



Havsul offshore wind farm

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Vestavind
OFFSHORE

Vestavind Offshore

- Established August 2009
- Owned by 7 energy producers in Norway, “Vestlandsalliansen”
- Core business in marine renewable energy production and distribution
- Norway’s only licence for a full scale offshore wind farm - Havsul – September 2009



Havsul



- Project company 100 percent owned by Vestavind Offshore
- Norway's only license for a full scale offshore windfarm
- Estimated yearly energy production up to 1 TWh
- Havsul improves regional energy production and reduces local energy crisis

Milestones Havsul

Project execution in four phases:

- **Feasibility Study**
October 2010
- **Concept Study in 3 parts**
June 2011
- **Pre-engineering**
December 2011
 - Basis for investment decision 1Q 2012
- **Detailed engineering, procurement and construction**
 - Phase 1 windfarm ready for start-up 1Q 2014
 - Full scale 2015



Concept competition substructure, inshore assembly total windmill and offshore installation of same

Scope:

- Technology and construction substructure
- Inshore assembly of complete windmill including substructure, tower, nacelle and blades and located assembly site
- Offshore installation targeted in 1 offshore operation
- Cost estimate



If pre-engineering phase is decided in Q3 2011

- 1-3 players for further pre-engineering

Background

- Full scale execution of Havsul
 - Current cost level too high
 - Our target – cost competitive energy production
- Cost drivers
 - No's of offshore operations
 - Assembly & logistics
 - Design and materials
 - Few players on turbines
- Mitigation
 - Reduce
 - New industry standard
 - Optimize design
 - Increase competition



Metmast Skråpen

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Milestones / Plan

- May - Sep 2010 Feasibility study completed
- Sep - Oct 2010 Develop design basis for concept studies
- Oct - Nov 2010 Prequalification (30 companies applied)
- Nov - Dec 2010 Tender competition (16 tenders of 17 prequal.)
- Dec - Jan 2011 Evaluation – qualification meetings
- Jan - May 2011 Execute concept study (4 companies)
- May - Jun 2011 Evaluation – concept selection (1-3)
Internal total cost estimate +/- 30%

Tender competition process

- Prequalification – announced on TED / Doffin
- Prequalified candidates received ITT
- Shortlisting of candidates
- Clarifications with shortlisted candidates
- Recommendation
- Selection (4 companies/Industrial Groups)

Strong companies/industrial groups as winners

- **Reinertsen** (concrete and steel)
 - Vattenfall power consultant AB
- **Technip** (steel)
- **Vici Ventus** (concrete)
 - AF-Gruppen ASA
 - Dr.techn.Olav Olsen AS
 - Lyse AS
- **Westcon** (concrete)
 - Eide Marine Services AS
 - Kruse Smith Entreprenører AS
 - Norconsult AS

