

# Engineers Ireland Excellence Awards 2013

Entry for Engineering Project of the Year category



# EAST WEST INTERCONNECTOR



**500 MW** of power output which is equivalent to a modern large generator

**300,000** households can be supplied by the Interconnector

**264 km** in total length from the Irish to GB Electricity Grids

**187 km** of subsea cable installed below the Irish Sea bed

**7 TB** of data transmission can flow per second across the fibre optic cable

***FACT:** EWIC has the Capability to 'black start' both electrical transmission systems in the event of a major system-wide outage.*



# EAST WEST INTERCONNECTOR



**45 Months** to complete the project from the placing of contracts to commercial operation

**285 Contractors** employed during the project life-cycle

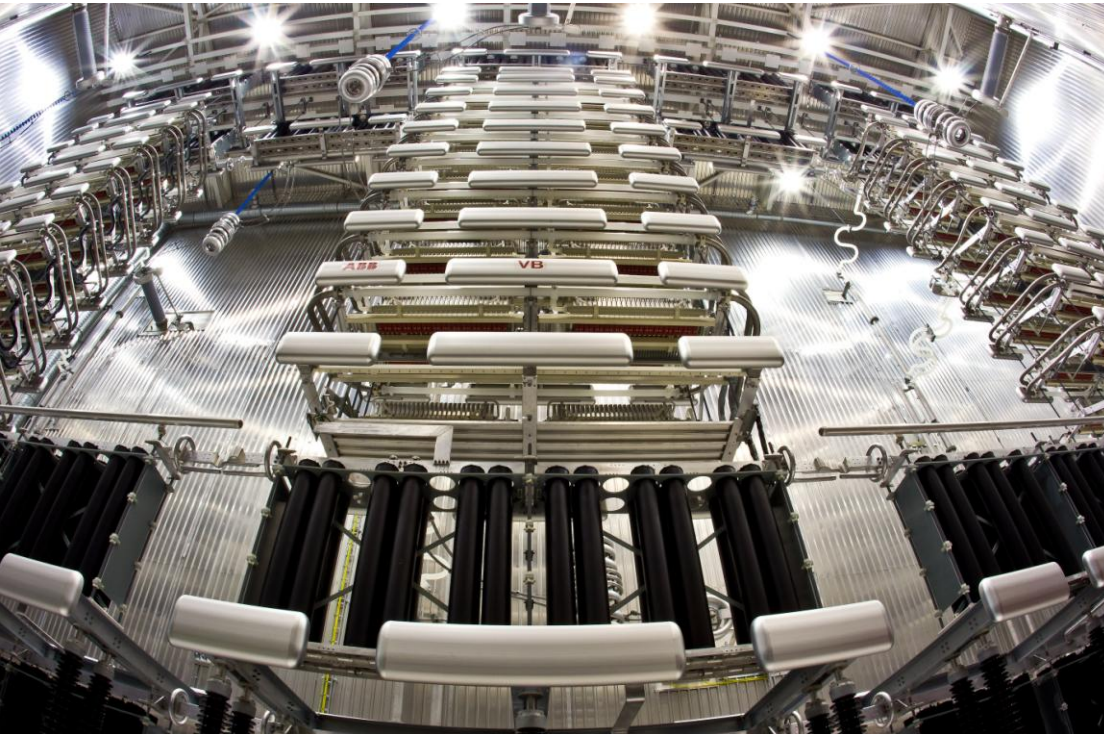
**2.2 Million hours** worked to deliver the Project

**3,700 People** worked on the project during its lifecycle

***FACT:** Over 200 marine permit conditions were discharged on the project in 6 separate licences over 4 distinct licencing areas.*



# EAST WEST INTERCONNECTOR



## HVDC Conversion

Latest generation of HVDC technology implemented to provide the optimum economical and technical solution

Core technology is based on the use of high power transistors which, when switched in the correct sequence, achieve the conversion of AC power to DC power and vice versa

**FACT:** While converting AC electricity to DC (and vice versa) the 416 IGBT valves (pictured above) switch 1,650 times per second and are controlled via fibre optic cables.



# EAST WEST INTERCONNECTOR



*Above: The Interconnector cable terminates on either side of the Irish sea at the respective Converter Stations where the AC/DC conversion takes place.*

## System Studies

Comprehensive sequence of analytical studies was performed to evaluate the interaction of the interconnector with the Irish and GB transmission systems

Thorough environmental assessment was performed for the converter stations to evaluate audible noise impact, electromagnetic field emissions, and the visual impact of the stations on the landscape, and ensure that these were within accepted international norms



# EAST WEST INTERCONNECTOR



## Cable Installation

**140 km** of land cable in total installed along the 70 km route, 40 km of which is in Ireland and 30 km in Wales

High speed fibre optic cable was laid with the power cables, to provide both dedicated communication between the two converter stations

Cutting-edge Distributed Strain and Temperature Sensing (DSTS) technology also operates on the fibre optic cable, providing diagnostic information on power cable condition



**Above:** A drum containing 500m of land cable is off-loaded and guided along cable rollers and pulled through the pre-installed cable ducts. The entire interconnector cable took almost 2 years to manufacture.



