



ScanWind Group AS

Reliable Energy for a Clean Future

I. Introduction

- Highlights

- ScanWind has developed a superior product platform especially designed for harsh environments with high winds and turbulence like the Northern European coastal onshore and offshore markets.
- The Northern European coastal onshore and offshore market segments constitute one of the fastest growing markets in the world with an estimated installed capacity in 2020 equal to 50 GW, or approx. 10.000 turbines. Estimated CAPEX equal to 1 Trillion NOK.
- Currently there are only five established players in this market which gives room for new entrants with superior technology like the ScanWind platform.
- The ScanWind platform has been proven over 25 years accumulated, of successful operations, in one of the toughest wind farms in the world; Hundhammerfjellet Wind Farm.
- ScanWind's platform is scalable; we are currently increasing the output and decreasing the cost through our product development and price reduction strategies to ensure profitability for both our customers and owners.
- Target in 2013: A 4.0 BNOK company generating 8% EBIT (9% EBITDA) margin with a 7% market share (in sold MW) in the Northern European coastal onshore and offshore market.



I. Introduction

- History

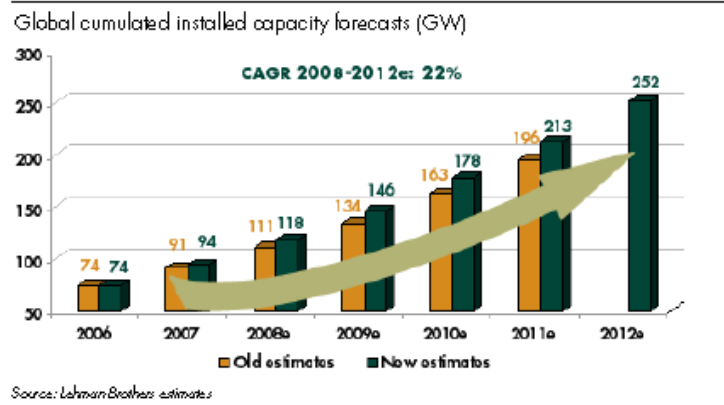
- Established in 1999 for marketing of large wind turbines suited for harsh environments based on own design.
- R&D project consisting of technology development and testing of 4 full scale prototypes in the period of 1999-2005, under realistic operational conditions at Hundhammerfjellet Wind Park on the Norwegian coast – one of the most extreme wind park sites in the world.
- Improved design and series production of another 11 turbines in the period 2007-2008. Hundhammerfjellet wind park completed in 2008 with a total capacity of over 50 MW and a total turbine order price of 508 MNOK.
- The technology platform is based on the experience gained from hydro electric power and the innovative multi megawatt wind turbines built in Sweden in the early 1990's.



II. The market

-Market overview:

“50 GW installed in Northern Europe Offshore 2009-2020”



Country	Existing Target	Year
United Kingdom	33 GW	2020
France	0.5 GW	2009
Denmark	5 GW	2030
Germany	15 GW	2020
Ireland	2 GW	
Netherlands	6 GW	2020
Sweden	4 GW	2015
Belgium	2 GW	2012

