

Wind Energy Industry Overview

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Sandia National Laboratories



**Albuquerque,
New Mexico**



**Kauai Test Facility,
Hawaii**



**Tonopah Test Range,
Nevada**



**Yucca Mountain,
Nevada**



WIPP, New Mexico



Pantex, Texas



Livermore, California



Wind Energy Research at SNL

- Began in the mid 1970's
- Initially focused on vertical-axis wind turbines
- Since 1993, the program has focused on industrial-sized horizontal-axis wind turbines (HAWT)



Installed Capacity

World

Year:	Installed MW	Increase %	Cumulative MW	Increase %
2002	7,227		32,037	
2003	8,344	15%	40,301	26%
2004	8,154	-2%	47,912	19%
2005	11,542	42%	59,399	24%
2006	15,016	30%	74,306	25%
2007	19,791	32%	94,005	27%
Average growth - 5 years		22.3%		24.0%

Source: BTM Consult ApS - March 2008



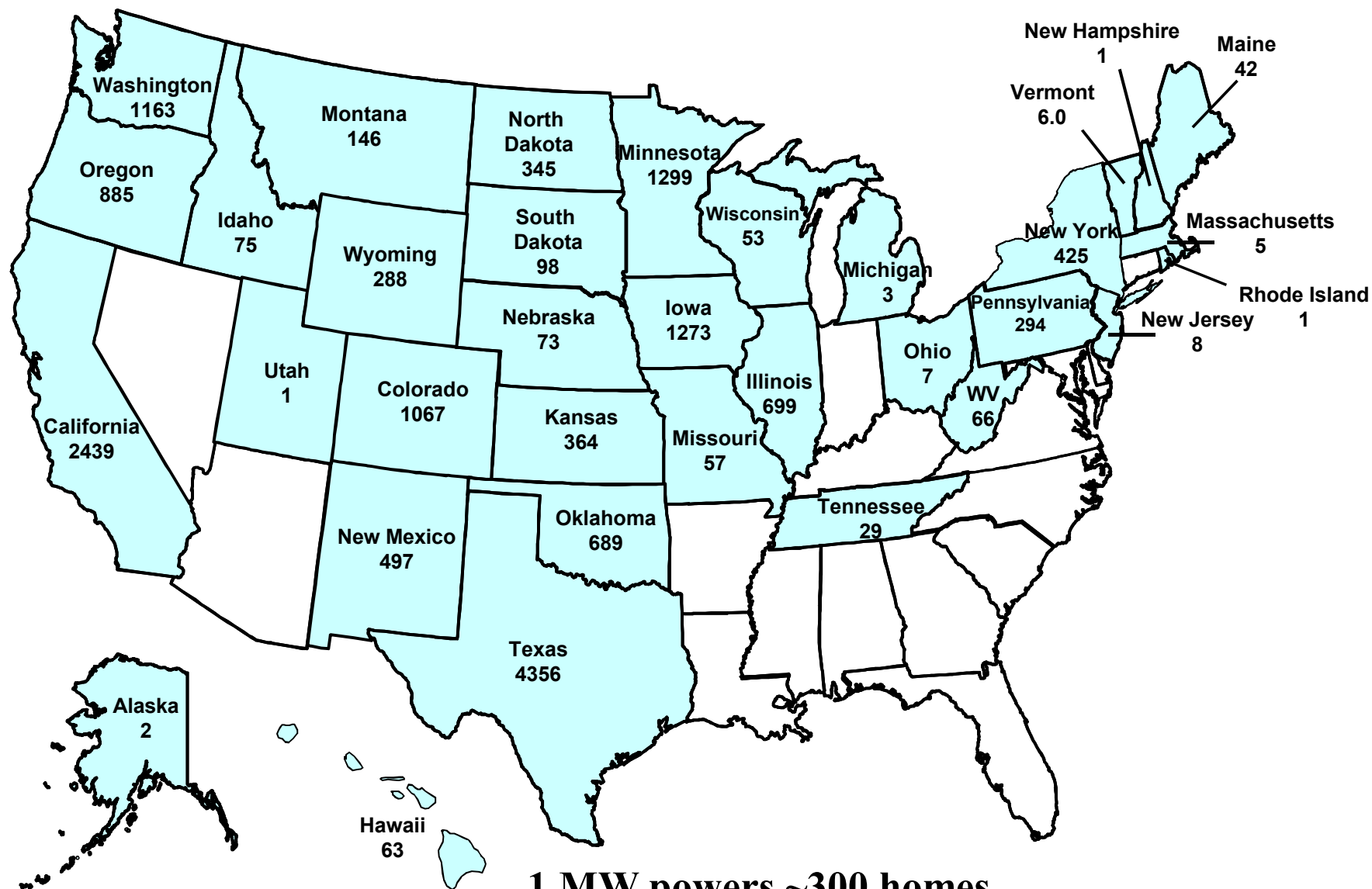
The 10 Largest Markets in 2007

Country	2005	2006	2007	Share %	Cum. Share %
USA	2,431	2,454	5,244	26.5%	26%
P.R. China	498	1,334	3,287	16.6%	43%
Spain	1,764	1,587	3,100	15.7%	59%
Germany	1,808	2,233	1,667	8.4%	67%
India	1,388	1,840	1,617	8.2%	75%
France	389	810	888	4.5%	80%
Italy	452	417	603	3.0%	83%
Portugal	502	629	434	2.2%	85%
UK	447	631	427	2.2%	87%
Canada	239	776	386	2.0%	89%
Total	9,918	12,711	17,653		
Percent of World	85.9%	84.7%	89.2%		

Source: BTM Consult ApS - March 2008

U.S. Installed Wind Capacity

(MW as of Jan 16, 2008)



1 MW powers ~300 homes

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The 10 Largest Markets by end of 2007

