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OFFSHORE WIND – AN INDUSTRIAL PERSPECTIVE

Policy recommendations for large-scale deployment of offshore wind power in Europe by 2020

Klaus Rave, EWEA Vice-President

Offshore Wind Energy – Good for our climate, bad for our seas?

The International Foundation for the Law of the Sea - (IFLOS), Hamburg

14 March 2008

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What is the European Wind Energy Association?

EWEA is the **voice of the wind industry**, actively promoting the utilisation of wind power in Europe and worldwide for the past 25 years.

Resources are focussed on **lobbying, communication and policy activities**, and responding to enquiries from our member organisations.

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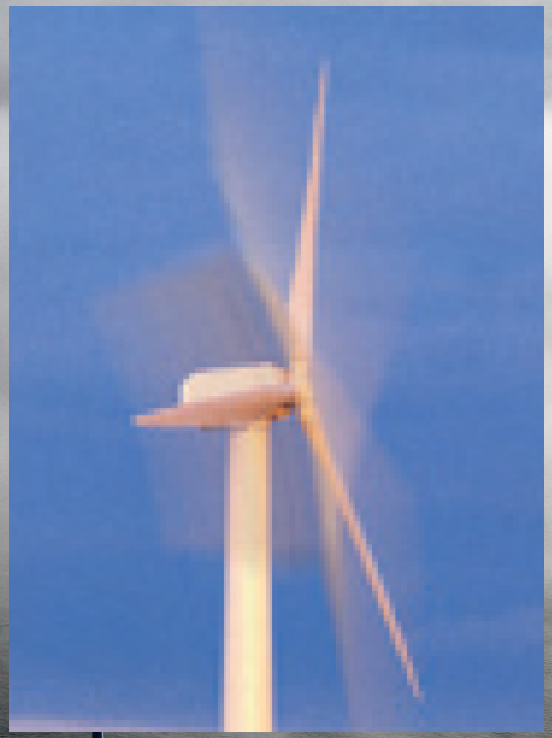
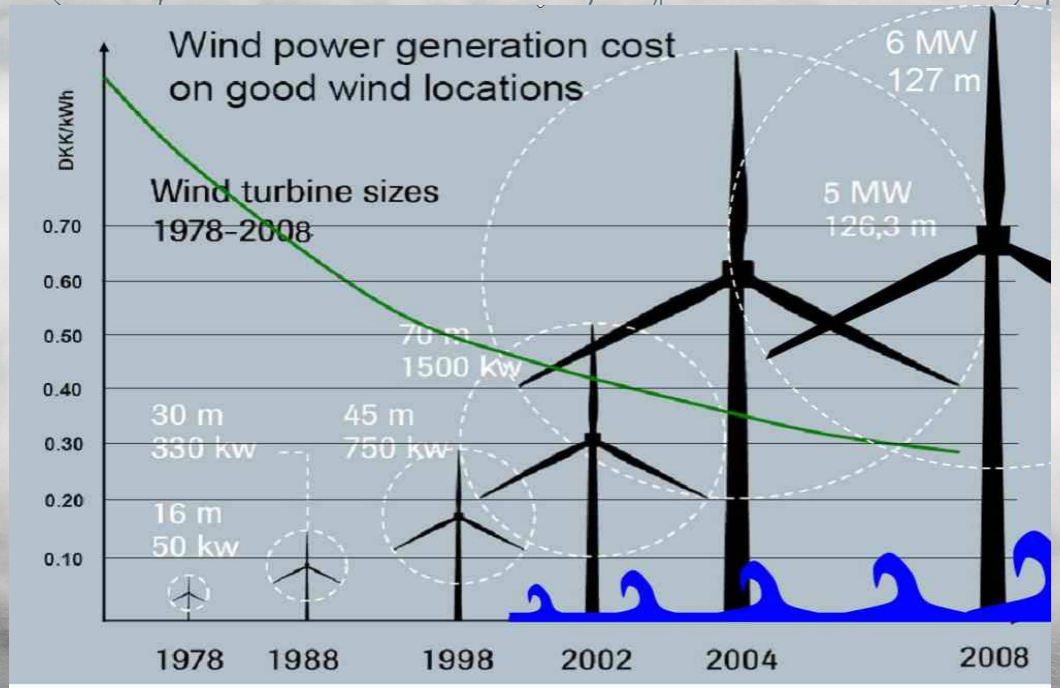
Investitionsbank Schleswig-Holstein

- Public Development Bank for the federal state of Schleswig-Holstein
- IB business segments: SME Financing, Housing, Municipalities
- Basic data (2007)
  - Balance sheet total of 12,8 Bill. €
  - New business volume of 1,8 Bill. €
  - 406 employees provide approx. 60 products and services
- Several special activities, e.g.
  - Energy Agency
  - IB.Europe as the EU advisory centre for Schleswig-Holstein
  - PPP Centre of Competence