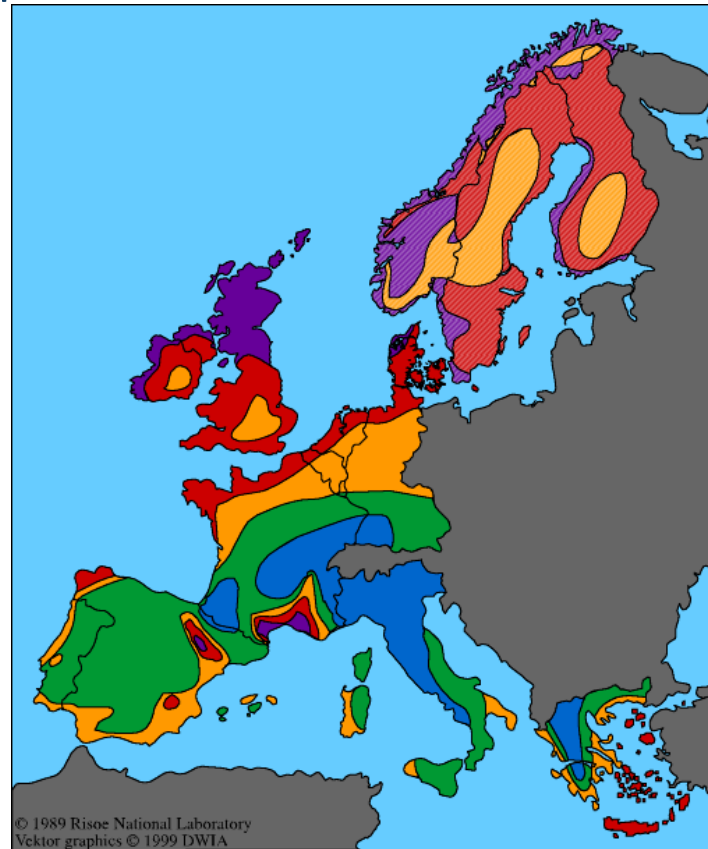
(EWEA, 2007)

Recent industry reviews indicate that the offshore European market is expanding very rapidly. According to the Global Wind Energy Council, the EU saw an expansion of cumulative wind power capacity of on average 28% per year over the last ten years, with annual installations growing by 21% per year over the same period (EWEA 2007). If this continues it is suggested that 50GW of offshore wind power will be operating Europe by 2020 (EWEA 2007). Furthermore, on December 9th 2008 a Renewable Energy Directive was agreed which targets more than one third of all the European Union’s electricity from renewables by 2020 (BEWA 2008).











