Challenges in Supply Chains

Boosting Collaborative Solutions Development and Commercialization 21.5.2025

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Outline

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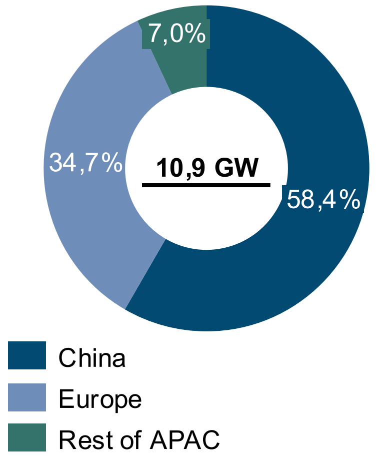
1. What is the business interest, what is the challenge?
2. Our approach:
   more intensive and concrete collaboration
3. Partner network, tendering and auctioning with an impact

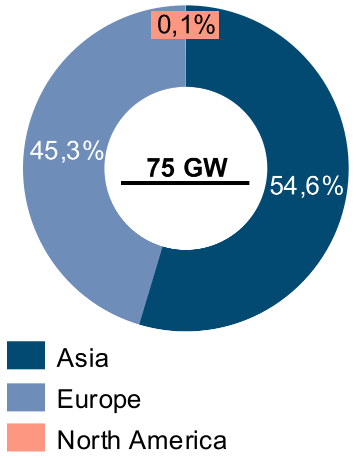
Global offshore wind power capacity reached 68 - 75 GW in 2023, with China representing the majority

- 10,9 GW of offshore wind power was installed globally in 2023. Around 58 % of the installations, or 6,3 GW, were located in China. 3,8 GW of offshore wind was installed in Europe in 2023 [1]. In 2024, the installed capacity in Europe grew by 2,6 GW to 36,7 GW, while the global capacity increased by 7,7 GW [2], [3].
- The offshore wind market has faced headwinds since the previous peak of new installations in 2021. 2023 was a difficult year for offshore wind with surging costs, supply chain issues, project delays, and cancellations. The geopolitical and economic uncertainties remain significant issues in the global offshore market.
- While the European offshore wind market has experienced setbacks, China has grown into a global leader in offshore wind power with 38 GW of installed capacity in 2023, representing the majority of the global offshore wind capacity. Europe is the second largest offshore wind market with 34 GW of installed offshore wind capacity in 2023.
- In 2025, the offshore wind market is expected to add 19 GW of new offshore wind capacity, with 65 % of new installations located in China. Europe is expected to see around 4,9 GW of new offshore wind capacity added in 2025 [3].

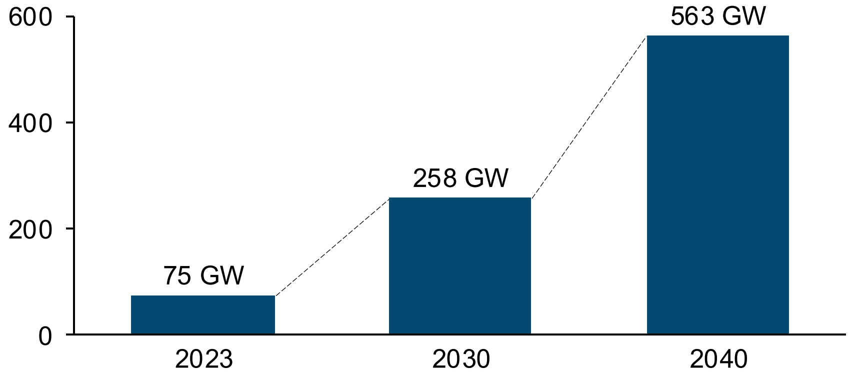
Global offshore wind installations in 2023



Global total installed offshore wind capacity, 2023



Forecasted global offshore wind capacity (GW)



CONFIDENTIAL

More than 60 players in Finland are in the offshore wind business - or in the entrance of the business

