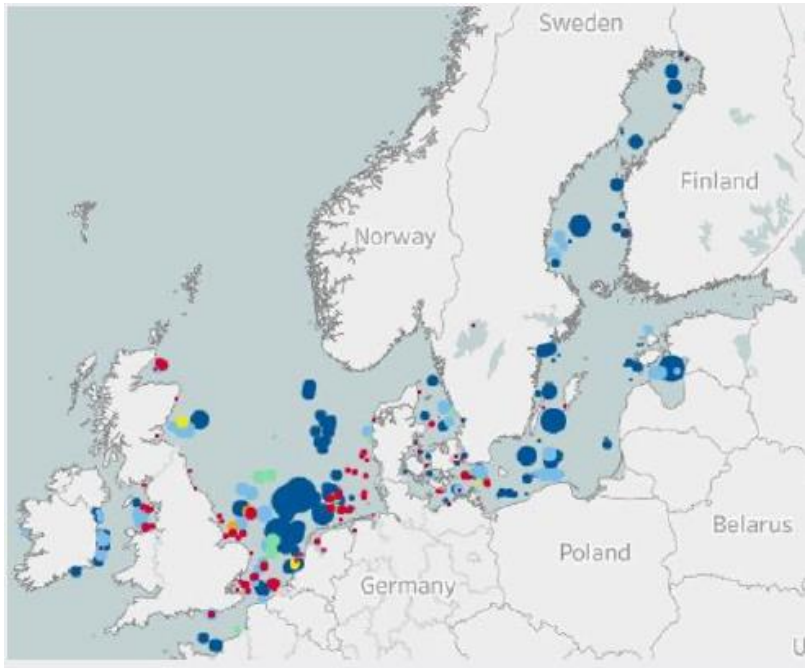
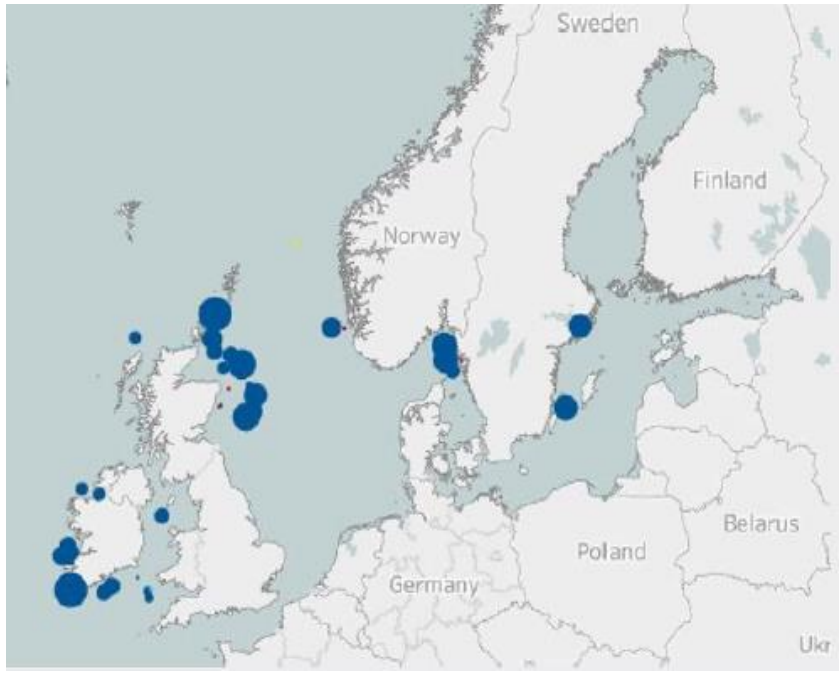


Floating



2050 vision:

North Sea 212 GW
Baltic Sea 83 GW

Status of offshore wind projects

- Online
- Partially online'
- Under construction
- With permits
- Under permitting procefure
- Planned

