GWEC
GLOBAL WIND ENERGY COUNCIL

Beijing | Brussels | London

Global Wind Power Overview

Steve Sawyer, Secretary General

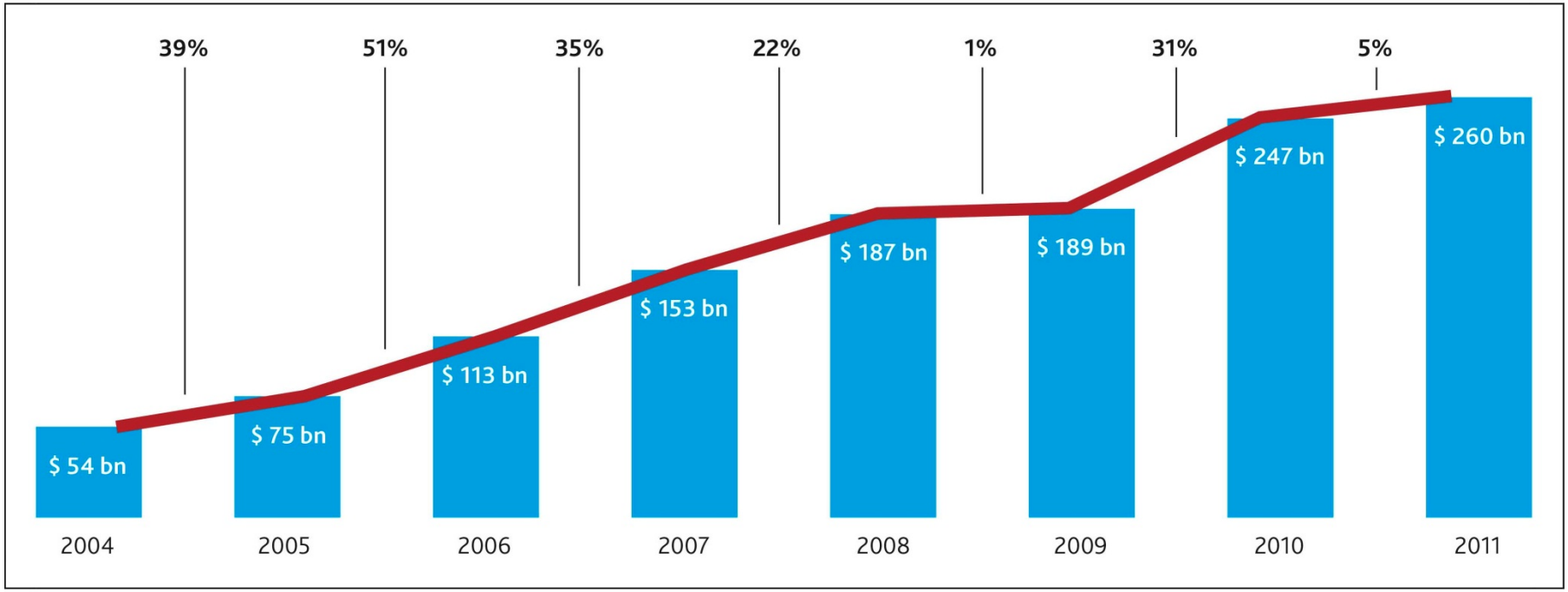
JREF Tokyo, 26 Feb 2013

Outline:

1. Status of global markets
2. Short and medium term projections
3. Challenges
4. Conclusions and Looking Ahead

Provisional 2012=$268 bn; down 11% from revised 2011 figure of $302 bn.

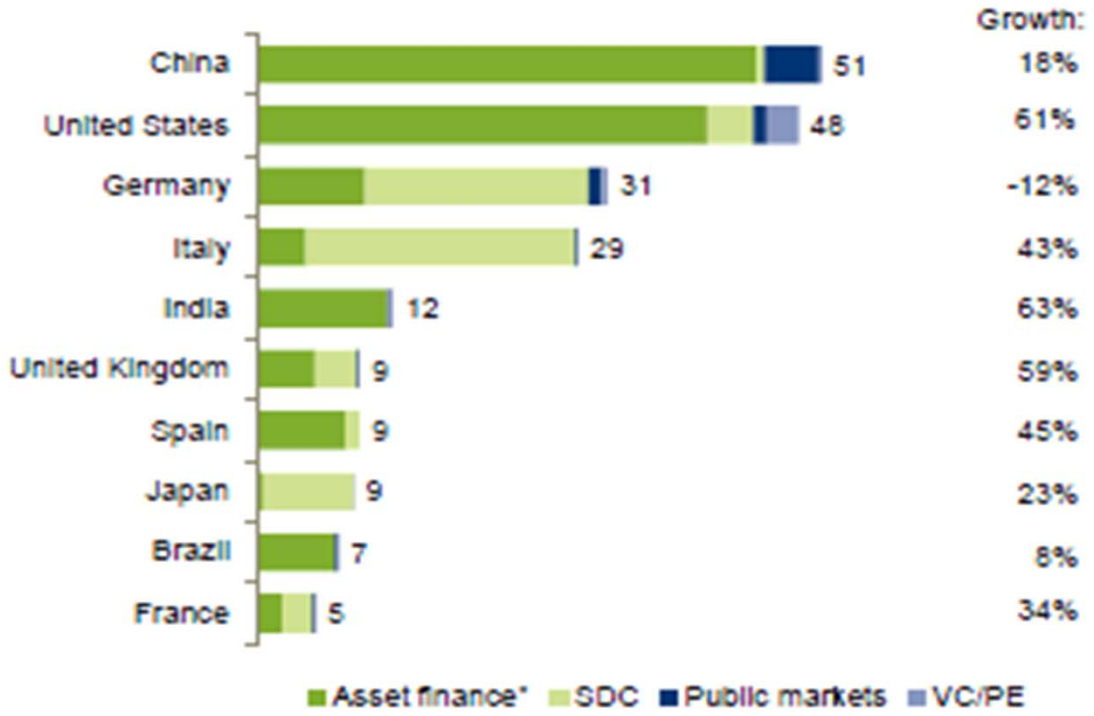
Global Total New Investment in Clean Energy 2004-2011 (US$ Bn)



Includes Corporate and Government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions.