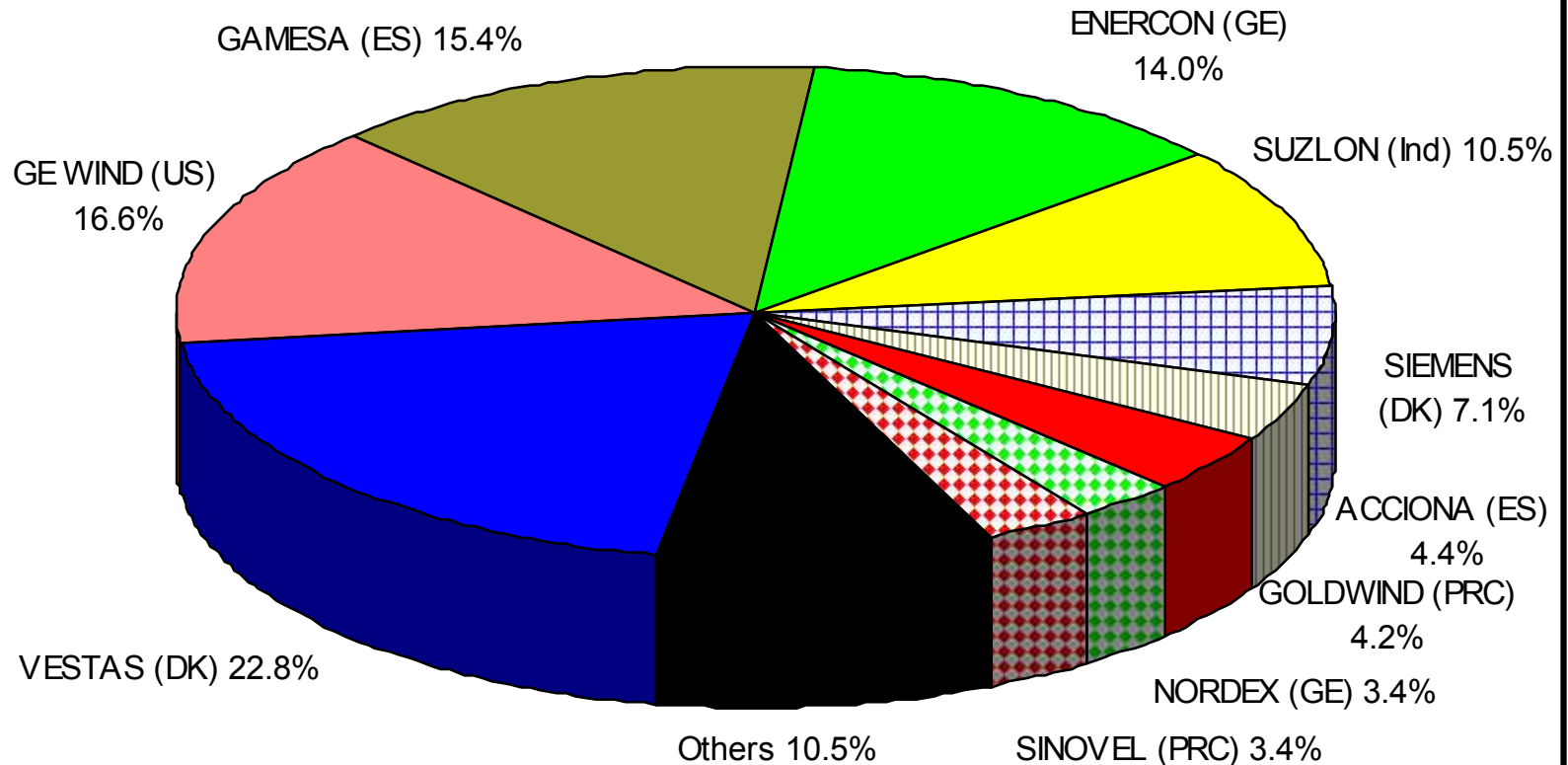
Country	2005	2006	2007	Share %	Cum. Share %
Germany	18,445	20,652	22,277	23.7%	24%
USA	9,181	11,635	16,879	18.0%	42%
Spain	10,027	11,614	14,714	15.7%	57%
India	4,388	6,228	7,845	8.3%	66%
P.R. China	1,264	2,588	5,875	6.2%	72%
Denmark	3,087	3,101	3,088	3.3%	75%
Italy	1,713	2,118	2,721	2.9%	78%
France	775	1,585	2,471	2.6%	81%
UK	1,336	1,967	2,394	2.5%	83%
Portugal	1,087	1,716	2,150	2.3%	86%
Total	51,303	63,203	80,415		
Percent of World	86.4%	85.1%	85.5%		