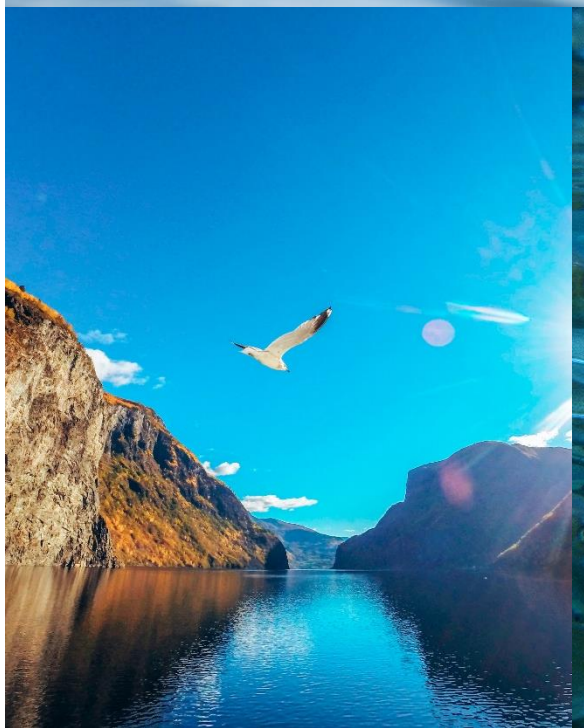
However…

Requires large areas
(surface, seabed and pelagic space)

Pressure on environmental assets

Risk of biodiversity loss i.e.