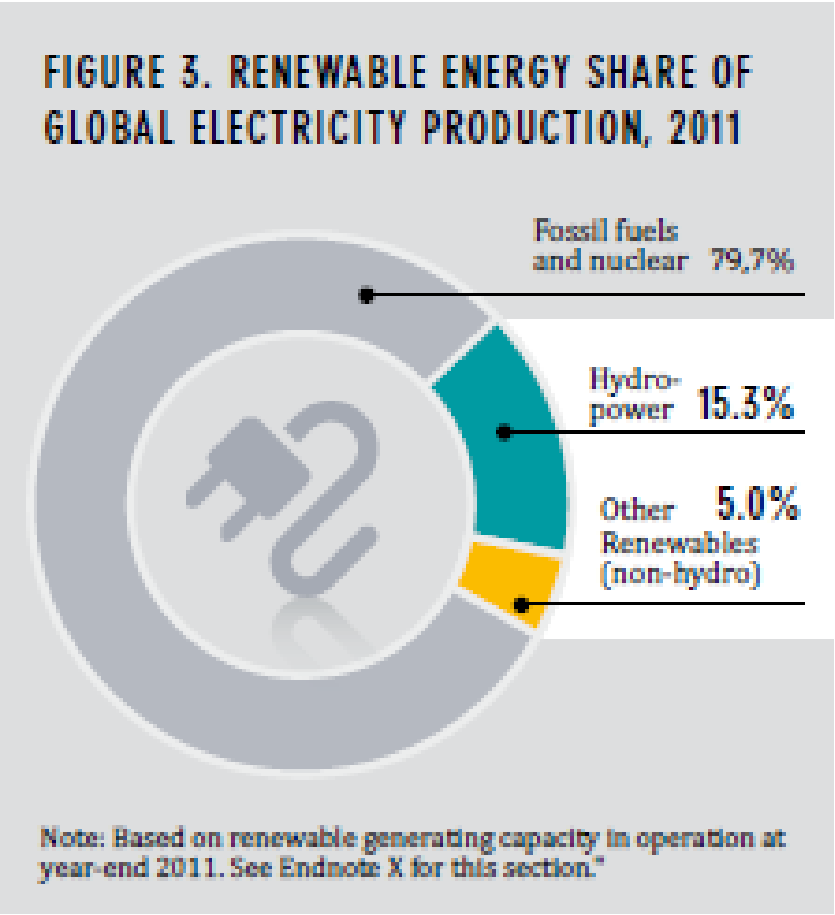
Source: Bloomberg New Energy Finance

New investment in RES: Top 10 countries 2011, and growth on 2010 ($bn)



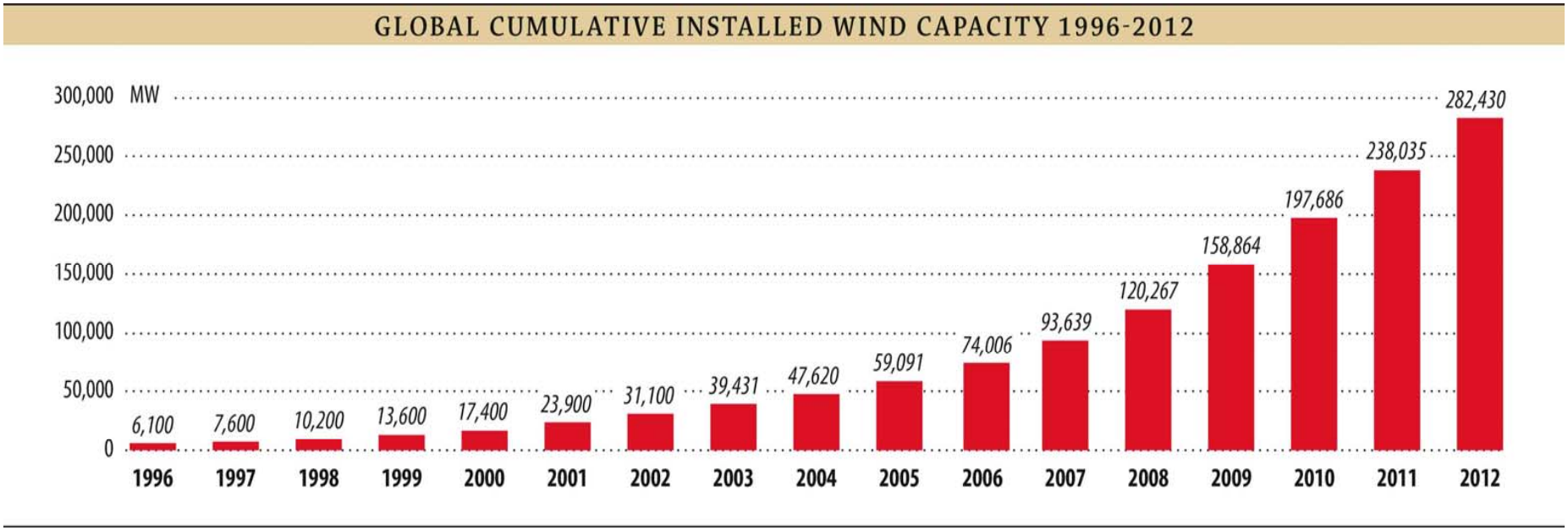
Top 10 countries. *Asset finance volume adjusts for re-invested equity.
Excludes corporate and government R&D
Source: Bloomberg New Energy Finance, UNEP

