

# UK Electricity Interconnection Supply Chain Update

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## IFA2 - updated information sheet

### Background

IFA2 is being developed as a 1 GW HVDC link between the French and British transmission systems. It will be around 240km in length; it will connect to the GB transmission system at the Chilling 400kV substation on the south east Hampshire coast, and will connect to the French transmission system at the Tourbe 400kV substation in the Lower Normandy region of France. The project is being developed jointly by French Transmission System Operator RTE (Réseau de Transport d'Électricité) and National Grid Interconnector Holdings. The future GB interconnector operator, and interconnector licence holder, will be National Grid IFA2 Ltd.

### Partners

National Grid has a strong background in developing and delivering subsea interconnectors. With IFA and BritNed already in the portfolio, and NEMO and NSL in construction, IFA2 is seen as a further commitment to National Grid's support to the provision of clean, renewable and sustainable energy to British consumers.

Réseau de Transport d'Électricité, also known as RTE, is the electricity transmission system operator of France. It is responsible for the operation, maintenance and development of the French high-voltage transmission system.

RTE is a wholly owned subsidiary of a company 50.1% owned by the partially state-owned French generator Électricité de France (EDF) and 2 other totally (CdC) and partially (CNP Assurances) state-owned companies, headquartered in Paris.

RTE have a strong background in jointly developing, constructing and operating subsea interconnectors: projects include IFA, INELFE and Midi Provence.

### Known technical parameters

The IFA2 project is being developed as an HVDC electricity interconnector with capacity to import and export 1000MW at the points of connection to the British and French grids (at Chilling and Tourbe substations respectively).

The project is intended to complete commissioning in 2020. A key supply chain risk that had to be overcome in order to achieve this operational target was the capacity of the HVDC cable manufacturing supply chain. To best mitigate and manage this risk, tracking other recent contract awards and future possible project requirements, the partners of IFA2 sought to increase competition in cable supply within the scope of mutual agreement, and have ensured that the project is open to both XLPE and MI cable technologies in order to provide as much flexibility as possible in the procurement of cable.

To include the XLPE cable technology in the procurement strategy, the partners undertook due diligence of the state of maturity of the product that was competitively available and deliverable by 2020, and concluded that this was represented by a 320kV cable voltage. As a result, the project was open solely to 320kV XLPE cable products and 390kV MI cable products.

The converter technology has been selected as VSC (Voltage Source Converter), primarily due to its compatibility with both XLPE and MI cable products. As noted, there is adequate competition in this sector to conduct an effective procurement process.

The point at which IFA2 will connect to the electricity transmission network in Great Britain is an existing National Grid Electricity Transmission site off Chilling Lane near Chilling in Hampshire. The location of the converter station is at a site at Daedalus Airfield, near Lee-on-the-Solent in Hampshire.

The connection point for IFA2 in France will be at Tourbe 400kV substation, East of Caen in Normandy, where there is also commercially available land for a converter station adjacent to the site.

## Supply chain challenges

### 2020 delivery

The IFA2 project is working to a challenging timeline to deliver benefits to consumers by 2020. To achieve this, appropriate due diligence of the supplier market was necessary to determine what was deliverable. This informed technology choice, but also contract strategy, with a clear preference for the supply chain to remain split based on technologies (converters, cables) without further bundling.

### Ensuring adequate competition

To ensure an effective competition, the IFA2 team showcased the project and its requirements with the supply chain over a year in advance of need. This was executed by issuing a request for information, and thereafter having a week of supplier meetings with credible suppliers of VSC converter and cable technology.

This process gave suppliers the opportunity to demonstrate their capabilities and differentiators. The process further helped the IFA2 team to shape the eventual procurement strategy – namely ensuring that both XLPE and MI HVDC cable products were sought.

In addition, a pre-qualification questionnaire (PQQ) process was used with criteria to ensure an appropriate amount of competition of tenderers with acceptable levels of experience in both the supply of the cables and converters. This led to a sufficient number of bidders pre-qualifying for both converter equipment supply and cable supply.

The early supplier engagement in 2014 delivered a good level of interest, with 17 respondents to the initial Official Journal of the European Union (OJEU) contract notice. Shortlisted qualified bidders were invited to tender on 30 November 2015 with tender submissions received on 30 March 2016.

Tender submissions have now been fully evaluated and clarified with Tenderers, scored and Contracts have been awarded.

This process included the evaluation of the different technologies (both lotted and combined submissions). At this stage the sole submission for MI cable products decided to withdraw from the tender process as the supplier was unable to meet the 2020 commissioning date required by the Project.

Following the first round of technical clarification meetings and legal negotiation meetings, each tender response was scored in accordance with the ITT rules and scoring criteria. Tenderers were each given feedback on their submission covering all aspects of the proposal. Following this feedback there was a short

resubmission period where Tenderers are afforded the opportunity to update their proposals in line with the feedback they have received and update their prices accordingly. This re-submission took place in early September.