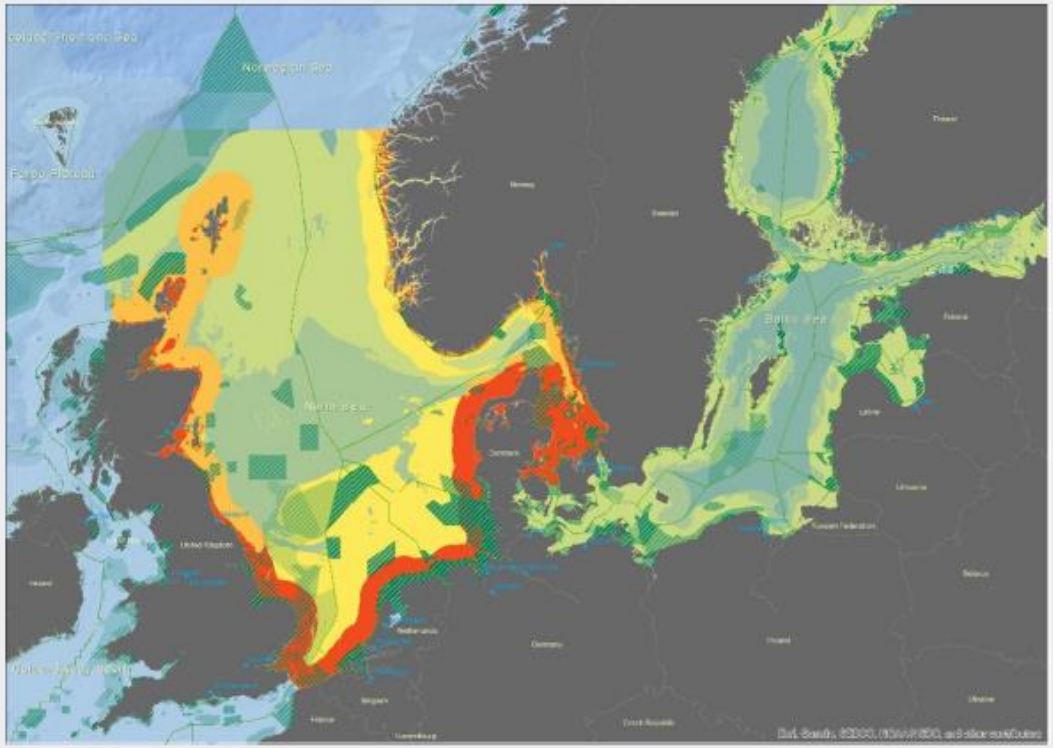
- Birds
- Fish
- Mammals
- Ecosystems



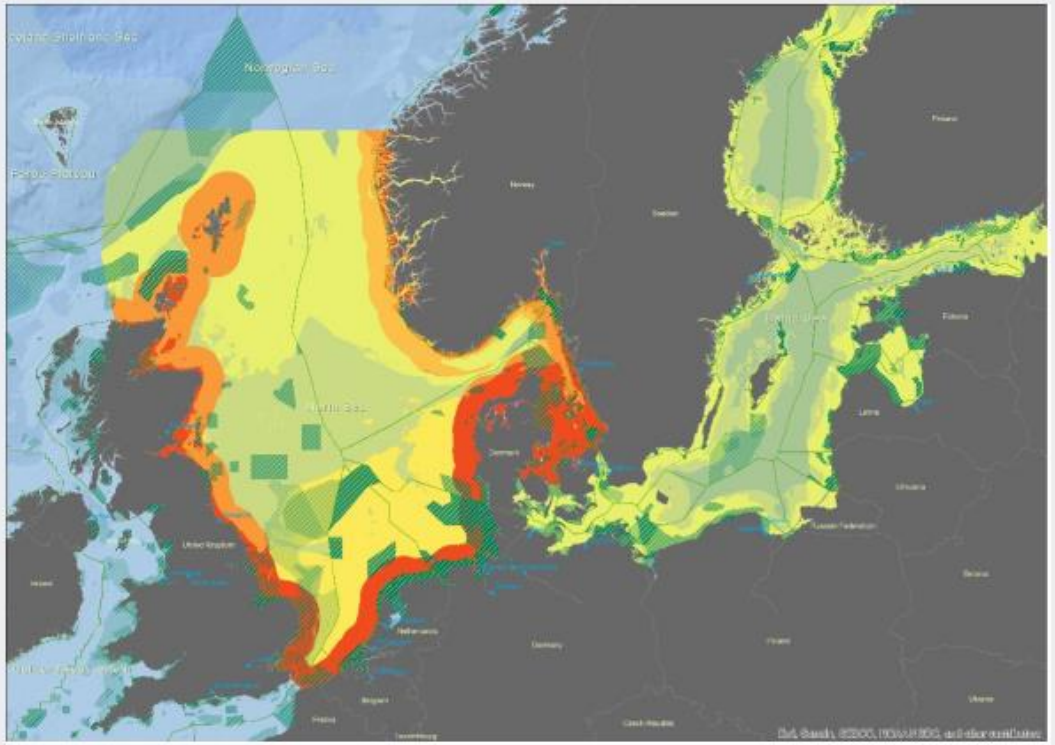
Spatial competition

- Fisheries
- Shipping
- Military activities
- Aquaculture (breeding, raising, and harvesting fish, shellfish, and aquatic plants)
- Tourism