Source: BTM Consult ApS - March 2008

Turbine Suppliers in 2007

Market Share

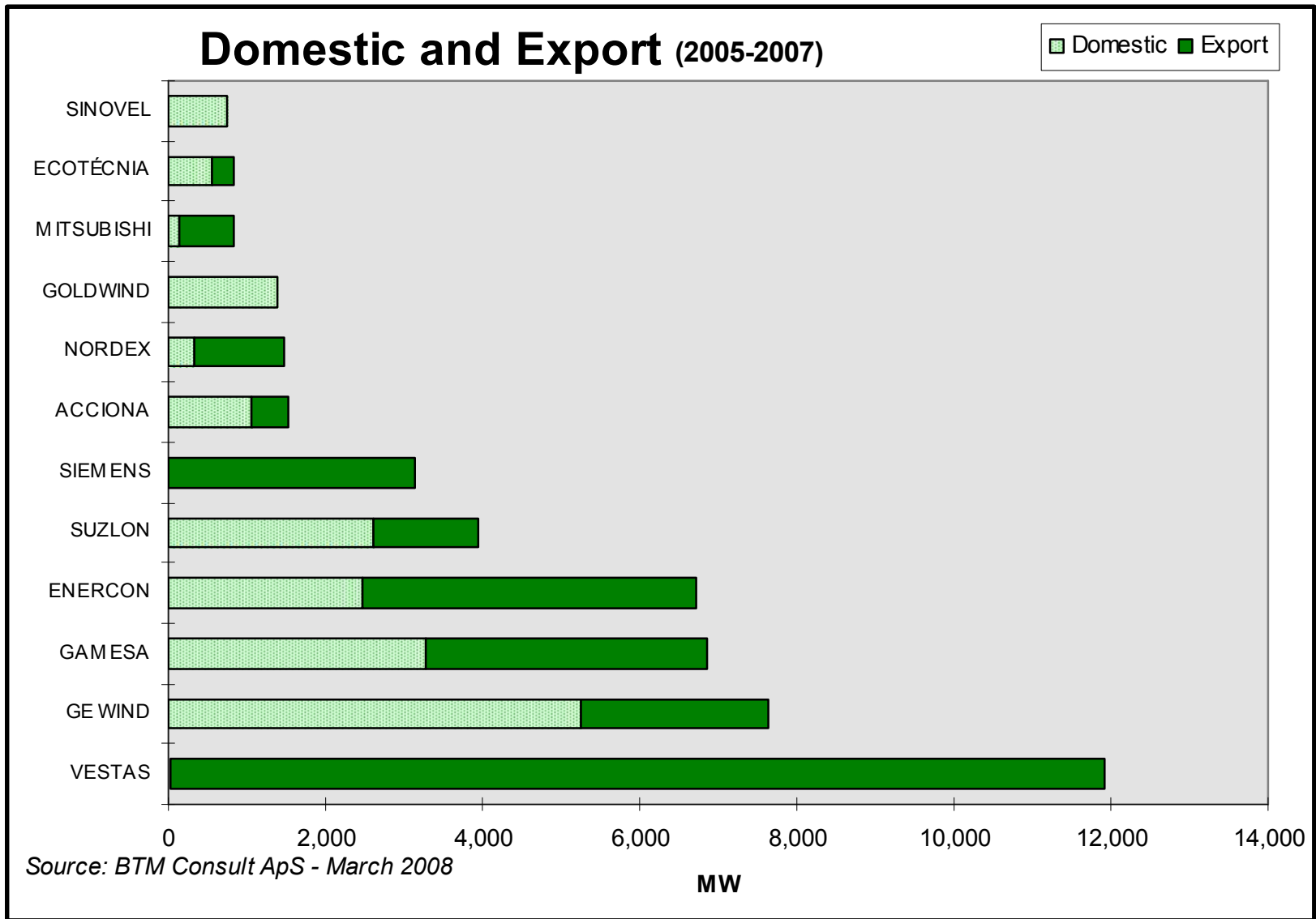
Top-10 Suppliers in 2007
% of the total market 19,791 MW