Allowing Tenderers the opportunity to resubmit their proposals is an effective way of ensuring that Tenderers submissions are aligned across the spectrum.

Following these resubmissions, submissions were further assessed with further legal negotiations and technical clarification meetings being held with each Tenderer, Tenderers were again provided with feedback related to all aspects of their tenders, before being afforded the chance to make updated submissions, this process or resubmitting was conducted three times in total. Following the receipt of Tenderer's third submissions in December 2016 and the completion of the evaluation and scoring of each submission, National Grid and RTE made the decision to shortlist to Preferred Bidders for both Converters and Cables.

This decision was based on a published Contract Award Criteria, awarding contracts on the basis of the most economically advantageous tender (MEAT). This strategy takes into consideration the quality of a Tenderer's technical offering as well of the Whole Life Cost (WLC) that National Grid and RTE would incur through the construction and operation of each proposal.

By shortlisting to Preferred Bidder for both Converters and Cables, National Grid and RTE were able to conclude negotiations with the highest scoring solutions while maintaining the option to re-invite deselected Tenderers to the process should a satisfactory outcome not be realised. Satisfactory outcomes were achieved with both Preferred Bidders, avoiding the need to reopen the procurement process.

### Procurement approach

The IFA2 contract notice (published on in OJEU journal on 15th July 2015) stated several conditions that the project is now officially bound to, such as:

- Definition of the power capacity as 1000 MW at the receiving ends
- VSC technology

The procurement strategy is based on two main EPC contract lots (converters and cables) but with the option for bidders to provide differentiation from a completely turnkey EPC contract. The description of the lots is as follows:

- Lot 1: HVDC converter station (1 in United Kingdom and 1 in France),
- Lot 2: Marine and onshore HVDC cable and installation and UK HVAC cable and installation,
- Lot 3 (Optional): HVDC converters and HVDC cable and installation and UK HVAC cable and installation (Lot1 + Lot 2).

Eligibility for Lot 3 was conditional upon the bidder having submitted bids for both Lot 1 and Lot 2. If the bidder is a joint venture or a consortium they must be able to demonstrate that their combined Lot 3 bid consists of bidders for Lot 1 and Lot 2.

For the different DC cable technologies, different DC voltages were considered; namely 320kV for XLPE and 390kV MI cable.

- The defined voltages of 320kV XLPE and 390kV MI opened the opportunity to a maximum number of cable suppliers to enter the tender and to be eligible for lot 3 too.
- Both voltages were required from Lot 1 tenderers, in order to maximize the chances of finding a match between Lot 1 and 2.

Following the withdrawal of all viable MI submissions, Lot 1 tenderers were requested only to provide submissions for 320kV solutions.

## Tender Programme

Table 8 – IFA2 Tender programme (amended to actual Dates)

Activity	Date
Invitation to tender (ITT) Launch	30 November 2015
Tender Return Deadline	30 March 2016
Evaluation and Clarification Period	May – Aug 2016
Initial Bid Resubmission Period	September 2016
Scoring and Shortlisting provision	September 2016
Second Bid Resubmission Date	17 October 2016
Third Resubmission Date	14 December 2016
Negotiation Period	May – December 2016
Internal Investment Decision	November 2016
Scoring Period	December 2016 – January 2017
Shortlisting Decision	15 January 2017
Preferred Bidder Final Offer Submission	3 March 2017 <sup>1</sup>
Offer For Acceptance	21 March 2017
Contract Award	6 April 2017

<sup>1</sup>Multiple documents updated through discussion after this date, however, full offer made on this date.

## Contracts Awarded

Following the successful completion of the Procurement Event, contracts were awarded to a consortium of ABB AB, ABB UK and ABB SAS for Lot 1, HVDC Converter Stations which totals in the region of €270m and Prysmian PowerLink for Lot 2, Marine and Onshore HVDC Cable and Installation and UK HVAC Cable and Installation, in the region of €350m.

The IFA2 Contract Award Notice (sent to OJEU for publish on 10 April 2016) notified the market that Contracts had been awarded for Converters and Cables as well as the names of the winning Tenderers for each Contract.

## Viking Link – updated information sheet

### Background

Viking Link is being developed as a 1.4GW HVDC link between the Danish (Energinet) and British transmission systems. It will be around 760km in length (including onshore cable) and will connect to the 400kV Bicker Fen substation in England and 400kV Revsing substation in Western Denmark. The subsea cable route will cross through several international territorial waters in depths of approximately 80 metres.

The project is being developed jointly by Danish Transmission System Operator (TSO) Energinet and National Grid Interconnector Holdings. Viking Link is currently considering Mass Impregnated Non Draining cable Technology and XLPE cable technology and will evaluate the risks of both during the procurement exercise. Commissioning of the link is expected by the end of 2022.

### Partners

National Grid has a strong background in developing and delivering subsea interconnectors. With IFA and BritNed already in the portfolio, and NEMO Link and NSL and now IFA2 in construction, Viking Link is seen as a further demonstration of National Grid’s commitment to support the provision of clean, renewable and sustainable energy to UK consumers.

