MAKE CONSULTING

AnalystPresentation

29 September 2011

Offshore wind power development

Vindmølleindustriens Offshore konference

Speaker: Steen Broust Nielsen, Director MAKE Consulting

Adding Value to Your Renewable Energy Business

Introduction

MAKE Consulting

- MAKE Consulting is one of the wind industry's premier strategic advisory firms, serving the world's leading wind companies from all parts of the value chain from raw material suppliers to IPPs and utilities.
- MAKE Consulting bases our services on a team of professional and independent advisors with documented experience from the international wind energy industry and a global team of experienced business analysts. Our team delivers in-house, detailed market intelligence to support executive level business decisions and increase our client's competitive advantage in the wind space.
- MAKE Consulting is based in Aarhus, Denmark and has offices in Chicago, Boston, and Tianjin.
- MAKE Consulting: www.make-consulting.com
- Speaker:

  Steen Broust Nielsen, M.Sc.BA.

  Director EMEA and Global Sales and Marketing

  15 yrs wind sector experience including from LM Wind Power

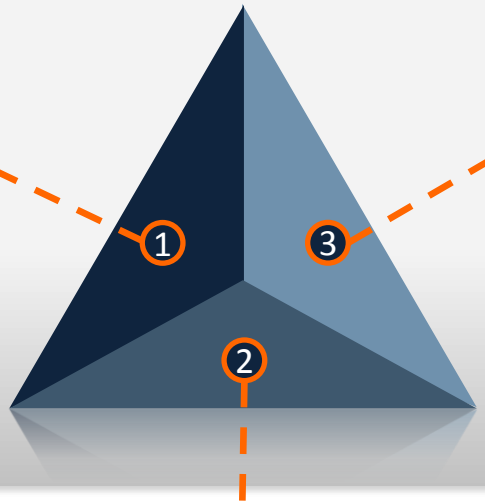
  Has served on the Board of EWEA and GWEC

MAKE's Offshore Wind Research

MAKE's offshore wind products are based on data montoring and industry analysis, comprising three main facets:

Markets

MAKE's global team of analysts closely monitor macro-economic, policy and project developments, order placements and installations in key and emerging offshore wind power markets worldwide.



Value Chain

Supply and demand dynamics are a key component of MAKE's research spectrum. We constantly study all aspects of the wind power value chain for interesting developments, such as supply-demand imbalances, sourcing strategies, key company positions, M&A activity and much more.

Technology

MAKE's technology team closely monitors individual partners in the supply chain and their technical innovation and product development and forecasts technological trends in key areas.

Executive Summary

Offshore wind power – an 'ocean of opportunity' – but not for everyone

Despite bearish macro outlook for global wind power markets, offshore wind power provides a silver lining

Renewable energy targets, attractive support schemes and scale has made offshore wind power an attractive option for utilities to reduce CO_2-emissions.

Technology innovation and industrialization of the offshore supply chain key is key for long term sustainability

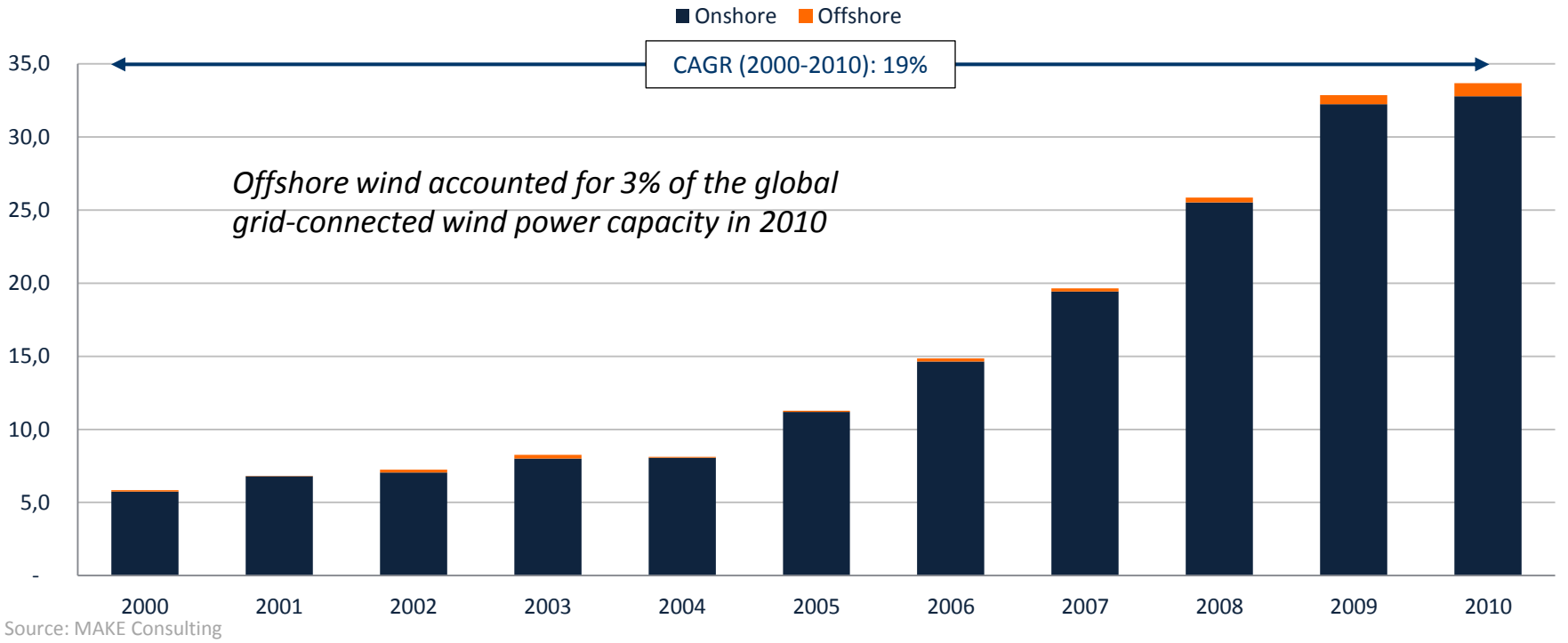
New technology and closer cooperation and strategic partnerships across the value chain is required to unlock large LCOE reduction potential in the emerging offshore wind power sector.