Technical improvements in the past





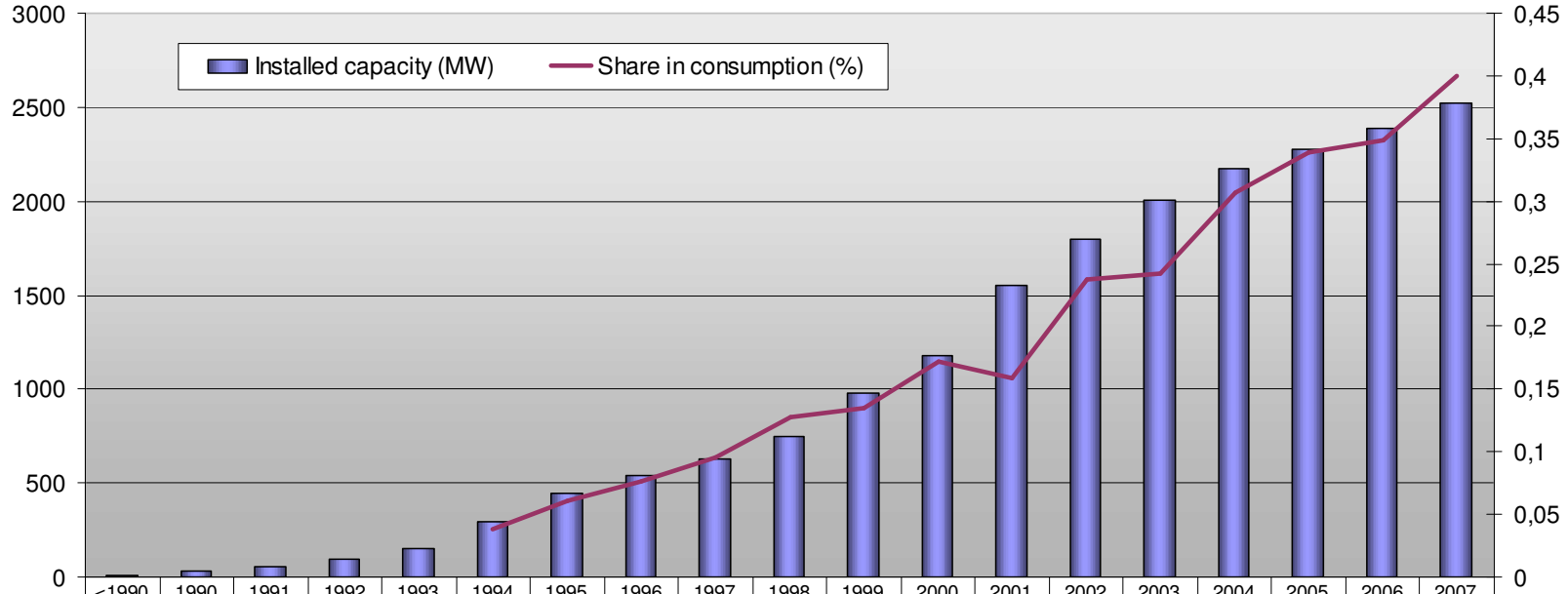
Source: Frank V. Nielsen, R&D Director, LM Glasfiber, European Wind Energy Technology Platform Launch Event (supplemented by own research)

	1980	2007	Factor
Rotor size	15 m	127 m	8,5
Installed power largest wind turbine	55 kW	6.000 kW	120
Wind energy plant capacity	100 kW	736.000 kW	7.360
Installed power (world)	100 MW	94.112 MW	941
Contribution to electricity supply (Europe)	0,001%	3%*	>10.000

* 2005

Wind energy in Schleswig-Holstein

- **In 2020 Schleswig-Holstein will be a net exporter of wind energy.**

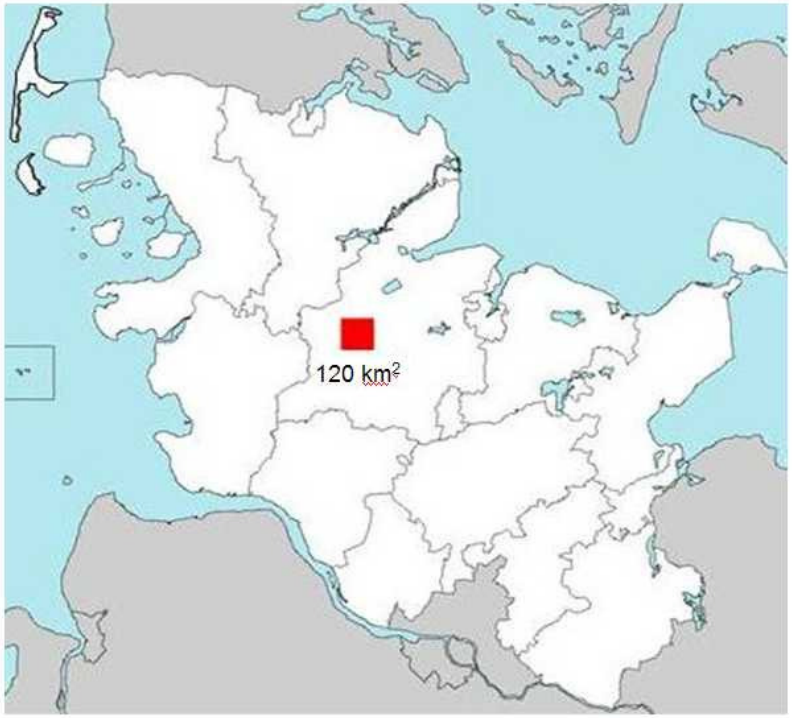


	<1990	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Installed capacity (MW)	7	35	59	92	153	290,81	448,87	540,14	630,8	745,7	976,3	1177,6	1555,2	1799,3	2007	2174,01	2274,91	2390,51	2522,21
Share in consumption (%)						3,85%	6,10%	7,61%	9,53%	12,81%	13,54%	17,23%	15,88%	23,79%	24,28%	30,65%	33,89%	34,87%	40,00%