Energinet is the Danish national TSO for electricity and natural gas. It is an independent public enterprise owned by the Danish state under the Ministry of Climate and Energy. Their main task is to maintain the overall short-term and long-term security of electricity and gas supply, and to develop the main Danish electricity and gas transmission infrastructure. Energinet achieves this whilst supporting eco-friendly power generation, the development and demonstration of green energy production technologies and calculating the environmental impact of the energy system as a whole.

Energinet has a strong background in jointly developing, constructing and operating subsea interconnectors: projects include KontiSkann, Skagerrak 1, 2, 3 & 4. Energinet has placed contracts with Siemens and Prysmian for the new CobraLink interconnector, between Denmark and Holland and developing the Kriegers Flak wind farm project which will form part of a new interconnector between Denmark and Germany.

### Known technical parameters

Table 1 – known technical parameters for Viking Link

Capacity	1400MW (1.4GW) @ 525kV	Preferred HVDC operating voltage	>500kV
<b>Converter Technology</b>	Voltage Source (VSC) – Bipole	<b>Offshore Cable</b>	630km
<b>Cable Technology</b>	MI or Extruded	<b>DK Land Cable</b>	75km
<b>UK Connection</b>	Bicker Fenn, Lincs	<b>UK Land Cable</b>	~65km
<b>DK Connection</b>	Revsing (Vejen)	<b>UK AC Cable</b>	<5km
		<b>DK AC cable</b>	No cable – connected directly to substation

## Supply chain challenges

Viking Link will be a 760km interconnector with a capacity of 1400MW. In order to ensure the successful completion of the Viking Link project by 2022, the Project is continuing to engage with the HVDC Converter and HVDC Cable supply markets for the main EPC contracts.

Following the Supplier Information Day that was held on 23<sup>rd</sup> February 2016, Viking Link has conducted two rounds of supplier engagement in Europe and the Far East. The feedback from the supply chain confirmed a capacity constraint in the HVDC cable market and a lack of competition in the HVDC converter market; this market intelligence has helped develop and defined the procurement and contracting strategy.

Taking into consideration the procurement scope, the technology choices and the market outlook the appropriate procurement strategy has been developed. The constrained cable market conditions leads us to conclude that a full turnkey solution for the entire procurement scope will not provide competitive bidding and therefore this has been ruled out. HVDC Converters and HVDC Cable will be conducted as independent parallel tender events similar to the NSL project.

Due to the anticipated DC cable market manufacturing constraints, both partners felt that it was imperative to engage with the supply chain as early as possible in order to maximise the projects ability to achieve a commissioning date of 2022 to the required operational performance. This has been conducted for the HVDC part of the project during the summer of 2016.

All tender documentation, in line with the EU Procurement regulations, was released to the supply chain 13<sup>th</sup> January 2017 via the EU Supply Portal. This gave all interested parties access the Contract Notice, Pre-Qualification Questionnaire (PQQ) and the full Invitation to Negotiate (ITN) documentation. Tenderers who successfully met the pre-determined criteria of the PQQ were invited to participate in the next stage of the process, the ITN. The ITN was released 23<sup>rd</sup> March with a submission deadline of 1<sup>st</sup> August 2017.

The procurement strategy consists of the following lots:

HVDC Converters – Single lot.

HVDC Cable – Five lots for Mass Impregnated cable and one lot for Extruded Cable.

Onshore Cable Civils – Separate contracts and procurement events for UK and DK.

With the tender submissions being now received, an initial evaluation is currently underway for both cables and converters.

It was agreed by both partners, that to enable a compliant and high standard submission, further supplier engagement would take place over this period above and beyond the normal question and answer process that exists using the procurement portal. This engagement will involve face to face meetings and with each individual supplier and key members of the Viking Project team to answer and clarify questions that may arise and also gives the opportunity to confirm the projects requirements and expectations. The negotiations will continue up until summer 2018, when the contracts for cables and converters will be awarded.

The contract notice for the UK Onshore works for the Viking Link project was published on 11<sup>th</sup> July. Prospective suppliers had until 10<sup>th</sup> August to register their interest. Pre-qualified suppliers will be notified by 15<sup>th</sup> September and invited to submit their tenders by no later than 8<sup>th</sup> December 2017. Tender evaluations are expected to start immediately after, with supplier negotiations to take place in January 2018 ready for FID. The Civil Works contract is scheduled to be awarded in summer 2018, consequent to the award of the Cable EPC contract.

**Short term next steps**

1. Continue proactive supplier engagement during the tendering period and ensure all questions and answers are dealt with as efficiently as possible to enable key deadlines to be met.
2. Ensure alignment and understanding of the tendering process with both partners including; evaluation process, negotiation strategy and key deliverables.
3. Continue the formal procurement process for the UK Land Cable Civil Works, in parallel to the tendering process for the Cable EPC contract.