Despite strong market growth, not everyone will have the ability to make it in offshore wind power

Time to market, track-record and technology make formidable entry barriers into a high growth sector.

Offshore wind development has just started

Global development of wind power (GW)

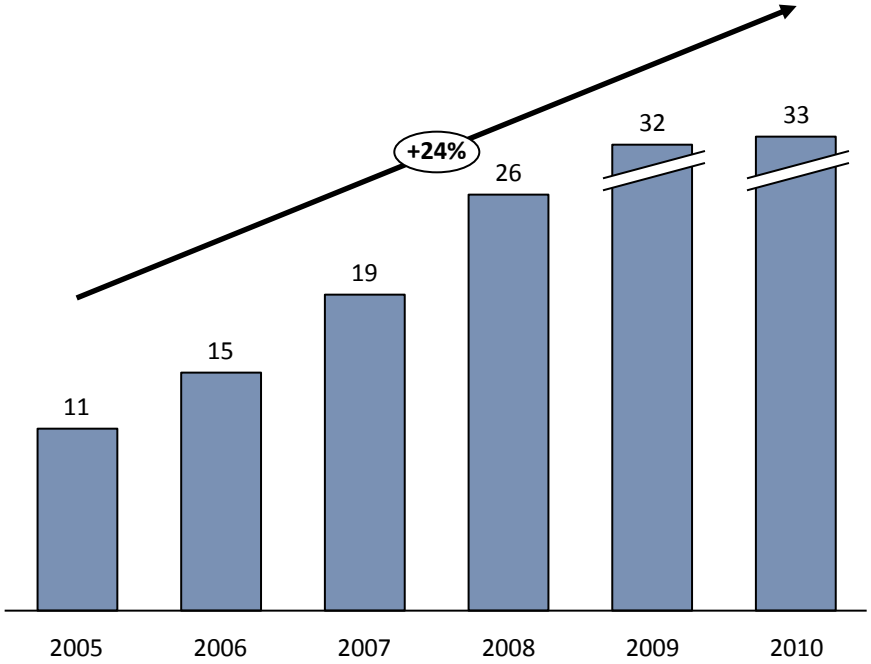


Source: MAKE Consulting

Global wind power development has been driven by the onshore segment, but offshore wind is gaining momentum and will take an increasing share of future industry growth.

