

BORNHOLM
ENERGY
ISLAND



Market dialogue – Cables

Discussion Paper

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Table of content

1. Introduction to Danish Energy Islands	4
2. Purpose and objectives for the Market Dialogue	5
3. Expected Scope of Works	6
3.1 Technical setup	6
3.2 Cable production	9
3.3 Expected installation setup	9
3.4 Operation, maintenance and repair	10
3.4.1 Operation and maintenance in the DNP (Defects notification period)	10
3.4.2 Repair and related activities	10
3.5 Design	11
3.6 Brief description of the project "Triton Link"	11
4. Expected Tender setup	12
5. Expected Time Schedule	13
5.1 Preliminary time schedule	13
5.2 Contractual measures to ensure Time for Completion	13
5.3 Contingency plan in case of delays	14
6. Expected Sustainability and Safety setup	15
6.1 Sustainability	15
6.1.1 General sustainability	15
6.1.2 Climate	16
6.1.3 Circular economy	16
6.1.4 Biodiversity	16
6.1.5 Social	16
6.2 Safety (HS)	17
6.3 Quality Management	17
7. Expected Contractual setup	18
7.1 Cooperation and coordination	18
7.2 Coordination of subcontractors	18
7.3 Interface management	18
7.4 Documentation and review	19
8. Expected Insurance setup	20
8.1 Insurance requirements	20
8.2 Levels of deductible	20
8.3 Policy management	20
8.4 Claim management	21
8.5 Risk management	21
9. Commercial parameters	22
9.1 Contract price	22
9.2 Payment plan	22
9.3 Price regulation and hedging	22
10. Risks parameters	24
10.1 Contract Risk Management Principles, System and Organization	24
10.2 Risk assessment of the project's current risk picture	25
10.3 Contractual risks in the FIDIC Yellow Book	25
11. Information about procedure for Market Dialogue	26
11.1 Time schedule	26
11.2 Description of procedure	26

1. Introduction to Danish Energy Islands

Denmark has established a position in the world elite of renewable energy and climate action through decades of committed effort. Denmark has especially been a pioneer in developing wind technology. From the world's first offshore windfarm Vindeby in 1991 to one of the world's first energy islands, Denmark has focused on the development of sustainable energy technologies and investments.

In 2020, nearly 30 years after the launch one of the world's first wind farm in Vindeby, Denmark decided to construct the world's first energy islands. One will be placed in the North Sea as an artificial island and one in the Baltic Sea at the Danish island, Bornholm. The energy island at Bornholm is expected to have an offshore wind capacity of 3 GW while the island in the North Sea will have an initial capacity of 3 GW offshore wind but with the potential of expanding it to 10 GW in the long run.

The islands will strengthen the integration of Europe's power grids and increase renewable electricity production necessary for a climate neutral Europe. The energy islands hub-structure will serve as an offshore power plant gathering and distributing green electricity from hundreds of wind turbines surrounding the islands directly to consumers in countries surrounding the North Sea and the Baltic Sea.

As the world moves towards an era of increased electrification, it is time to take further advantage of the massive wind resources and export green energy to the rest of Europe. The energy islands are a crucial element in the global green transition and in the national goal in Denmark of reaching carbon neutrality by 2050.

After the Bornholm Energy Island project was set into motion in the summer of 2020 neighbouring transmission system operators 50Hertz (Germany) and Energinet (Denmark) signed a corresponding cooperation agreement on the construction of a hybrid interconnector between the respective countries.

Wind power in Germany is leading the way in the field of renewable electricity generation. In consultation with the political world and society, 50Hertz is committed to boosting all potentials that are needed for its 100% renewables target by 2032. This means active support when it comes to unlocking extra renewable energy potentials on land and at sea. The Bornholm Energy Island is one step forward to create the first real power grid hub for the Baltic Sea and an important milestone to jointly exploit its wind potential.

2. Purpose and objectives for the Market Dialogue

The subject of this market dialogue is the Bornholm Energy Island's upcoming demand for cable systems. The market dialogue will be an interaction between Energinet and 50Hertz (hereafter the Employer(s)) and the potential suppliers prior to the public procurement procedure. The expected procurement procedure will be the competitive procedure with negotiation with prior call for competition. Through the market dialogue the Employers seek to improve their market knowledge and receive feedback that can help them optimize their tender material and their approach to the market.

The Employers intend to inform the market about the expected setup, to gain knowledge and more detailed information about current technical solutions and developments within cable and installation in relation to their work within the Bornholm Energy Island. Further, the market dialogue seeks to cover as many other relevant topics as possible, that is: production capacity and market situation, scope of works, pricing, contractual issues, sustainability, QHSE, time schedule, risk etc.

Information and results of this market dialogue might also be useful and adapted according to the objectives mentioned above for the North Sea project of Energinet and Elia (Belgian Transmission Service Operator) "Triton Link". A brief project description can be found in section 3.6.

3. Expected Scope of Works

3.1 TECHNICAL SETUP

The technical setup for Bornholm Energy Island included in the Energinet and 50Hertz scope of works consists of:

- A new substation on Bornholm where the offshore wind farms near Bornholm and interconnectors to Zealand and Germany will be connected.
- A new substation on Zealand near Solhøj where the connection from Bornholm will be connected to the existing Danish 400 kV Transmission Grid.
- A new 1,2 GW connection from Bornholm to Zealand.
- A new 2GW connection from Bornholm to Germany.
- A new substation in Germany where the connection from Bornholm will be connected to the existing German Transmission Grid.