Global Market Overview – Power Markets



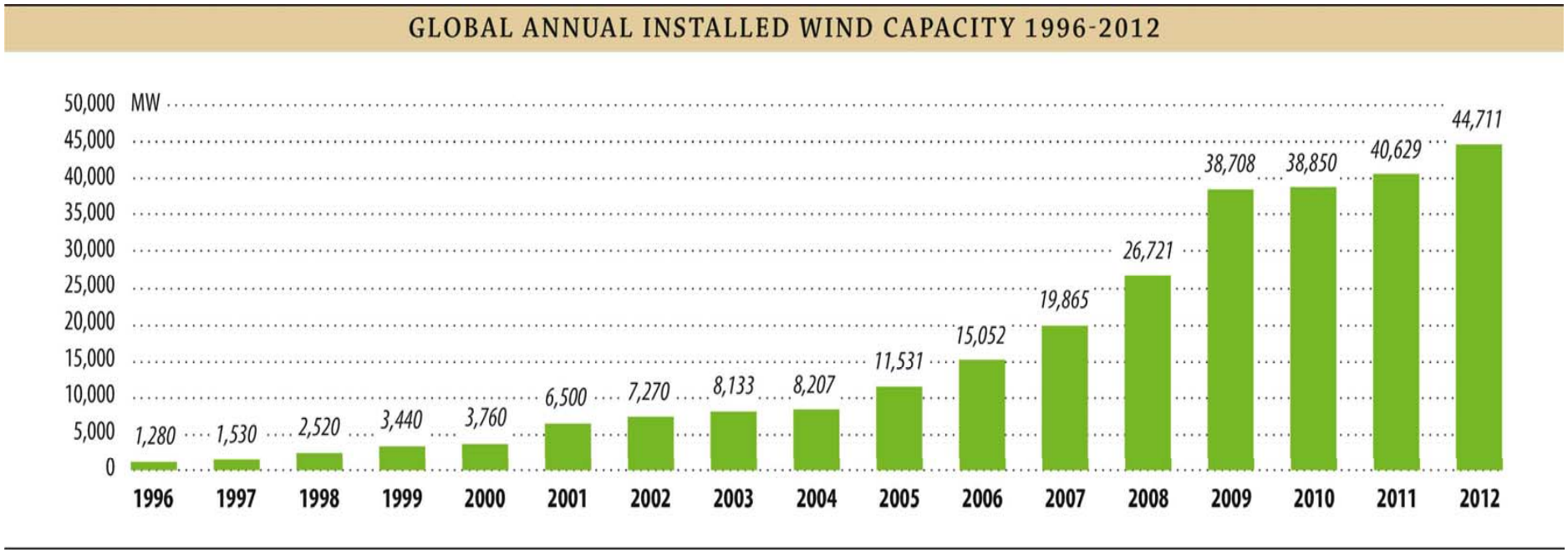
- Renewables accounted for nearly half of the estimated 208 GW of new electric capacity installed in 2011
- Renewable electric power capacity worldwide reached **1,360 GW** (+8%) in 2011
- Renewable energy comprised more than **25%** of **global power generation capacity**
- **20.3% of global electricity** was produced from renewable energy

2011 growth: 18.7%



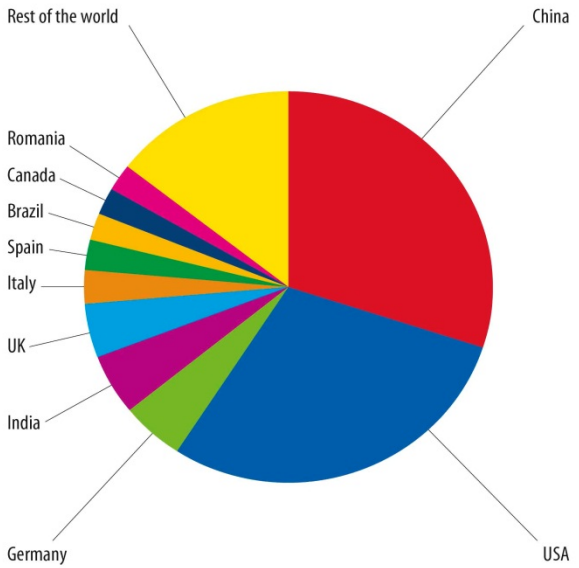
16 yr avg growth: 27.7%

2012 growth: 10%



16 yr avg growth: 26.5%

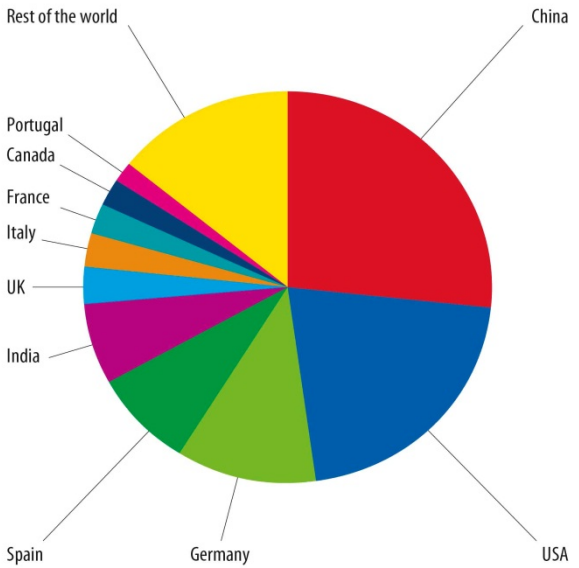
TOP 10 NEW INSTALLED CAPACITY JAN-DEC 2012



Country	MW	% SHARE
PR China**	13,200	30
USA	13,124	29
Germany	2,439	5
India	2,336	5
UK	1,897	4.2
Italy	1,273	2.8
Spain	1,122	2.5
Brazil	1,077	2.4
Canada	935	2.1
Romania	923	2.1
Rest of the world	6,385	14.3
Total TOP 10	**38,326**	**85.7**
World Total	**44,711**	**100.0**