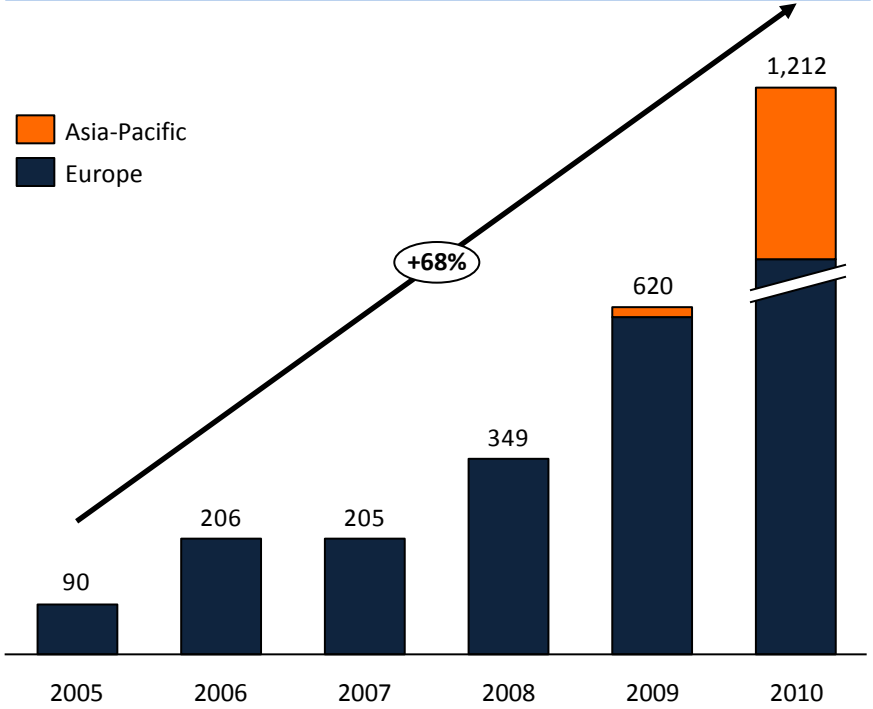
Offshore wind power see high growth

Onshore annual installed capacity 2005-2010 (GW)



Source: MAKE Consulting

Offshore annual installed capacity 2005-2010 (MW)

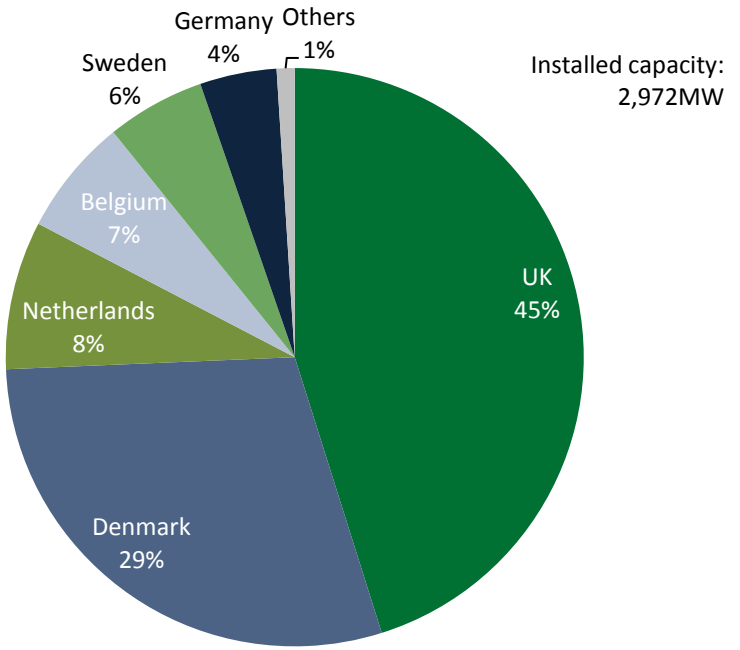


Source: MAKE Consulting

Strong growth in the offshore segment, though the volumes remain relative small in comparison with the installed onshore capacity in the period.

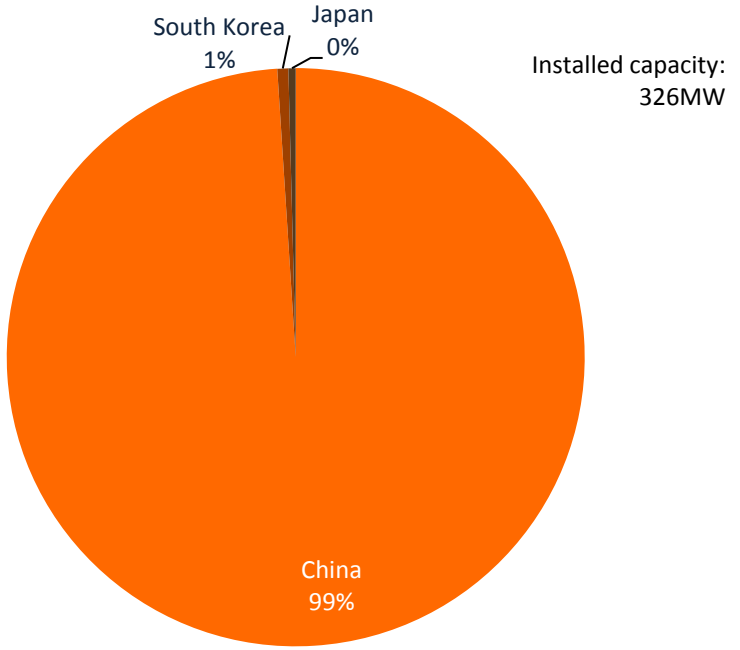
Key European markets dominate the offshore segment

European cumulative share by country (YE 2010)



Source:MAKE Consulting

Asian cumulative share by country (YE 2010)