Sources: Statistisches Amt für Hamburg und Schleswig-Holstein, Ministerium für Wissenschaft, Wirtschaft und Verkehr des Landes Schleswig-Holstein, Bundesverband WindEnergie

* approximate value

Wind energy in Schleswig-Holstein



- Surface area of Schleswig-Holstein: 15.763 km²
- About 0,75% of the surface area of Schleswig-Holstein => more than 30% of the power requirement of Schleswig-Holstein

Source: Report XVIII, Landwirtschaftskammer Schleswig-Holstein, Praxisergebnisse 2005

- **Wind energy has become an important and effective instrument for rural development in Schleswig-Holstein.**
- **Wind power plants are an opportunity for farmers to diversify their business and finance growth.**
- **Almost 7.000 jobs have been established.**
- **The annual tax revenue for municipalities in Schleswig-Holstein can reach up to 13.000 € per MW.**

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WIND – THE CHALLENGE

The EU members States agreed in June 2007 on a 20% by 2020 binding target for renewables by 2020:

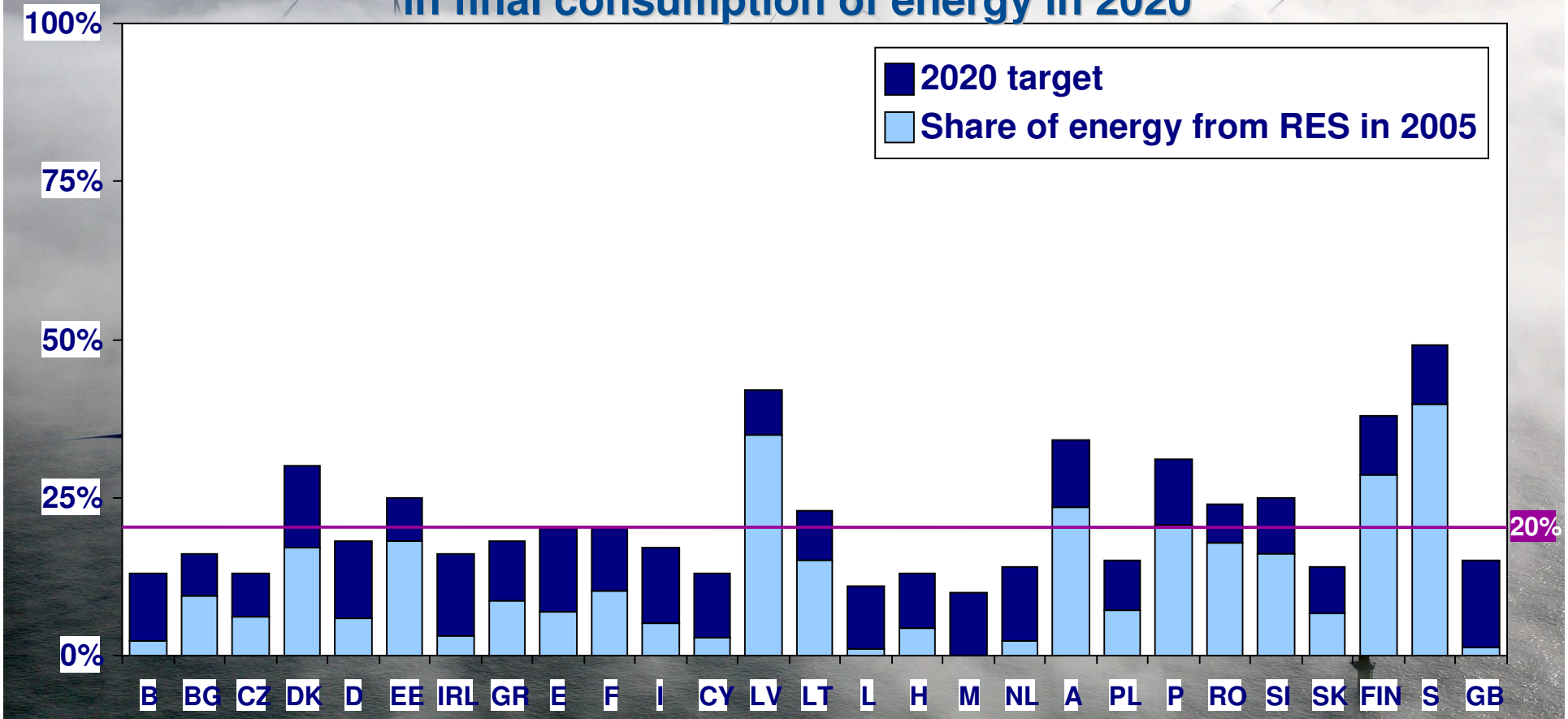
- **Offshore wind power will have to play a crucial role in meeting this target**

