



Tu socio en el mar

Offshore Wind Projects

Cadena de suministro y logística interior. Oportunidades



08 Junio 2018

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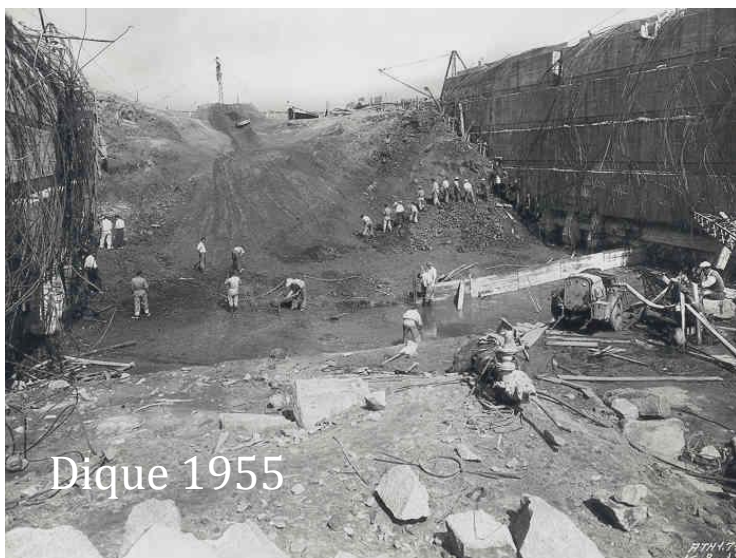


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3. Cadena de Suministro y Logística Interior



1. Astillero de Fene



1. Astillero de Fene



1. Astillero Fene

1.1 Instalaciones y Recursos Humanos



1. Astillero Fene



1.1 Instalaciones y Recursos Humanos



Área Total: **900.000 m²**

Capacidad de izado: **750 Tons (Pórtico)**

Talleres de acero **22.400m²**

Cabinas de chorro y pintura **1.450m²**

Talleres de Prearmamento **14.400m²**

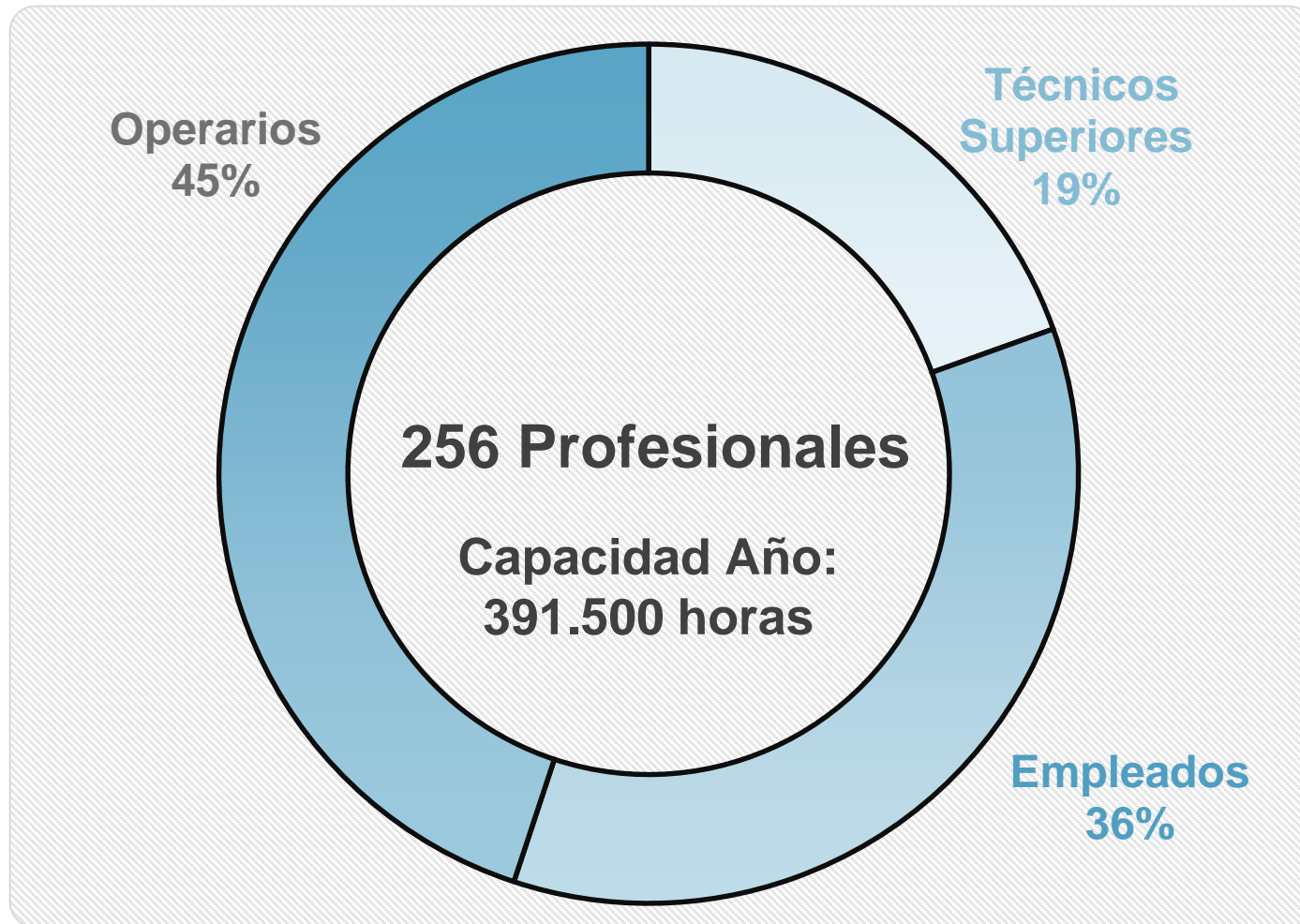
Dique N° 4: **155 x 24 m**

Dique N° 5: **265 x 38 m**



1. Astillero Fene

1.1 Instalaciones y Recursos Humanos



1. Astillero Fene



1.2 Líneas de Actividad



Buques
militares



Buques civiles y
offshore



Reparaciones y
conversiones



Diversificación
Offshore Wind

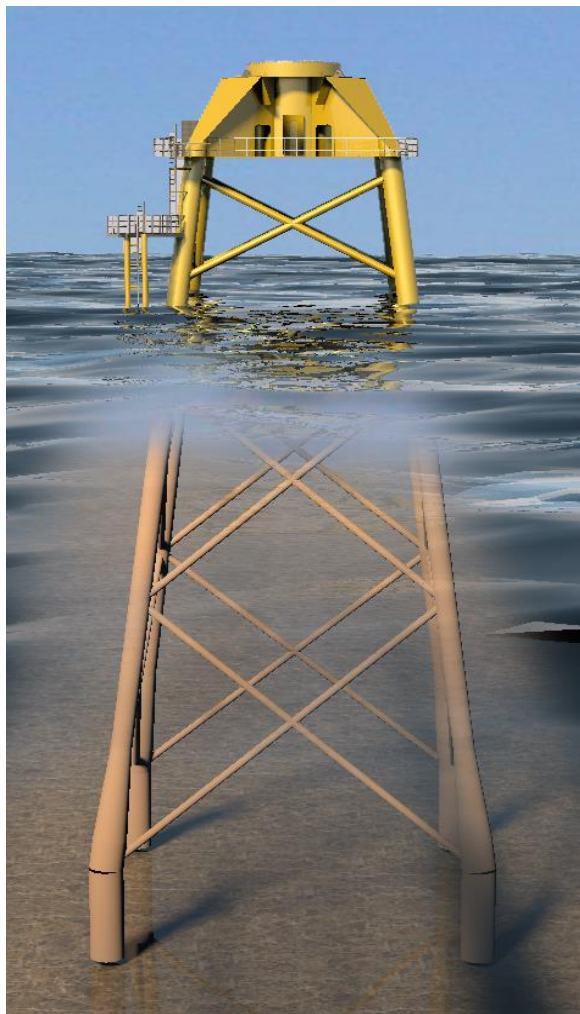






JACKETS WIKINGER (IBERDROLA)





29 Estructuras tipo Jacket

Estructura de Acero, formada por una celosía Tubular, con 4 patas longitudinales y crucetas o “bracings”.