The final design of the entire cable system will be the sole responsibility of the contractor.

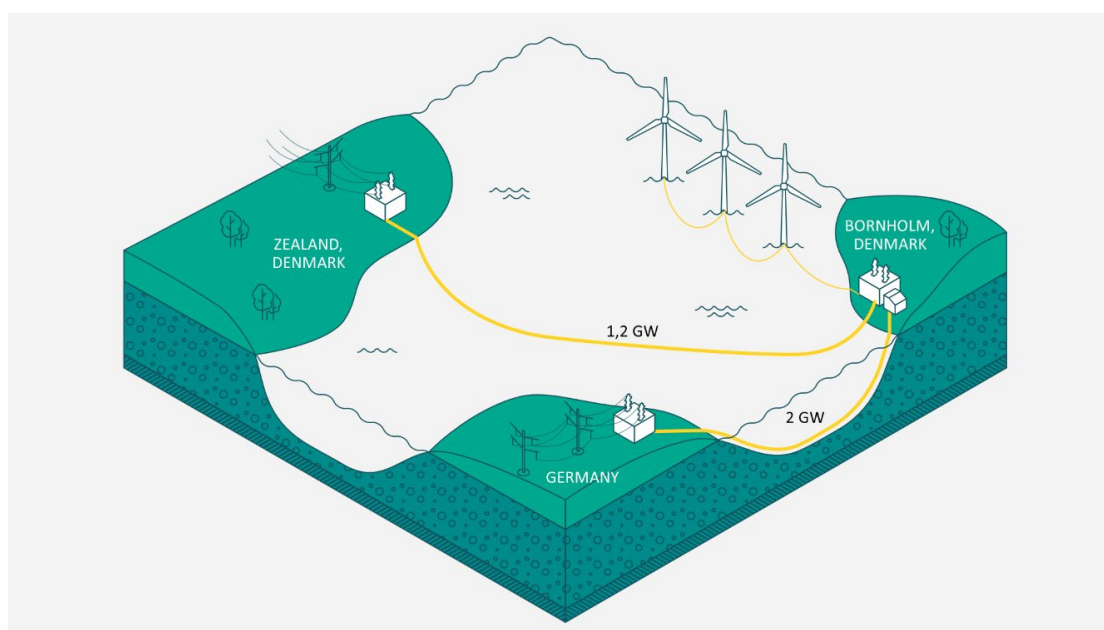


Figure 1: Basic project setup of Bornholm Energy Island

The cable system between Bornholm and Zealand consists of approx. 5 km of land cable route at Bornholm, 209 km of submarine cable route offshore and 12 km of land cable route at Zealand. For the full length of the route a fiber optic cable connection is to be established.

The cable system is configured as a 525 kV HVDC Bi-Pole including a metallic return with a transmission capacity of 1,2 GW. Cable configuration offshore will be as one common bundle of the cables.

Along the cable route from Bornholm to Solhøj it is expected to have the transition joint onshore at Bornholm approx. 200m from the coastline. At the landing in Zealand the transition joint is located onshore approx. 100m from the coastline.

The landing of the offshore cables at Bornholm will be through longer HDD's which are expected to be installed in complex geological surroundings with an elevation of up to 40m.

The landing at Zealand is expected to be by means of surface laid preinstalled pipes in excavated ducts.

Only a few relatively short HDDs are expected onshore along the cable route at Bornholm to crossroads and creeks, but on Zealand a larger number of longer HDD's are expected as the cable route crosses larger roads, railways and a highway.

The cable system between Bornholm and Germany consists of approx. 5 km of land cable route at Bornholm, 130 km of submarine cable route offshore and an approx. length of 10 km for the land cable route in Germany.

A potential cable route originates on Bornholm from a landfall site with a similar design as mentioned below, before travelling south and ending at a single landfall site near Greifswald.

The land cables will be installed in a cable duct system along the entire onshore route in Germany. For the full length of the route a fiber optic cable connection is to be established.

The cable system is configured as a 525 kV HVDC Bi-Pole including a metallic return with a transmission capacity of 2 GW.

Bornholm substation will be a multi-terminal HVDC solution with AC connection as a backup. Bornholm substation will also consist of a 400 kV AC part, which is the connection point for the offshore wind farms. Internal substation cables are not expected to be a part of the cable supply and installation contract.

The layout of Solhøj substation is with a direct connection of the 525 kV HVDC cable system to the 1,2GW converter. Internal substation cables are not expected to be a part of the cable supply and installation contract.

In both substations at Bornholm and Solhøj the termination of the 525 kV HVDC cable system will be outdoor terminations for the two pole cables. The metallic return will be terminated by means of a termination at the suitable voltage level. Fiber optic cables will be terminated in an accessible manhole.

The substation on Bornholm must be designed so that it can eventually be expanded with two additional interconnections to two other countries, one on each DC switching station. In addition, the system is prepared for future expansion on the AC side in the form of PtX, electricity storage or other innovative solutions. The system is also prepared for connection with the Bornholm AC-network in order to supply the island of Bornholm. This may have an impact on which technical solutions can be chosen for the electricity infrastructure at Bornholm.