2030



2050



Map Legend

- Exclusive Economic Zones
- Marine Protected Areas

Spatial Competition Index

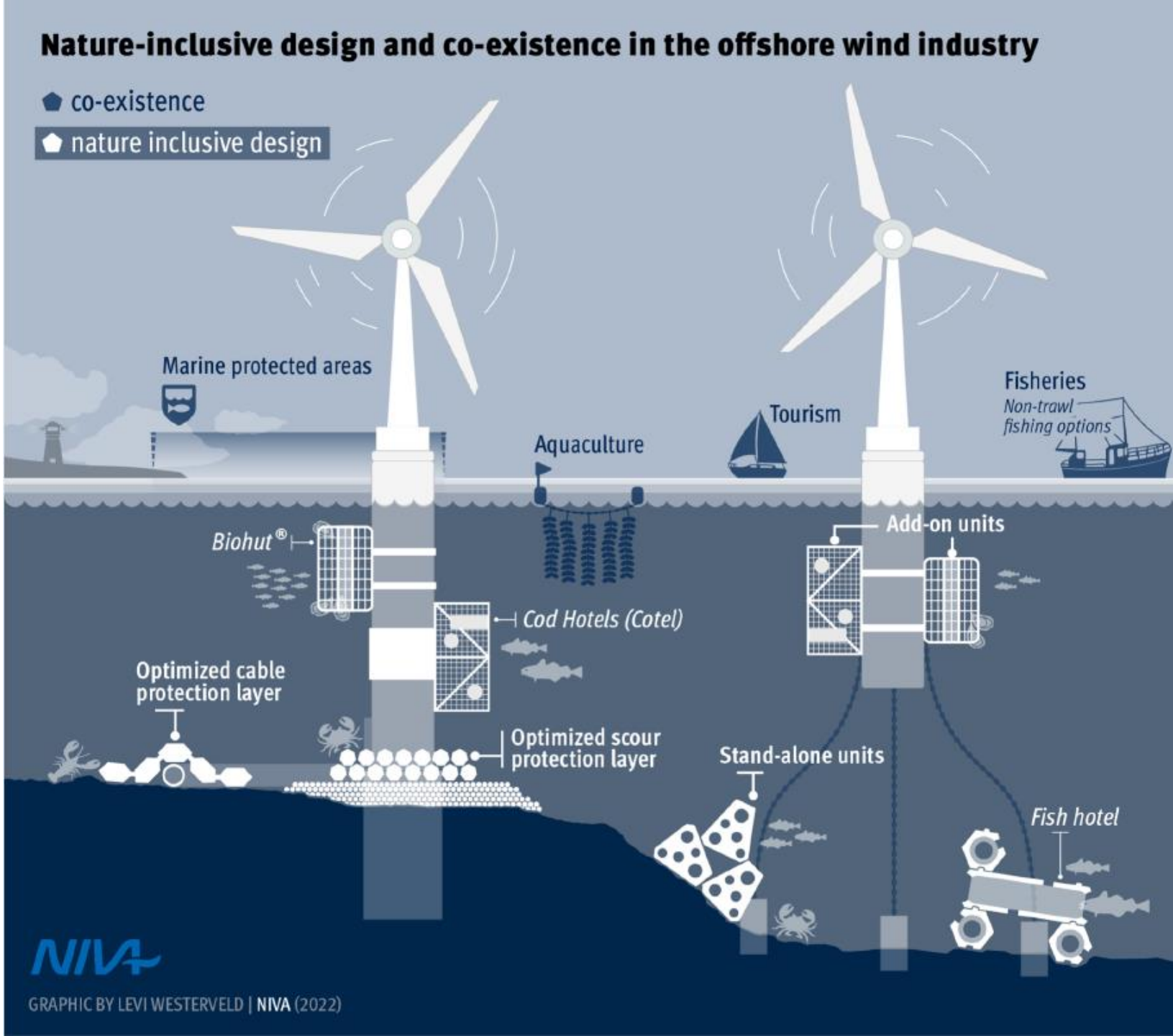
< 1.2	0.5 - 0.6
1.0 - 1.2	0.4 - 0.5
0.9 - 1.0	0.3 - 0.4
0.8 - 0.9	0.2 - 0.3
0.7 - 0.8	0.1 - 0.2
0.6 - 0.7	0 - 0.1

Key: Coexistence

(Source: DNV)