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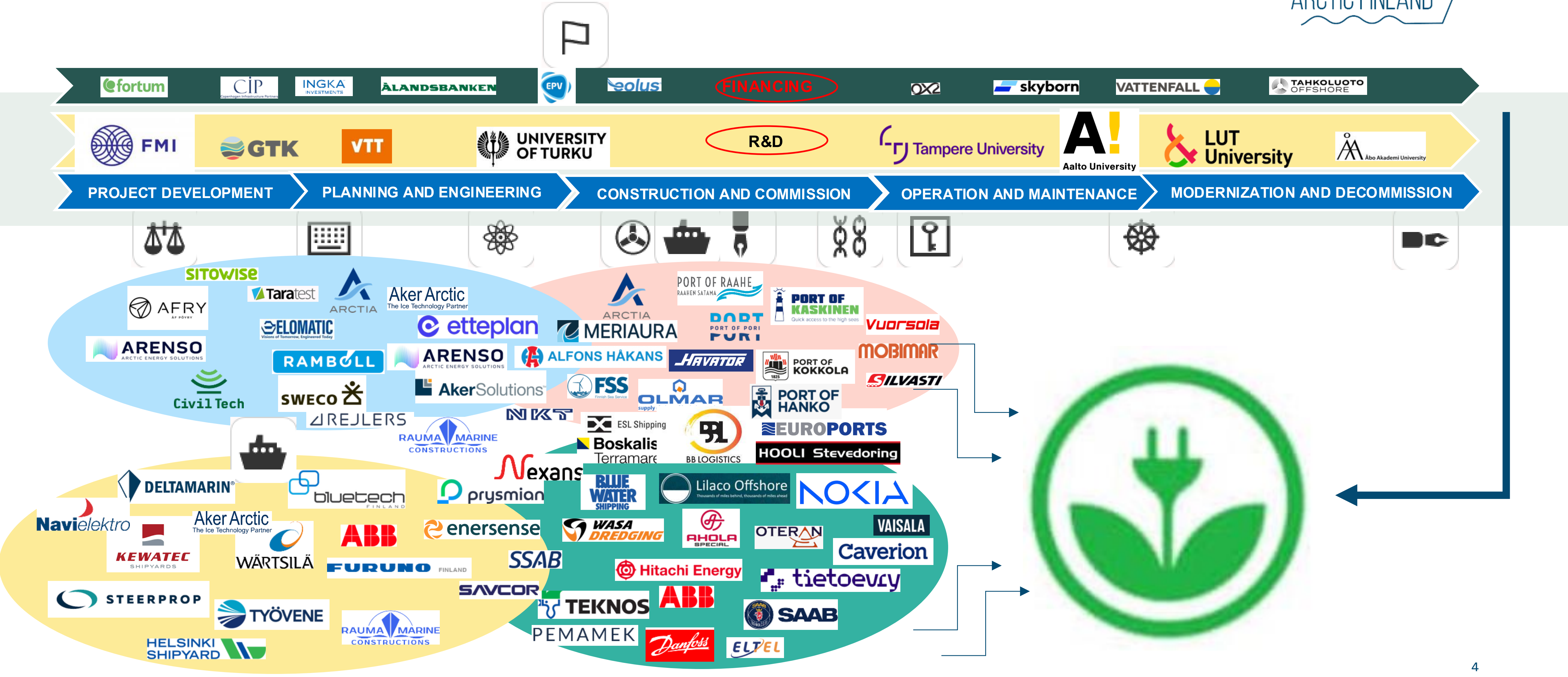

Prioritization of actions is somewhat different from the investor and from the supplier perspective

- Investor concentrates on LCOE and its' most important and/or critical elements: e.g. delivery/schedule, technical core, long-term collaboration, local knowledge, experience and references

- Supplier concentrates on
  - Business opportunity on a large scale
  - Competition environment (performance, quality, pricing, deliveries) and level playing field (local content requirement exists even when not stated)
  - Value of local presence, knowledge, circumstances, content
  - Opportunity to "make a difference"
  - References and probability to win

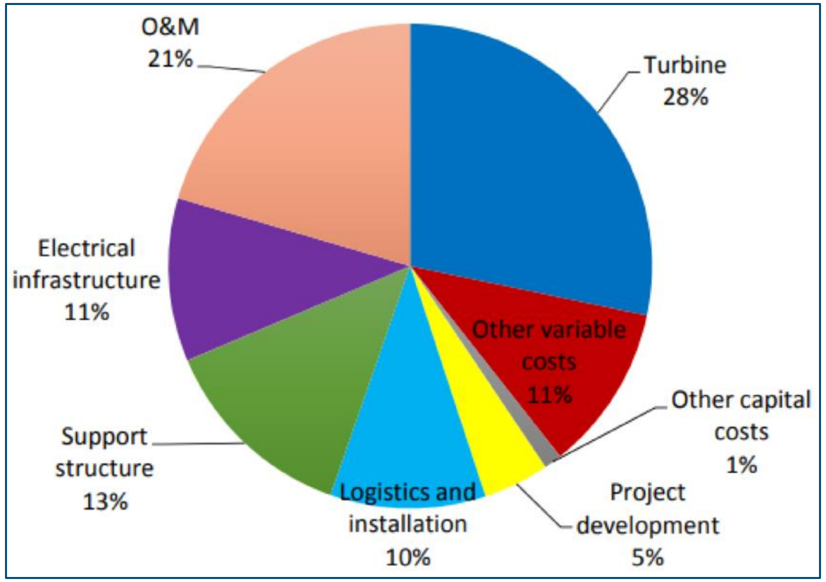

Table 1: Percentage Breakdown of LCOE by Lifecycle Stage

Component	% Contribution to LCOE – Range*	% Contribution to LCOE - Average value
DEVEX	1 – 10	3
CAPEX	35 - 70	52
OPEX	25 - 60	41
DECEX	1 - 5	4