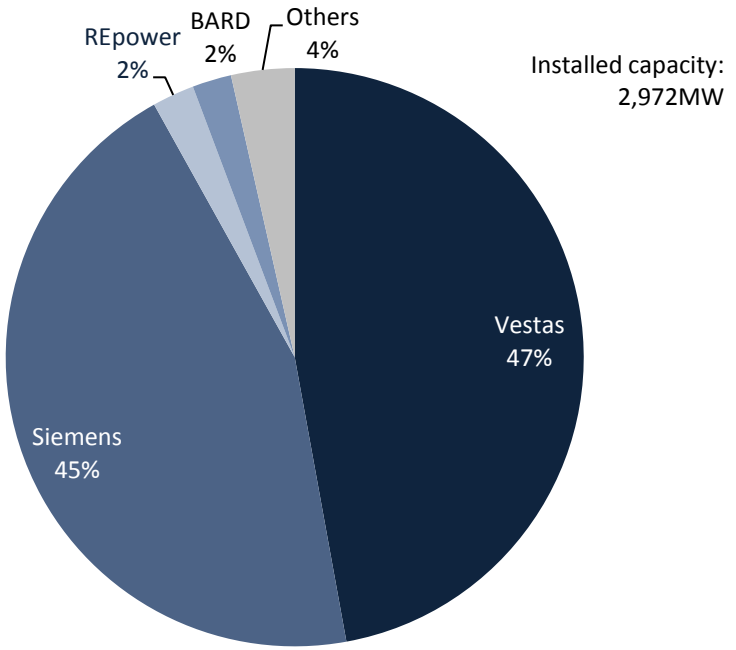


Source:MAKE Consulting

- ***UK and Denmark are the leading European offshore markets accounting for almost 75% of the installed capacity at end of year 2010.***
- ***China is the predominant market in Asia-Pacific with an installed capacity of more than 320MW at end of year 2010.***

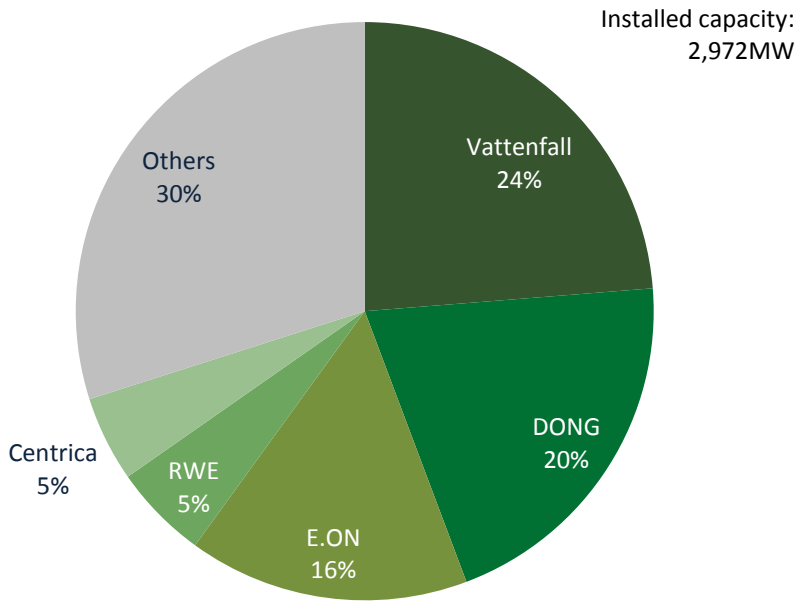
Vestas and Siemens dominates the European market

European turbine OEM market share (YE2010)



Source: MAKE Consulting

European ownership market share (YE 2010)

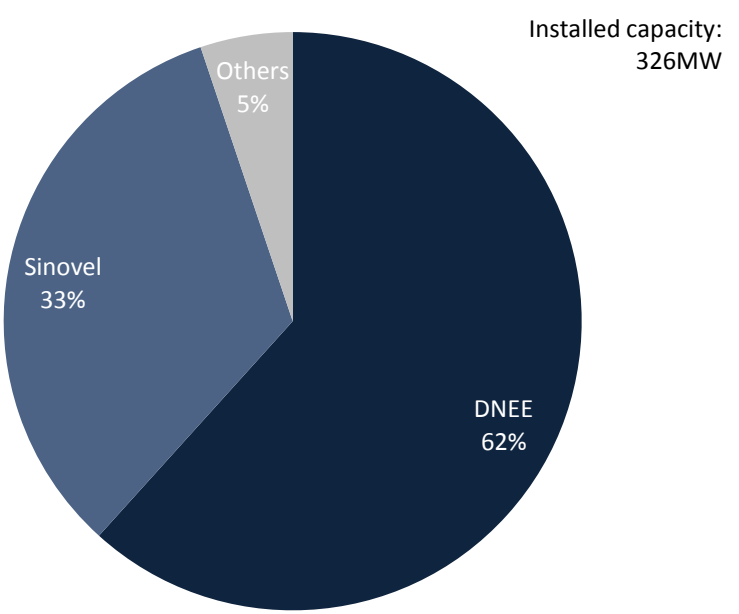


Source: MAKE Consulting

- ***Vestas and Siemens are the dominating offshore turbine OEMs with a combined market share of more than 90% of the installed capacity and a long track record in the leading European offshore markets.***
- ***European offshore development has been dominated by a few key European utilities.***