*** Provisional Figure*

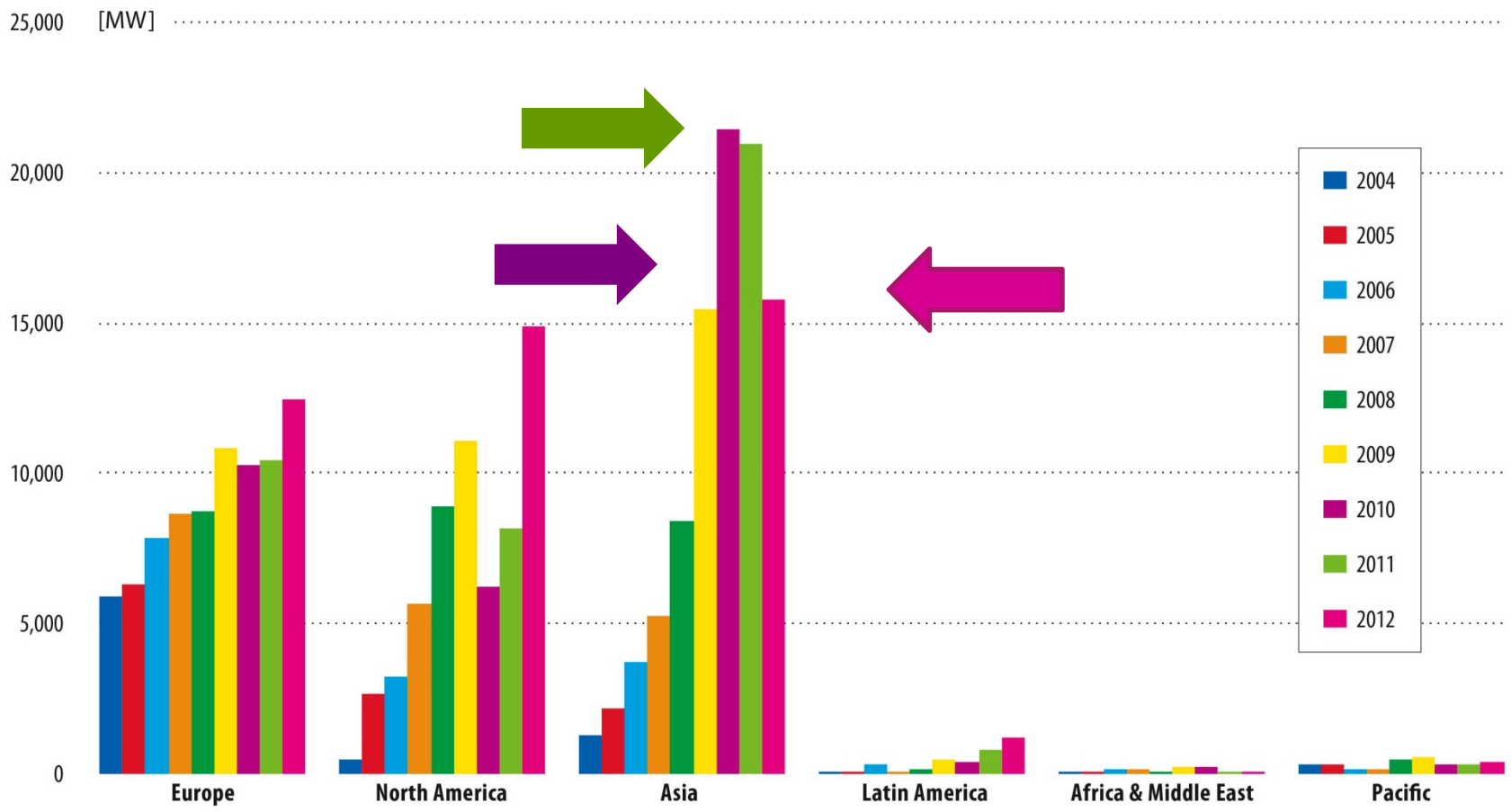
TOP 10 CUMULATIVE CAPACITY DEC 2012



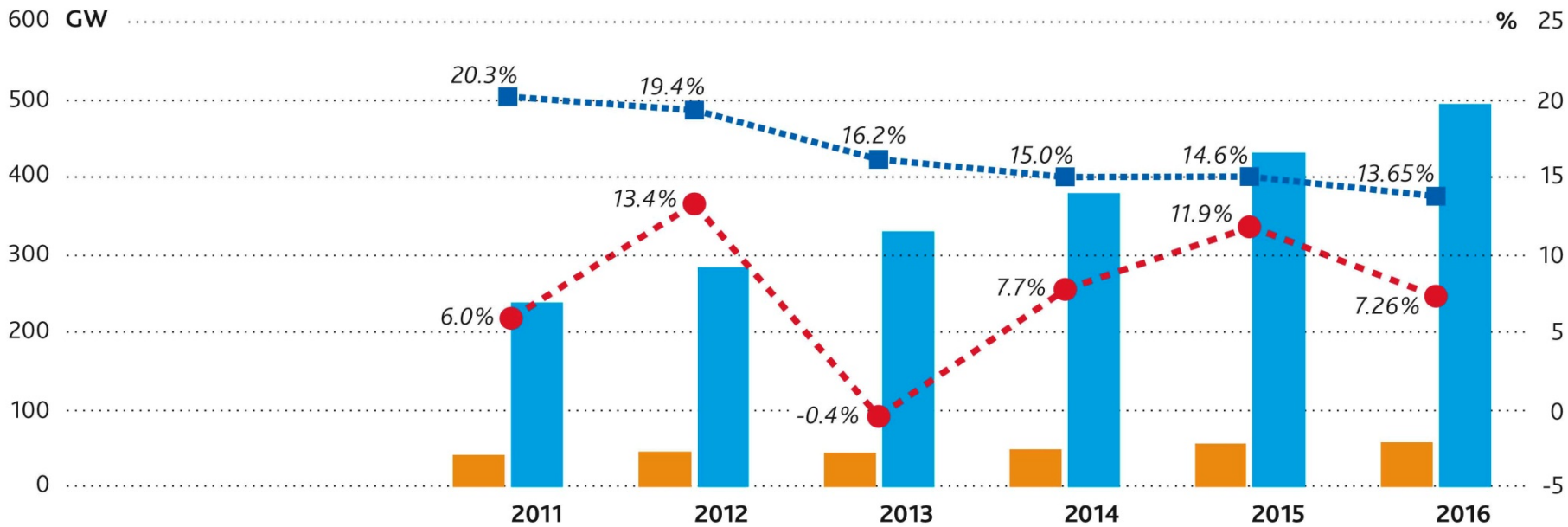
Country	MW	% SHARE
PR China**	75,564	26.8
USA	60,007	21.2
Germany	31,332	11.1
Spain	22,796	8.1
India	18,421	6.5
UK	8,445	3.0
Italy	8,144	2.9
France**	7,196	2.5
Canada	6,200	2.2
Portugal	4,525	1.6
Rest of the world	39,853	14.1
Total TOP 10	**242,630**	**85.9**
World Total	**282,482**	**100.0**