II. The market

- Winds in European onshore



Wind Resources at 50 m Above Ground Level

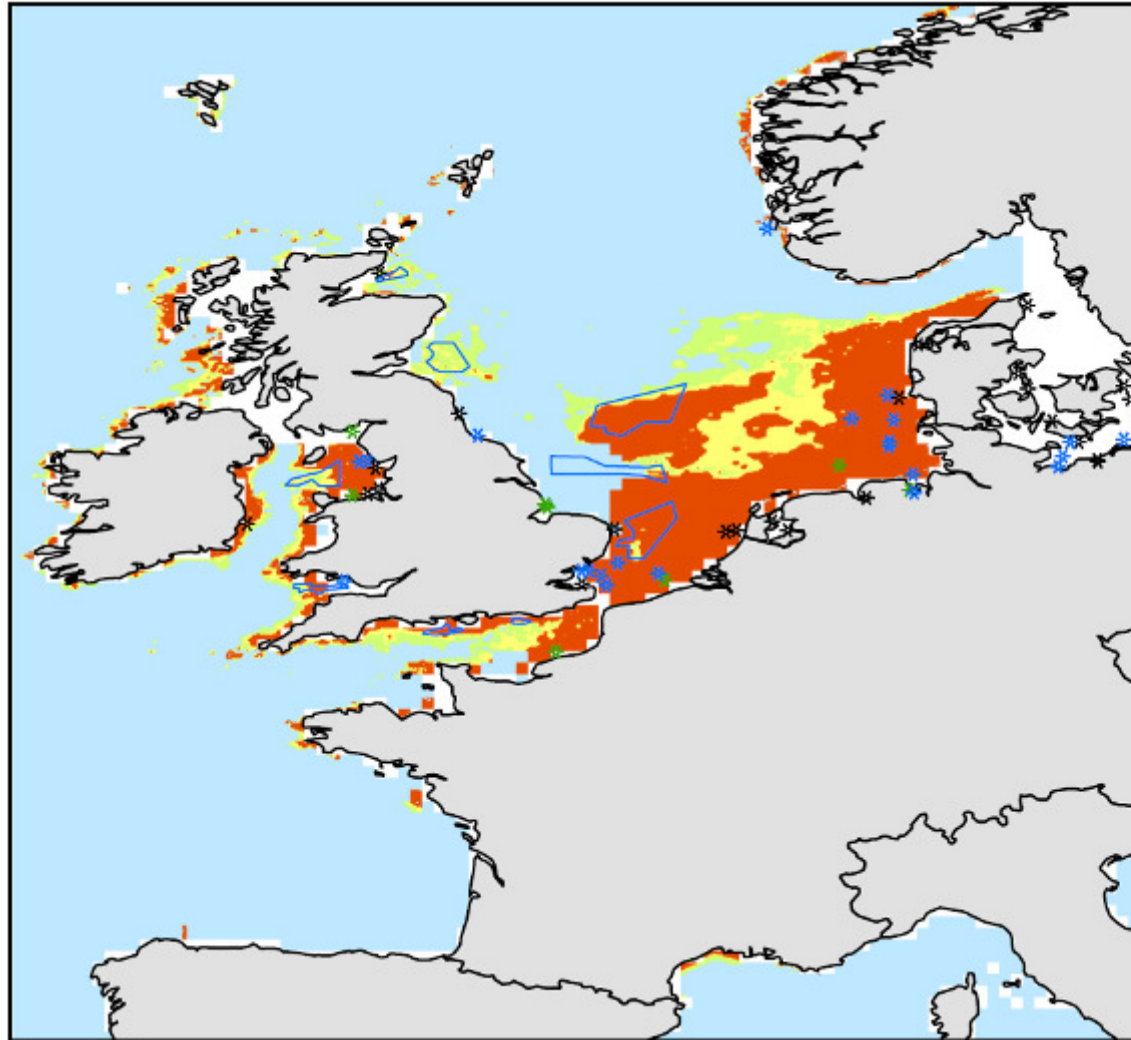
Colour	Sheltered Terrain		Open Plain		At a sea Coast		Open Sea		Hills and Ridges	
	m/s	W/m ²	m/s	W/m ²	m/s	W/m ²	m/s	W/m ²	m/s	W/m ²
	>6.0	>250	>7.5	>500	>8.5	>700	>9.0	>800	>11.5	>1800
	5.0-6.0	150-250	6.5-7.5	300-500	7.0-8.5	400-700	8.0-9.0	600-800	10.0-11.5	1200-1800
	4.5-5.0	100-150	5.5-6.5	200-300	6.0-7.0	250-400	7.0-8.0	400-600	8.5-10.0	700-1200
	3.5-4.5	50-100	4.5-5.5	100-200	5.0-6.0	150-250	5.5-7.0	200-400	7.0-8.5	400-700
	<3.5	<50	<4.5	<100	<5.0	<150	<5.5	<200	<7.0	<400
			>7.5							
			5.5-7.5							
			<5.5							

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II. The market

- Immense potential in offshore



INNOVATION NORWAY

Figure 3.0: Suitability Analysis

Legend

- Crown Estate Round 3 Zones
- Marine Wind Farms**
- * Operational
- * Planned
- * Under construction
- Potential suitability**
- Unsuitable
- Suitable
- Moderately Suitable
- Highly Suitable

Figure No.	Date	Revision
2348 1417	15/12/06	001
AUTHOR	CLIENT	SCALE @A3
ADW	JFS	1:4,000,000
DWG SOURCE	PROJECTION SYSTEM	
BASED ON NASA, SHERA, OEBDD	WGS 1984	
EWEA	Datum	
Spheroid	Transverse Mercator	
WGS84		

0 200 500 Km

Do not scale this drawing. PMSS to be notified of any discrepancies on this drawing. This drawing is copyright.

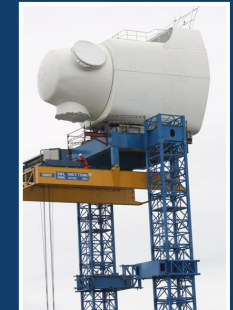
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II. The market

- Summary market assumptions

- Significant potential across Northern Europe, with considerable demand for offshore capable turbines.
- Identified projects showing that more than 45 GW of capacity is required offshore in Europe within 2020 (BTM Consult Mars 2008).
- Currently there are only 5 manufacturers of note in the offshore manufacturer market: Vestas: V90, Siemens: 3.6MW, Multibrid: M5000, Repower: 5MW and GE: 3.6 MW. (PMSS Offshore market Review December 2008).
- This illustrates limited availability of WTG suppliers in the market, and thus provides for significant evidence of the need for a new entrant to penetrate the market and develop a significant market share (PMSS Offshore market Review December 2008).



