GWEC
GLOBAL WIND ENERGY COUNCIL

Beijing | Brussels | Washington

The picture of global wind energy

Klaus Rave, President GWEC – REvision2014: Global Energy Turnarounds and Japan's Path

25 February 2014

Outline:

1. About GWEC
2. 2013 Statistics
3. 5 Year Market Projection
4. Longer Term Projections
5. New Markets
6. Conclusions and Looking Ahead

About GWEC

The Global Wind Energy Council is the **international trade association for the wind power industry**.

Our mission is to ensure that **wind power establishes itself** as the answer to today's energy challenges, providing substantial environmental and economic benefits.

GWEC represents the wind industry at the following international organisations:

Our members are also all of the national wind industry trade associations, from both **established and emerging markets**, including the world largest markets of the **United States**, all the **European** markets, **India** and **China**.

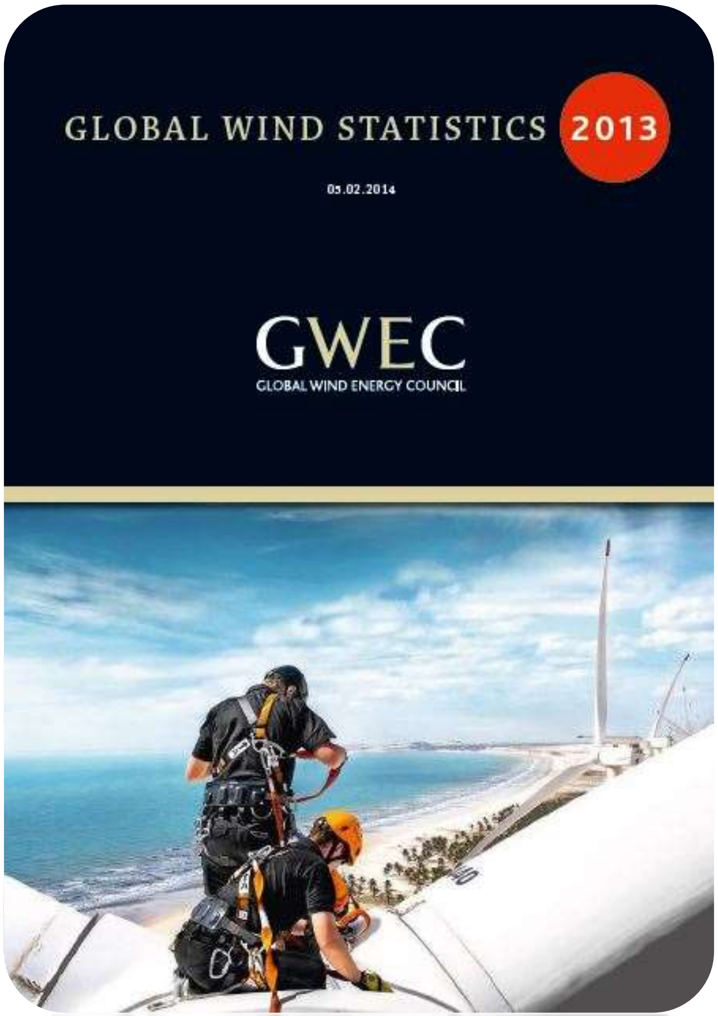
Who does GWEC represent?

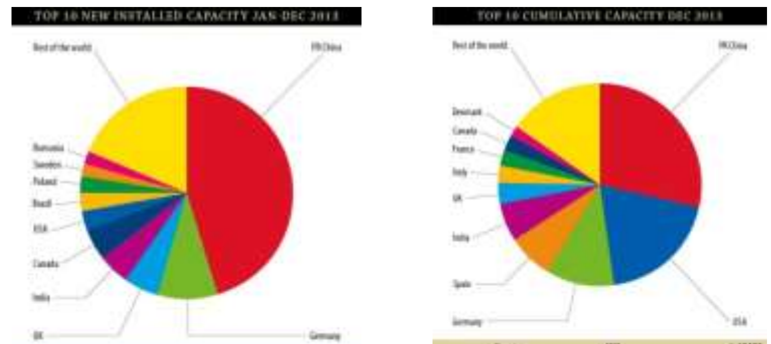
Over **1,500** companies, organisations and institutions in **50** countries

99% of the world's **282.5 GW** installed wind power capacity

- turbine manufacturers
- equipment suppliers
- project developers
- utilities
- wind farm owners
- investors
- consultants
- national and regional wind energy
- associations

Global Wind Statistics 2013





Country	MW	% SHARE
**PR China	16,100	45.4
Germany	3,238	9.1
UK	1,883	5.3
India	1,729	4.8
Canada	1,599	4.5
USA	1,084	3.1
*Brazil	948	2.7
Poland	894	2.5
Sweden	724	2.0
Romania	695	2.0
Rest of the world	6,573	18.5
Total TOP 10	**28,894**	**81**
World Total	**35,467**	**100.0**

** Provisional Figure
* Projects fully commissioned, grid connections pending in some cases

Country	MW	% SHARE
** PR China	91,424	28.7
USA	61,091	19.2
Germany	34,250	10.8
Spain	22,959	7.2
India	20,150	6.3
UK	10,531	3.3
Italy	8,552	2.7
France	8,254	2.6
Canada	7,803	2.5
Denmark	4,772	1.5
Rest of the world	48,352	15.2
Total TOP 10	**269,785**	**84.8**
World Total	**318,137**	**100.0**