Chinese companies leading the Asian offshore market

Asian turbine OEM market share (YE2010)



Source:MAKE Consulting

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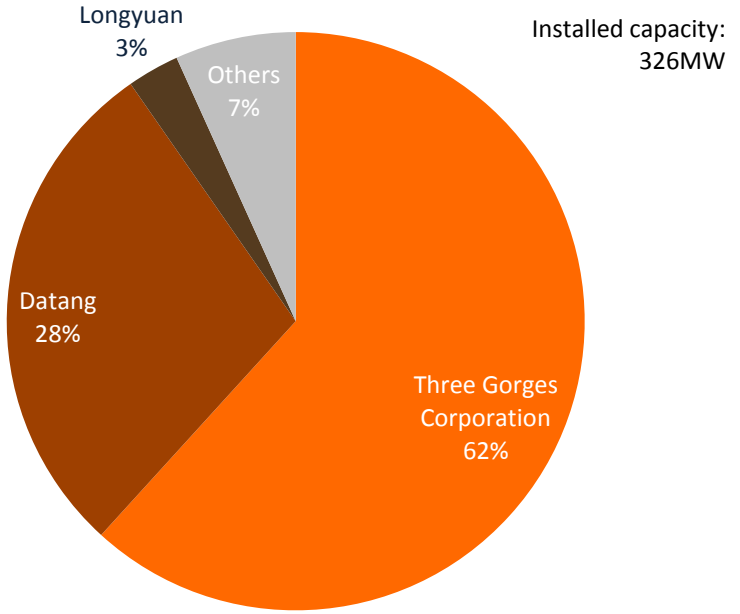


Source:MAKE Consulting

- ***Three Gorges and Datang are the dominating offshore asset owners with a 90% market share of the installed capacity.***
- ***The Chinese companies, DNEE (Dongfang) and Sinovel, are the dominating turbine OEMs accounting for 95% of the installed capacity at end of year 2010.***

Market drivers and barriers in key markets

Americas


- Unclear policy support impedes forward planning in the U.S. – federal incentives for wind set to expire end-2012 with extensions or replacements uncertain.
- Macroeconomic conditions pose a structural challenge – low electricity prices, low natural gas prices, and less new generation demand strongly reduce utility demand for wind power.
- Improvements seen in the U.S. permitting regime but process still lengthy and cumbersome.
- Eastern U.S. seaboard states strongly supportive of offshore wind for economic development reasons.
- Offshore largely stalled in Canada following offshore moratorium in Ontario province.

Europe

- Offshore wind is vital for reaching the NREAP 2020 targets.
- UK and Germany will be the dominating markets with targets of 18GW and 10GW of installed capacity by 2020.
- Strong offshore incentives supporting the future development of offshore wind power plants.
- Large offshore project pipeline which are beginning to materialize.
- Tendency of slow permitting process and potential grid bottlenecks could impede the offshore growth.