Peso Unitario:

602 Tons Jacket

508 Tons Piles

Dimensiones:

Altura: 58.7 m

Ancho de la base: 27 m

Magnitudes Globales del Proyecto:

31.000 Tons de Acero

1.541.00 horas-hombre

42% se realizan en Asturias

58% restante en la comarca de Ferrol

Turbina ADWEN 5MW



JACKETS WIKINGER (IBERDROLA)





JACKETS WIKINGER (IBERDROLA)





El parque eólico de Wiking, de aproximadamente 400 MW, está compuesto por **70 aerogeneradores offshore, soportados por estructuras tipo jacket, y una subestación eléctrica** que conecta dicho parque a la red eléctrica alemana.

Iberdrola ha repartido el alcance de trabajo en 2 paquetes:

- 29 jackets, Navantia-Windar
- 41 jackets, Bladt Industries (Dinamarca)





5 Estructuras Tipo SPAR, de longitud total 91 metros y diámetro de 14,8.

Peso Unitario:

1970 Tons Spar

1250 Tons Lastre fijo

Dimensiones:

Longitud: 91 m

Diámetro: 14,8 m

Magnitudes Globales del Proyecto:

9,850 Tons de Acero

750.00 horas-hombre

30% se realizan en Asturias

70% restante en la comarca de Ferrol



Turbina SWP 6 MW



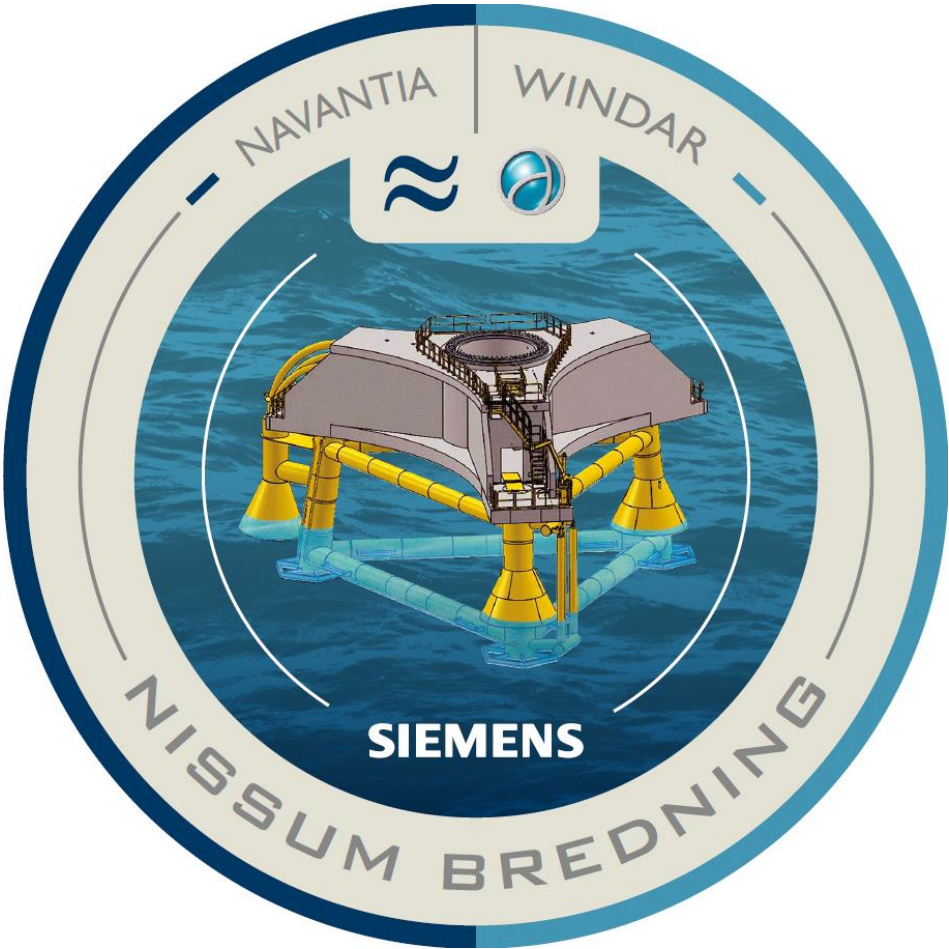


Hywind Scotland Pilot Park, Statoil AS

Parque situado en UK en su conjunto consta de los siguientes equipos y elementos:

- 5 turbinas offshore eólicas SWP 154 (6MW) instaladas sobre estructuras flotantes tipo SPAR
- Una subestación en tierra (no incluye los transformadores que están colocados en cada uno de los generadores eólicos).

Este proyecto es la primera pre-serie comercial a nivel mundial de un concepto de eólica marina flotante.





4 Unidades - Jacket de 3 patas de estructura tubular y bracings horizontales. No incluye TP (Hormigón)

Peso Unitario:

190 Tons Jacket

280 Tons Piles

Dimensiones:

Altura: 9 m

Base Triangular de 22 m de lado

Magnitudes Globales del Proyecto:

1,880 Tons de Acero

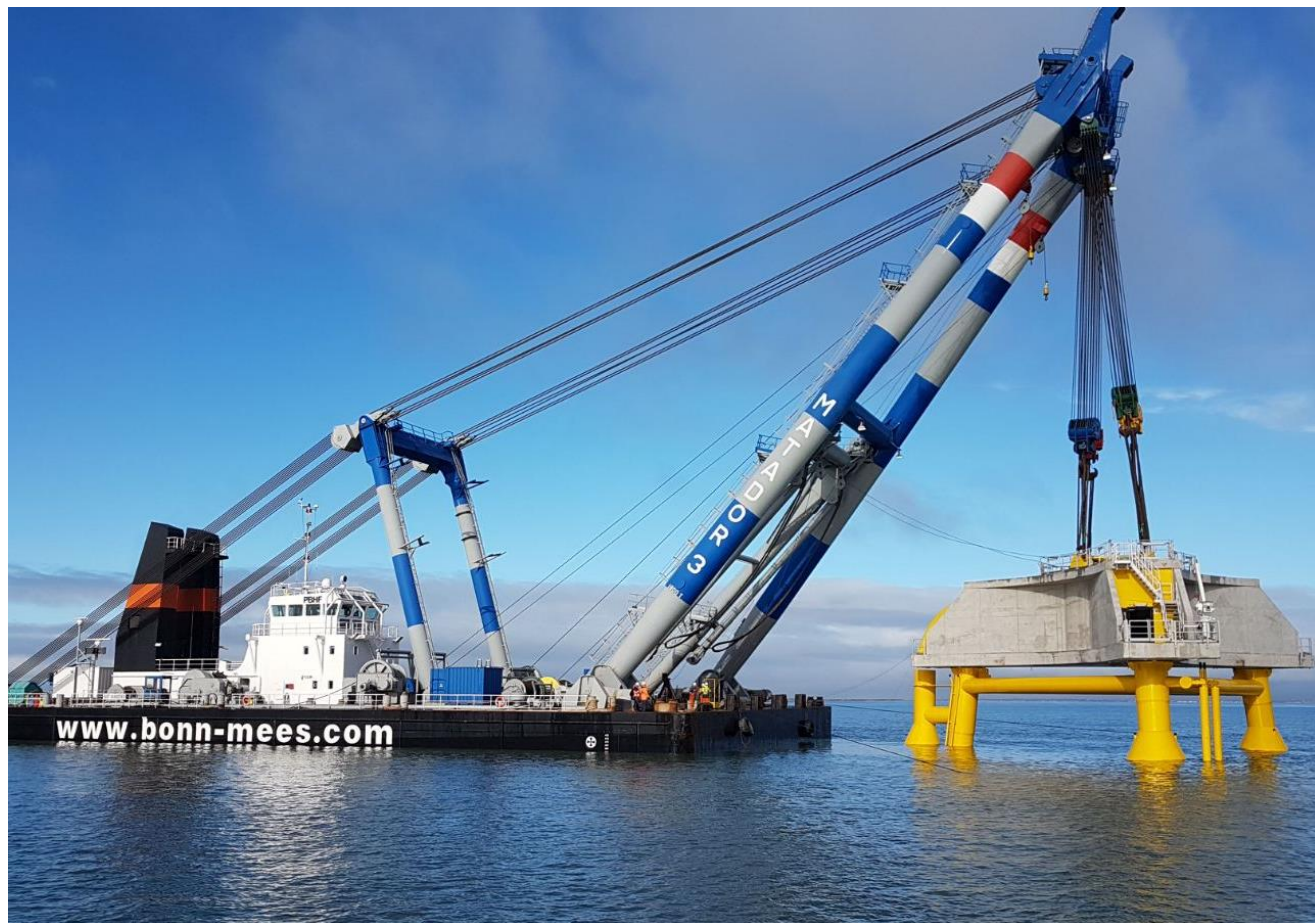
75.000 horas-hombre

35% se realizan en Asturias

65% restante en la comarca de Ferrol

Turbina SWP 7 MW



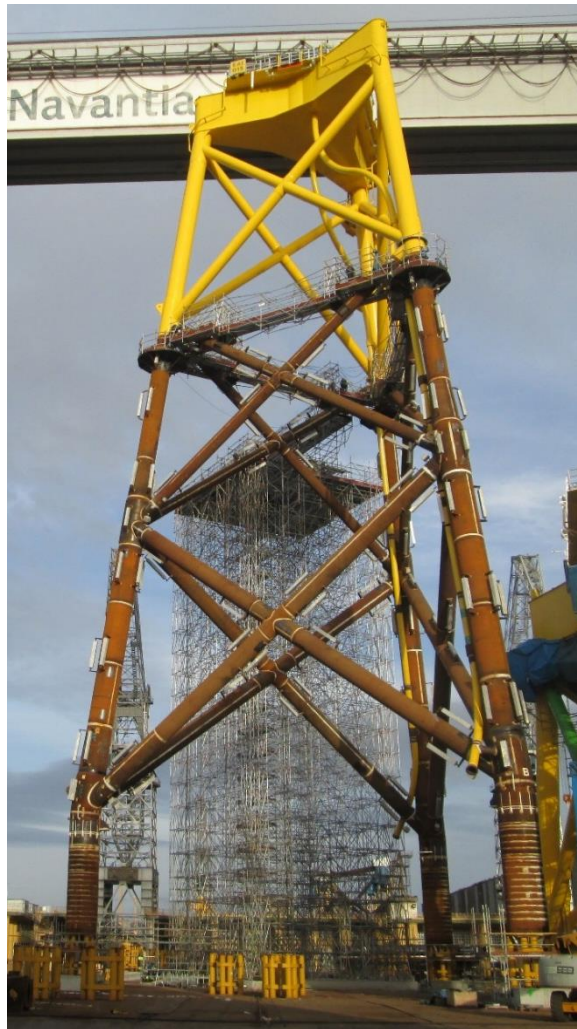


Nissum Bredning Vind Offshore Wind Farm, Siemens Wind Power A/S

Parque situado en Dinamarca en su conjunto consta de los siguientes equipos y elementos:

- 4 turbinas offshore eólicas SWT (7MW) instaladas sobre estructuras mixtas tipo Jacket (post pilotada) y TP de Hormigón
- Innovative Gravity Jacket Concept





Estructura de Acero, formada por una celosía Tubular, con 3 patas longitudinales y crucetas o “bracings”.

Peso Unitario:

850 Tons Jacket

360 Tons Piles

Dimensiones:

Altura: 66 m

Ancho de la base: 27 m

Magnitudes Globales del Proyecto:

50.800 Tons de Acero

1.547.000 horas-hombre

23% se realizan en Asturias

67% restante en la comarca de Ferrol

Turbina SWP 7 MW



EAST ANGLIA ONE (SCOTTISH POWER))





EAST ANGLIA ONE (SCOTTISH POWER))



**¿CUAL ES EL DENOMINADOR
COMÚN DE TODOS DE ESTOS
PROYECTOS?**



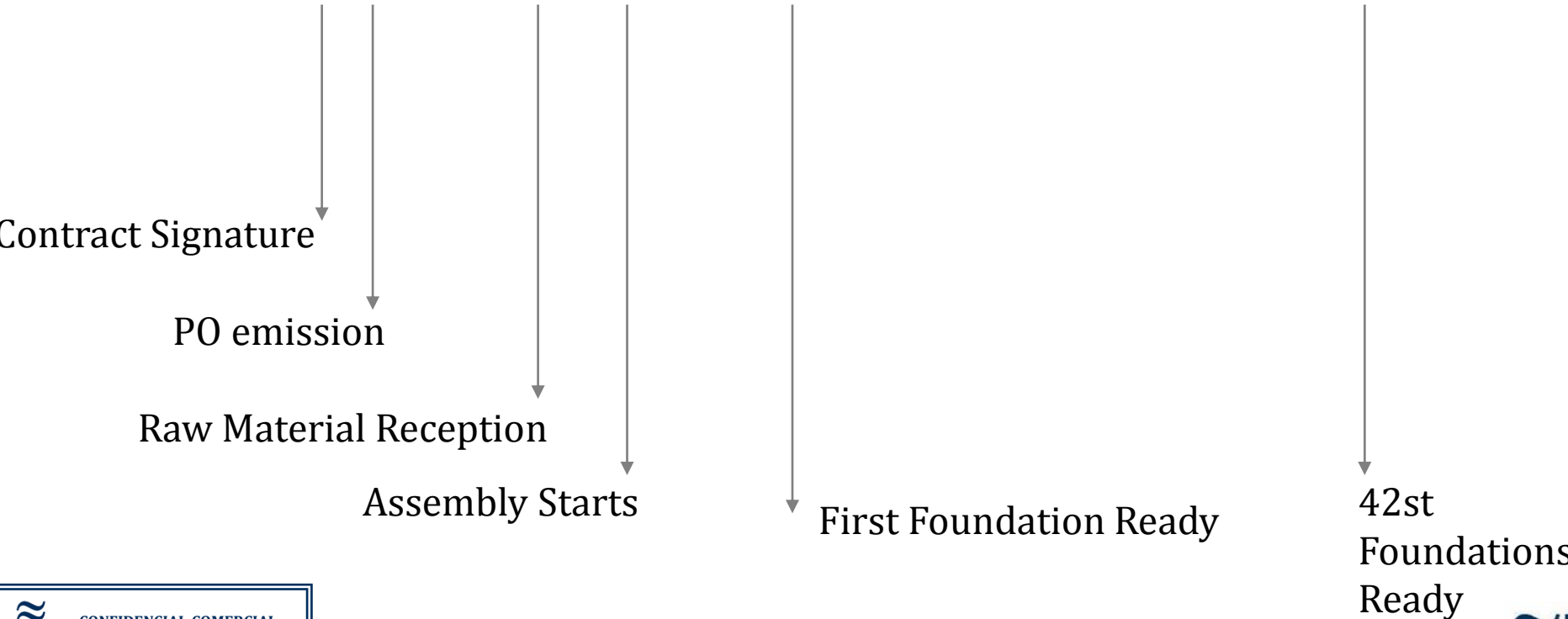
PLAZO DE CONSTRUCCION





PLAN DE COMPRAS/CADENA DE SUMINISTRO

FENE	2017												2018											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Eólica Marina																								
East Anglia One jackets (SPR)																								