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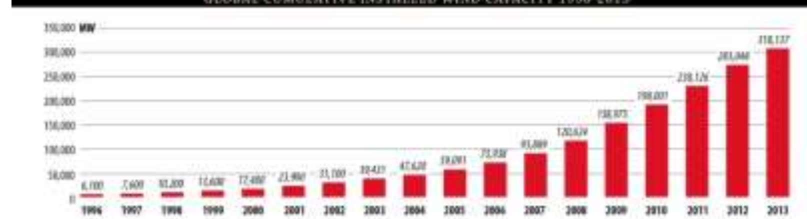
GLOBAL CUMULATIVE INSTALLED WIND CAPACITY 1996-2013



GLOBAL ANNUAL INSTALLED WIND CAPACITY 1996-2013

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2013 growth: 10.5%

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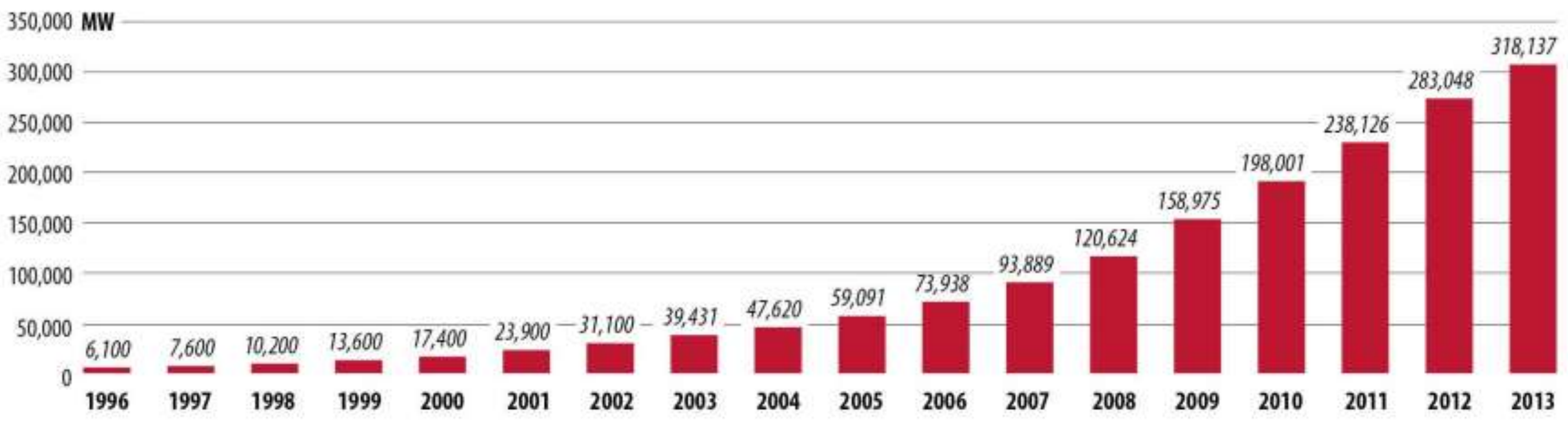
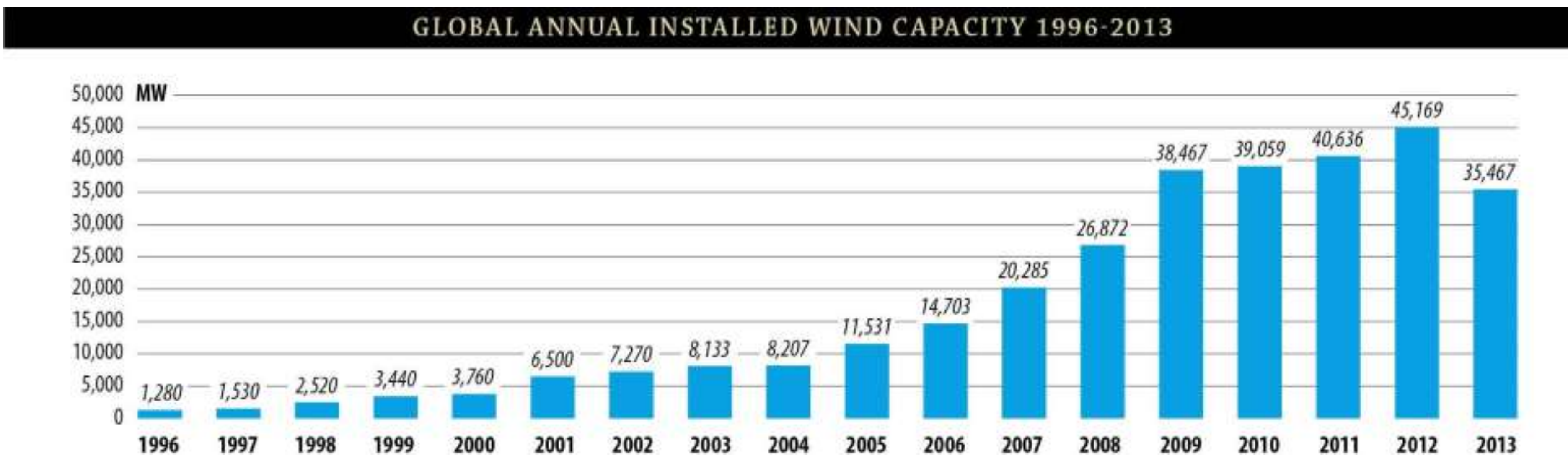