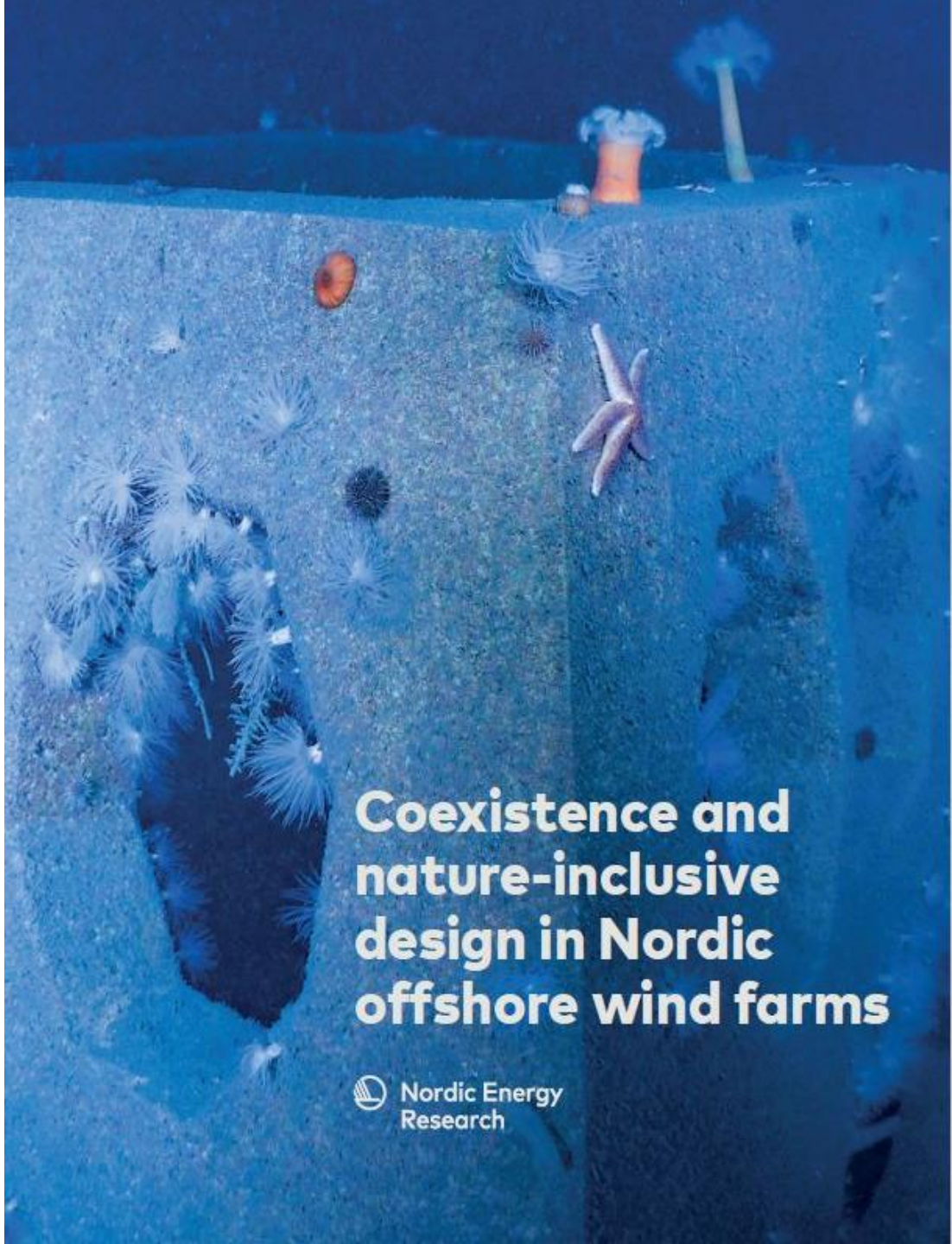
Nature-inclusive design

- **Restore** degraded habitats
- **Enhance** ecological functioning
- **Promote** biological production



Aim of project

To develop a catalogue of allocation and tendering instruments to support Nordic governments on coexistence and nature inclusive design



2 workshops – 70+ participants

Representing

- Governmental bodies
- Energy companies
- Trade organisations
- Aquaculture
- Financial institutions
- Technology providers
- Research institutions
- NGOs/ Environmental organisations

First workshop

Focus on identifying stakeholder **needs** to achieve successful coexistence and nature inclusive design

Second workshop

Focus on stakeholder engagement

– how to get fruitful processes and dialogue

What kind of tools we need for marine spatial planning

Governmental Instruments to Facilitate Co-existence and Nature Inclusive Design

Examples - questions:

- *Why is co-existence/nature inclusive design important?*
- *What are the opportunities and constraints for coexistence?*
- *Do you have any good examples of succesful stakeholder engagement?*
- *What are suitable instruments and non-price criteria for nature inclusive design?*

Outcome

- Collected a list of 22 governmental instruments to inspire succesful coexistence and stakeholder engagement
- Overview of suggested solutions to minimise conflict and maximise synergies for each phase of the tendering process
- The list of opportunities statet by stakeholders was longer than the list of contrains

Main take-aways

Not why co-existence, but **how**

Co-existence is key for solving climate and nature crisis and for efficient consenting processes

Vital to move away from sector-by-sector management of marine activities to a more holistic and integrated approach- to identify opportunities and risks

Key instruments

Enforce coexistence

- Ensure collaboration as early as possible
- Apply consenting criteria where developers must comply before they construct

Use non-price criteria

- Nature inclusive design goals to be stated in the tender
- Reward willingness to fund on-site research on NID