*** Provisional Figure*

ANNUAL INSTALLED CAPACITY BY REGION 2004-2012



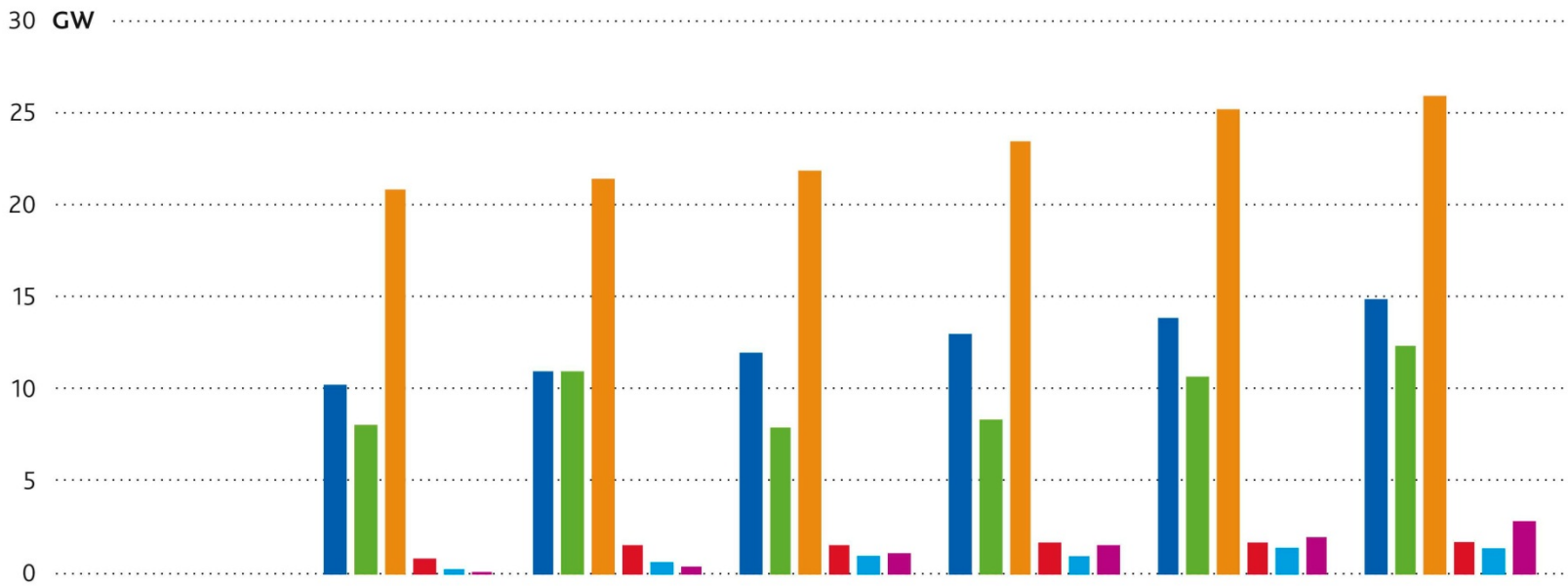
Market Forecast 2012-2016



	2011	2012	2013	2014	2015	2016
Annual installed capacity [GW]	40.6	46.0	45.8	49.4	55.2	59.24
Cumulative capacity [GW]	237.7	283.7	329.5	378.9	434.1	493.33
Annual installed capacity growth rate [%]	6.0%	13.4%	-0.4%	7.7%	11.9%	7.26%
Cumulative capacity growth rate [%]	20.3%	19.4%	16.2%	15.0%	14.6%	13.65%