Source: BTM Consult ApS - March 2008

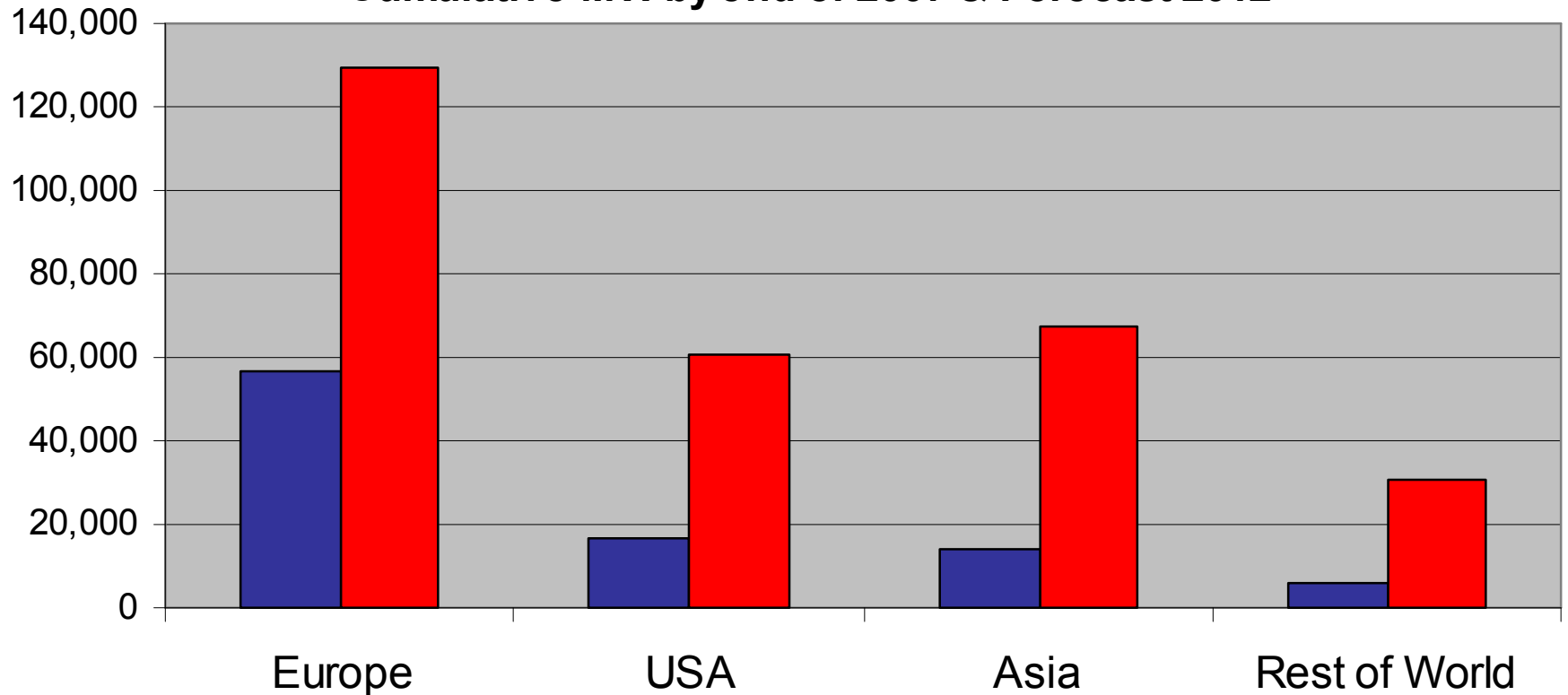


Turbine Suppliers (2005 - 2007)