GLOBAL ANNUAL INSTALLED WIND CAPACITY 1996-2013

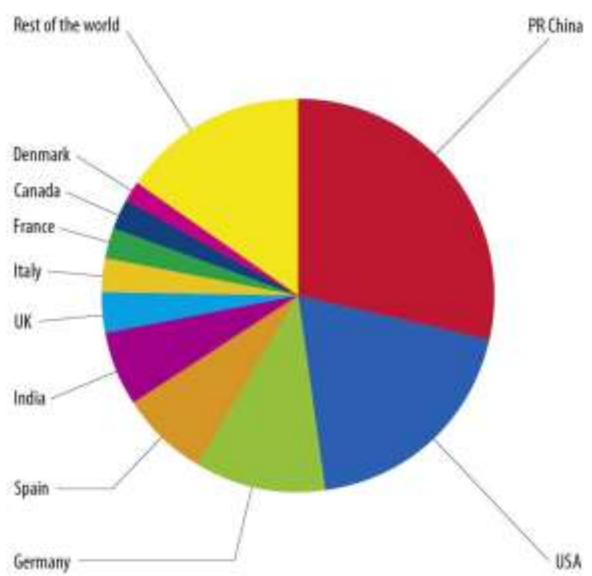
17 yr avg. growth: 26.2%

2013 growth: - 21%



17 yr avg. growth: 23.7%

TOP 10 CUMULATIVE CAPACITY DEC 2013



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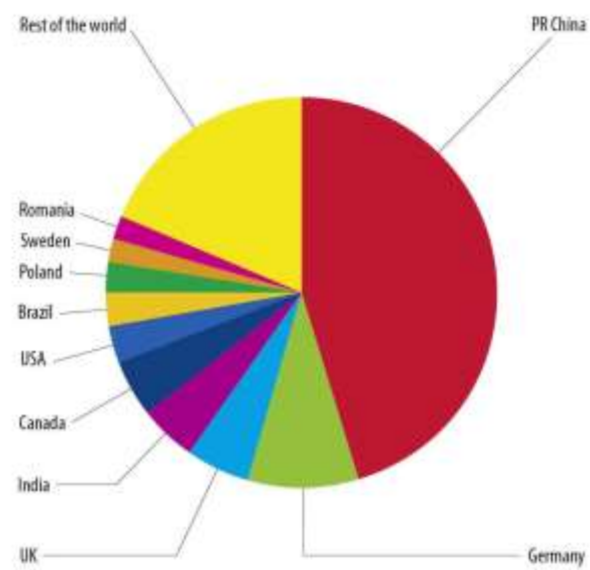
TOP 10 NEW INSTALLED CAPACITY JAN-DEC 2013