Source: GWEC

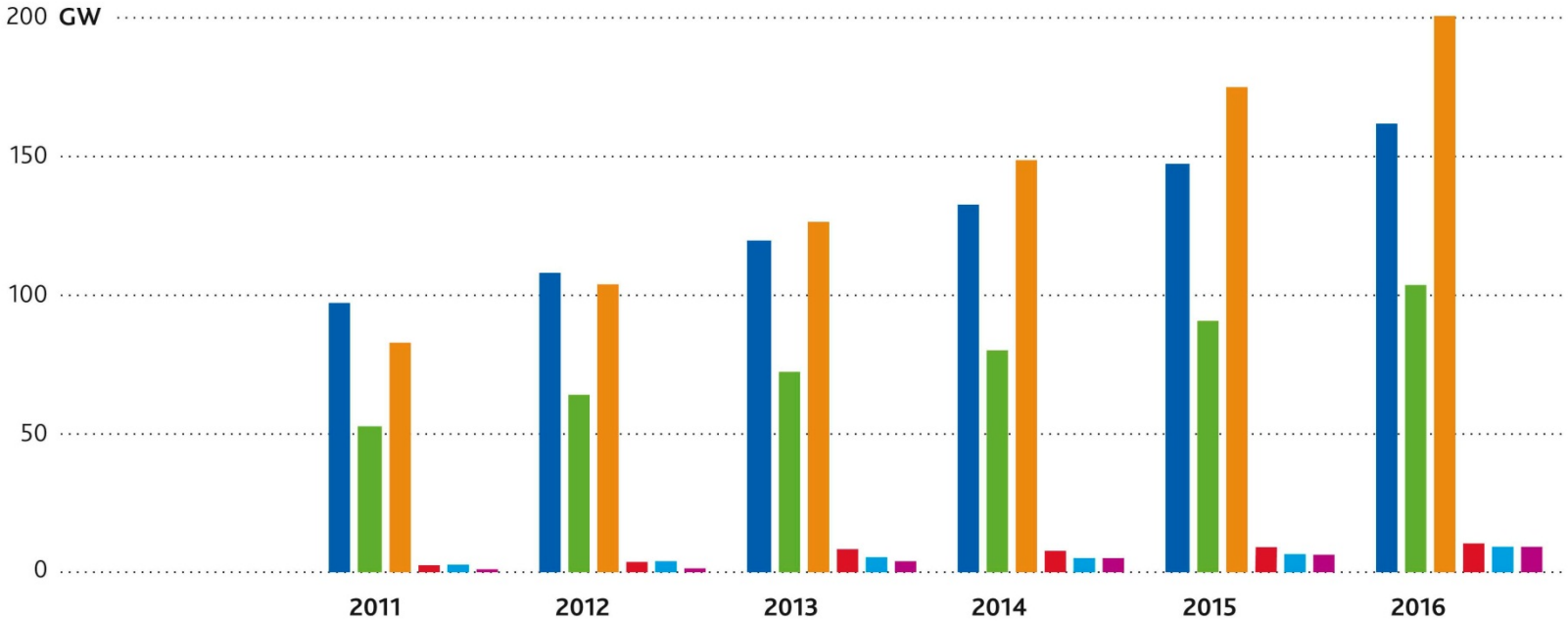
Annual Market Forecast by Region 2012-2016



	2011	2012	2013	2014	2015	2016
Europe	10.3	11.0	12.0	13.0	14.0	15.0
North America	8.1	11.0	8.0	8.5	10.8	12.0
Asia	20.9	21.4	22.0	23.6	25.2	25.9
Latin America	0.9	1.6	1.7	1.7	1.7	1.8
Pacific	0.3	0.5	1.0	1.0	1.5	1.5
Middle East and Africa	0.1	0.5	1.2	1.6	2.0	3.0

Source: GWEC

Cumulative Market Forecast by Region 2012-2016



	2011	2012	2013	2014	2015	2016
Europe	96.6	107.6	119.6	132.6	146.6	161.6
North America	52.7	63.7	71.7	80.2	91.0	103.02
Asia	82.0	103.4	125.4	148.9	174.1	200.04
Latin America	2.3	3.9	5.6	7.3	9.1	10.89
Pacific	2.9	3.4	4.4	5.4	6.9	8.36
Middle East and Africa	1.1	1.6	2.8	4.4	6.4	9.42