PLAZO DE CONSTRUCCION

**PLAN DE COMPRAS/CADENA DE SUMINISTRO
LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA**



PLAN DE COMPRAS/CADENA DE SUMINISTRO

Establecimiento del Plan de Compras en la
Etapa Pre-Contractual

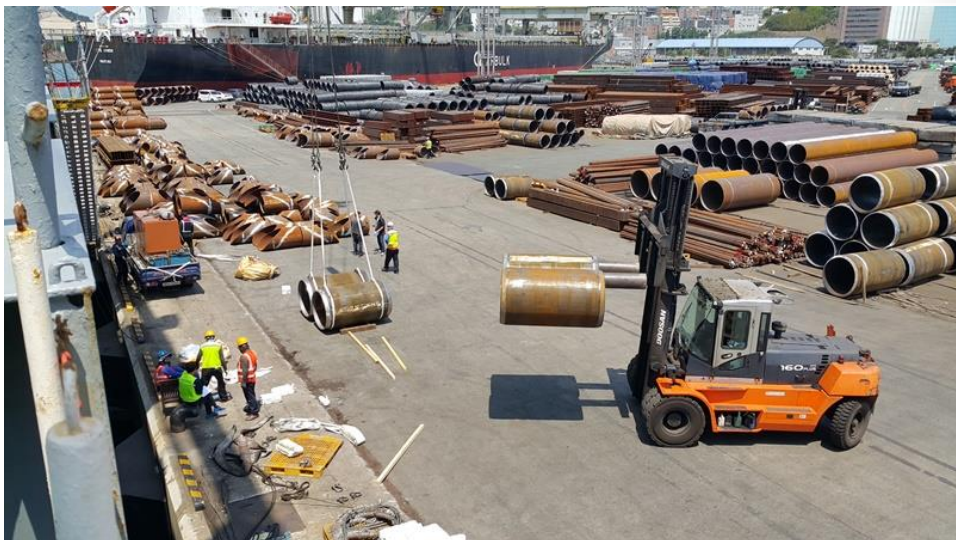
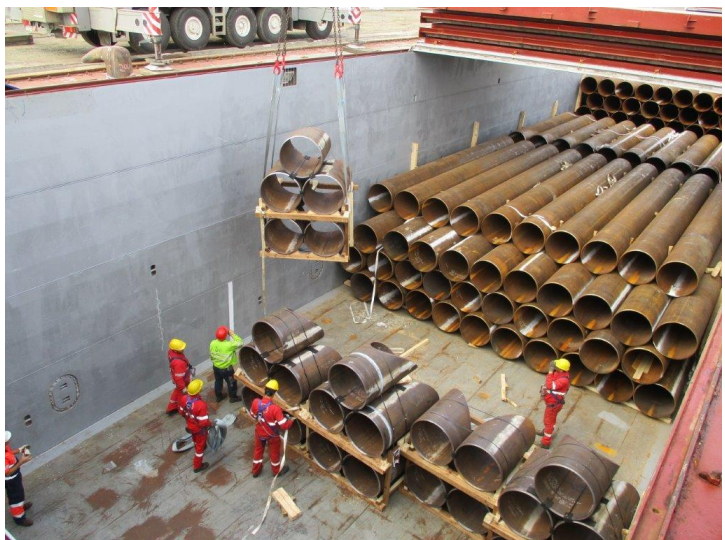
Cierre de Acuerdos (Lotes , Plazo, Precio) sin haber
comenzado la Ingeniería de Fabricación

- Acero Primario (Chapa y Tubo Estructural)
- J-Tubes
- Protección Catódica
- Grandes Paquetes de Trabajo (Fabricación y Montaje,
Pintura, Andamios, Actividades de Load Out,..)

	Date	Week	Units	Weight [T]
Pipe Order	16/01/2017	3		
Batch 1 (10 jackets) Pipes ready for Nodes fabrication	09/05/2017	19	780	2108,4
Pipes ready for jacket 1 fabrication	28/06/2017	26	51	326,5
Pipes ready for jacket 2 fabrication	05/07/2017	27	51	326,5
Pipes ready for jacket 3 fabrication	12/07/2017	28	51	326,5
Pipes ready for jacket 4 fabrication	19/07/2017	29	51	326,5
Pipes ready for jacket 5 fabrication	27/07/2017	30	51	326,5
Pipes ready for jacket 6 fabrication	03/08/2017	31	51	326,5
Pipes ready for jacket 7 fabrication	10/08/2017	32	51	326,5
Pipes ready for jacket 8 fabrication	18/08/2017	33	51	326,5
Pipes ready for jacket 9 fabrication	25/08/2017	34	51	326,5
Pipes ready for jacket 10 fabrication	01/09/2017	35	51	326,5
Batch 2 (8 Jackets) Pipes ready for Nodes fabrication	27/07/2017	30	624	1686,8
Pipes ready for jacket 11 fabrication	08/09/2017	36	51	326,5
Pipes ready for jacket 12 fabrication	15/09/2017	37	51	326,5
Pipes ready for jacket 13 fabrication	22/09/2017	38	51	326,5
Pipes ready for jacket 14 fabrication	29/09/2017	39	51	326,5
Pipes ready for jacket 15 fabrication	06/10/2017	40	51	326,5
Pipes ready for jacket 16 fabrication	16/10/2017	42	51	326,5
Pipes ready for jacket 17 fabrication	23/10/2017	43	51	326,5
Pipes ready for jacket 18 fabrication	30/10/2017	44	51	326,5
Batch 3 (8 Jackets) Pipes ready for Nodes fabrication	22/09/2017	38	624	1686,8
Pipes ready for jacket 19 fabrication	07/11/2017	45	51	326,5
Pipes ready for jacket 20 fabrication	14/11/2017	46	51	326,5
Pipes ready for jacket 21 fabrication	21/11/2017	47	51	326,5
Pipes ready for jacket 22 fabrication	28/11/2017	48	51	326,5
Pipes ready for jacket 23 fabrication	05/12/2017	49	51	326,5
Pipes ready for jacket 24 fabrication	14/12/2017	50	51	326,5
Pipes ready for jacket 25 fabrication	21/12/2017	51	51	326,5
Pipes ready for jacket 26 fabrication	29/12/2017	52	51	326,5
Batch 4 (8 Jackets) Pipes ready for Nodes fabrication	21/11/2017	47	624	1686,8
Pipes ready for jacket 27 fabrication	08/01/2018	2	51	326,5
Pipes ready for jacket 28 fabrication	15/01/2018	3	51	326,5
Pipes ready for jacket 29 fabrication	22/01/2018	4	51	326,5
Pipes ready for jacket 30 fabrication	29/01/2018	5	51	326,5
Pipes ready for jacket 31 fabrication	05/02/2018	6	51	326,5
Pipes ready for jacket 32 fabrication	12/02/2018	7	51	326,5
Pipes ready for jacket 33 fabrication	19/02/2018	8	51	326,5
Pipes ready for jacket 34 fabrication	26/02/2018	9	51	326,5
TOTAL			4386	18270,3



PLAN DE COMPRAS/CADENA DE SUMINISTRO



4 Buques – Corea 22 Buques – Germany 4 Buques – Avilés 2 Buques – UK

168 T. Especiales +3000 Camiones



LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA



LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA

WIKINGER JACKETS
DOCUMENTATION



Doc.: WIK-CIV-P-NAVA-0017
Navantia's Traffic Management Plan
Rev. 0A

Prepared for:



Prepared by :



<p>PREPARED BY: VALENTÍN RÍGUEZ, GREGORIO HSE MANAGER WIKINGER PROJECT</p>  <p>SIGNATURE: DATE: 23-04-15</p>	<p>REVIEWED BY: CARLOS PASCUAL-ANDRÉS CONTRACT MANAGER WIKINGER PROJECT</p>  <p>SIGNATURE: DATE: 23-04-15</p>	<p>APPROVED BY RAÚL RICO RECIRO PROJECT DIRECTOR WIKINGER PROJECT</p>  <p>SIGNATURE: DATE: 23-04-15</p>
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LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA

Material	Comp any	nº Jacke ts	Real nº trucks	Delivery date
Structural pipes	EEW	3	50	30/05/2015
		3	50	30/06/2015
		3	51	30/07/2015
	EEW Corea	10	103	30/08/2015
		10	104	30/10/2015
J Tubes	TAME GA	3	10	07/06/2015
		3	15	01/07/2015
		3	15	01/08/2015
		10	40	01/09/2015
		10	40	30/10/2015
Anodes	WWI	3	5	01/06/2015
		3	5	01/07/2015
		3	6	01/08/2015
		10	10	01/09/2015
		10	10	01/10/2015
Construction 100 concrete blocks	FONS ÁN	25	470	20/04/2015 to 8/7/2015
Filler. Dock 7	TRAG SA	-	640	2/6/2015 to 11/6/2015
Filler. Dock 2	TRAG SA	-	960	15/6/2015 to 30/6/2015
Sundry materials	-	-	579	1/8/2015 to 29/04/2016
Total nº trucks			3163	