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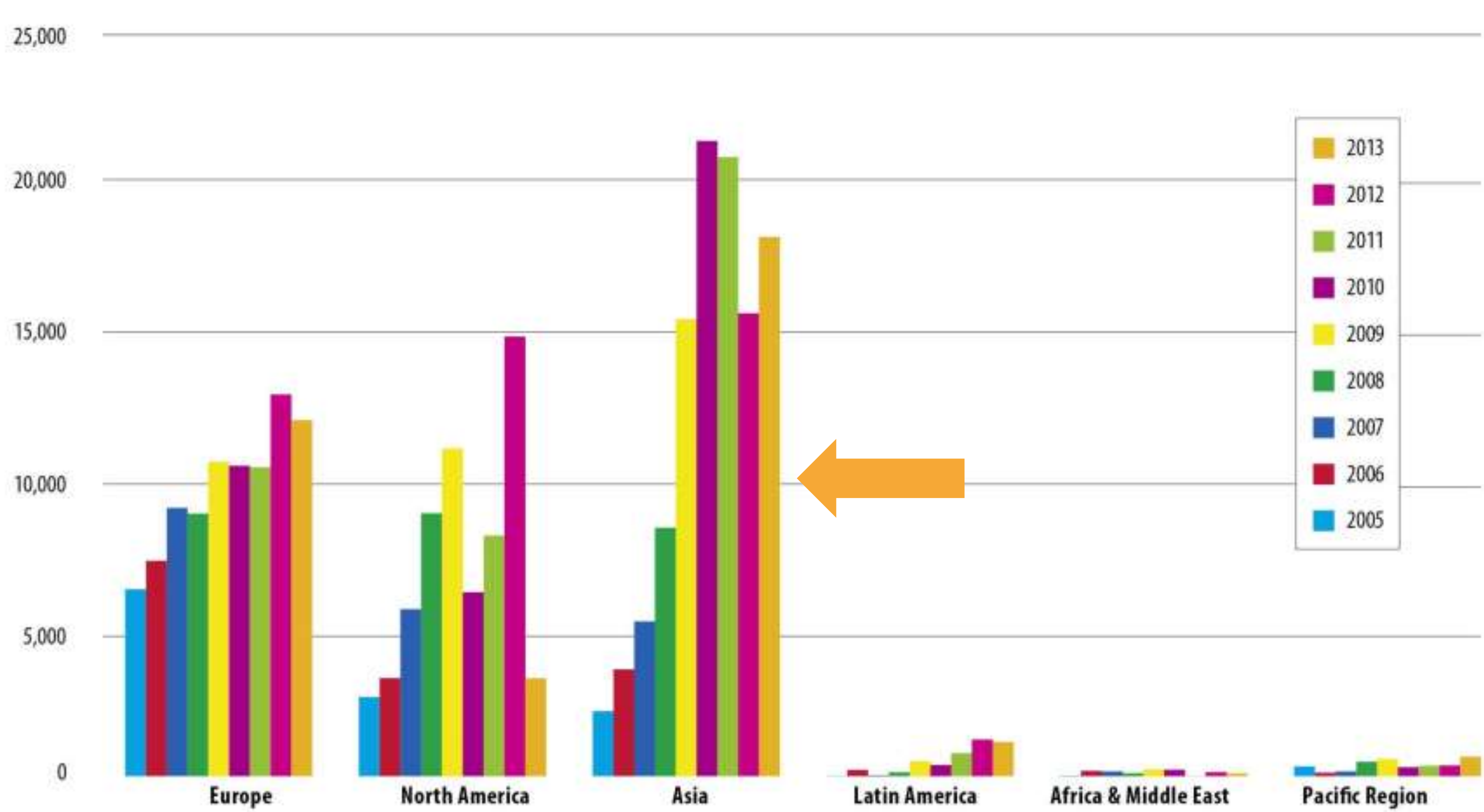
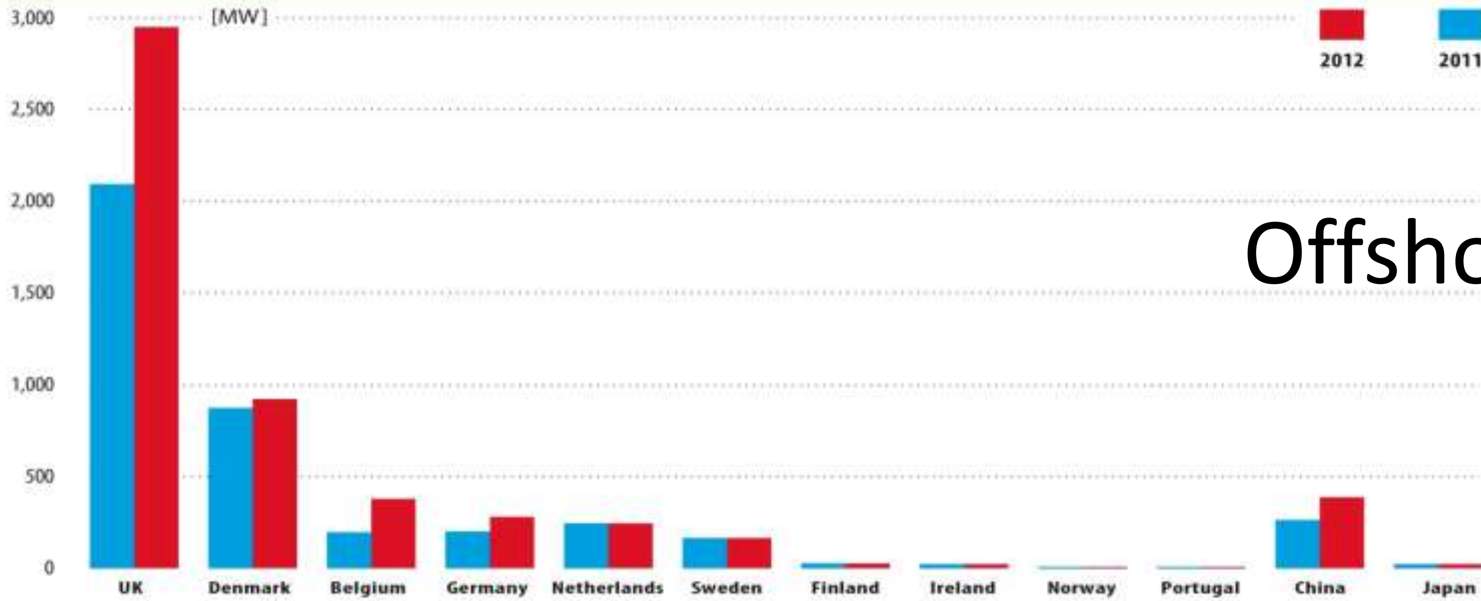
ANNUAL INSTALLED CAPACITY BY REGION 2005-2013