Source: GWEC

report 4th edition 2012 world energy scenario

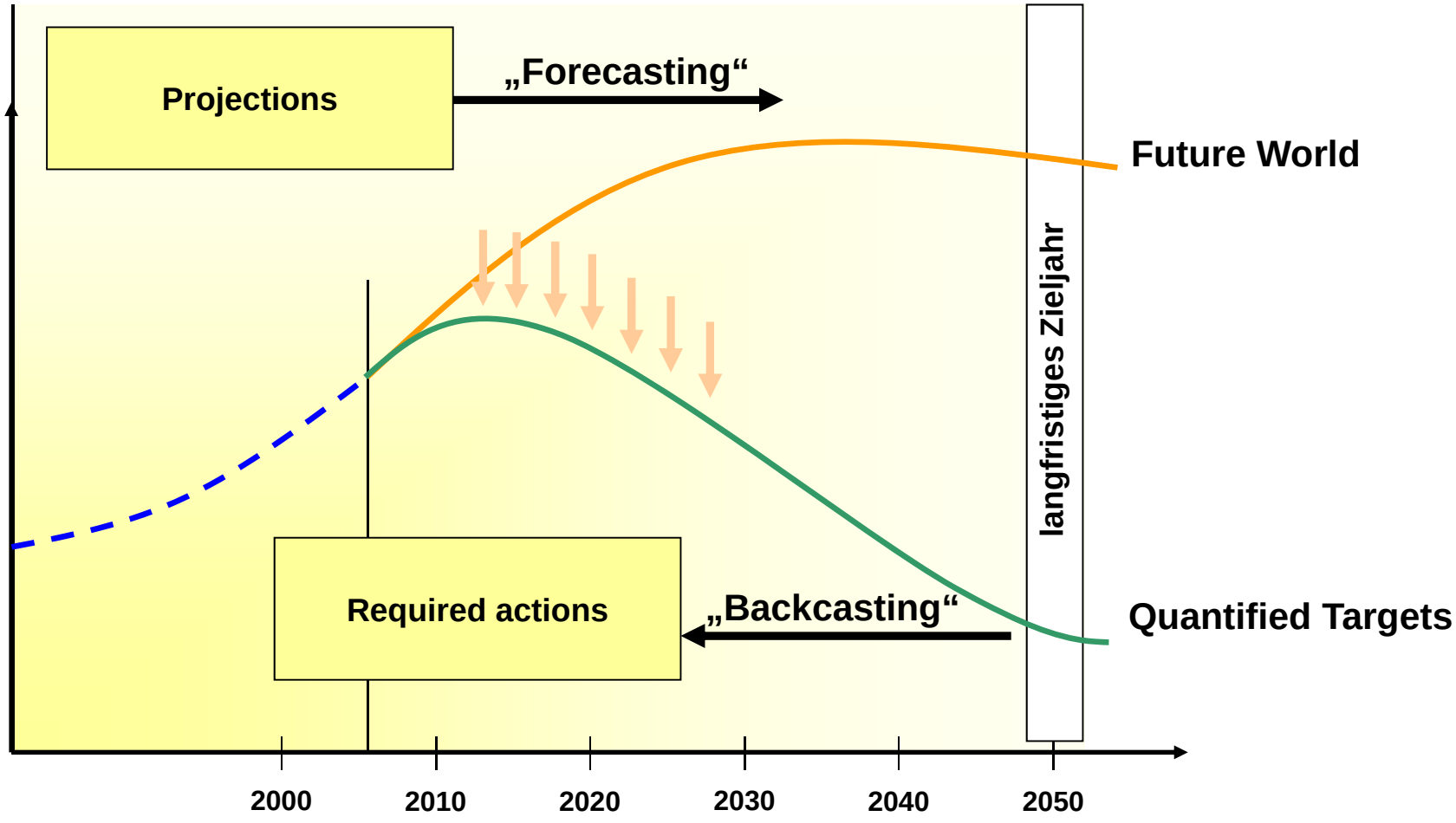
GREENPEACE

The Energy [R]evolution 2012

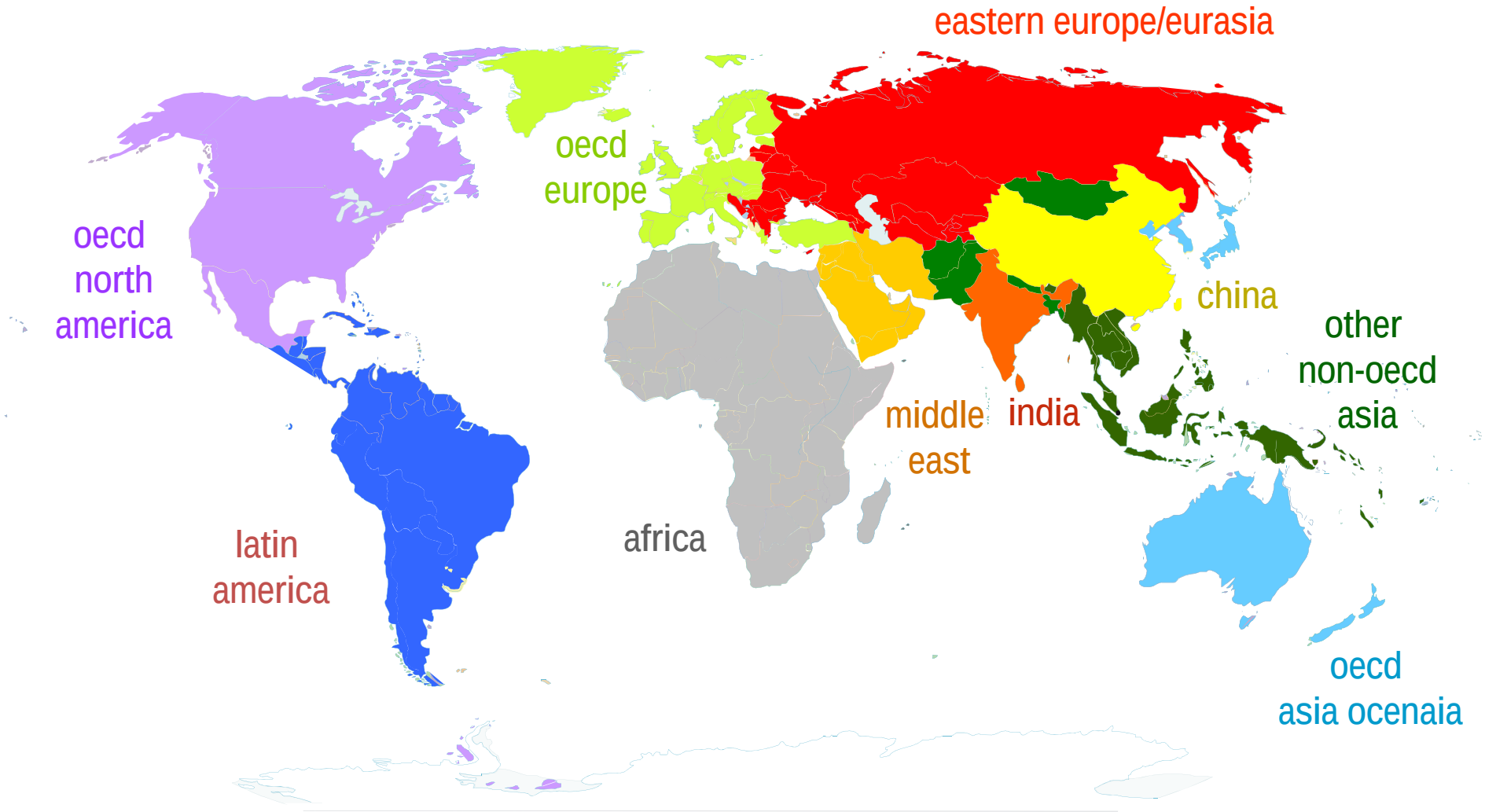
EREC

GWEC
GLOBAL WIND ENERGY COUNCIL

DLR


Projections
„Forecasting“
Future World
langfristiges Zieljahr
Required actions
„Backcasting“
Quantified Targets
2000
2010
2020
2030
2040
2050