- **Offshore wind: a key technology to achieve energy, climate and maritime policy goals of the EU**

"Wind could contribute 12% of EU electricity by 2020. One third of this will more than likely come from offshore installations" *(Commission's Energy Package 10 January 2007)*

EU 2020 RENEWABLE ENERGY TARGETS

National overall targets for the share of energy from RES in final consumption of energy in 2020



Source: European Commission draft proposal for a Directive on the promotion of the use of energy from renewable sources

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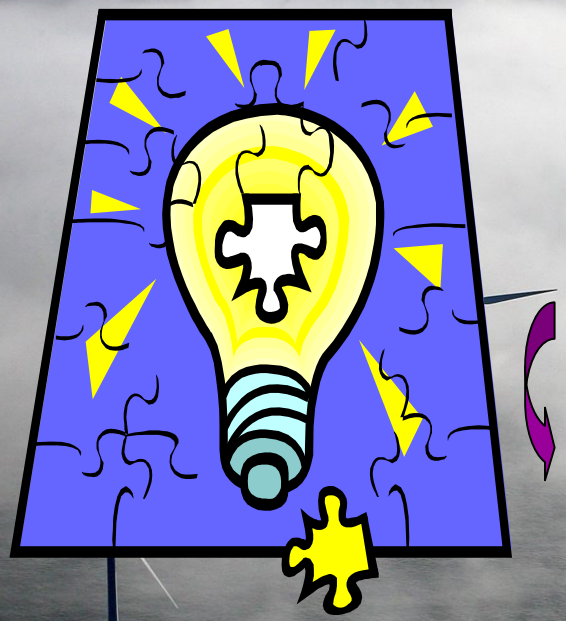
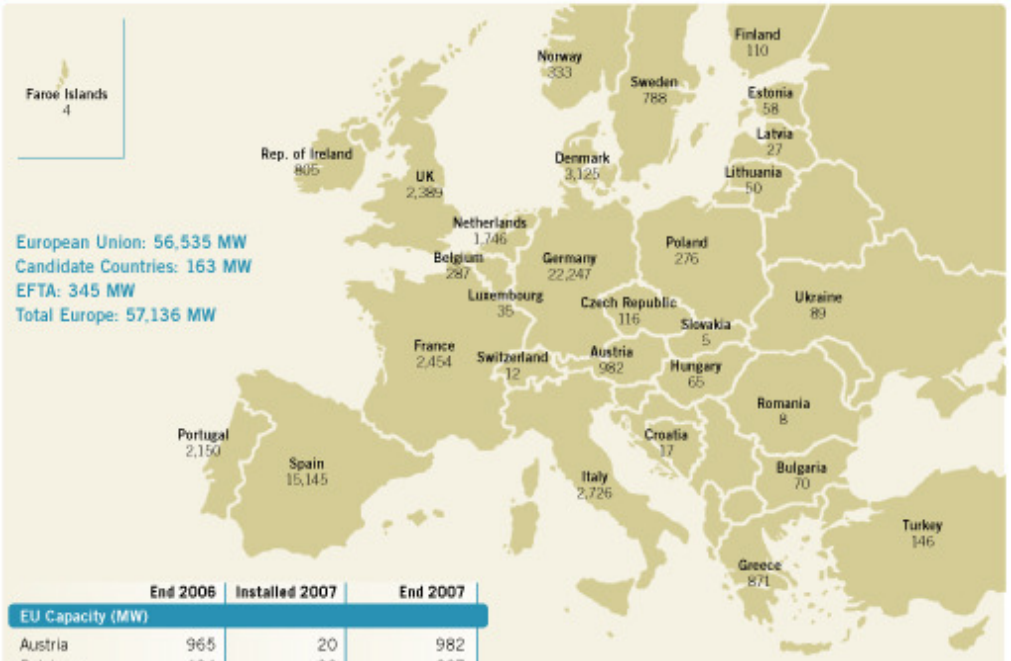
WIND ENERGY'S CONTRIBUTION TO THE TARGET



	Today		2020
RES	8.5%	➡	20%
Electricity	15%	➡	34%
Wind energy	3%	➡	11-14%
Offshor	0%	➡	1.8-3.7%

Without offshore wind, we will not reach the target
Without infrastructure, we will not meet the target

Wind power installed in Europe by end of 2007 (cumulative)



	End 2006	Installed 2007	End 2007
EU Capacity (MW)			
Austria	965	20	982
Belgium	194	93	287
Bulgaria	36	34	70
Cyprus	0	0	0
Czech Republic	54	63	116
Denmark	3,136	3	3,125
Estonia	32	26	58
Finland	86	24	110
France	1,567	888	2,454
Germany	20,622	1,667	22,247
Greece	746	125	871
Hungary	61	4	65
Ireland	746	59	805
Italy	2,123	603	2,726
Latvia	27	0	27
Lithuania	48	7	50
Luxembourg	35	0	35
Malta	0	0	0
Netherlands	1,558	210	1,746
Poland	153	123	276
Portugal	1,716	434	2,150
Romania	3	5	8
Slovakia	5	0	5
Slovenia	0	0	0
Spain	11,623	3,522	15,145
Sweden	571	217	788
UK	1,962	427	2,389
Total EU-12	**419**	**263**	**675**
Total EU-15	**47,651**	**8,291**	**55,860**
Total EU-27	**48,069**	**8,554**	**56,535**
Of which offshore	*870*	*210*	*1,080*