Asia-Pacific

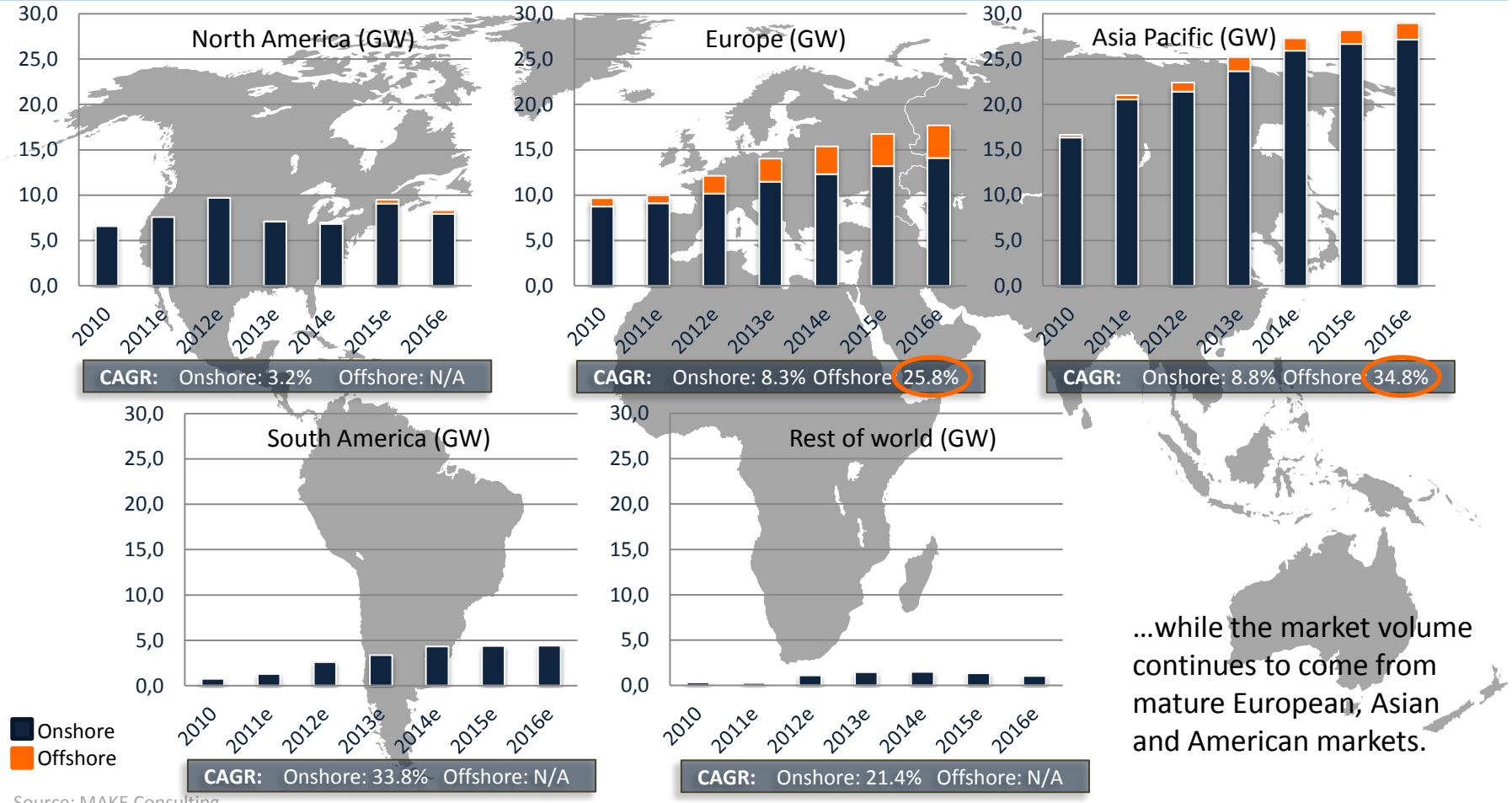


- China will dominate the Asian offshore market with a target of 5GW of installed capacity through 2015.
- In the medium term other markets like South Korea and Japan will begin to exploit offshore opportunities, as local turbine OEMs will have built an offshore turbine platform.
- High energy demand in the region creating an increased demand for renewable energy.
- Lack of experience with offshore technology and installation could pose a risk of delay to the industry.

Source: MAKE Consulting

Regional market development

Emerging markets and offshore wind power expected to lead in Y-O-Y growth…



…while the market volume continues to come from mature European, Asian and American markets.