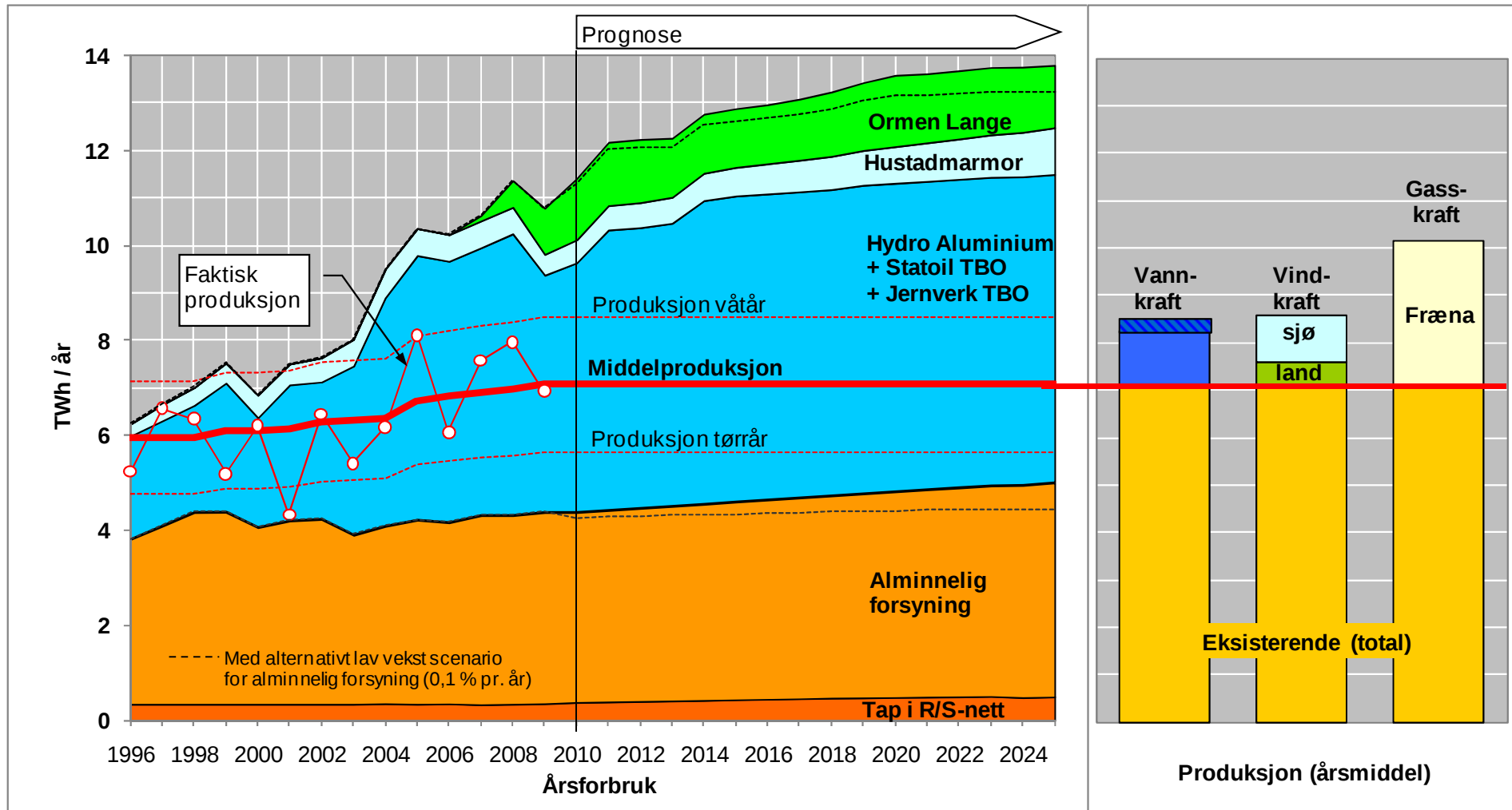
Market Dimensions

Adding 30,000 MW offshore wind capacity requires to build 2 large offshore wind turbines per day until 2020



Picture taken at E.ON Offshore Project - Robin Rigg (United Kingdom, 2009)

Prognosis energy consumption Mid-Norway



VESTAVIND Offshore's "Kinderegg"

- **Energy crisis in Mid-Norway**
 - Part of permanent solution
 - New production renewable energy from 2013/2014
 - Local energy production – SHORT TRAVELLED!

- **Climate friendly**
 - Renewable energy
 - Short travelled
 - Paradigm shift, from Onshore to Offshore approach

- **New industrial approach**
 - New innovative solutions based on proven technology
 - Capitalize on offshore Petromarine core competence
 - Cost-effective, sound solutions

Vestavind Offshore's goals in offshore wind:

- Create tomorrow's global solutions in offshore wind together with the industry in a 'wind – wind' approach
- Utilize unique offshore Petromarine competence in marine renewable energy production
- New market opportunities for the industry





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