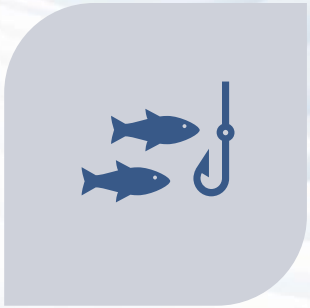
Stakeholder engagement

- Many administrative authorities involved – Transparency and communication is key
- Include stakeholder engagement in public tender requirement

Coexistence and NID– Key Takeaways

HARD TO MEASURE VALUE OF NATURE VS ENERGY

KNOWLEDGE GAPS – NEED PLATFORMS FOR SHARING KNOWLEDGE



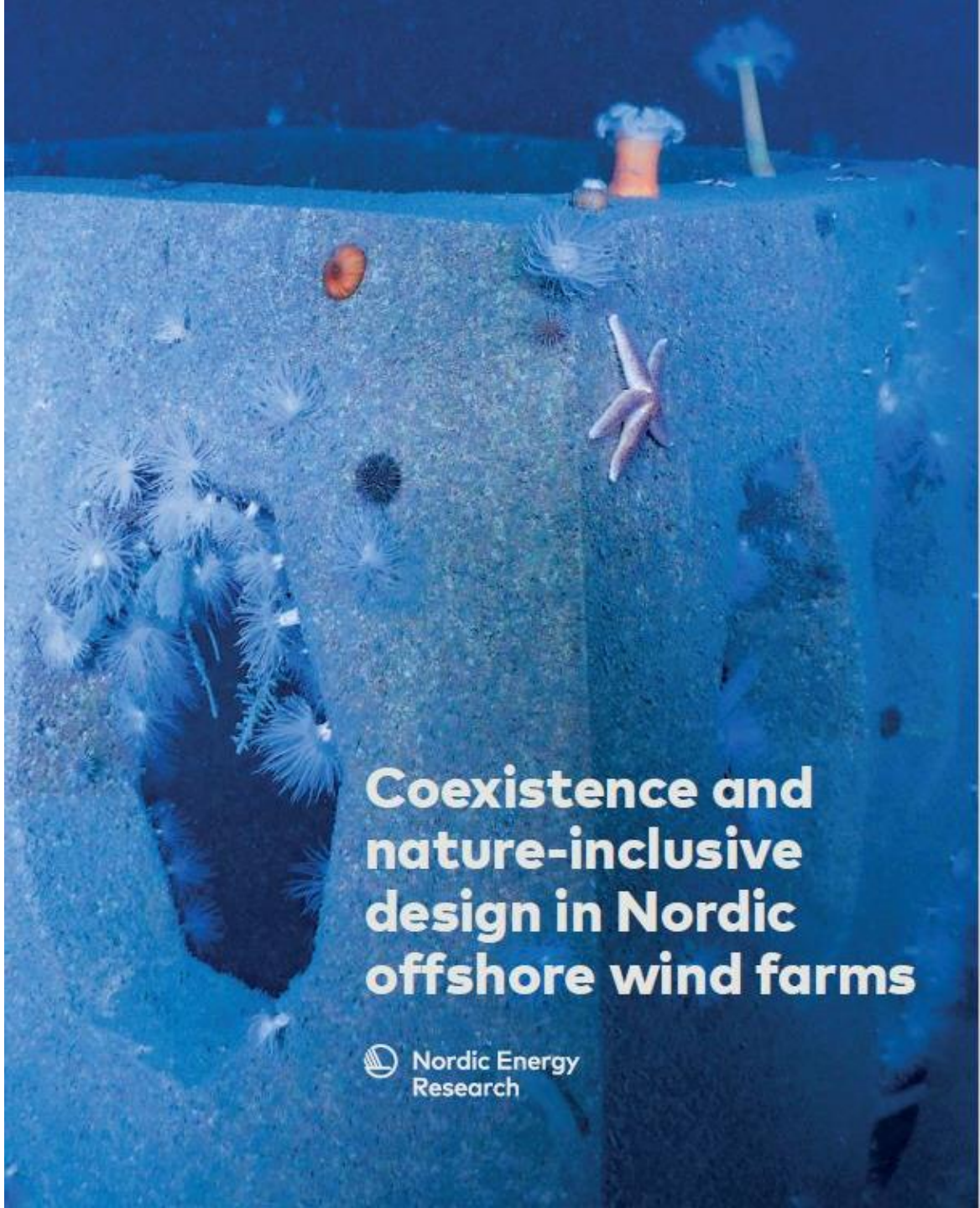
COEXISTENCE NEEDS COOPERATION

NEED TO FUND STRATEGIC RESEARCH AND JOINT INDUSTRY PROGRAMS