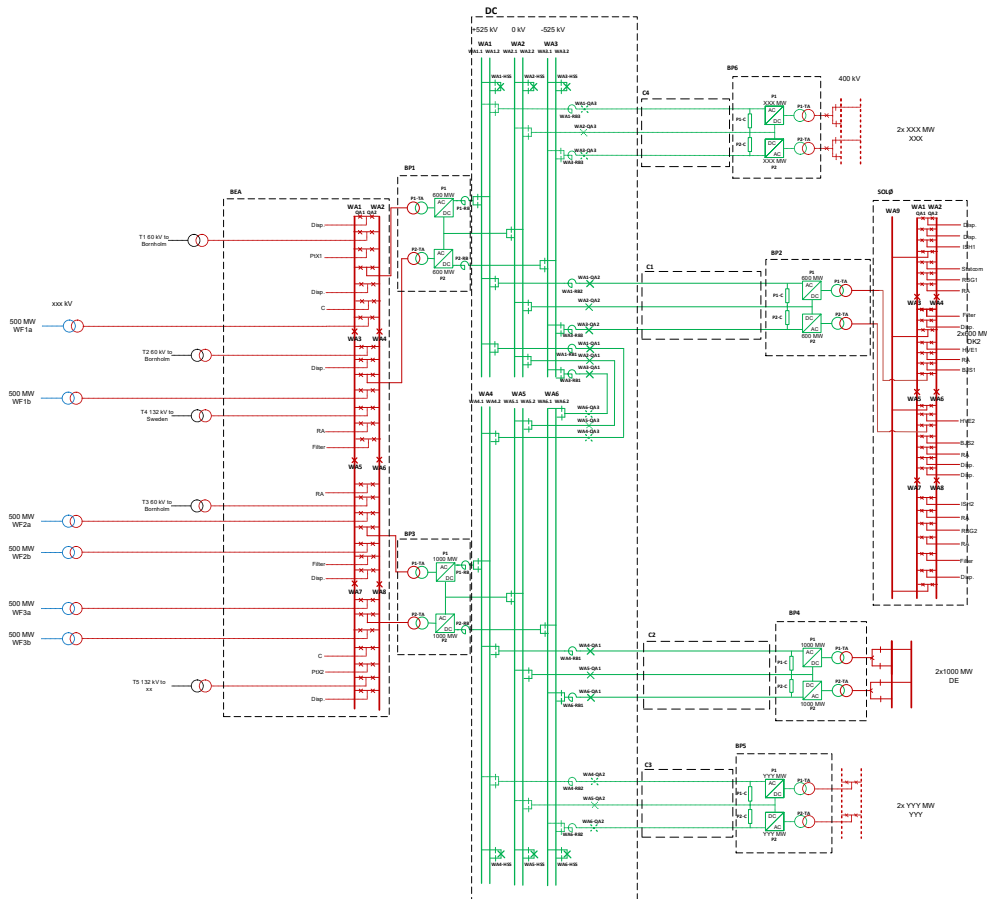


Figure 2 Topology for BEI with expansion scenarios. Dotted lines are future components

In this market dialogue, the following working assumptions are used to set the framework:

- Converter configuration is bipolar with Dedicated Metallic Return
- +/-525 kV DC.
- 2 x 600MW (Capacity between Bornholm and DK) and 2 x 1000MW (capacity between Bornholm and DE), see Figure 2.
- On all onshore HVDC converters DC choppers are installed
- The DMR shall only be grounded in one converter station, but it shall be possible to ground it in all converter stations.
- The offshore converters shall be grid forming (V-f control) for the offshore AC grid.
- The onshore converters shall be grid-following and control the DC voltage on the MTDC grid.
- The operation and protection of the MTDC grid is in such a way that the healthy part of the grid remains in operation and enables reconfiguring to a configuration with the highest transmission capacity after clearing of a fault. For now, the amount of DCCB and placement is seen in Figure 2
- The DC switching stations are configured as double busbar single breaker and with high-speed switches for busbar couplers.

3.2 CABLE PRODUCTION

The cable system will be tendered as a 525 kV HVDC system according to international standards with special focus on the new CIGRÉ TB 852. A project specific type test will be a mandatory requirement for the supply and installation contract.

Based on the above, the Employer has the following questions:

Q3.1: Please describe your production capacity roadmap for 525 kV HVDC cables & accessories including the following considerations:

- Where are your current production facilities located, what is their capacity for MI and XLPE HVDC cables respectively, and when is the next available production slot for approx. 330 km single core cable?
- Do you plan to expand your cable production capacity for MI and XLPE HVDC cables respectively? If yes, when will the expanded/new facilities be ready for production of HVDC cables?
- How does your fleet of installation vessels comply with your cable production capacity and which part do you possibly see at the main bottleneck in terms of meeting the market demand?

Q3.2: Please describe your PQ test roadmap for 525 kV HVDC cables, MI and XLPE respectively including the following considerations:

- What is your current status of PQ tests for 525 kV HVDC cable systems and do you see them adequate in fulfilling international standards.
- How do you see the PQ roadmap fulfilling the requirements according to CIGRÉ TB 852?
- Have any of your current facilities passed the PQ tests according to CIGRÉ TB 852?
- When are you expecting PQ tests according to CIGRÉ TB 852 to be passed for existing and for eventual expanded and new facilities?

Q3.3: Are you planning to continue or to phase out the production of 525 kV MI HVDC cables? Would there be any advantages for Energinet as a customer in terms of economy or earlier available production capacity if Energinet chooses MI cables instead of XLPE cables?

3.3 EXPECTED INSTALLATION SETUP

Installation of onshore cables both at Bornholm and Zealand is expected to be in the scope of the supply and installation. Installation onshore will include all related preparatory works including onshore HDD's.

The onshore cable system parts at Bornholm and Zealand are to be tested once installed.