GLOBAL CUMULATIVE OFFSHORE INSTALLED CAPACITY



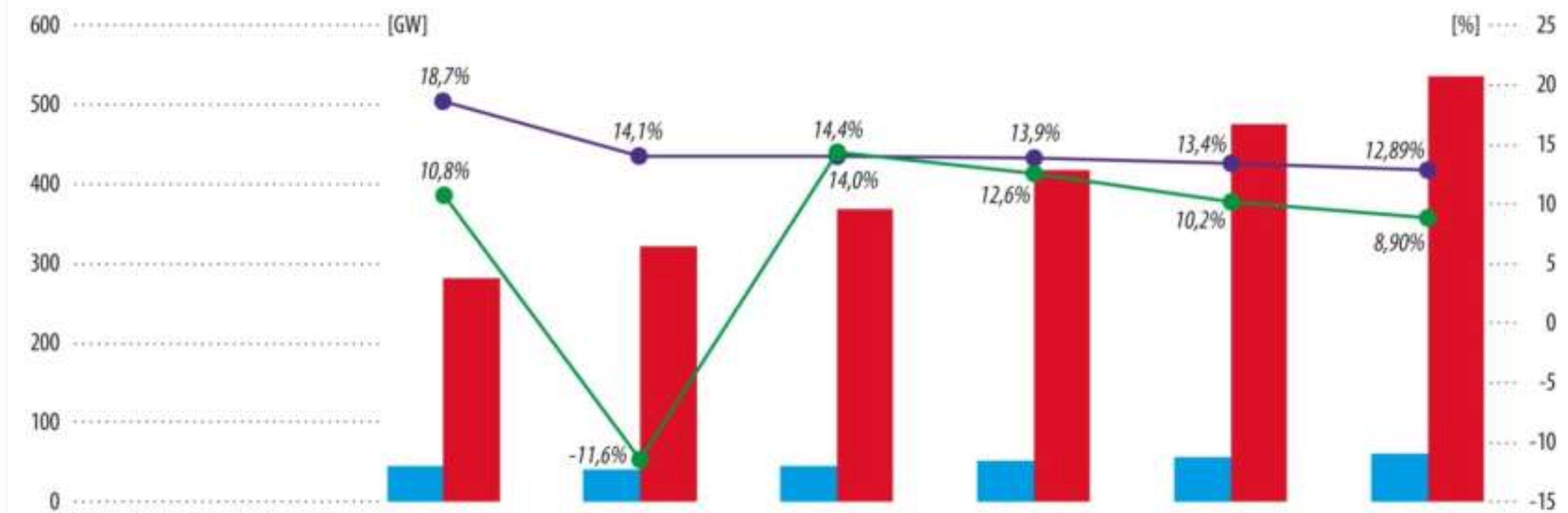
Offshore

Offshore (MW)	Total 2011	New 2012	Total 2012
UK	2,093.6	854.2	2,947.9
Denmark	874.3	46.8	921.1
Belgium	195.0	184.5	379.5
Germany	200.3	80.0	280.3
Netherlands	246.8	0.0	246.8
Sweden	163.7	0.0	163.7
Finland	26.3	0.0	26.3
Ireland	25.2	0.0	25.2
Norway	2.3	0.0	2.3
Portugal	2.0	0.0	2.0
PR China	262.6	127.0	389.6
Japan	25.2	0.1	25.3
Total	**4,117.3**	**1,292.6**	**5,410.0**

- 2013 was worst than projected (US -12GW)

- GWEC expects 2014 installations to be higher than these projects from March 2013

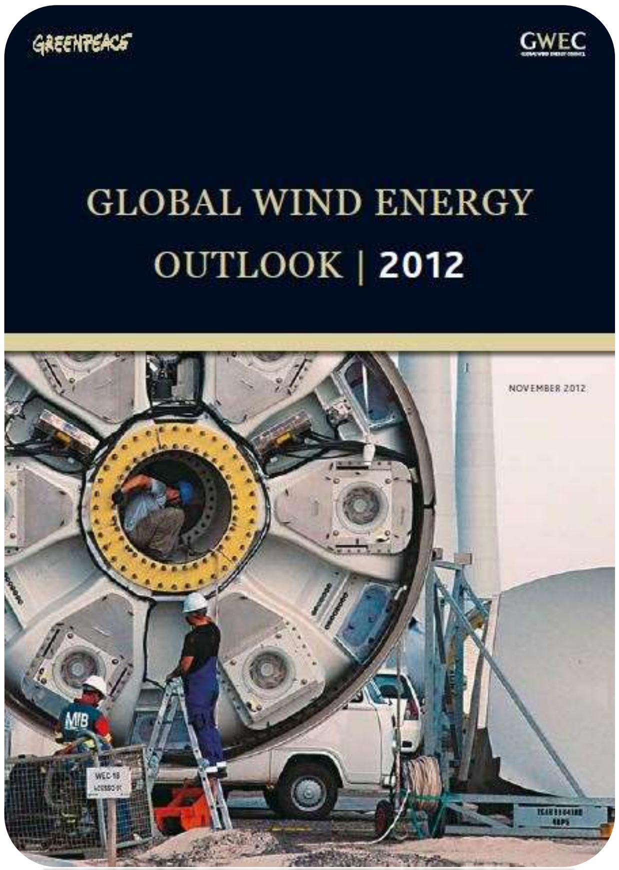
Market Forecast 2013-2017



	2012	2013	2014	2015	2016	2017
Cumulative [GW]	282.6	322.4	367.7	418.7	474.9	536.13
Cumulative capacity growth rate [%]	18.70	14.10	14.00	13.90	13.40	12.89
Annual installed capacity ([GW]	44.8	39.6	45.3	51	56.2	61.2
Annual installed capacity growth rate [%]	10.80	-11.60	14.40	12.60	10.20	8.90