III. The business

-Market strategy:

“Focus on close markets with high winds and rough conditions”

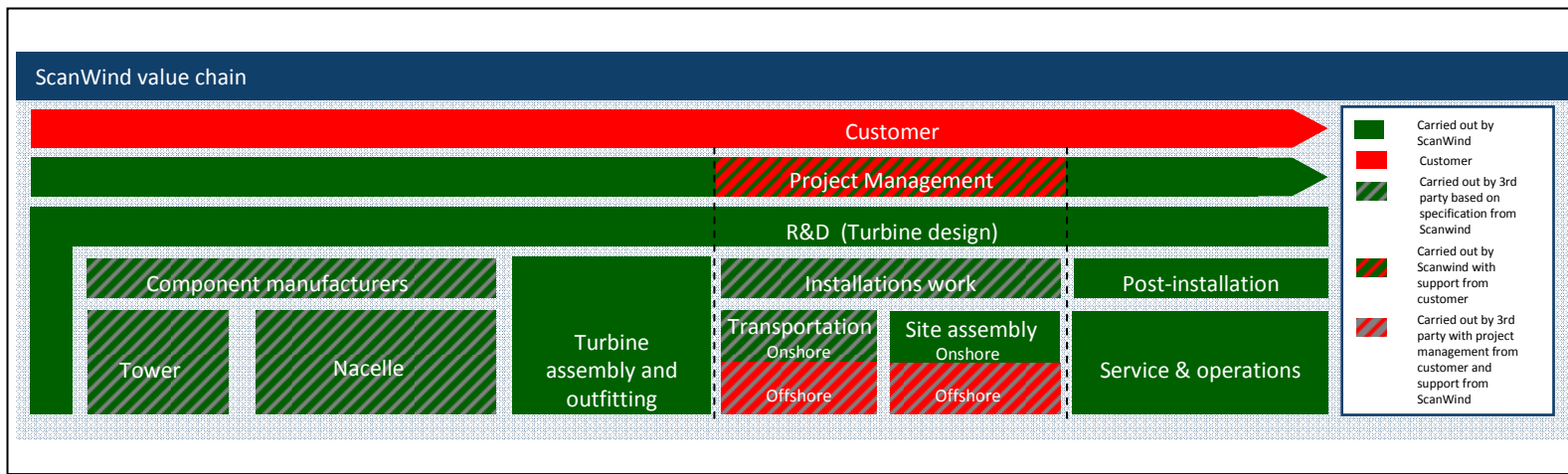
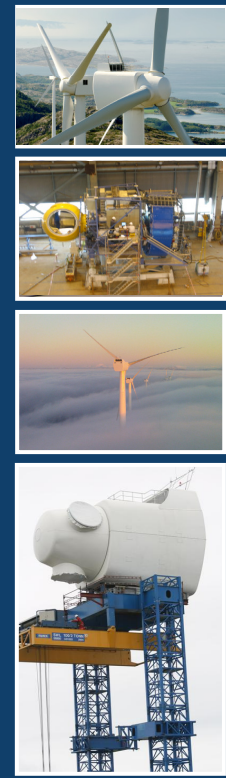
- 7% market share in 2013 of selected markets:
 - Northern European Coastal onshore: IEC S, 1 – marketing from Q1 2008
 - Northern European Offshore: IEC S, 1 – marketing from Q1 2009
- Target Customers:
 - First: Traditional utilities with a solid balance sheet able to self-finance the project.
 - Second: Also single purpose COs

Year	2009	2010	2011	2012	2013	2014
ScanWind target (sold turbines)	2	22	40	110	155	170
-of which Coastal onshore IEC 1 (sold turbines)	2	20	30	40	55	60
-of which Northern European offshore (sold turbines)	0	2	10	70	100	110
Costal onshore IEC 1 (MW)	8	80	120	160	220	240
Total costal onshore IEC 1 market (MW)	4100	4200	4700	5100	5300	5500
SW% of costal onshore IEC 1 market	0.2%	2%	3%	3%	4%	4%
Northern European Offshore, (MW)	0	8	40	280	400	440
Total Northern European Offshore market (MW)	852	2180	2725	3400	3900	4500
SW% of total selected offshore market	0%	0.4%	2%	8%	10%	10%