The Cable Contractor shall be responsible for the entire cable system, including protection and post-installation stabilization.

The Employer will provide an extensive documentation pack for both the onshore and the offshore cable route including route surveys, RBBB, Bathymetry, geotechnical bore reports etc.

It is to be noted that the cable route in the Arcona Basin is with a very soft seabed and the area close to Bornholm (from the coastline and 15 km out) is a boulder filled hard seabed.

Please note that Energinet can provide a preliminary survey report for the cable route between Bornholm and Zealand once an NDA is signed.

Q3.4: What is the most difficult aspect of installing a bundle arrangement of four cables consisting of 2x pole HV cables, 1x metallic return (MR) and 1x fibre-optic cable?

Q3.5: What are the main risks of a four core Bundled Cable installation, compared to current installation practices?

- Laying one cable vs. laying multiple cables (in a bundle)
- Burial of one cable vs. burial of multiple cables

Q3.6: Based on the issued survey data offshore of the coast of Bornholm, what are the main challenges in installing cables offshore in the boulder filled area of the coast of Bornholm? Do you see any other problematic issues along the rest of the cable route between Bornholm and Zealand?

Q3.7: Do you have a strategic partner in relation to onshore civil works and for landfall establishment (HDD works)?

Q3.8: Do you have a strategic partner in relation to pre-lay, post-lay-burial and backfilling works and could you provide references and experiences for technical solutions?

Q3.9: Could you provide expected delivery lengths for onshore and offshore sections for 1,2 GW and 2,0 GW cable design?

3.4 OPERATION, MAINTENANCE AND REPAIR

3.4.1 Operation and maintenance in the DNP (Defects notification period)

As part of the scope of the Contract, the Employer is also considering a service and maintenance period for 5-10 years. Based on this, we have the following questions:

Q3.10: What are your experiences with handling the service and maintenance of the Works after TOC?

Q3.11: Do you prefer to have this as part of your scope? If optional, kindly provide details as to the scope of the services and the upper limits of the scope.

3.4.2 Repair and related activities

In the past, the Employers have usually provided the vessels needed for the repair and related activities through its own framework agreement also for the Defect Notification Period. The Employers would like to explore if it is possible and beneficial to include all the marine activities needed for submarine cable repair in the contract both for the Defect Notification Period and a subsequent 5 years' service level agreement covering the same services after the Defect Notification Period has expired. Energinet will store the spare cable and repair joints at its own storage facility, the location of which is to be decided. Based on this, we have the following questions

Q3.12: Which services of the ones listed below are you able to provide?

- Survey and fault finding
- Deburial
- Cut-and-seal
- Repair

- Post repair protection

Q3.13: Can you guarantee mobilization for the vessel operations stated above, what would the mobilization times be and would these be the same during both Defect Notification Period and a subsequent service level agreement?

Q3.14: Are you able to guarantee repair times and what are the prerequisites for this?

Q3.15: In terms of fault-finding which methods/equipment can you offer?

Q3.16: Which setup for repairs within the warranty period does the manufacturer offer, and how quickly can they deliver?

3.5 DESIGN

As part of the scope of the Contract, the Employer expects the Contractor to deliver detailed design for the execution of the Works.

Q3.17: How will Contractor ensure that Employer is informed during the design phase?

Q3.18: How will a fit for purpose responsibility affect Contractor's tender?

3.6 BRIEF DESCRIPTION OF THE PROJECT "TRITON LINK"

Reference is made to the mentioning of Triton Link in Section 2 "Purpose and objectives of the market dialogue.

The TritonLink is a first step in creating an interconnected offshore grid in the North Sea. The hybrid interconnector will transfer offshore wind energy to Denmark and Belgium via two artificial energy islands.

The project covers a total distance of almost 1.000 kilometres, starting from the Danish onshore HVDC converter passing via two energy islands and ending at the onshore HVDC converter in Belgium. This technological feat enables Elia Group (BE), Energinet (DK) and all the companies involved to gain an innovative global lead. Expertise gained from the construction of the TritonLink will help accomplish future sustainable offshore energy projects.



Figure 3 Basic project setup of TritonLink

4. Expected Tender setup

The Employer expects that the two cable connections (Bornholm-Zealand and Bornholm-Germany) will be tendered as two separate lots. Most probably, there will be a limitation in such a tender, that each tenderer can only win one of the two lots.

Each lot can be tendered as either an "all-inclusive" EPC contract for the entire works, that is cable production, delivery and jointing works both onshore and offshore, UXO, landfalls, offshore installation including preparation, laying and burial and onshore civil works. Alternatively, the Employer may choose to tender parts of the total scope, such as UXO, landfalls and/or onshore civil works as separate EPC contracts.

The Employers consider establishing an SQS (Supplier Qualification System) which would be tendered via TED and would be launched and maintained with relevant categories. Dependent upon whether the SQS is established or not, the tender will be launched either as a call-off on the SQS or via TED. Regardless of the procedure, the tender process is expected to be competitive procedure with negotiation.

Based on the above, the Employer has the following questions:

Q4.1: Please indicate whether you would prefer an "all-inclusive" EPC including all of the listed works or whether you would prefer that works like UXO, landfall and onshore civil works be taken out of the main contract and tendered as separate EPC contracts. In your opinion, how do the different approaches influence on time needed for tender, on the risk picture and on the pricing? Please motivate your answer.

Q4.2: Please comment on the idea of an SQS (Supplier Qualification System). Do you have experience with being part of such SQS' and what is your experience? Is it of less workload to maintain the qualification on an SQS than to keep deadlines and conditional application to traditional prequalification procedures?