New report launched

Download or read online at norden.org

https://pub.norden.org/nordicenergyresearch2023-01/



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Olli Himanen,
Researcher and Team Leader,
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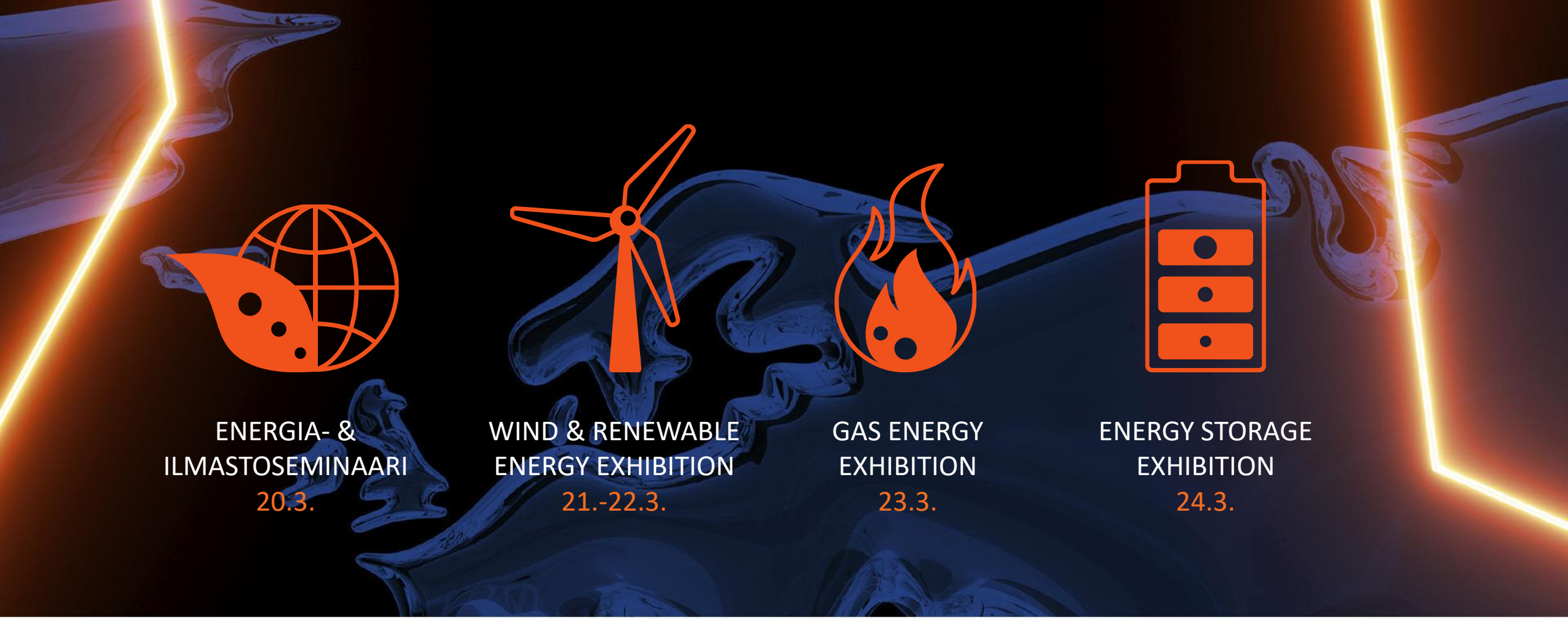
VTT

Clean energy choices for reaching a resilient and carbon neutral Nordic region

Nordic Energy Research



ENERGIA- & ILMASTOSEMINAARI
20.3.