	End 2006	Installed 2007	End 2007
Candidate Countries (MW)			
Croatia	17	0	17
FYROM*	0	0	0
Turkey	50	97	146
Total	**67**	**97**	**163**
EFTA (MW)			
Iceland	0	0	0
Liechtenstein	0	0	0
Norway	325	8	333
Switzerland	12	0	12
Total	**337**	**8**	**345**
Other (MW)			
Faroe Islands	4	0	4
Ukraine	86	3	89
Total Europe	**48,563**	**8,662**	**57,136**

*FYROM = Former Yugoslav Republic of Macedonia

Note: Due to previous-year adjustments, project decommissioning of 88 MW, re-powering and rounding figures up and down, the total for the 2007 end-of-year cumulative capacity is not exactly equivalent to the sum of the 2006 end-of-year total plus the 2007 additions.

Source: EWEA

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Wind energy sector today

At the End of 2007, Europe has

- 80% global manufacturing share
- 65% cumulative market
- 50% of annual market
- Annual market value of ~€ 11bn
- 150,000 jobs
- Generates 3% EU electricity
- 40% of the total new power installations came from the wind industry

By 2010 wind is predicted to

- Annual electricity generation of 167 TWh, equivalent to meet the demand of 34m people
- 28% of all new installed generation capacity
- 10.6% of overall generation capacity
- Deliver 50% of the Renewable Directive target
- Meet >30% of the EU Kyoto Protocol commitment
- Avoid €13 billion imported fuel costs,
- Avoid €10-25 billion external costs

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Why going offshore wind

Some of the Benefits…

- Higher wind speeds & huge offshore wind resources
- Land areas constraints in some countries
- Reduced visual impact of offshore wind
- Larger generation output
- Increased interconnection

Some of the Challenges …

- Higher costs (project economics)
- Insufficient confidence in technology to attract participation
- Limited industry experience
- Lack/limited/inconsistent political support
- Grid integration (extension, upgrades and financing)
- Limited knowledge on environmental impacts
- Potential conflicts with other sear users