Q4.3: Would it be a more attractive project for you if The Employers tender the cables for TritonLink and BEI together?

5. Expected Time Schedule

5.1 PRELIMINARY TIME SCHEDULE

A preliminary and tentative milestone plan for Bornholm Energy Island for the tender process is presented below:

Milestone	Indicative date
(Launch of SQS)	(Q3 2023)
Launch of tender (either call-off on SQS or via TED)	Q1 2024
Tender and negotiation phase	Q3 2024 – Q1 2025
Tender award and contract signing	Q1 2025

Based on this, Employer has the following questions:

Q5.1: How much time do you need from PQ till deadline for 1st tender if the 1st tender should be complete, including detailed pricing? How much time can be saved in the first tender round if the first tender should only contain a rough price indication?

Q5.2: Which commissioning dates should the Employer expect as earliest possible if planning the BEI contract award in Q1 2025 for cables?

Q5.3: How do you see that time can be saved in the project, from award of contract till commissioning? Which risk factors can have a negative influence on time, and which ways of working could have a positive impact on time?

5.2 CONTRACTUAL MEASURES TO ENSURE TIME FOR COMPLETION

As the completion of the project on time is a key success factor, it is important for Energinet to have measures in the contract that ensure progress of the works, as well as transparency and cooperation in case of a delays. Based on this, we have the following questions:

Q5.4: Which terms and conditions in the contract do you believe are important to ensure that you meet the Time for Completion?

Q5.5: Can you list possible and expected events that have a risk of delaying the Time for Completion and can you give examples on how to mitigate these delays and how the contract should address this?

Q5.6: How will you ensure that the Time Schedule is being updated on an ongoing basis and that these changes are being communicated to the Employer?

5.3 CONTINGENCY PLAN IN CASE OF DELAYS

In case of delays the Contractor is required to provide a contingency plan in their tender, to ensure transparency and acceleration measures. Based on this, we have the following questions:

Q5.7: Would you be able to describe a contingency plan for different operations in contract (for example acceleration methods for production)? And would you be able to price the options in the contingency plan?

Q5.8: Can Contractor describe its contingency plan for production of replacement of cables/spares during the execution of the Works?

Q5.9: Can Contractor provide a description of the vessel spread, including the contingency vessel spread?

Q5.10: The Employer wishes to know the Contractors policy for issuing advance warnings, including which events and levels of delays are deemed significant enough to trigger the issue of an advanced warning?

6. Expected Sustainability and Safety setup

Sustainability and safety are one of the key drivers of the Bornholm Energy Island and The Employer seeks to achieve the highest possible level of sustainability and safety within the budget frame.

Sustainability covers climate, environment and social – including [Energinet's Code of Conduct for Suppliers](#) – and 50Hertz's Code of Conduct for suppliers [50Hertz' Code of Conduct for suppliers](#) whereas Safety includes health (mental and physical) and safety.

6.1 SUSTAINABILITY

The ambition for sustainability for the Bornholm Energy Island is to be best in class by limiting GHG emissions, ensuring that the infrastructure is climate resilient, integrating circularity into design, construction, and operation, limiting pollution, ensuring positive impacts on biodiversity and reducing negative impacts on water and marine resources. Moreover, Bornholm Energy Island will also work actively to limit negative and promoting positive social impacts, as well as impacts on human rights, labour rights and anti-corruption. This level of ambition builds on the EU Taxonomy for Sustainable Activities and its related criteria for sustainability.

The purpose of these questions on sustainability is to understand the feasibility of achieving this ambition level for the project by understanding the current availability of sustainable solutions and expected developments in the market.

6.1.1 General sustainability

Q6.1: How do you work with sustainability, specifically in relation to lifecycle GHG emissions, circular economy and biodiversity, in cable projects regarding production and installation and which measures do you implement? To document this, please provide references/ examples for lifecycle GHG emissions-, circular economy- and biodiversity measures you have implemented in previous cable projects.

Q6.2: Based on your experience from previous projects and/or expectations, which implications do you anticipate from the implementation of climate-, circular economy- and biodiversity measures related to the finance and timeline of the project? In what percentage range do you expect implications on costs?

Q6.3: If company-level sustainability ratings or ambitions such as Ecovadis, Carbon Disclosure Project (CDP) or Science Based Targets (SBTi) were to be required of contractors, how would you ensure that these ambitions are shared with relevant partners in the supply chain?

Q6.4: How does the Contractor ensure that all subcontractors are aligned and delivers on the sustainability criteria in the tender? How can the efforts be tracked during the construction phase?

6.1.2 Climate

Q6.5: The Employer is considering to define requirements for the GHG emissions of the project measured on a lifecycle basis to incentivize that the GHG footprint of the project is limited to the extent possible. How do you assess your ability to meet such requirements in the project?

Q6.6: What efforts are you undertaking to obtain a comprehensive GHG reporting on a project bases? Do you have processes, methodologies, and data exchange platforms in place to obtain relevant data from your subcontractors and how do you ensure availability and quality of this data?

Q6.7: Do you have any experience with Carbon Pricing mechanisms in tenders or contracts (meaning a monetary evaluation of GHG emissions or other broader environmental impact scores, either as expected and/or actuals)? If so, what mechanisms do you propose to track, certify, and verify actual performance against the initial expectation and promise?