Source: GWEC

Global wind energy outlook

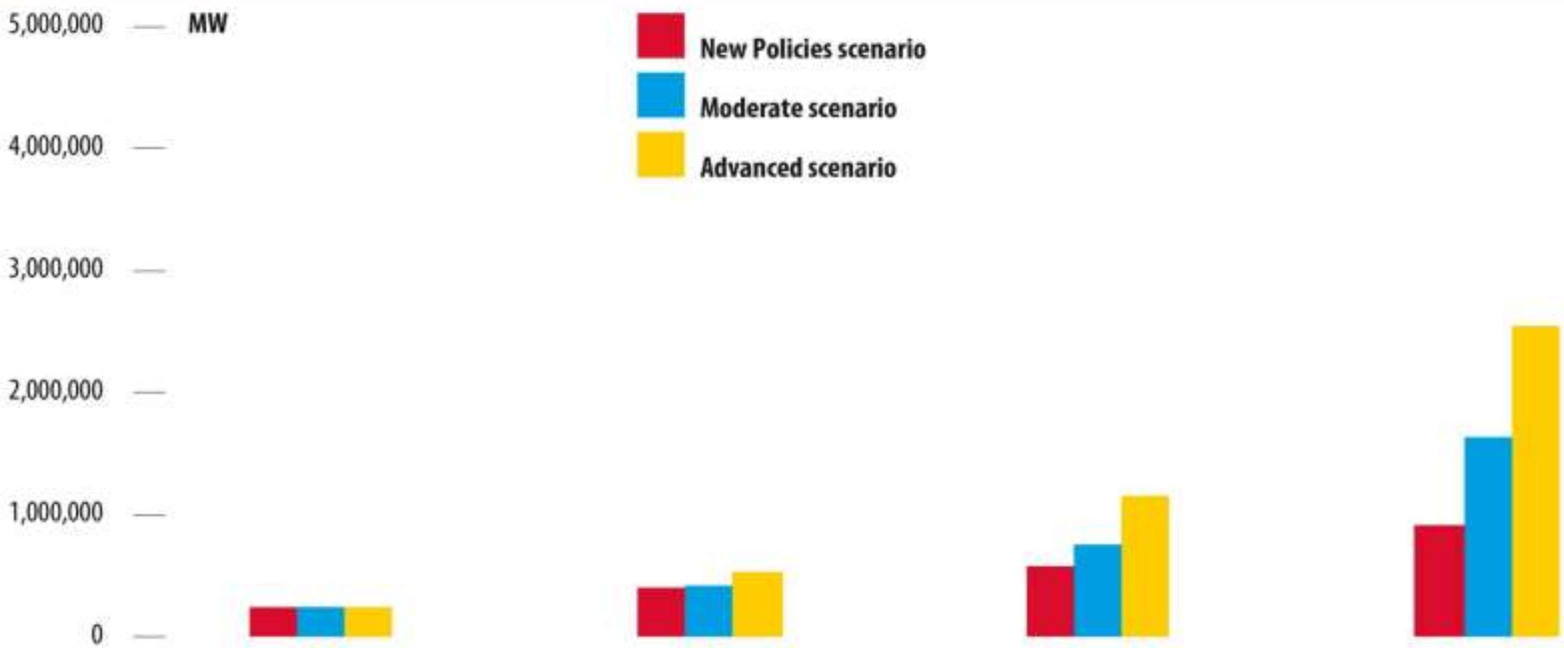


The **Global Wind Energy Outlook** paints a picture of three different futures for the wind industry, looking at scenarios out to 2020, 2030, and eventually to 2050;

..and then measures these scenarios against two different projections for the development of electricity demand:

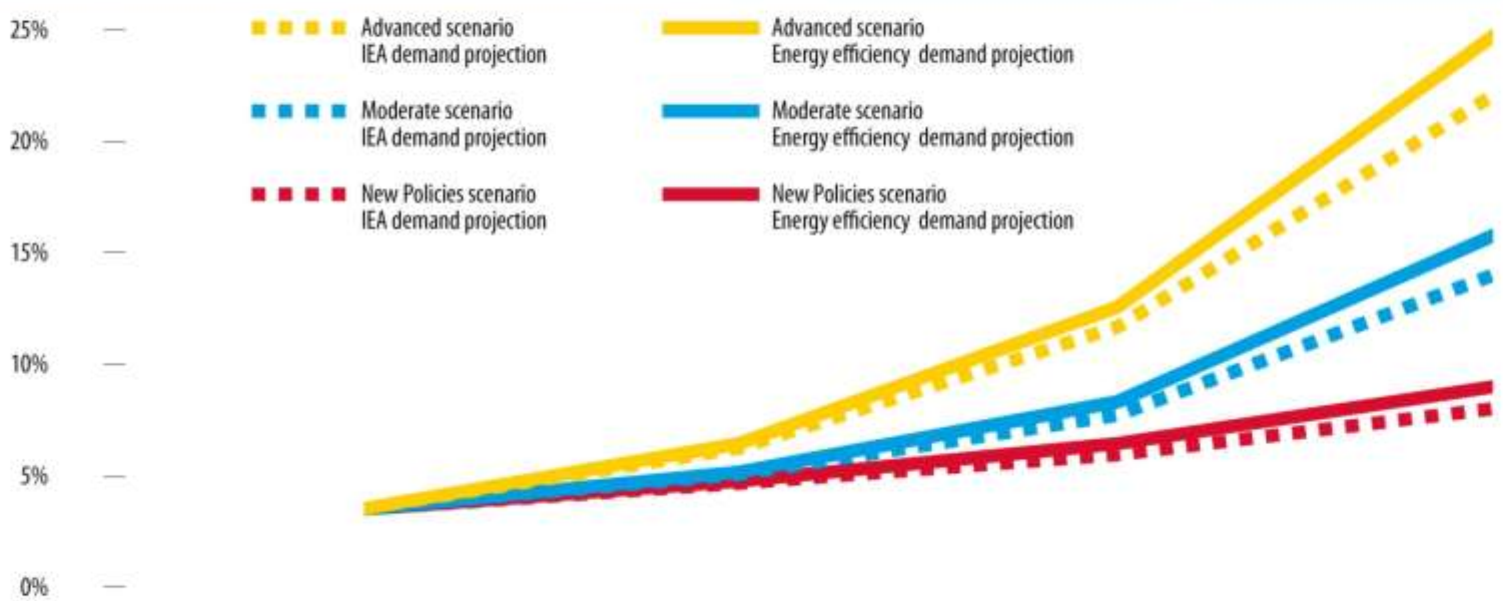
- the first based on the International Energy Agency's World Energy Outlook,
- and another, more energy efficient future developed by the ECOFYS consultancy and researchers at the University of Utrecht.