- 1. Movements
 - 1.1. Movements of vehicles transporting people
 - 1.2. Movements of industrial and commercial vehicles
- 2. Entry of material flows
 - 2.1. Movements made by trucks in the shipyard
- 3. Production flows
 - 3.1. Movements in production area
- 4. Processed products
 - 4.1. Movements
- 5. Load-out
 - 5.1. Load-out operation

LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA

- Structural pipes



EEW Germany



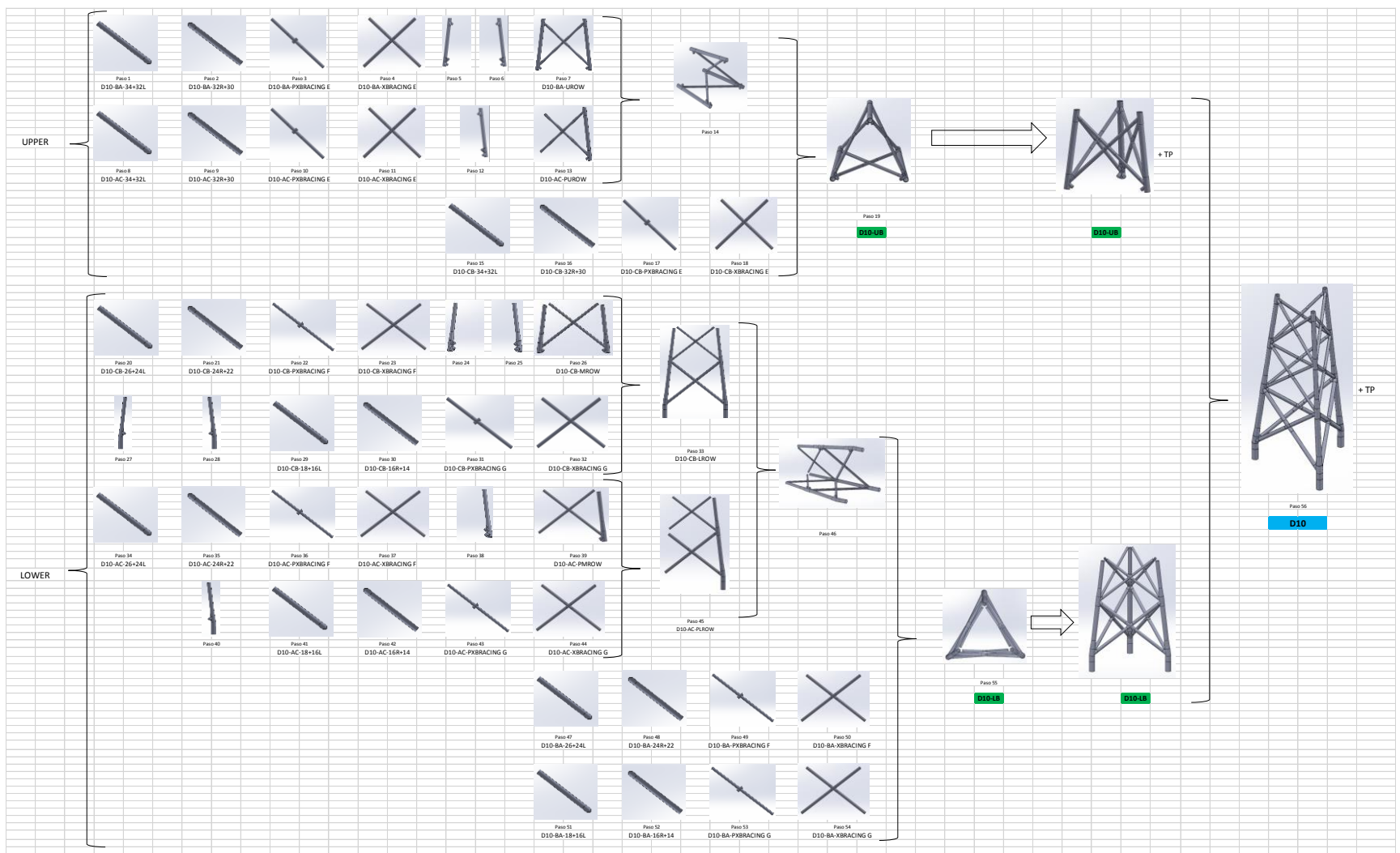
EEW Korea

- Same procedure for J-tubes and anodes

Traffic management plan
09 de junio de 2016



LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA

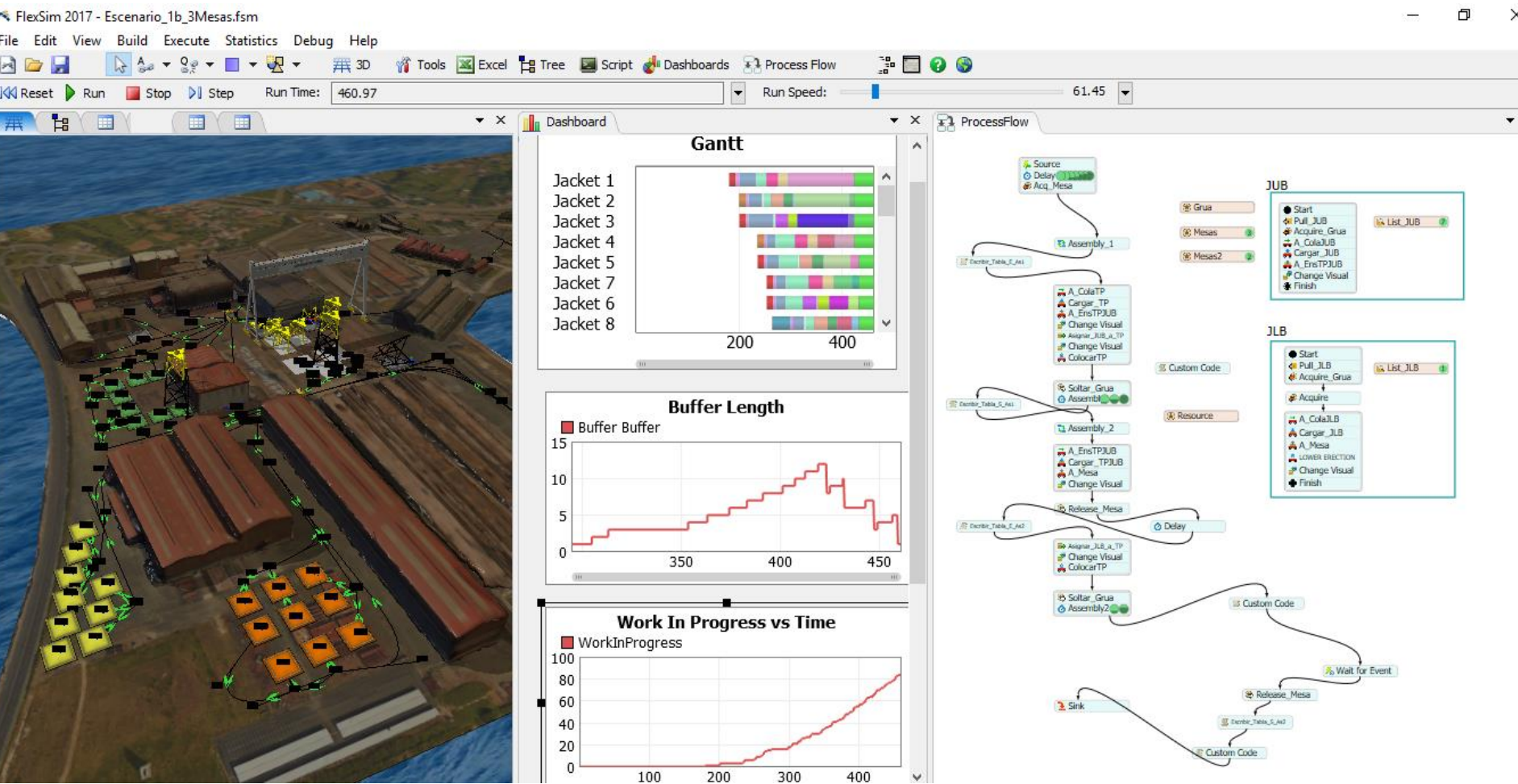


LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA



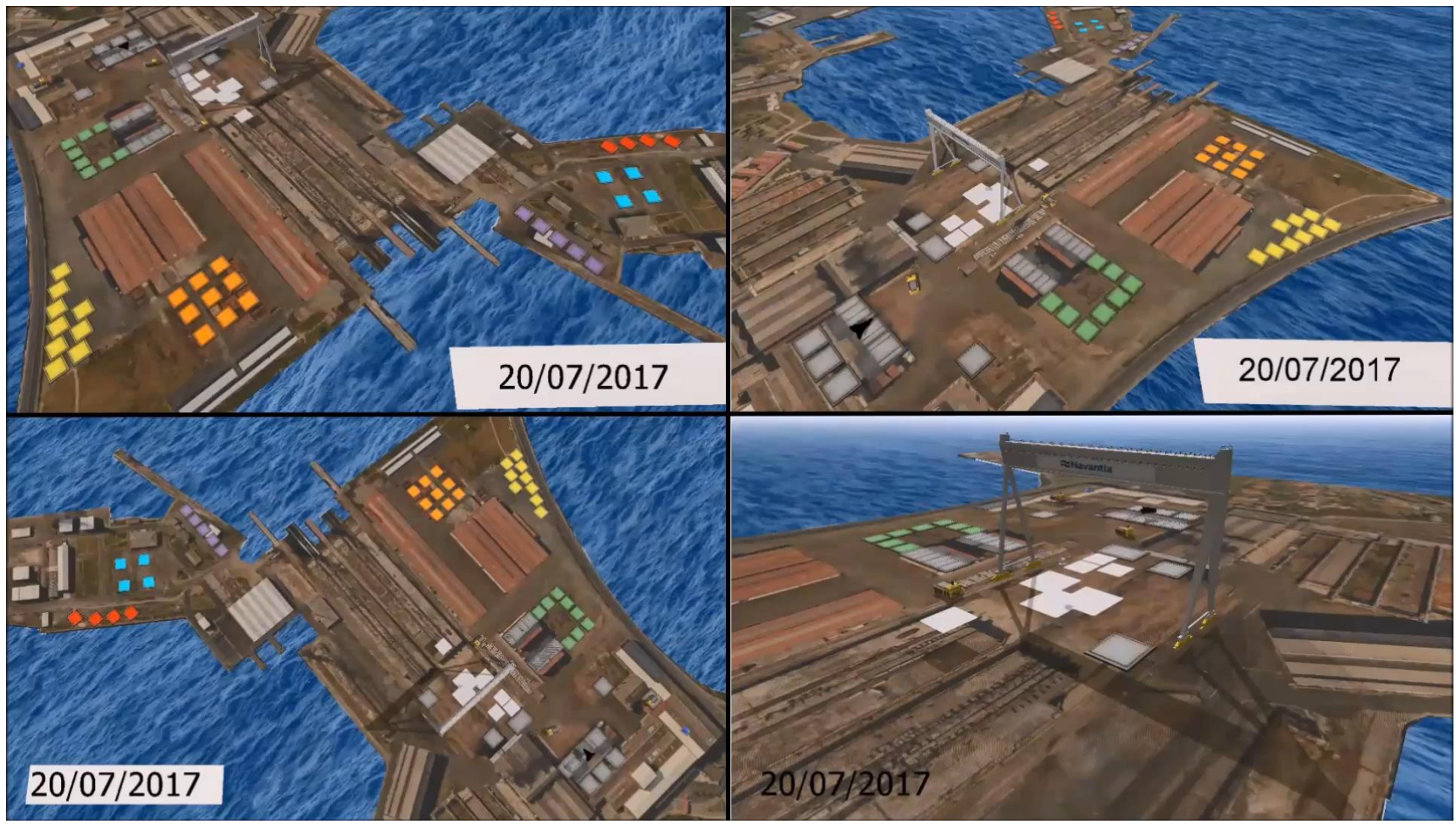


LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA

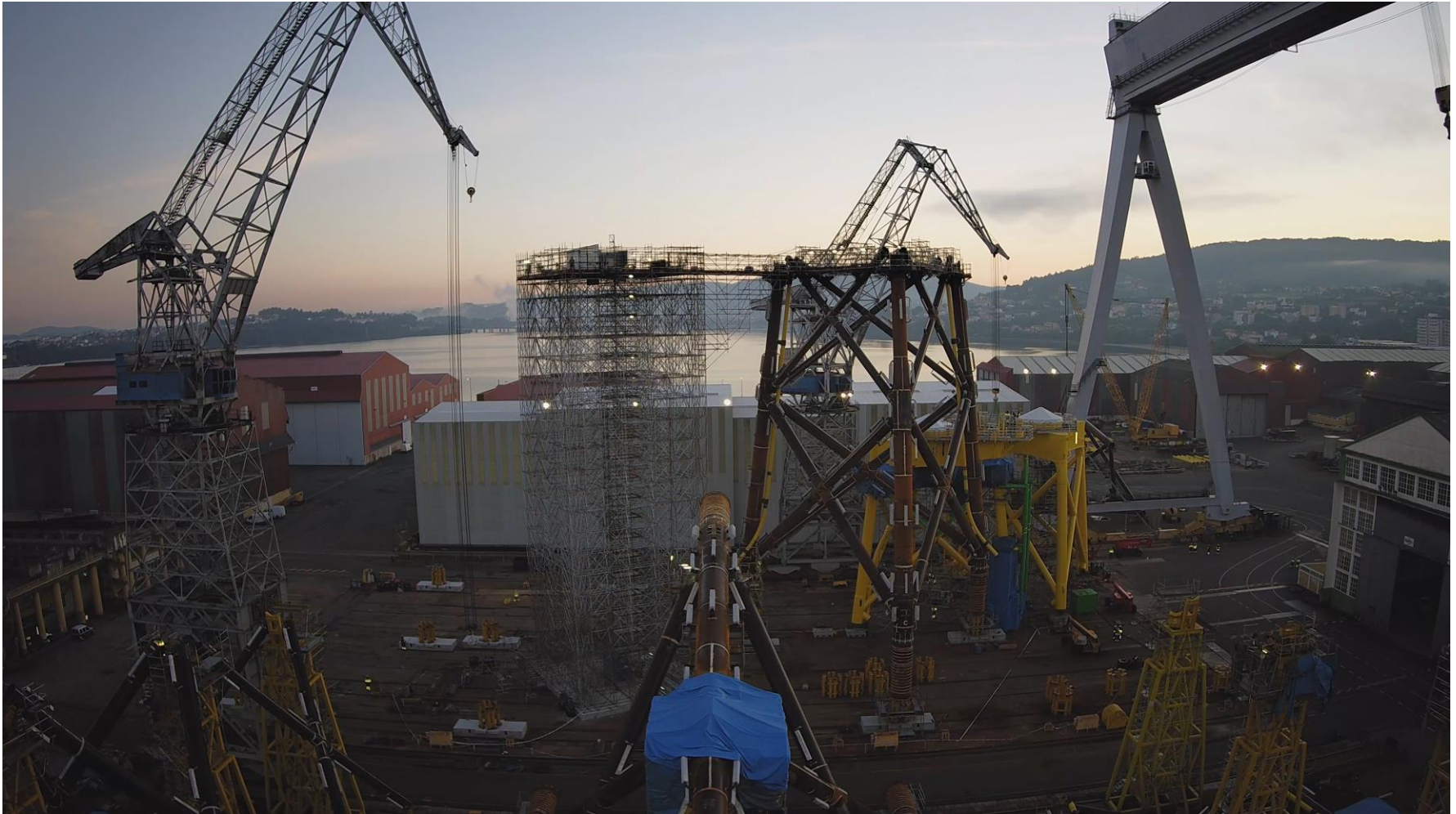




LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA



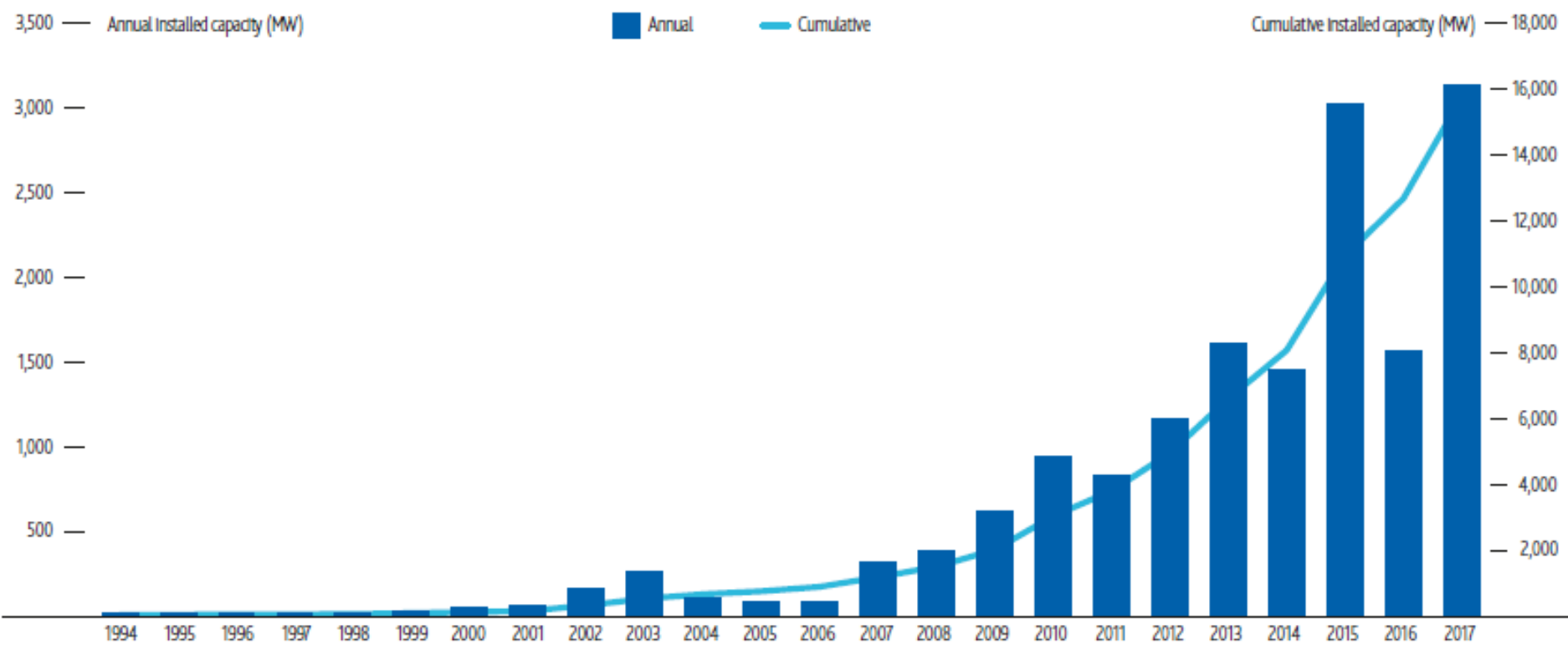
LOGISTICA INTERIOR/ESTRATEGIA CONSTRUCTIVA







CUMULATIVE AND ANNUAL OFFSHORE WIND ENERGY INSTALLATION IN EUROPE



Source: WindEurope

4. OPORTUNIDADES



SUMMARY OF WORK CARRIED OUT AT EUROPEAN OFFSHORE WIND FARMS DURING 2017

Wind Farm	Capacity connected in 2017 (Mw)	Country	Status
Race Bank	498	UK	Partially grid-connected
Dudgeon East	402	UK	Fully grid-connected
Walney 3 (Extension Phase 1 - West)	256	UK	Partially grid-connected
Burbo Bank Extension	200	UK	Fully grid-connected
Ramplon	179	UK	Partially grid-connected
Galloper	72	UK	Partially grid-connected
Blyth	42	UK	Fully grid-connected
Hywind Scotland	30	UK	Fully grid-connected
Veja Mate	402	Germany	Fully grid-connected
Wilkingen	350	Germany	Fully grid-connected
Nordsee One	332	Germany	Fully grid-connected
Nordergründe	111	Germany	Fully grid-connected
Sandbank	52	Germany	Fully grid-connected
Nobelwind (Belwind II)	165	Belgium	Fully grid-connected
Porti Tahkoluoto 2	36	Finland	Fully grid-connected
Kemil Ajos 1+2	24	Finland	Fully grid-connected
Floatgen	2	France	Fully grid-connected