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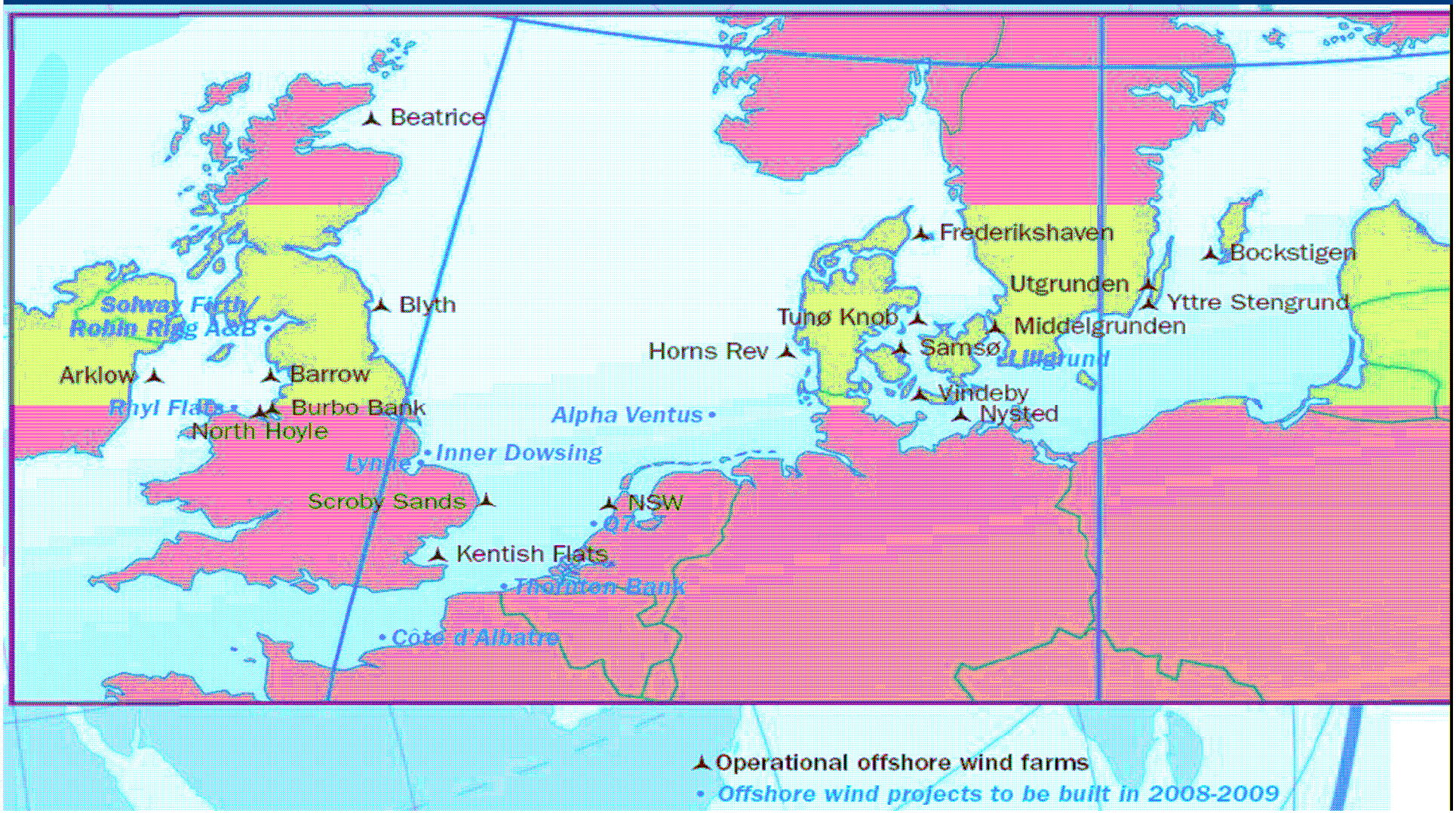
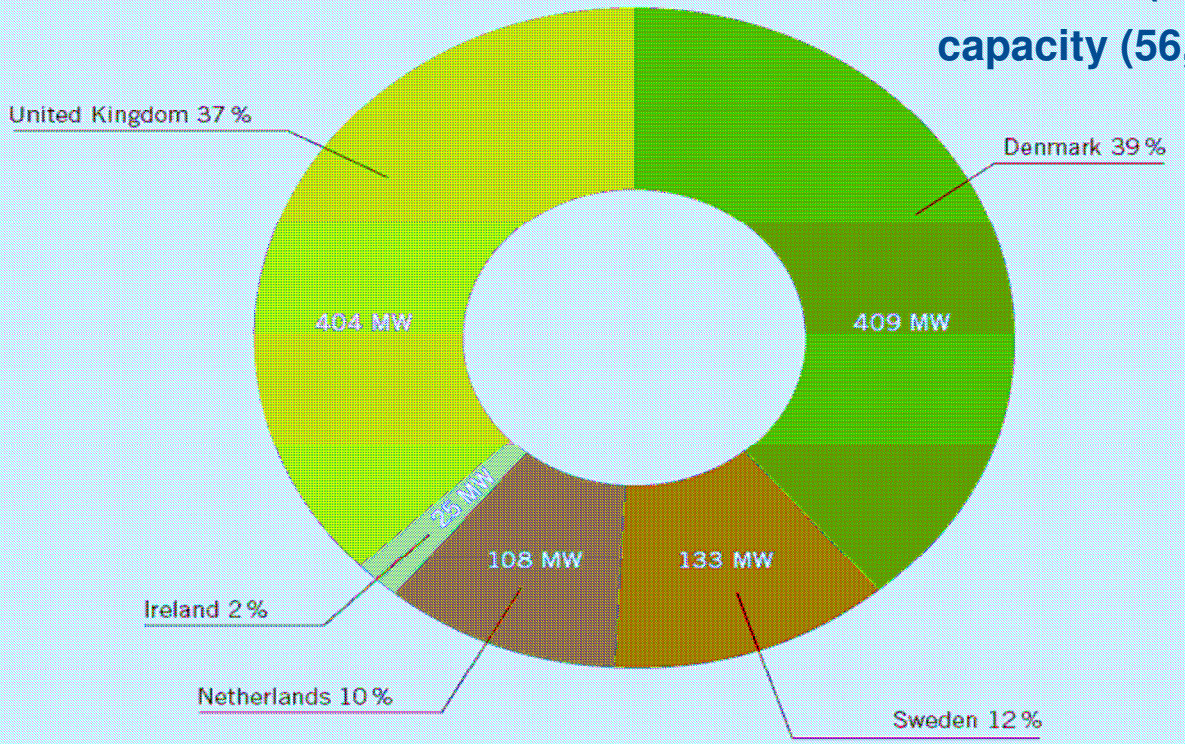
Offshore wind – Today