GLOBAL CUMULATIVE WIND POWER CAPACITY



		2011	2015	2020	2030
New Policies scenario					
	[MW]	237,699	397,859	586,729	917,798
	[TWh/a]	583	976	1,439	2,412
Moderate scenario					
	[MW]	237,699	425,155	759,349	1,617,444
	[TWh/a]	583	1,043	1,863	4,251
Advanced scenario					
	[MW]	237,699	530,945	1,149,919	2,541,135
	[TWh/a]	583	1,302	2,821	6,678

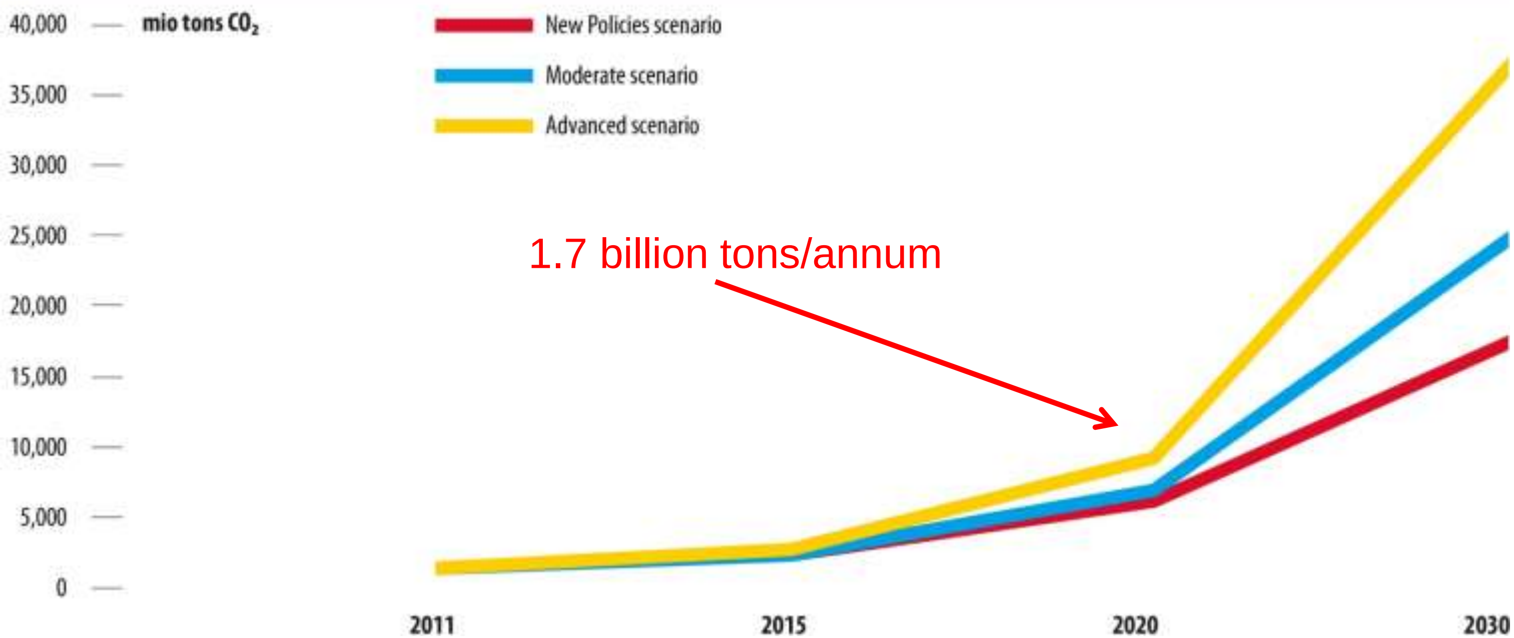
WIND POWER SHARE OF GLOBAL ELECTRICITY DEMAND



	2011	2015	2020	2030
New Policies scenario				
IEA demand projection	3.5%	4.7%	6.0%	8.0%
Energy efficiency demand projection	3.5%	4.8%	6.4%	9.0%
Moderate scenario				
IEA demand projection	3.5%	5.0%	7.7%	14.1%
Energy efficiency demand projection	3.5%	5.1%	8.3%	15.8%
Avanced scenario				
IEA demand projection	3.5%	6.3%	11.7%	22.1%
Energy efficiency demand projection	3.5%	6.4%	12.6%	24.8%

Climate Imperative

CUMULATIVE CO_2 EMISSIONS REDUCTIONS



ANNUAL AND CUMULATIVE CO_2 EMISSIONS REDUCTIONS

		2011	2015	2020	2030
New Policies scenario					
Annual CO_2 savings	million tons	350	586	863	1,447
Cumulative CO_2 savings	million tons	1,368	2,316	6,095	17,522
Moderate scenario					
Annual CO_2 savings	million tons	350	626	1,118	2,550
Cumulative CO_2 savings	million tons	1,368	2,411	6,958	24,979
Advanced scenario					
Annual CO_2 savings	million tons	350	781	1,692	4,007
Cumulative CO_2 savings	million tons	1,368	2,690	9,254	37,504

"New" Markets


KOREA
TUNISIA
MONGOLIA
MEXICO
MOROCCO
EGYPT
PAKISTAN
THAILAND
VIETNAM
ETHIOPIA
KENYA
SRI LANKA
TANZANIA
BRAZIL
SOUTH AFRICA

Looking Ahead (1)

- **2013 was a tough year,** with a dramatic 12GW drop in the US market. However, Q4 2013 saw 12GW under construction, which bodes well for 2014 and 2015;
- **China, India -** China's market recovered substantially in 2013, growing by about 23%, and looks to grow further in 2014. India is still stagnant, but a new round of growth is expected to begin in 2014. Other small Asian markets emerging;
- **Europe** – 2013 market was surprisingly robust, although market less diverse than in previous years; critical debates on post-2020 regime will continue throughout 2014 (at least).
- **Latin America** – Brazil plus…?
- **Africa** - South African market takes off, along with other markets in East Africa; Morocco and Egypt beginning to recover.