III. The business

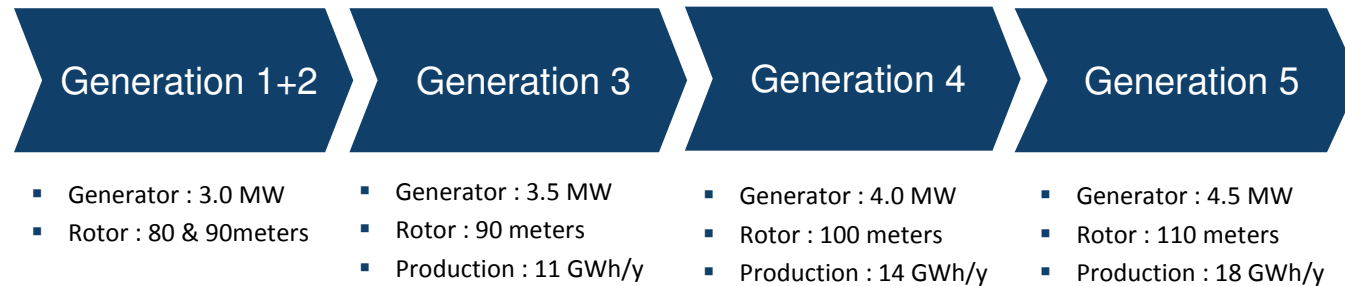
- ScanWind value chain



III. The business

- Product strategy:

“Increase output on existing platform”



- New technology platform, 6 MW+, to be evaluated in 2010 – 12.

