Baltic InteGrid
on the WindEnergy Hamburg 2018

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Iberdrola in the Baltic Sea
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Iberdrola

An international energy leader
Iberdrola - An international energy leader

Focus – Renewable Energy and Grid

HYDRO  WIND  SOLAR  WAVES  ENGINEERING  GRID

GAS  NUCLEAR  CARBON  TRADING
The utility of the future

Portfolio correspond to the mix aimed for in the „Energiewende“

More than 50% of the installed capacity are renewable energies and hydropower
Iberdrola - An international energy leader

+ 6.9 GW for clean energy
(carbon will be only 1%)

[Strategic Pillars, London 24 Feb. 2016]
Iberdrola - An international energy leader

- Global player in energy business, huge investments in renewables energy since years

- Main markets:
  - Spain
  - UK
  - USA
  - Brasil
  - Mexico

- Revenue 2017: 31.2 Mrd EUR

- No. 1 wind energy producer in Europe

- Capacity renewable energy: approx. 16.6 GW; mainly onshore wind
Iberdrola - An international energy leader

- Over 7.5 GW Offshore-Pipeline until year 2022

- Baltic Sea – 900 MW pipeline
  - Wikinger, DE in operation since end 2017
  - Baltic Eagle, DE awarded in auction 2018
  - Wikinger Süd, DE awarded in auction 2018
  - Windanker part of auction 2021

- North Sea (UK) – 2.8 GW pipeline
  - West of Duddon Sands, UK in operation since 2015
  - East Anglia ONE, UK in construction, completion 2020
  - Saint-Brieux, F planned for 2023
  - East Anglia 2-4, UK

- US East Coast – 4.0 GW pipeline
  - Kitty Hawk
  - Vineyard
2

Wikinger
Offshore Windfarm
Wikinger – Overview

- Owner and operator Iberdrola
- Investment approx. 1.4 Bil. EUR
- Project team in Berlin, London, Madrid, Sassnitz
- Baseport: Sassnitz/Mukran (Island Rügen)

- Capacity 350 MW
- 70 Windturbines (Adwen AD5-135)
- Start Installation March 2016
- Commissioning 2017
- Handed over to operation team
Wikinger – Overview

- 70 Windturbines (WTG): Adwen M 5000-135
  - Nacelle (Bremerhaven)
  - Blades (Stade)

- Substation (OSS)
  - Shared with TSO (50hertz)
  - Manufacturing Navantia
  - Transport and Installation SHL

- Foundations:
  - Manufacturing (Navantia-Windar and Bladt)
  - Transport and Installation (OWFJV)

- Internal array cables Prysmian
• Typ Adwen M-5000-135
• Nennleistung 5 MW
• Nabenhöhe 97,5 m
• Rotordurchmesser 135 m
• Anlagenanzahl 70
Tallest Jacket Height: 60m

Jacket weight: 620t

Maximum Water Depth: 40m

Jacket Foot Print: 23m x 23m

Maximum Pile Lengths: 60m
Topsides

Elevations:
- Cable Deck → + 13.5 m
- Main Deck → + 20.5 m
- Utility Deck → + 25 m
- Roof Deck → + 29.5 m

Weights:
- Topside 1 → 2,646 tn
- Topside 2 → 2,202 tn
 Wikinger Preparations Works

- UXO & Obstacle Investigation 2015 / 2016
• UXO removal
Wikinger Preparations Works

- Cardinal buoy
- Weather buoy
- Weather forecasts
- Guard vessel
- Crew Transfer Vessels (CTV)
- Marine coordination
Baseport and Stagging port
Saßnitz / Mukran
Installation vessel piles: Giant 7
Foundation installation incl. grouting

03/2016 – 01/2017
Wikinger Installation
Wikinger Installation
Wikinger Installation
Wikinger Installation
Wikinger Installation
Offshore Substation (OSS):

Offshore installation OSS (foundation and topside) 08/2016
Wikinger Installation
Wikinger Installation
Wikinger Installation
Wikinger Installation
Wikinger Installation

Internal cables:

Cable laying completed 01/2017
Wikinger Installation
Wikinger Installation

Windturbine installation:

Installation

01/2017 – 10/2017
Wikinger Installation
Wikinger Installation
Wikinger Installation
Wikinger Installation
Iberdrola’s future projects in Baltic Sea
Overview projects: German Baltic Sea
Overview projects German Baltic Sea

Area O-1 in German EEZ acc. to Pre-Draft of Area Development Plan (FEP)
Baltic Eagle and Wikinger Süd

- Iberdrola was awarded in 2nd interim auction acc. to §26 WindSeeG
- Awarded capacity 486 MW
- Area approx. 35 km² + 5 km²
- Windturbine 8 – 10 MW class
- Investment approx. 1.1 Bil. EUR
- Project set-up comparable to Wikinger
- TSO 50hertz - shared platform in planning
- Grid connection scheduled acc. to BFO
- Grid connection Baltic Eagle with system OST-2-2 and OST-2-3
- Wikinger Süd will be connected to the Wikinger OSS (system OST 1-3)
Windanker

- Windanker area is considered in pre-draft Area Development Plan (FEP) – O-1.3
- Iberdrola expects consideration of Windanker area in next auction
- Area size approx. 18 km²
Grid connection concepts
Possible alternatives for Grid connection in Baltic Sea

- Short-term solution in Germany:
  - Higher utilization of installed grid connection cables
  - Buffers identified within ongoing discussion of 2K-criteria

- International solution (example UK):
  - Grid connection build by windfarm operator
  - After completion handed over to TSO in a tender (OFTO)
  - Higher investment costs but project is in control of timing (coordination in one hand)
Vielen Dank