6.1.3 Circular economy

Q6.8: The Employer intends to set requirements on the implementation of a waste management plan that promotes reuse and recycling as well as requirements on the integration of measures that promote circularity through reducing, reusing, repairing and recycling in relation to resource inflows and outflows. How do you assess your ability to meet such requirements in the project?

Q6.9: To what extent are you able to provide project-specific documentation on resource inflows, such as material passports or similar, and on resource outflows?

Q6.10: What do you see as potential measures that could promote the circularity of the project in both the upstream and downstream value chain and particularly with regards to alternative construction materials?

6.1.4 Biodiversity

Q6.11: The Employer intends to set requirements related to the development and implementation of measures that promote positive impacts and reduce negative impacts on biodiversity in relation to the project. How do you assess your ability to meet such requirements in the project?

Q6.12: What do you see as potential measures that could promote positive impacts and reduce negative impacts on biodiversity in relation to the project?

6.1.5 Social

Q6.13: How do you ensure that internationally recognised human rights, including labour rights, 1) for your own workers and 2) for your subcontractors' workers are respected?

Q6.14: How do you ensure that suppliers beyond tier-1 operate in alignment with international principles and conditions related to human rights, labour rights, environment, and anti-corruption?

Q6.15: What policies and procedures do you have on wages (incl. special benefits), working hours, and general employment conditions and how do they apply to workers performing onshore and offshore construction works, including those of subcontractors? Please forward

your policies and procedures in relation to employment conditions and worker's rights as well as your procedures for selection and management of sub-contractors.

Q6.16: Please explain whether and how your company can ensure supply chain transparency beyond tier-1 suppliers? Can you, for example, provide information on the origin of the main materials such as aluminium, copper, plastic, or steel in your products down to country level?

Q6.17: How do you ensure that the materials and components in your products are ethically sourced? Are any of the materials or components in your products for example certified according to an international standard or initiative that guarantees ethical sourcing?

Q6.18: Does any of your products or parts thereof contain one or more of the following minerals: tantalum, tin, tungsten, or gold? If so, please explain how you mitigate potential risks related to human rights.

6.2 SAFETY (HS)

The ambition for health and safety is to be best in class within all disciplines of safety. This means that Bornholm Energy Island will use a risk-based approach, report and evaluate all incidents, work actively with safety culture and involve suppliers proactively in risk identification and mitigation. Overall health is important for Bornholm Energy Island which means that the ambition is to ensure that there is access to fitness and healthy food and make sure that work life balance is in focus from both management and employees.

Q6.19: HSE management system: Do you have a system certified according to ISO 45001 and 14001?

Q6.20: Incident statistics: Please provide incident statistic for the last three years. LTIF and TRIR per 1 million working hours if available.

Q6.21: Sub-contractors: Is HSE part of your evaluation criteria when you select sub-contractors? If yes, please describe.

Q6.22: Safety by design: Please forward a description of how HSE risks are included and managed in design processes.

Q6.23: Safety culture: Please provide examples/ references for the implementation of Safety Culture initiatives in your organisation.

6.3 QUALITY MANAGEMENT

Q6.24: Do you have a System certified according to ISO 9001?

7. Expected Contractual setup

Employer expects to enter into two contracts for the Scope of Works for cables. One contract for the cables from Zealand to Bornholm and one contract for the cables from Germany to Bornholm. The contracts are planned to be EPC contracts based on FIDIC Yellow Book including Particular Conditions, Part A Contract Data and Part B Special Provisions.

7.1 COOPERATION AND COORDINATION

The use of a FIDIC Yellow Book gives the Contractor the responsibility for the engineering, procurement, and construction of the Works. However, it is still important for the Employer to be closely informed and ensure a good cooperation with the Contractor. Based on this, Employer has the following questions:

Q7.1: It is important for the Employer to be informed and involved in the planning, operation, and execution of the Works. How do you intend to ensure this?

Q7.2: How will you ensure a strong cooperation with the Employer and how should the contract focus on this? Which meetings/tools/processes do you find relevant to use to ensure a strong cooperation with the Employer?

Q7.3: Which competencies regarding contract management and organization do you consider crucial to be present at Energinet for you to have the right conditions to perform the Works?

Q7.4: How will the Contractor ensure Key Personnel is maintained on the project for the full duration of the contract to ensure all relevant competences and learnings are maintained?

7.2 COORDINATION OF SUBCONTRACTORS

The scope of the contracts is wide, and Employer therefore expects Contractor to enter contracts with sub-contractors in order to deliver the entire scope. Based on this, Employer has the following questions:

Q7.5: Based on the described scope, how many subcontractors do you expect to enter into contract with on this project and how will you manage and organise the subcontractors?

7.3 INTERFACE MANAGEMENT

As stated previously, there will be interfaces with other contractors, both hired by Energinet and third parties. It is therefore important that the Contractor has a strong focus on interface management. Based on this, Employer has the following questions:

Q7.6: How does the Contractor intend to manage interfaces, both internally, but also with other contractors?

Q7.7: Which contractual measures do you think should be taken to manage the interfaces in the best way?

Q7.8: What role do you think the Employer should take in handling interfaces, and what are your experiences in this regard?

7.4 DOCUMENTATION AND REVIEW

A big part of the design phase as well as the following construction phase is the Contractors obligation to deliver design descriptions, documentation, method statements etc., and in connection hereto the Engineers review obligation. Based on this, Employer has the following questions:

Q7.8: The Employer wishes to know how the Contractor will work to ensure the quality of the Contractor's document submissions and thereby limit the amount of review cycles?