WIND & RENEWABLE ENERGY EXHIBITION
21.-22.3.

GAS ENERGY EXHIBITION
23.3.

ENERGY STORAGE EXHIBITION
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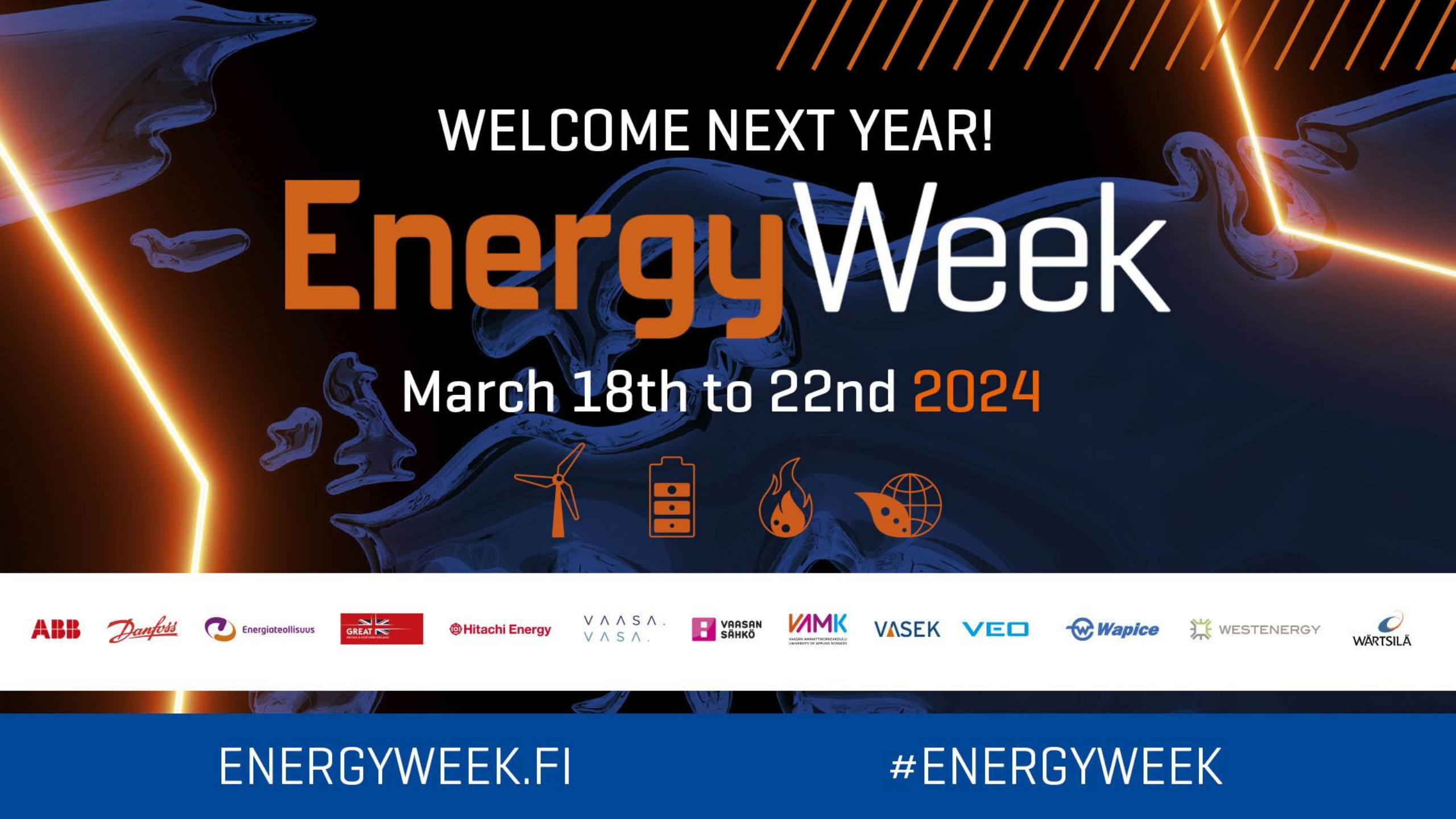
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