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## Cable Installation

Horizontal Directional Drilling employed where the cable route crossed natural barriers such as rivers or man-made obstacles such as railway lines or highways

This included the crossing of the M1 and M3 in Ireland and the River Dee in Wales

**Above:** A 250 tonne Horizontal Directional Drill bores a 600m crossing below the River Dee in Wales.



# EAST WEST INTERCONNECTOR



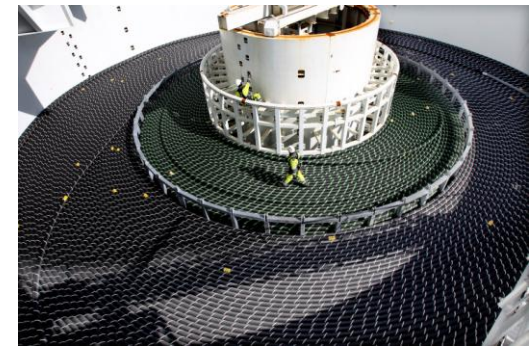
## Marine Installation

**186 km** of power cable and high speed fibre cable laid across the seabed

**30** plus vessels used during the Marine Installation and burial of the cable below the seabed for protection

**1 Million** man-hours worked without a Lost Time Accident

Above: The “AMC Connector” - Worlds Largest cable laying vessel



# EAST WEST INTERCONNECTOR



## Marine Installation

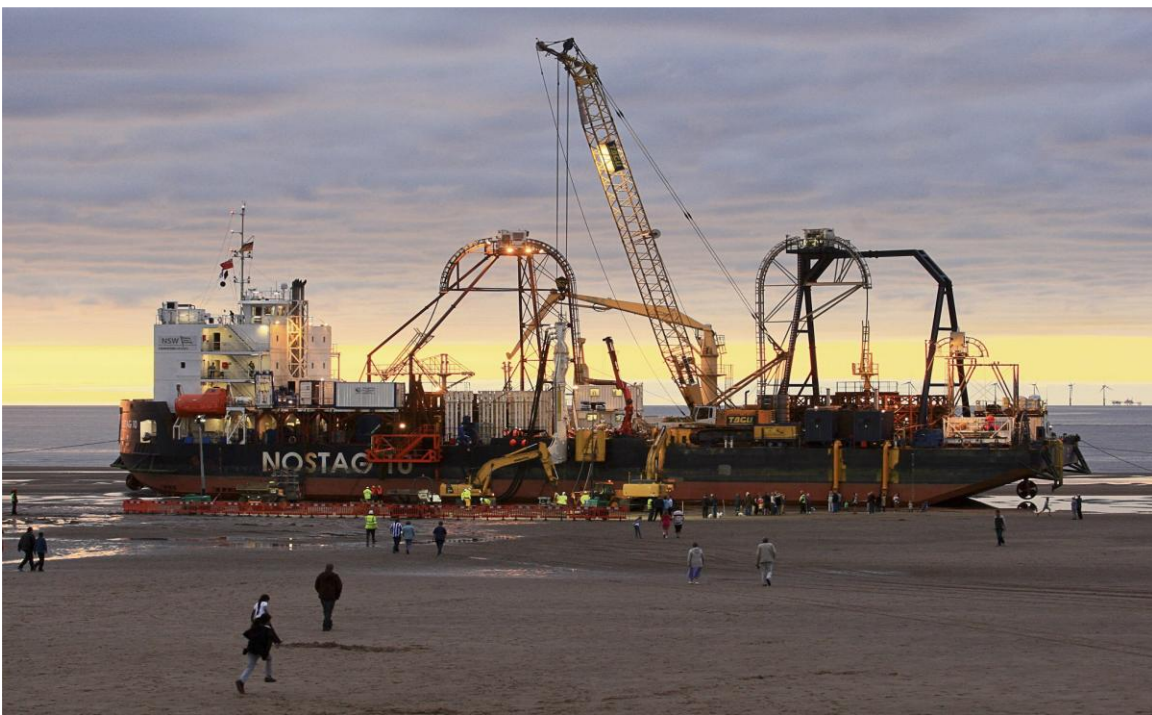
Specialised ships were required to place the cables, using Remote Operated Vehicles (ROV) to excavate a trench on the sea bed and guide the cable into position



*Above: The Canyon “i-Trencher” being lowered to the Irish seabed where it will simultaneously excavate a trench and bury the Cable.*



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## Marine Installation

Near-shore works using the Nostag 10 cable installation vessel which traverses in a sideways direction while simultaneously laying and burying cable at Barkby Beach (Wales) in preparation for the near shore burial of the EWIC cable.

*Above: The "Nostag 10"*



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## Spare Cable Storage

A purpose built cable storage facility houses 10km of spare cable ready for loading in the event of a repair to the interconnector



*Above: Cable storage facility*



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## Benefits

**EWIC** adds a new dimension to the Irish energy sector and will deliver significant long-term economic benefits for electricity consumers.

The additional capacity provided by EWIC has enhanced security of supply on the island of Ireland.

*Above: Irish and British Energy Ministers Pat Rabbitte and Edward Davey at the launch of the Interconnector*



# EAST WEST INTERCONNECTOR



**EWIC** will facilitate growth and prosperity, and will provide the bedrock on which to rebuild our economic strength just as Ardnacrusha, Turlough Hill and Moneypoint generation stations have over the past century.

This world class interconnector represents a significant national economic advantage for Ireland into the future and will facilitate progress for many years to come.