Offshore wind market today

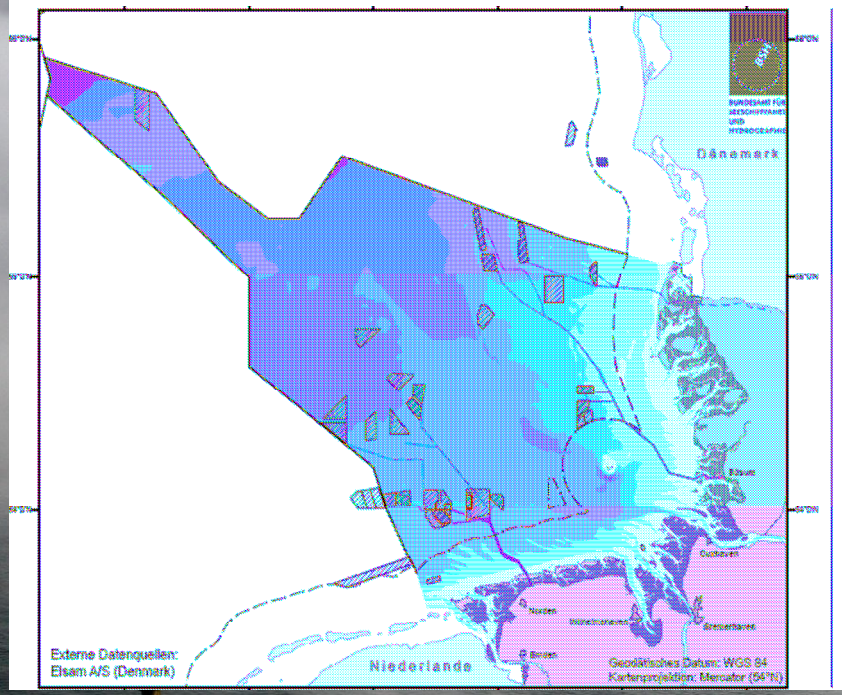
Total offshore wind power installed by end 2007

EU Offshore wind total capacity (2007) 1,080 MW (1.92% of Cumulative wind capacity (56,535 MW))

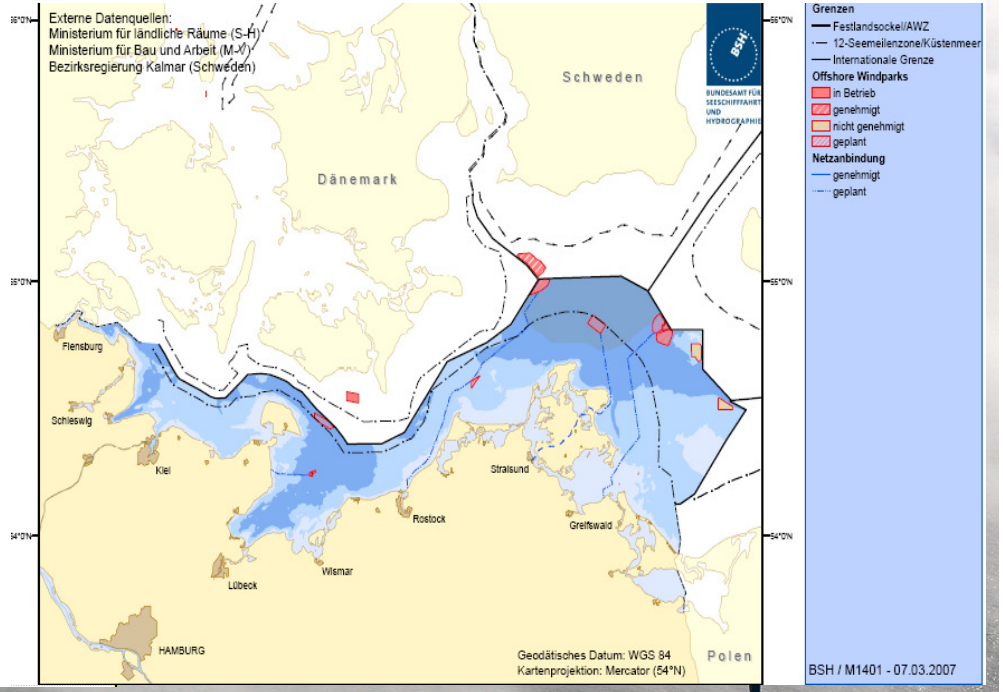


Where Offshore wind energy? Example of the Germany

North Sea Exclusive Economic Zone of Germany



Baltic Sea Exclusive Economic Zone of Germany



In 2007
No Operating offshore wind farms in Germany (December 2007)

In 2020 – 2030
Offshore wind capacity in Germany
20 to 25 GW (Source: BMU and BWE)

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EWEA'view on offshore wind - Offshore Wind Industry Group

Objective

To achieve industry consensus on the likely future path for offshore wind energy in Europe

Participants

EWEA members representing components suppliers & manufacturersdevelopers,contractors,
utilities, service providers, national associations and research organisations

Outcomes

- Development of scenarios for the development of offshore wind power in Europe;
- Development of policy recommendations to maximise offshore wind delivery

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Policy recommendations report

The report intends to map out the potential development up to 2020, alongside an analysis of the issues and barriers surrounding the sector, and which must be addressed if the potential for offshore wind is to be tapped fully.

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Delivering Offshore Wind Power in Europe

POLICY RECOMMENDATIONS FOR LARGE-SCALE DEPLOYMENT OF OFFSHORE WIND POWER IN EUROPE BY 2020

By the European Wind Energy Association

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Offshore wind market development by 2015

FIGURE 2: **Offshore wind development (Annual and cumulative in MW) 2010-2015**

		2007	2008	2009	2010	2015
Annual	Low*	205	645	500	1,000	1,700
	Medium					2,350
	High			900	1,500	3,000
Cumulative	Low	1,083	1,848	2,228	3,228	10,000
	Medium					12,000
	High			2,628	4,128	15,000

* For 2009 onwards a low and high estimate had to be developed, so as to reflect the increasing uncertainty over project delivery in this timescale.