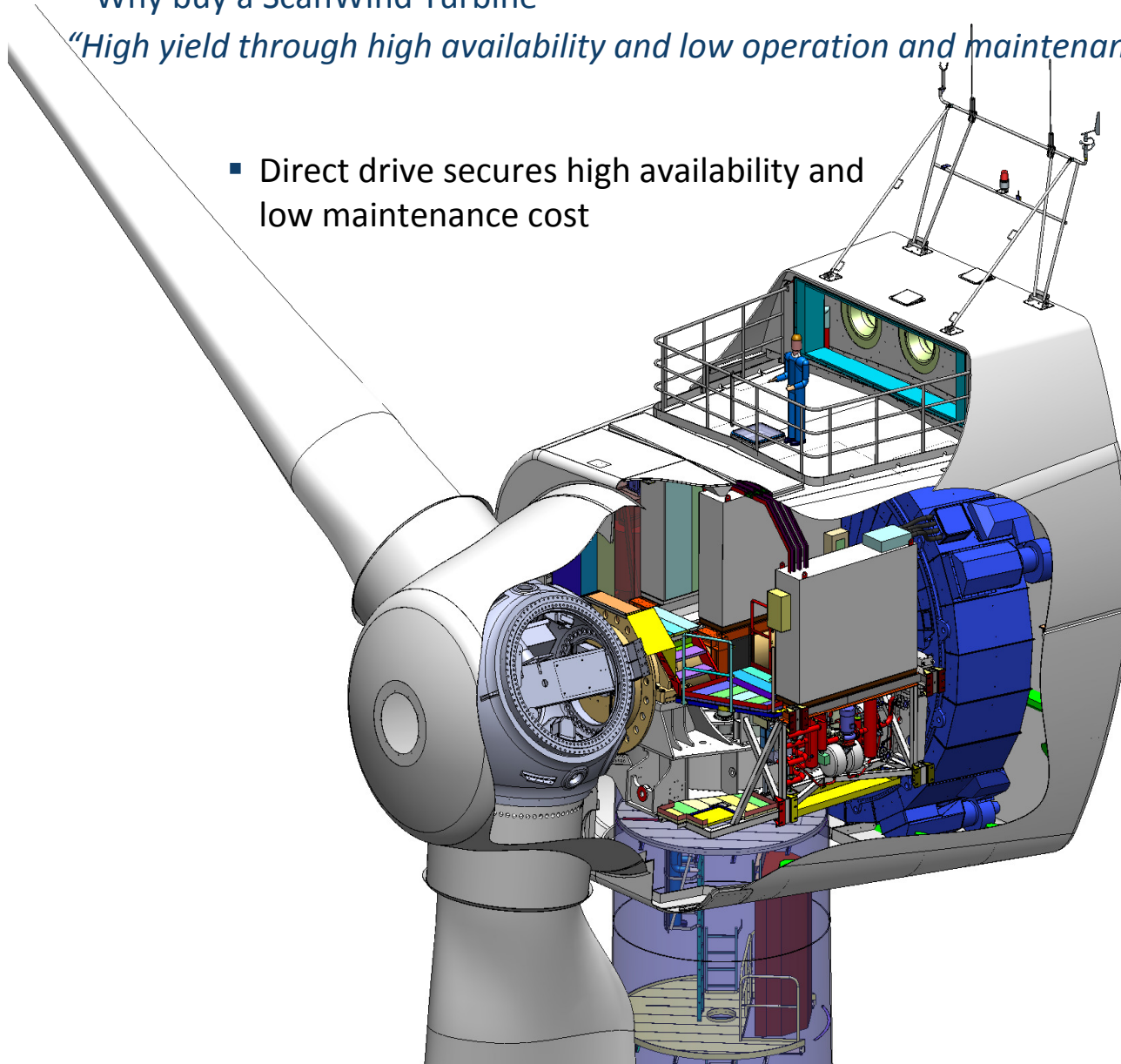


IV. Technology

- Why buy a ScanWind Turbine

“High yield through high availability and low operation and maintenance cost”

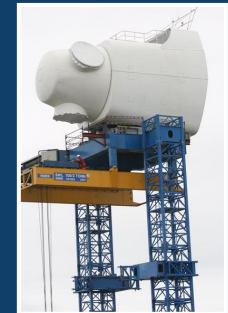
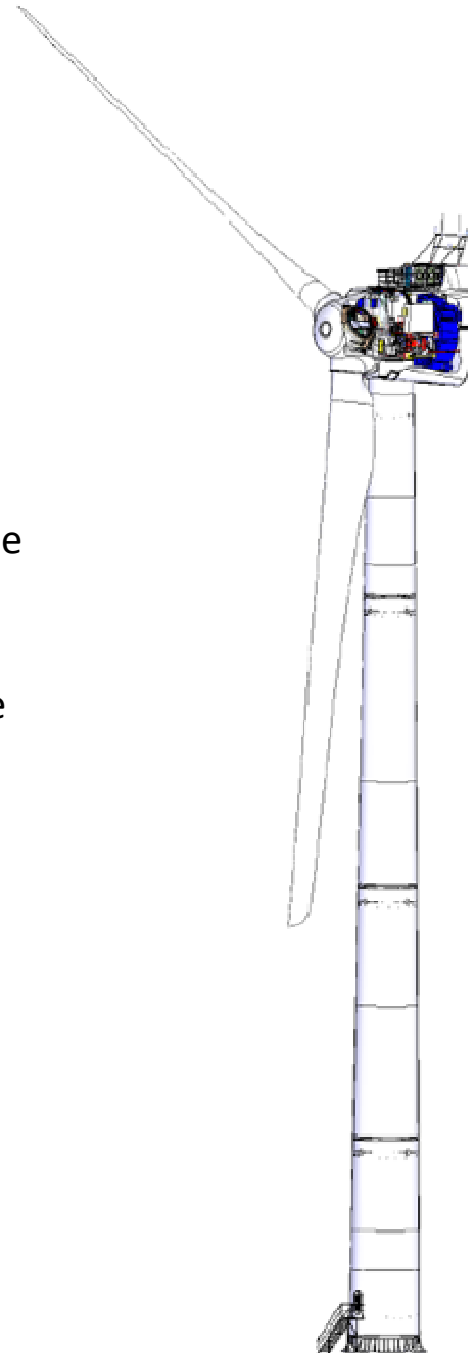
- Direct drive secures high availability and low maintenance cost