Source: MAKE Consulting

European Offshore Wind Market Assessment

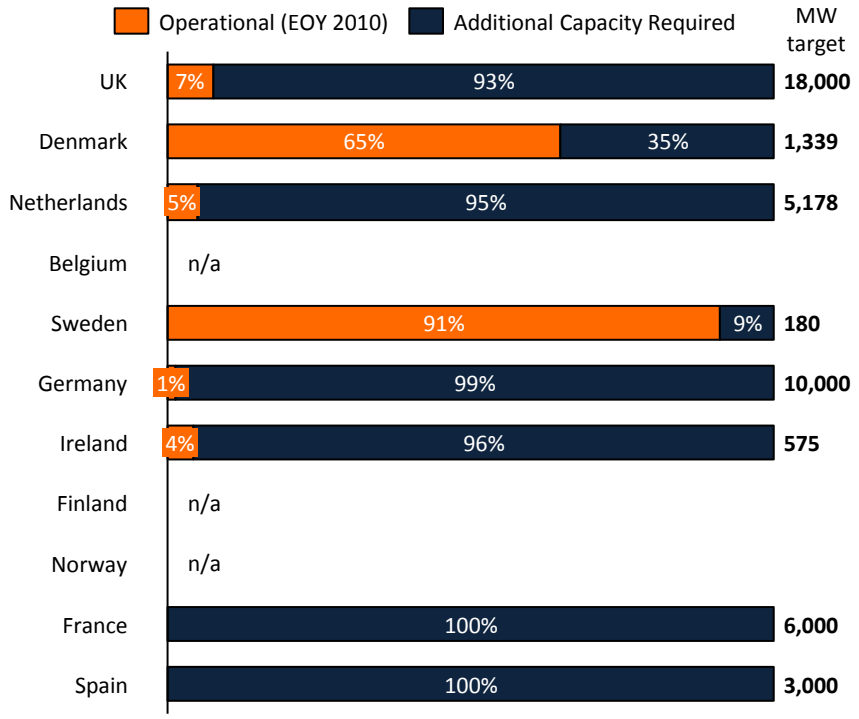
Support Mechanisms

Market	2020 RES target	Support Scheme	Value (EUR/kWh)
UK	15%	Renewable Obligation Certificates (ROC)	0.153*
Germany	18%	Feed-in tariff	0.150-0.190
Belgium	13%	Green Certificates (GC) on top of electricity price	0.09-0.107
Netherlands	14%	Tender	n/a
Denmark	30%	Premium	0.141
Sweden	49%	Green Certificates (GC) on top of electricity price	0.086*
Norway	n/a	Green Certificates (GC) on top of electricity price	n/a
Finland	38%	Feed-in tariff	0.105
Ireland	16%	Feed-in tariff	0.140
France	23%	Feed-in tariff	0.130
Spain	21%	Premium	0.164

Notes: Belgium and France have not divided their target between onshore and offshore.
Spain has proposed to reduce its offshore target to 750MW

Source: MAKE Consulting, *Average price, 2010

Offshore Wind Energy Targets by 2020

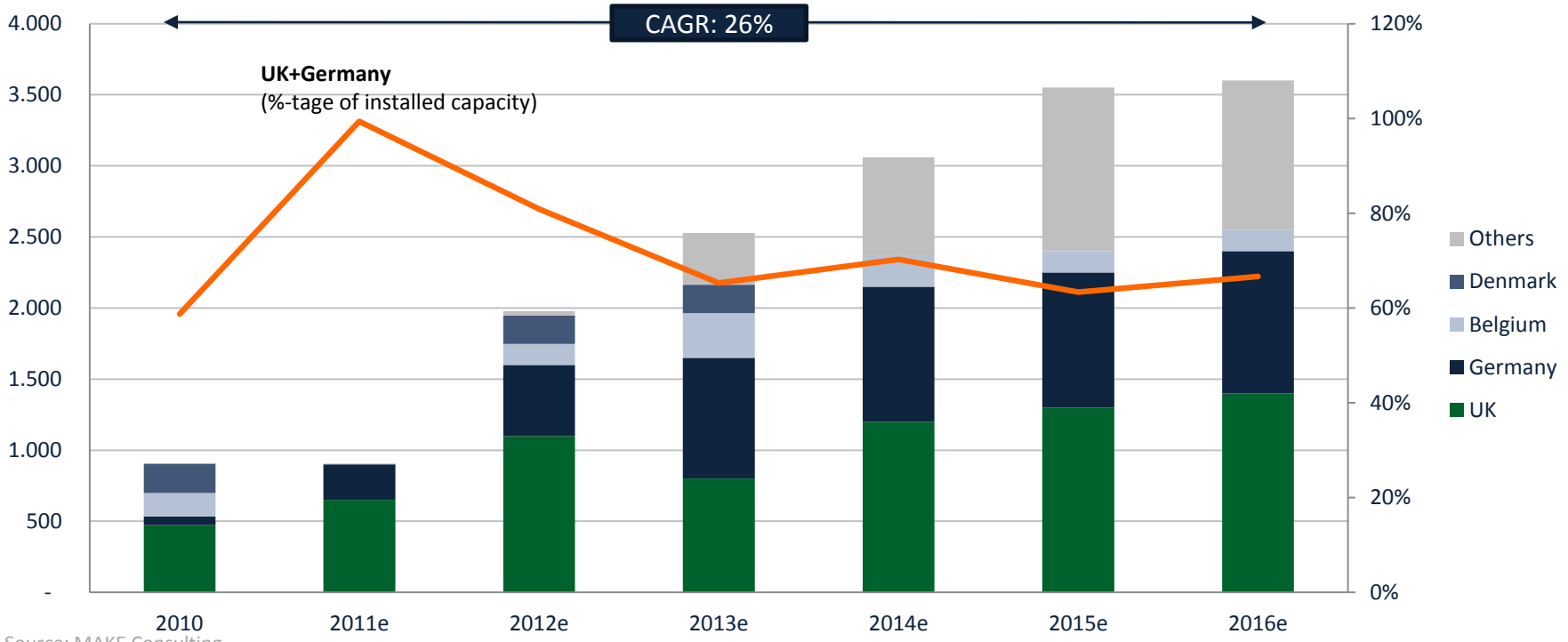


Source: NREAPs, MAKE Consulting

High RES targets and attractive incentive schemes in leading markets create solid market fundamentals for future European offshore wind power growth

UK and Germany to lead European offshore wind

European offshore market forecast split by country 2010-2016e (MW)