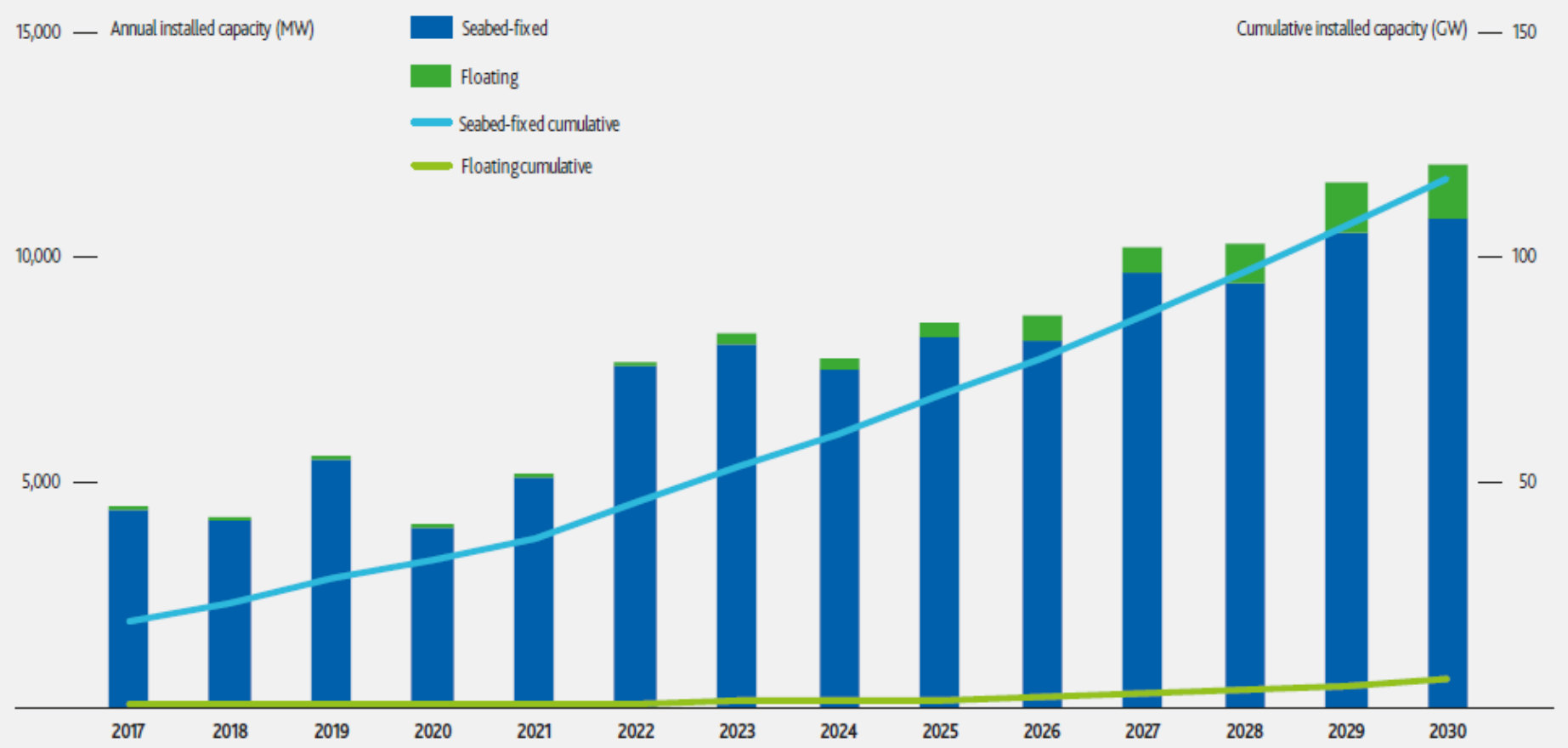
3.153 MW en 2017

12% Fabricados en Navantia Ria de Ferrol

4. OPORTUNIDADES



PROJECTIONS FOR OFFSHORE WIND DEVELOPMENT GLOBALLY OUT TO 2030



Source: BVG Associates

ANNUAL MARKET UPDATE 2017

GLOBAL WIND
REPORT






**OFFSHORE WIND™
EXECUTIVE SUMMIT**
THE PARALLELS OF WIND, OIL & GAS



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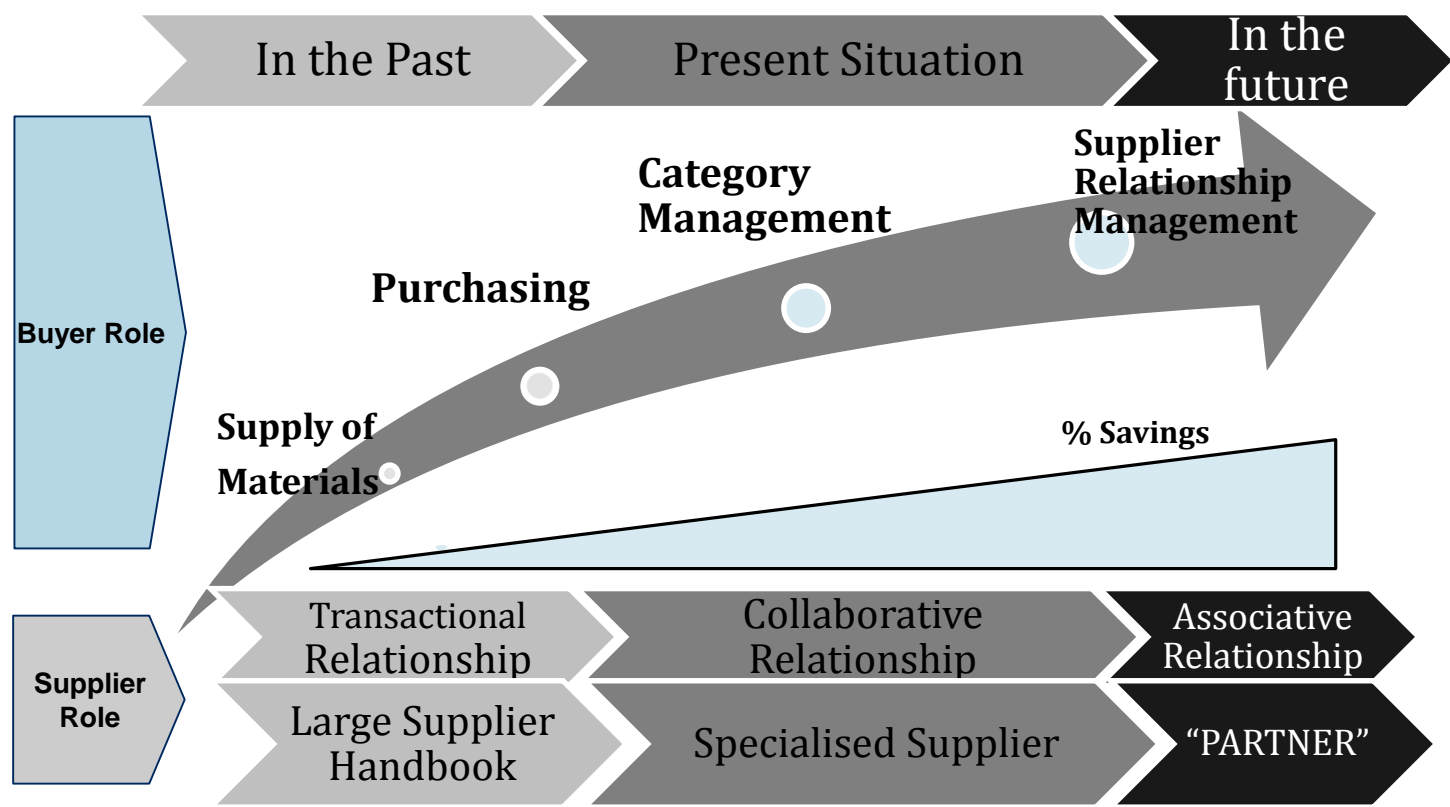
Owned & Produced By  Presented & Supported By  

   **#OWES18**
OFFSHOREWINDSUMMIT.COM



Purchasing transformation in Navantia

- Market is changing from a traditional model to a Comprehensive & Collaborative Model
- To get greater savings we must work in an advanced and optimized demand



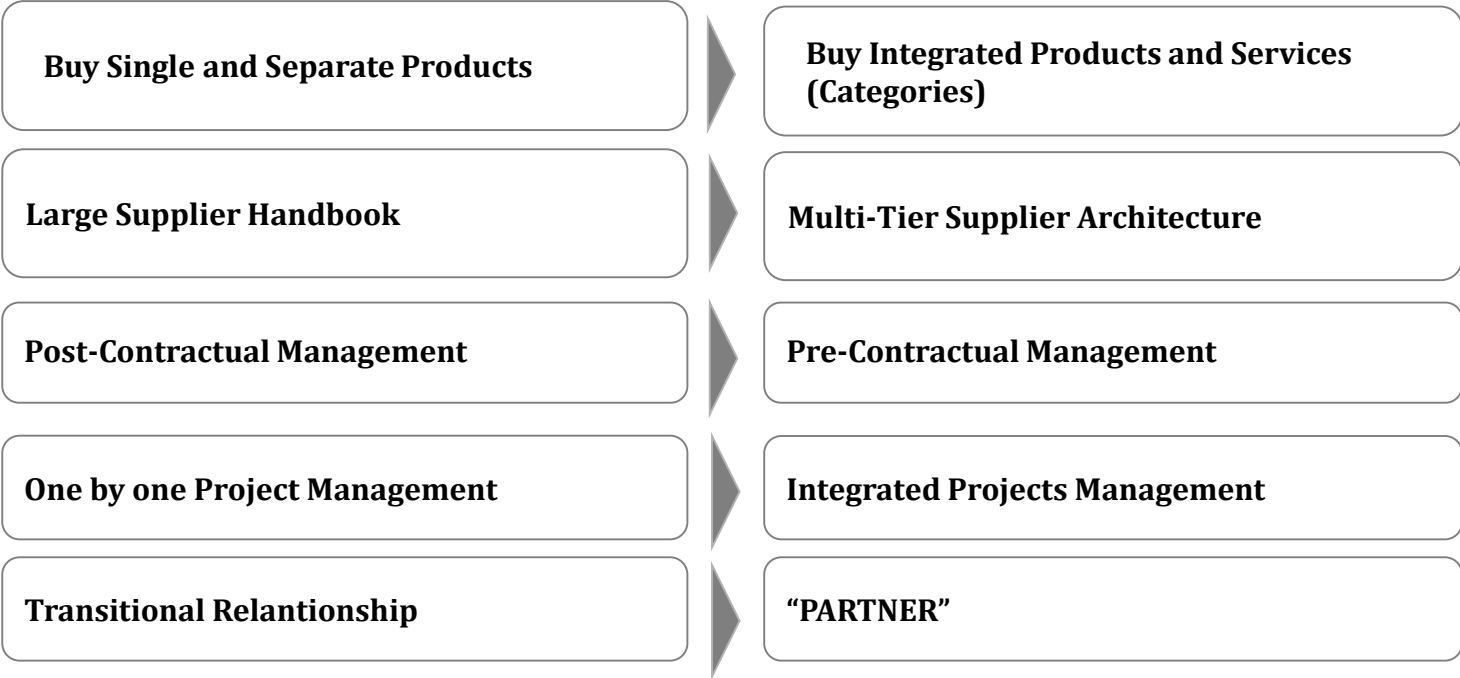
The main benefits for Navantia and Suppliers are listed below:

- **Loyalty** of suppliers, **Long term** collaborative relationships with their suppliers strategic
- **Agility** in engagements
- Transform the supply chain to **value chain**
- Improve **communication**, jointly definition of problems and solutions
- **Specialization** by product
- **Motivation for developing capacities**
- **Anticipation** and collaboration from the phase pre-contractual
- Greater **competitiveness** since cost and risk are reduced
- Joint **innovation** in the search for solutions that make a **competitive advantage**





Integrated Supplier Management will enable change management





That's all Folks!



Navantia

Gracias por su atención

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