IV. Technology

- Why buy a ScanWind Turbine

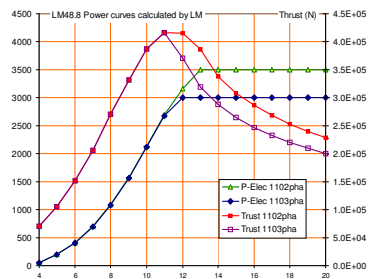
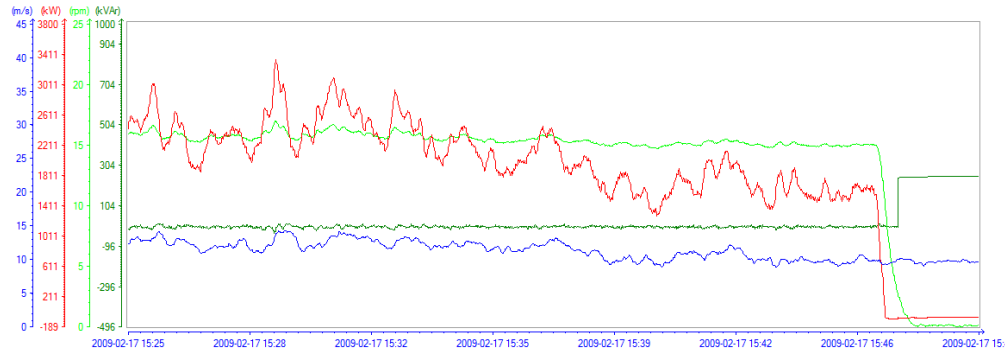
- Robust construction without gearbox guarantees:
“High yield through high availability and low operation and maintenance cost”
- Adaptive Turbine Control (ATC™) monitors all turbine data and all important environmental data. The ATC optimizes energy production and turbine lifetime.
- Active Positioning System (APS™) directs the turbine in an optimal position depending on the operating conditions.
- Design without any hydraulics for faster performance and low environmental impact
- Scandinavian design made for complex terrain and rough conditions (such as turbulence, salt and ice)
- Built on engineering experience and research accumulated since the 1980s



IV. Technology

- Control System

- Excellent control system available in three levels:
 - Turbine control system
 - Wind farm control system
 - Remote control system (for dispatch centres)
- Highly flexible control of power output and rotation speed
- Extremely detailed information to the operator with park overview, trends, turbine status, alarms, park performance, statistics, etc.
- Condition monitoring with 170 signals from important components (ATC™)



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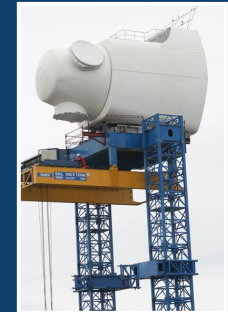
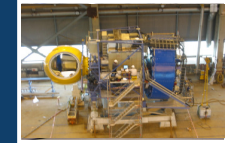
A composite screenshot of the ScanWind control system interface. It includes a 'Statistics WT 10' window with fields for 'From' and 'To' dates, and a table of statistics: Total time (h): 167.29, Availability time (h): 154.20, Availability (%): 92.21, Production (t): 93.57. Below this is a 'System status' window with tabs for 'Status', 'Production', 'Customer Cooling', and 'Generator Cooling'. At the bottom is a map of the 'ScanWind Wind Park, Hundhammerfall' with turbine locations marked.