Source: MAKE Consulting

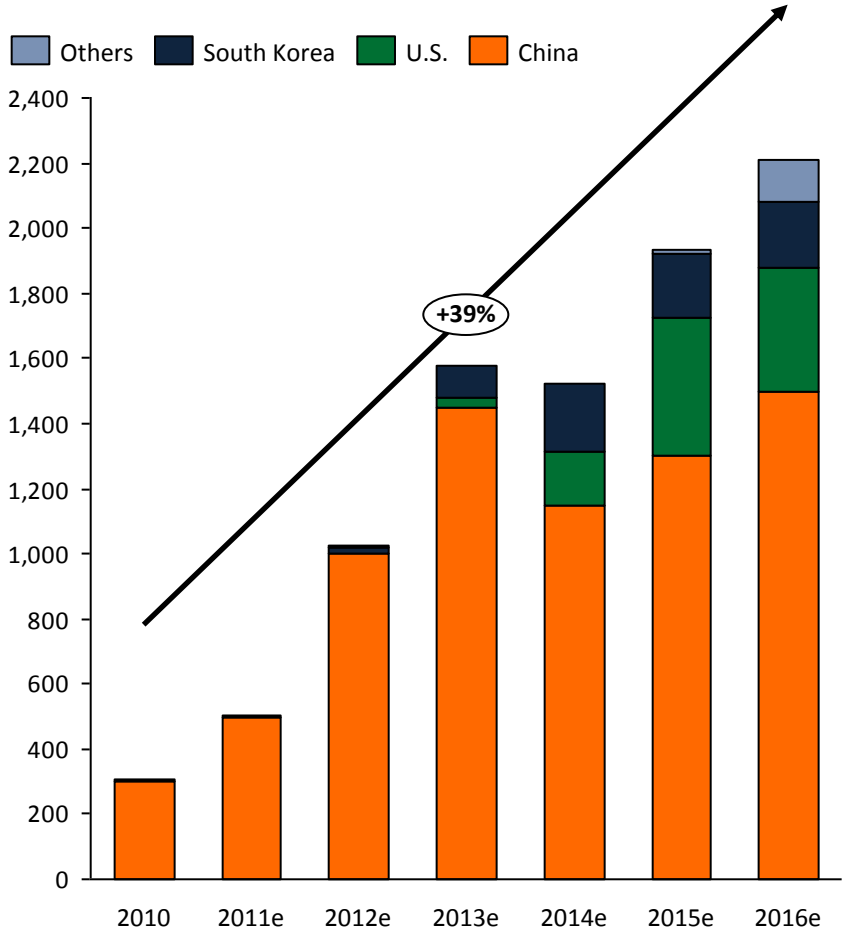
- ***RES targets and NREAPs will continue to boost the European offshore industry as governments expect the segment to be a major contributor in achieving the 2020 targets.***
- ***UK and Germany will dominate the European offshore market accounting for more than 60% YoY of the offshore project pipeline.***
- ***Political focus on increasing energy security from non-fossil fuels and initiatives will facilitate the future growth of offshore wind power.***

Chinese offshore will dominate outside Europe

Key highlights

- China is the dominating offshore market outside Europe and the government has indicated a potential offshore target around 5GW by 2015.
- The U.S. and South Korean offshore market is still in the early development but is expected to emerge from 2013 and onwards.
- The turbines deployed in these markets have a lower rating in comparison with Europe, however both Chinese and South Korean turbine manufacturers are developing larger turbines to serve the local demand.

RoW offshore market forecast (MW)



Sneak Preview: MAKE's Offshore Wind Package

A complete offshore market intelligence package that covers every aspect of the industry

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Offshore Subscription Package	Content
Global Policy Horizon	Quality insight into future policy activity that will impact market conditions
Project Pipeline Analysis	Detailed analysis of project development in key offshore markets
Flash Notes	Fast analyst reactions and insight into key offshore wind industry events
Research Notes	Expert synthesis and in-depth analysis of the latest & most significant developments
Quarterly Forecasts	Global 6 year market outlook updates for offshore markets
Analyst Presentations	Expert offshore presentations delivered at global wind power conferences
Annual Offshore Wind Power Business Study (Oct 2011)	Comprehensive insight into the status and development of the offshore wind market


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Reports and notes recently compiled by MAKE Consulting:

- Q3/2011 Global Wind Power Market Outlook Update (quarterly update, August 31, 2011)
- Demand Side – 2011 (market report, August 19, 2011)
- ZF Hansen deal furthers industry consolidation (flash note, August 1, 2011)
- Forecasting mandate to advance China wind market (flash note, July 22, 2011)
- 1H/2011 wind turbine order: growth onshore, uneventful offshore (research note, July 22, 2011)
- Siemens pushing PMG strategy with rare earth JV (flash note, July 21, 2011)
- Third Ontario FIT awards raise hope and stakes (flash note, July 15, 2011)
- Innovation on the horizon for offshore wind logistics (research note, June 30, 2011)
- Q2 2011 market outlook update (quarterly update, June 28, 2011)
- Wind could benefit from German nuclear phase out (flash note, June 14, 2011)

Upcoming publications:

- Business Study: China Wind Power 2011
- Business study: Offshore Wind Power 2011