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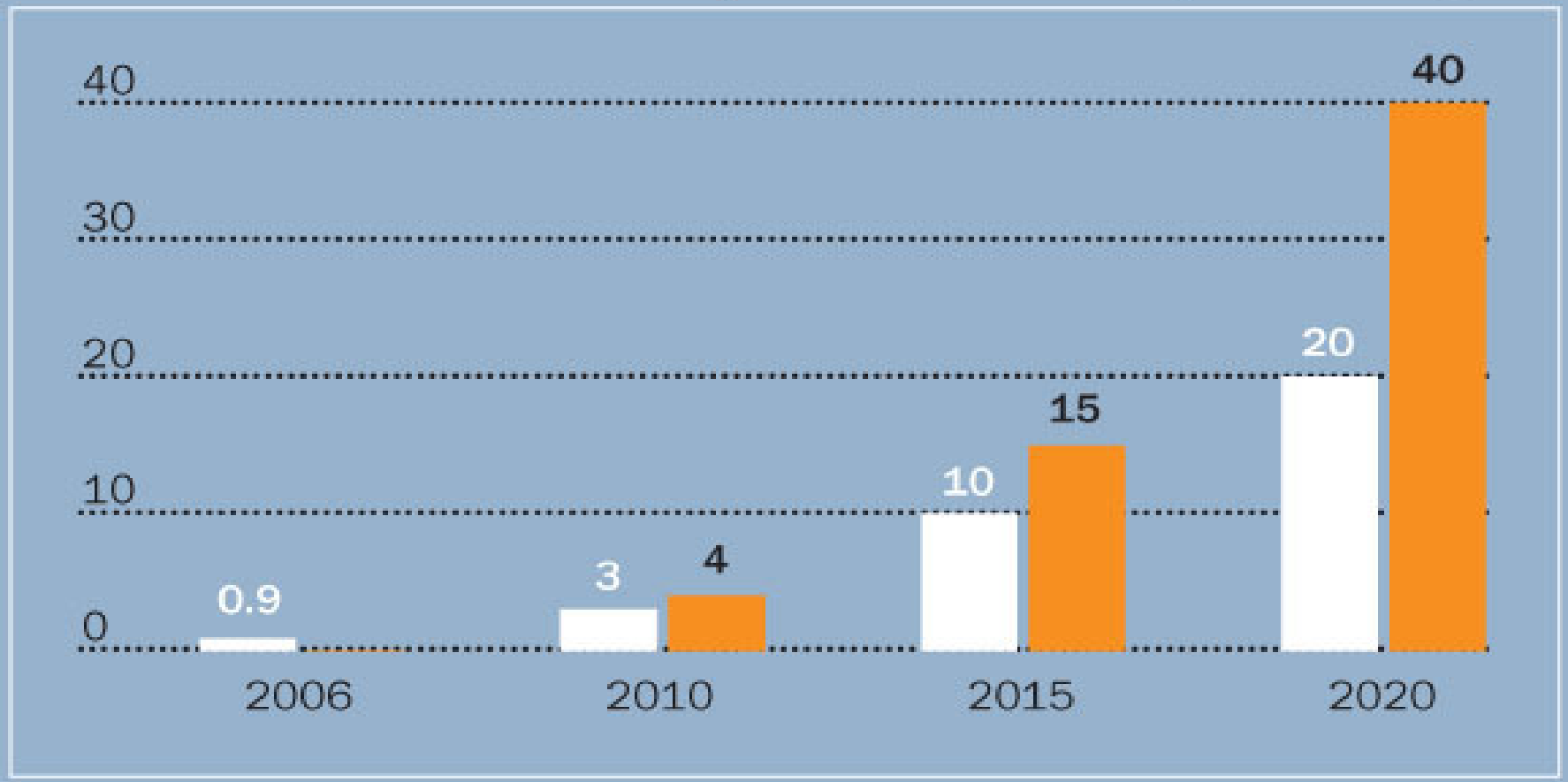
Offshore wind market scenario by 2020

FIGURE 3: **Offshore wind development 2006-2020 (Cumulative, GW)**



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Policy recommendations

POLICY

- ✓ Establishing a European policy framework for offshore wind power (…)

MARKET

- ✓ Establishing stable, coordinated long-term markets for offshore wind in Europe (…)

RESEARCH AND TECHNOLOGY

- ✓ Increasing and prioritising offshore wind R&D calls at EU and national level (…)

GRID INTEGRATION

- ✓ Defining allocation of costs for grid infrastructure mechanisms to ensure that all players have a real incentive (…)

ENVIRONMENT AND PLANNING

- ✓ Encouraging efficient planning procedures which are based on past experiences and are in proportion to the scale and the impact of the project (…)

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Final words

Now is the time for the EU to act in a coordinated manner in order
to develop offshore wind technology to its full potential and
consequently export it around the globe. Only then can it can
contribute fully to the urgent battle against climate change

Thirty years ago, North Sea oil came to the rescue of a Europe facing an international oil crisis. We are now faced with a different crisis, and we need offshore wind to help solve it …

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