*rounded to nearest 5%.

Machine Learning on Fault Diagnosis in Wind Turbines by Eddie YK Ng and Jian Tiong Lim, Dec 2022

https://assets.publishing.service.gov.uk/media/655371f7019bd600149f1ffa/floating-offshore-wind-lcoe-report_.pdf

Suppliers' challenge is to move higher and deeper

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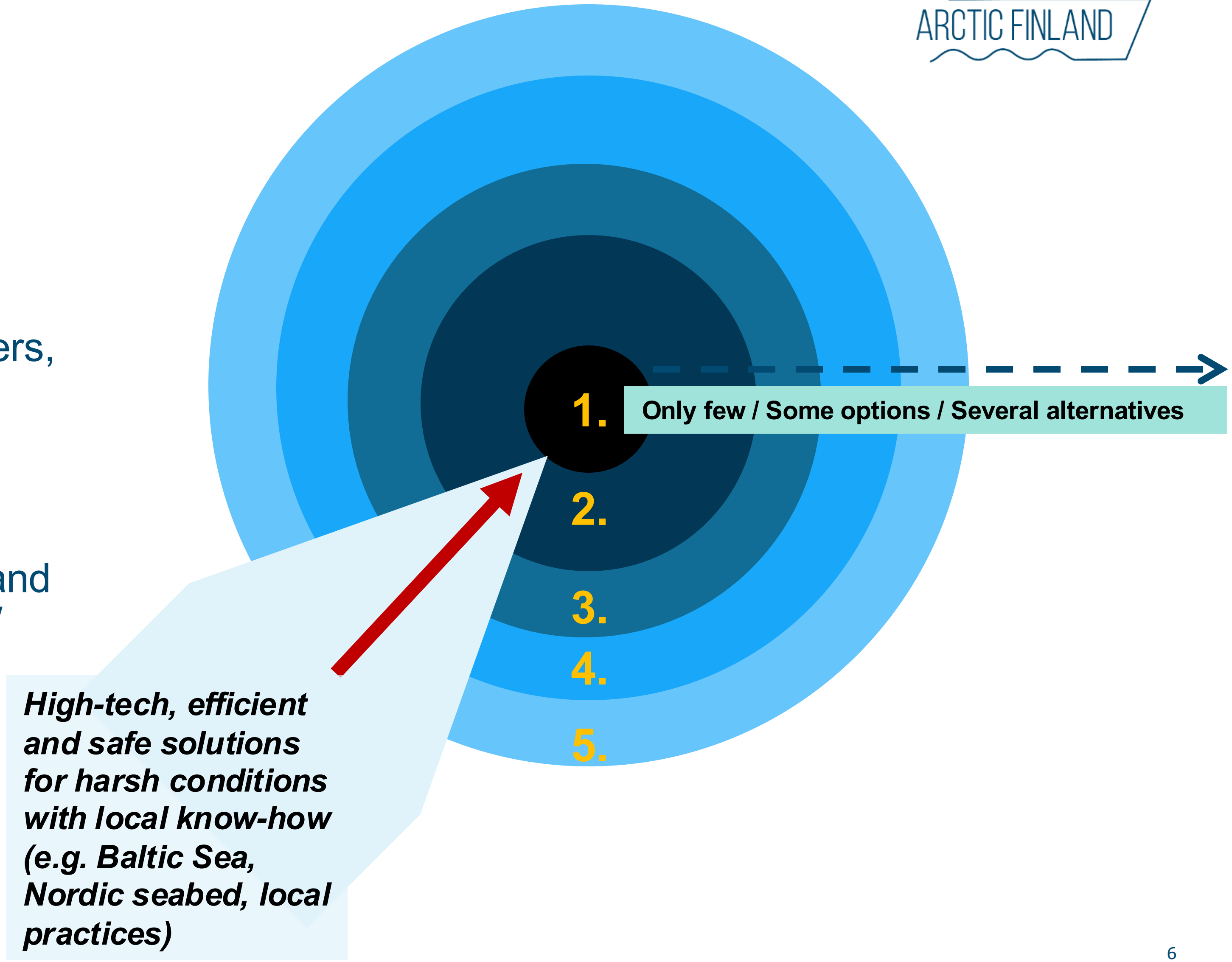
Tier 1:	Investor, project developer
Tier 2:	Turnkey solution provider / turbine manufacturer
Tier 3:	System provider (e.g. sea constructions, offshore structurers, logistics)
Tier 4:	Component manufacturer / solution providers
Tier 5:	Sub-suppliers for components and special services / assemblings / logistics