Q7.9: To which extent do you consider the Contract to be able to control on an ongoing basis that the works you perform meet the quality defined in the Contract?

Q7.10: Which steps does Contractor find relevant to follow when producing As-Built Material and how will Contractor describe these steps in the Contract?

Q7.11: The Employer expects to place a client representative to perform observation and reporting during both the production and installation. The client representative will have no instruction or approval authority in relation to the Contractor. Can Contractor confirm that such personnel on Contractor's production facility and vessels are acceptable?

8. Expected Insurance setup

The Employer intends to procure Construction/Erection All Risk Insurance ("CAR/EAR Insurance") of a good international standard. The CAR Insurance will include any contractor, sub-contractor, supplier for their site activities only and/or advisor of any tier as additionally insured and the insurers shall waive any right of subrogation against Contractor group

Construction All Risk Insurance ("CAR/EAR Insurance") covering the Work, Materials and Employer Provided Items against Property Damage, and shall include the Works, Materials and Employer Provided Items designated for the Project.

Based on this, we have the following questions:

8.1 INSURANCE REQUIREMENTS

Q8.1: Is the Contractor able comply with, and take out and maintain the following insurances (or procure, using its reasonable endeavors, that the same are taken out and maintained by its Key Subcontractors)?

- Any and all insurance the Contractor may by statute, applicable law be required to affect and maintain wherever the work is being carried out.
- Third Party Liability insurance (including completed operations and product liability) of a good-local-standard with A- rating according to S&P or similar acting as primary insurance and with a limit of no less than EUR 10 Million each and every occurrence and in the aggregate per policy year and a deductible of no more than EUR 1 Million per claim.
- Marine Cargo insurance for Contractors transportation of materials etc. until such destination as contractually defined as destination in Contract.
- Marine vessel insurance, such as Hull and Machinery, Protection and Indemnity coverage, and Charterer's liability insurance. Insurance sum TBD.
- Professional indemnity insurance (or comparable insurance) in an amount of not less than EUR 10,000,000 each and every occurrence and in the aggregate per policy year.

8.2 LEVELS OF DEDUCTIBLE

Q8.2: Can the Contractor accept the following levels of deductible with regards to property damage on the scope of works?

- Onshore works: EUR 250,000
- Offshore works: EUR 3,000,000

8.3 POLICY MANAGEMENT

Q8.3: Is the Contractor able to give prompt notification to the Employer with regards to changes to the agreed Scope of Works?

Q8.4: Financial Credit Rating. In case of downgrading of your insurance company's credit rating, will the Contractor be able to give prompt notification to Employer?

8.4 CLAIM MANAGEMENT

Q8.5: Has the Contractor experienced any insurance claims the last 5 years?

Q8.6: Can the Contractor provide insurance claims statistic including details of trigger and financial costs?

8.5 RISK MANAGEMENT

Q8.7: Has the Contractor established any risk prevention procedures and investment plan? Please describe it in detail.

9. Commercial parameters

9.1 CONTRACT PRICE

Q9.1: Based on the information given in this discussion paper, would you be able to give a rough price estimate or interval on the total price for each of the cable connections Bornholm-Zealand and Bornholm-Germany if they were tendered as EPCI contracts which all activities included as described in Section 3.2.1 "Scope of Works"?

When using lump-sum as contract price, the Employer wishes to explore the option of fixed incentives which will be released based on pre-defined triggers/alternative milestones. These incentives can be materialized through accelerated payment milestones and as an example, such acceleration milestones could be placed in relative connection with the agreed time for completion, meaning that if the contract is able to accelerate progress to a point where it is possible to reach the acceleration milestone, thereby achieving earlier completion, the acceleration milestone releases an additional payment in addition to the agreed milestone payment for completion. Contractor to consider this a forming part of the milestone program and payment plan. Based on this, the Employer has the following question:

Q9.2: The Employer considers the use of an increased percentage of retention money (+10% of contract value) based on final completion of all milestones. Please advise on Contractor's considerations and reservations with regards to the use of retention money.

9.2 PAYMENT PLAN

Q9.3: The Contractor is asked to describe their preferred Payment Schedule set-up (number of milestones, percentage allocations etc.) Please include which milestones and considerations are important to ensure a neutral cash flow for you?

Q9.4: Which circumstances or motivations lies behind the way you would prefer to structure the Payment Schedule in the contract?

Q9.5: When structuring a payment plan, how much would you require in advance payment (with a corresponding Advance Payment Guarantee?)

9.3 PRICE REGULATION AND HEDGING

The Employer wishes to explore the possibility of determining fixed cost indexation brackets in incrementing scales on items not included in a lump-sum contract price, including bill of quantity rates for Variation Order purposes. Based on the scope of supply, the Employer wishes to agree such indexation brackets on defined and agreed key deliverables (labor & product) including pre-defined triggers for when the relevant indexation brackets may be activated. Employer furthermore wishes to explore the application of a cost benchmarking regime as an alternative to fixed indexation. A cost benchmarking clause for pre-determined key deliverables mandates periodic open-book reviews of Contractors pricing against relevant industry standards and market rates. Based on this, the Employer has the following question:

Q9.6: The Employer wishes to know to which extent the Contractor has hedged costs on raw materials and metals?

Q9.7: The Employer wishes to know to which extent the Contractor has hedged currency, both in relation to the main contract cost, but also in relation to subcontracts?