Global Wind Power Forecast

Cumulative MW by end of 2007 & Forecast 2012

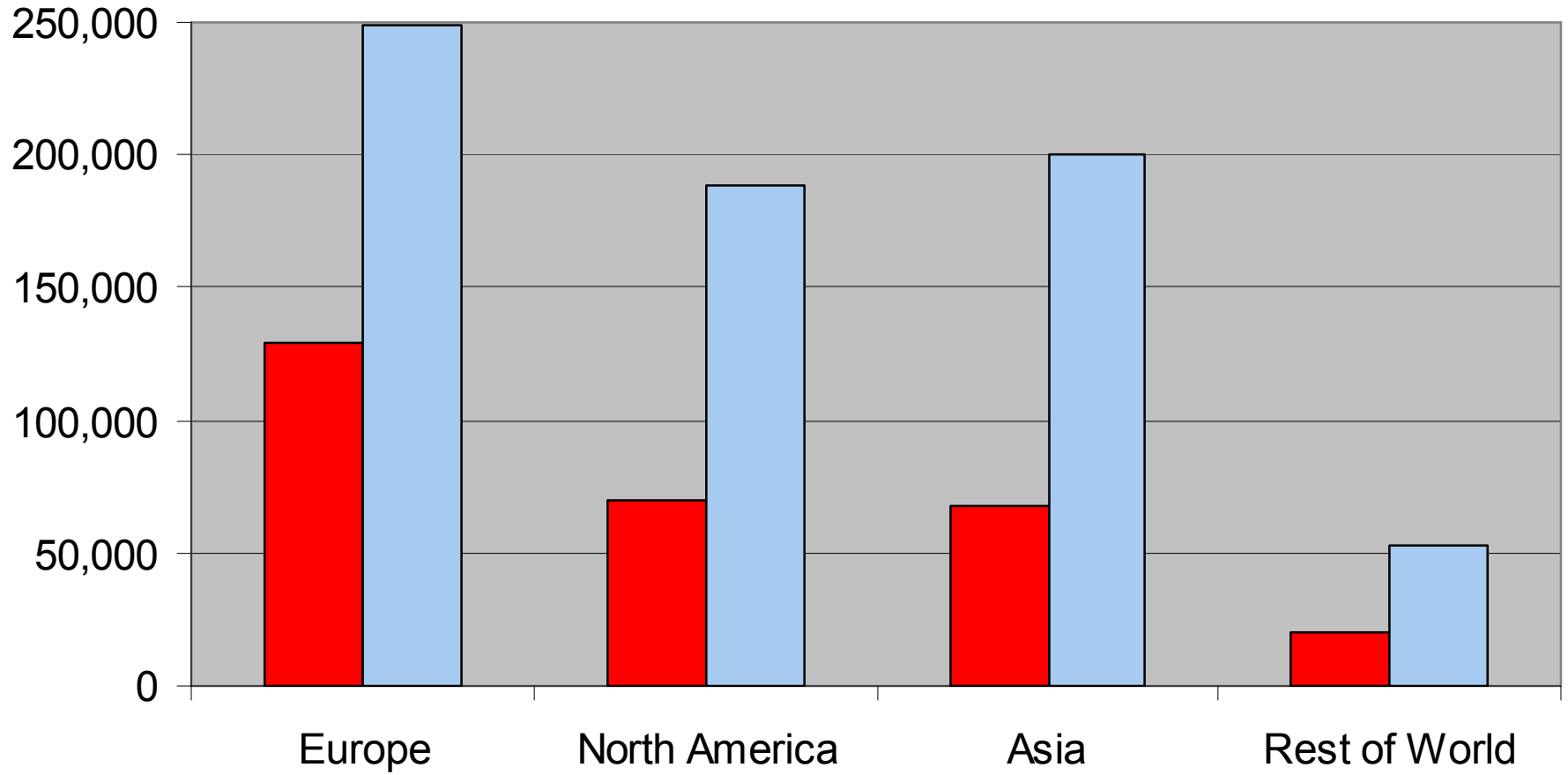


Source: BTM Consult ApS - March 2008

■ 2007 (94,005 MW) ■ 2012 (287,940 MW)

Global Wind Power Projections

Cumulative MW - Forecast 2012 & Prediction 2017



Source: BTM Consult ApS - March 2008

■ 2012 (287,940 MW) ■ 2017 (690,994 MW)

Wind Power's Share of World Power Generation

Generation Technology Year:	Electricity gen. by Wind Power (BTM-C) TWh	Electricity from all gen. sources (incl. Wind) IEA TWh	Wind Power's share of the world's electricity generation: %
1996	12.23	13,613	0.09%
1997	15.39	13,949	0.11%
1998	21.25	14,340	0.15%
1999	23.18	14,741	0.16%
2000	37.30	15,153	0.25%
2001	50.27	15,577	0.32%
2002	64.81	16,233	0.40%
2003	82.24	16,671	0.49%
2004	96.50	17,408	0.55%
2005	120.72	17,982	0.67%
2006	152.35	18,576	0.82%
2007	194.16	19,189	1.01%
2012 (forecast)	605.4	22,571	2.68%
2017 (est.)	1573.8	26,549	5.93%

Source: BTM Consult ApS - March 2008 ; World Figures: IEA World Energy Outlook 2007

Phenomenal Growth - No End in Sight!

Global Wind Industry

- 25% growth rate, 1990-2007 (actual)
- 25% growth rate 2008-2012 (BTM)
- 19% growth rate 2013-2017 (BTM)