Looking Ahead (2)

Rate of global growth will slow until and unless:

- new markets fill the 'gap' left by lack of growth in OECD, or…
- OECD economy recovers, and/or
- new CO2 related legislation takes effect.

Downward price pressure continues:

- Oversupply and tough economic times mean margins are slashed to the bone and competition is fierce
- cheap' gas in the US; oversupply due to fracking boom
- 'Consolidation' in manufacturing sector seems inevitable.

Looking Ahead (3)

A global climate agreement will be fundamental for wind power to achieve its maximum potential, but for the short term:

UNCERTAINTY:

- in international political landscape
- in the future of the carbon markets
- in ‘new’ climate-related funds

Focus on national/regional legislation and markets

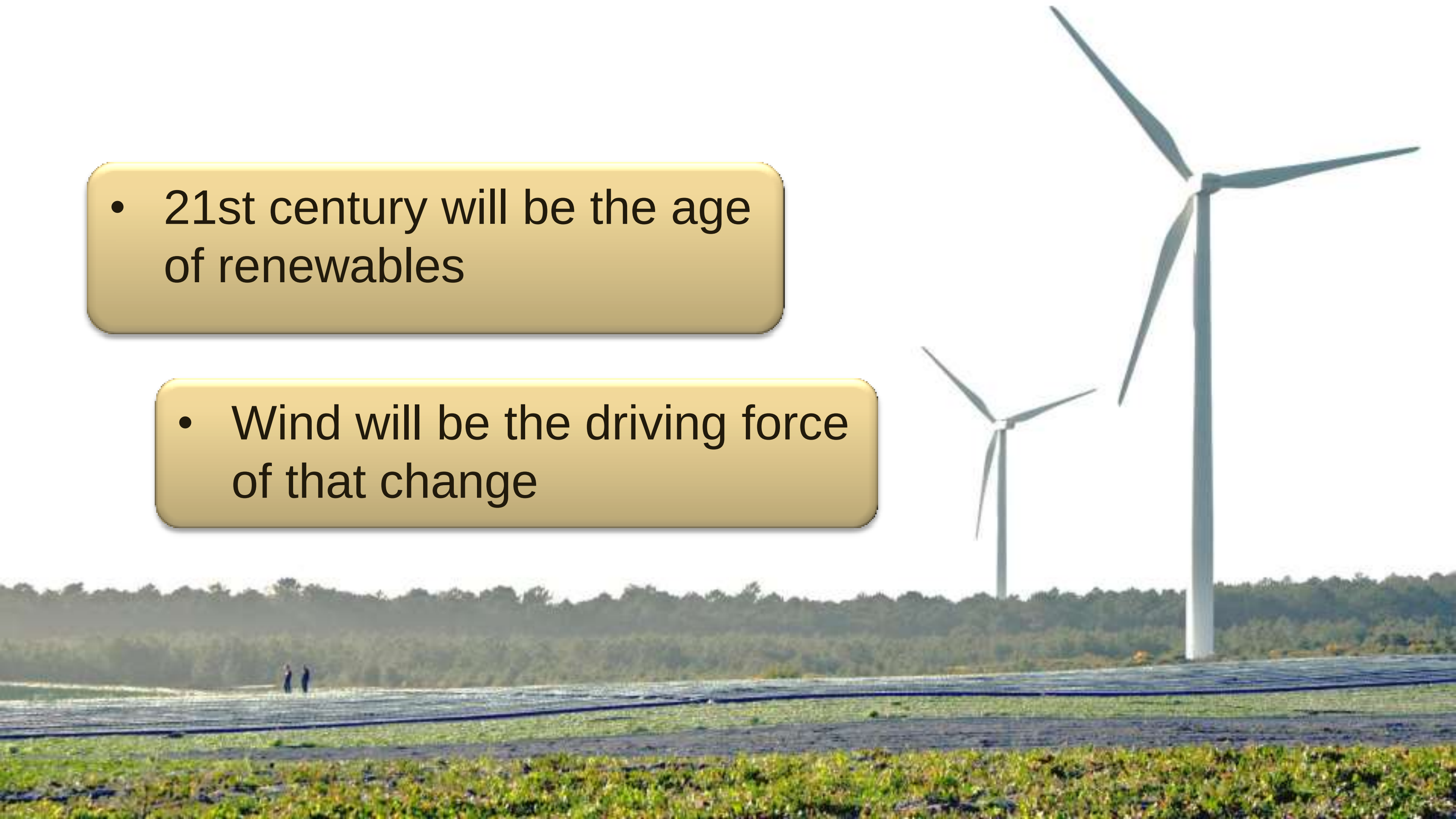
Market drivers all still in place, and increasingly prominent:

- energy security; cost stability; macroeconomic security; local economic development and job creation; local environment and climate

Conclusions (1)

- 21st century will be the age of renewables

- Wind will be the driving force of that change



Conclusions (2)

Stop **BURNING**
and start **EARNING**!

No **TRANSITION**
without
TRANSMISSION!

No **COMMUNICATION**
without **ELECTRIFICATION**!

Thank you!

For more information:

Klaus Rave
info@gwec.net