Business opportunity and challenge induced the need for strong collaboration for integrating competencies and needs,
and empowering the development actions!

Team Renewable Arctic Finland 2025–2026
- competencies with great synergies

- offshore wind planning, construction and operation support
- special vessel design, construction, technologies and operations

Scope, objectives, themes and tasks 2025-26

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SCOPE **Offshore wind energy business and investments, solutions for planning, construction and operation support for offshore wind park**

Related and relevant special vessels segments and vessel operations

OBJECTIVES

- *DEVELOPMENT, TESTING AND COMMERCIALIZATION*:
  LOCAL CONTENT > 35%, OSW INVESTMENTS IN FINLAND
- *OFFERING PROMOTION AND MARKET ENTRIES*
  100% INCREASE IN OSW SEGMENT SALES & EXPORT
- *PROMOTION OF RENEWABLES AND SPECIAL VESSELS INVESTMENT IN FINNISH INTEREST WITH EXPORT IMPACT*
  100% INCREASE IN INVESTMENTS AND BUSINESSES IN FINLAND

THEMES

Development & Commercialization

Promotion & Sales

Business Environment

TASKS

Solution Workshops

Keynote Sessions

Client Meetings

Delegation Trips

Market Studies

Newsfeed

Solutions development and promotion in offering portfolios

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PROJECT PLANNING, MANAGEMENT AND INVESTMENT SUPPORT

ARENSO, fortum

OFFSHORE STRUCTURES ENGINEERING AND MANUFACTURING

Aker Arctic (The Ice Technology Partner), enersense, RAUMA MARINE CONSTRUCTIONS, VTT

MARINE OPERATIONS, CONSTRUCTION AND EXECUTION

ALFONS HÅKANS, ARCTIA, Boskalis Terramare, OTERAN

SURVEYS AND PROJECT STUDIES

Aker Arctic (The Ice Technology Partner), ARCTIA, ARENSO, ALFONS HÅKANS, Taratest, VTT

LOGISTICS, TERMINAL OPERATIONS AND PORT DEVELOPMENT

BB LOGISTICS, EUROPORTS, HAVATOR, PORT OF KASKINEN (Quick access to the high seas), PORT OF KOKKOLA, PORT OF PORI, PORT OF RAAHE (RAAHEN SATAMA)

POWER ENGINEERING, SPECIAL VESSEL DESIGN AND CONSTRUCTION

ABB, Aker Arctic (The Ice Technology Partner), RAUMA MARINE CONSTRUCTIONS, STEERPROP, TYÖVENE

PROJECT DEVELOPMENT → **PLANNING AND ENGINEERING** → **CONSTRUCTION AND COMMISSION** → **OPERATION AND MAINTENANCE**

IN FINLAND → **IN SELECTED EXPORT COUNTRIES**

CASE: TAHKOLUOTO OFFSHORE

Supply chain and procurement are connected to the auctioning process with an impact: direct and indirect

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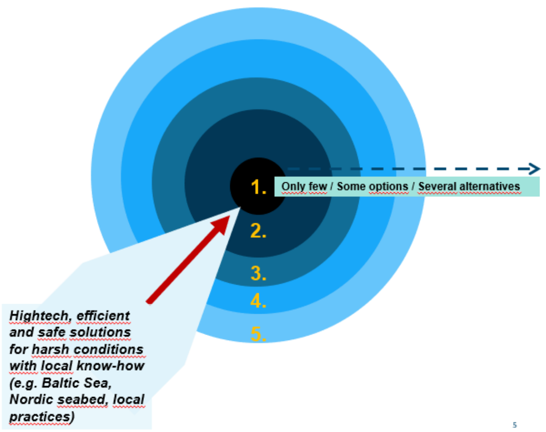
Supply chain and procurement



Partner network management

Solutions' development with selected partners

Investment planning

Auctioning

Final planning, procurement processes and execution

Auctioning

https://www.metsa.fi/en/public-water-areas/

Thank you!

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