IV. Technology

- Lifting System

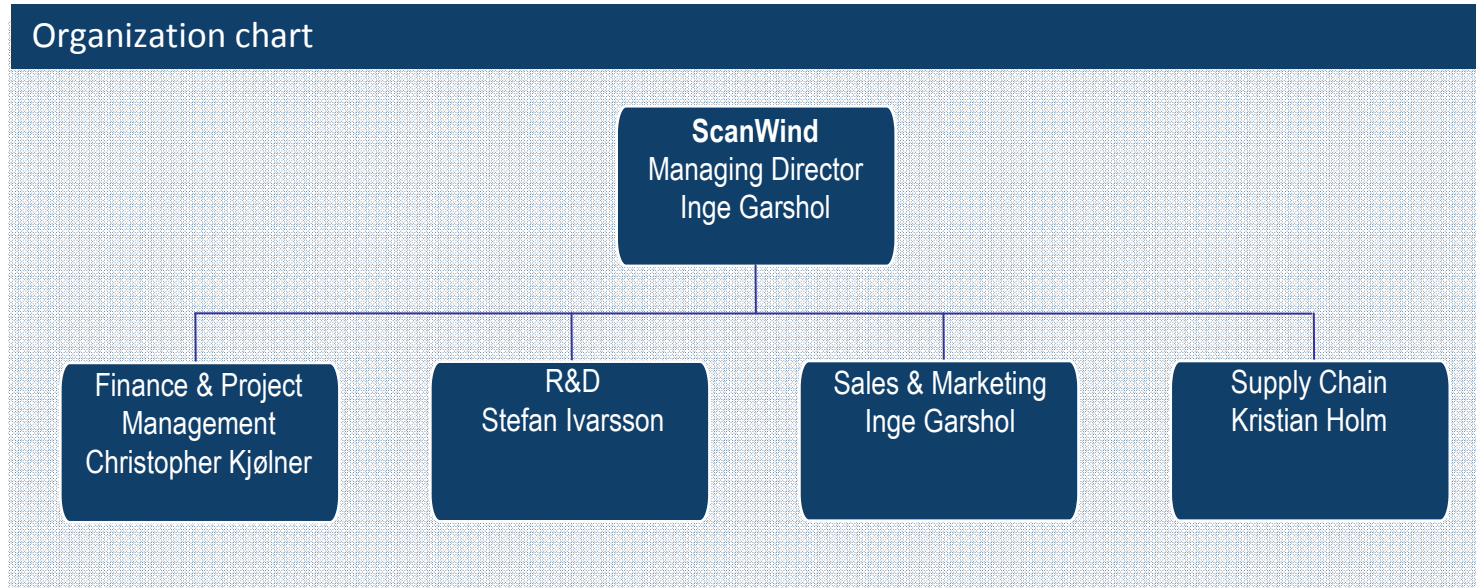
- Unique lifting system tailor made for erection of large turbines in complex terrain.
- Works in up to 15 m/s winds. Excellent for wind class IEC 1.
- Impact on the environment is minimal due to its small footprint.



V. Organization

- Organization structure

Organization chart



- 43 employees and 4 consultants
- Average age ~38
- HQ in Trondheim incl. Sales & Marketing, Finance & Project Management and Purchasing & Logistics
- Manufacturing & Services in Verdal
- R&D is located in Karlstad (Sweden)

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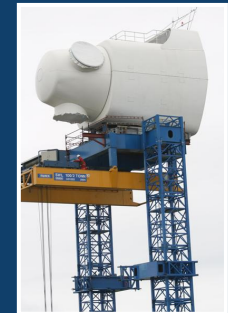
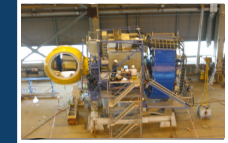
V. Organization

- Premises and production facility

- Well invested facility with machinery in place for turbine assembly
- Capacity of 30 turbines/year, which can be expanded to 60.
- Possibility for new factory with capacity of over 200 turbines/year.
- Located in a dynamic industry park with many companies focusing on offshore applications.
- Proximity to deep water harbor and to the Norwegian University of Science and Technology.
- Land of 17.081 m² and building of more than 3.000 m².



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VI. Conclusion

- Superior and scalable technology platform for harsh environments.
- Estimated CAPEX in Northern European Offshore segment within 2020 equal to 1 Trillion NOK.
- Few established players in offshore segment, giving room for new entrants.
- Technology platform proven over an aggregate of more than 25 years of successful operations.
- New management team capable of commercializing the business.
- Target in 2013: A 4.0 BNOK company generating 8% EBIT (9% EBITDA) margin with a 7% market share (in sold MW) in the Northern European coastal onshore and offshore market.