Q9.8: Does the Contractor recommend the Employer to include a standardized detailed price escalation format in the tender, covering not only metals, but also labour, energy or an IPP index? Can the Contractor propose a format? The format should include the indexes which the Contractor finds relevant and which reflect the actual cost drivers for the Contractor.

10. Risks parameters

10.1 CONTRACT RISK MANAGEMENT PRINCIPLES, SYSTEM AND ORGANIZATION

The Employer wishes that the following general principles be applied to and adopted by the Contractor:

- Risk should be managed by the party most suitable to manage the risk,
- Risk allocation as defined in the contract should be respected,
- Decisions on risk treatment should be supported by due time analysis,
- Risk management should be integrated part of design, construction, and operational planning,
- Risk management should be integrated part of review and monitoring setup,
- Decision and Governance processes should be supported by risk assessments, and
- Risk Management should adopt best practice from other large-scale multidisciplinary infrastructure projects.

Furthermore, the Employer wishes that the Contractor should develop, operate, and maintain a system, consisting of:

- Risk Management planning,
- Risk Process, defining methodologies for identification, analysis, evaluation, and assessment process,
- Quantitative and Qualitative risk assessment,
- Produce and maintain risk register(s),
- Mitigation definition and planning,
- Contingency planning,
- Risk Monitoring and Control,
- Reporting,
- Support change management system, and
- Early warning and resolution.

Based on this, the Employer has the following questions:

Q10.1: What Risk Management Tool does the Contractor use (Excel, RamRisk or another system)?

Q10.2: The Employer wishes to know whether the Contractor will establish a risk management organization supporting the project's Risk Management activities, hereunder appointing a dedicated Risk Manager to the project?

Q10.3: As part of the overall program management, the Employer intends to establish a risk coordination forum. The forum will consist of Risk Manager(s) from the Employer and the Contractor. Does the Contractor support this approach, and do you have experience from other projects?

Q10.4: Does the Contractor work with a quantitative risk assessment, hereunder Monte-Carlo simulations?

Q10.5: Is the Contractor's Risk Management Setup supported by relevant policies, procedures, and instructions? An example of a relevant policy is the Risk Management Guidelines from the ISO31000 Standard or the principles from PRINCE2.

10.2 RISK ASSESSMENT OF THE PROJECT'S CURRENT RISK PICTURE

Q10.6: What are the top 5 risks associated with the Contractor's Work?

10.3 CONTRACTUAL RISKS IN THE FIDIC YELLOW BOOK

Q10.7: Where does the Contractor see the biggest contractual risks in the project? An example of a contractual risk can be interface management or a fit for purpose clause.

Q10.8: How would the Contractor suggest that these contractual risks are handled by Contractor?

Q10.9: The Employer wishes to know whether the Contractor uses a continuously updated risk register including regular risk reviews?

11. Information about procedure for Market Dialogue

This section describes the expected time frame and procedure of the market dialogue.

11.1 TIME SCHEDULE

The expected time schedule for the market dialogue is presented below:

Topic	Expected date
Launch of market dialogue	28.04.2023
Reservation of time slots for market dialogue meeting	01.05.2023 – 01.06.2023
Deadline for sending responses	02.06.2023 at 12:00 CET
Expected latest date for confirmation of market dialogue meeting	07.06.2023
Individual market dialogue meetings	Weeks 24 and 25, 2023

11.2 DESCRIPTION OF PROCEDURE

1. The Employers have published Periodic Indicative Notice (PIN) in the Official Journal of the European Union and made this document available.
2. Interested parties should send an e-mail to sew@energinet.dk in order to receive a link to our booking system. By using the link, a time slot for an individual market dialogue meeting can be reserved. Final confirmation of the market dialogue meeting will be sent by email from Energinet and 50Hertz only after receipt of the written responses – please see step 3.
3. Further to the above, interested parties should provide written responses to the questions found in this “Discussion paper”, doc. no. 23/04783-2. The same questions are listed in the excel questionnaire, doc. no. 23/04783-3. The Employer prefers that the questions are answered via the Excel questionnaire, however the applicant is free to answer the questions directly in the discussion paper instead. The responses should be sent by e-mail to sew@energinet.dk. The deadline for sending the responses is **June 2nd 2023 at 12.00 CET**.

The Employers will successively consider the incoming responses and confirm the individual dialogue meetings.

4. The individual market dialogues will be held either physically or online via Teams during the weeks 24 and 25, 2023. The practicality will be planned more specifically with each participant once the booking times have been confirmed.
5. After the first market dialogue round and until launch of tender, the Employers intend to have further individual market dialogue rounds with the selected candidates.

ENERGINET

Energinet is the transmission system operator for electricity and gas in Denmark. We are an independent public enterprise owned by the Danish Ministry of Climate, Energy and Utilities. We operate 8400 km power lines and 1250 km gas grid, and together with our neighbours we operate onshore and offshore interconnectors to Norway, Sweden, Germany, The Netherlands and Poland. Around 1800 employees keeps Denmark's security of supply high and makes sure that the green transition to 100 percent renewable energy can be carried out in an economically responsible way.



50Hertz operates the electricity transmission system in the north and east of Germany, which it expands as needed for the energy transition. Within these regions, 50Hertz and its around 1,600 employees ensure that 18 million people are supplied with electricity around the clock. 50Hertz is a forerunner in the field of secure integration of renewable energy. In our grid area, we want to integrate 100 percent renewable energies securely into the grid and system by 2032 - calculated over the year. The shareholders of 50Hertz are the Belgian holding Elia Group (80 percent), which is listed on the stock exchange, and the KfW bank group with 20 percent.