10 World regions

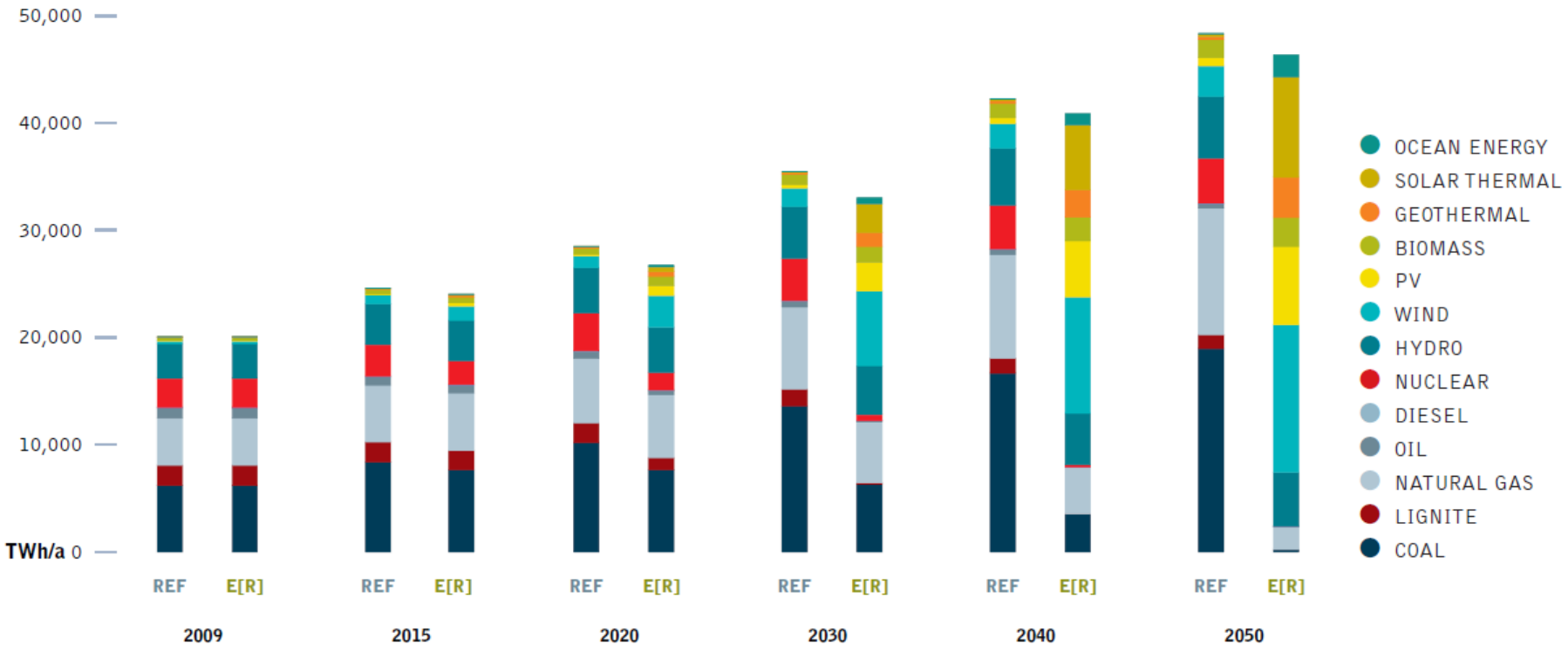


Global Power supply:

2009: 19% Renewables

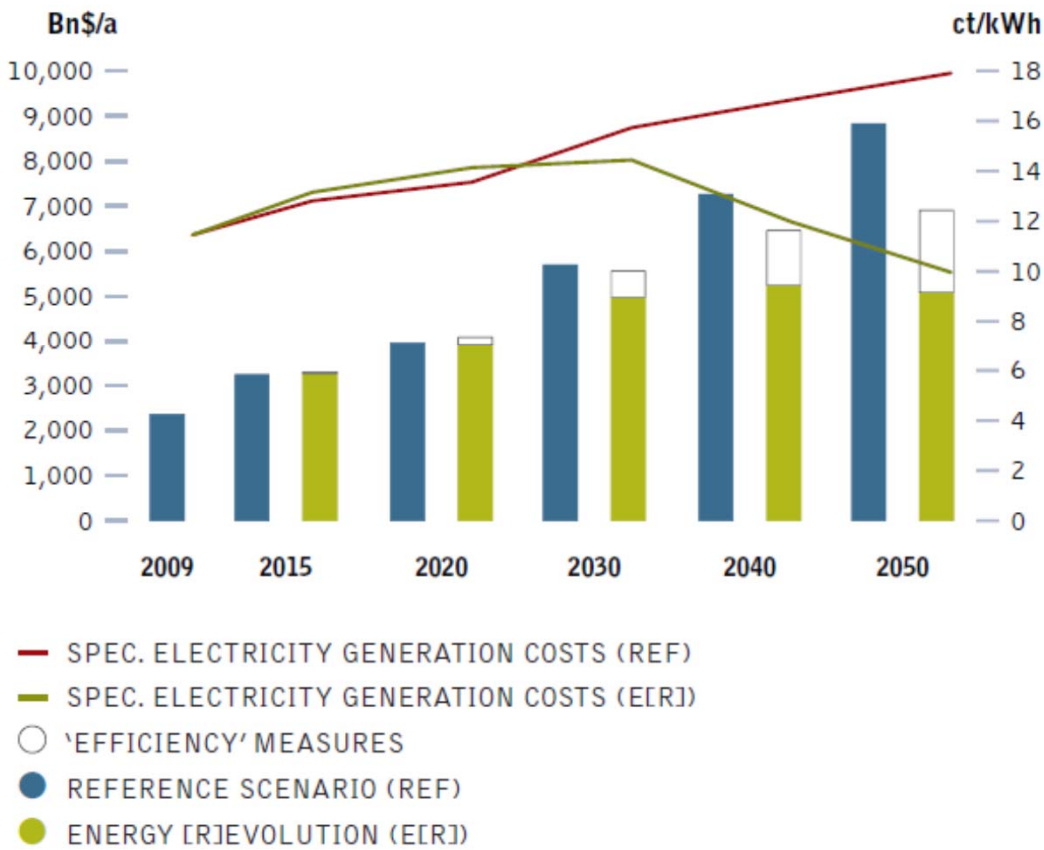
2020:37% - 2050:94%

figure 5.6: global: electricity generation structure under the reference scenario and the energy [r]evolution scenario (INCLUDING ELECTRICITY FOR ELECTROMOBILITY, HEAT PUMPS AND HYDROGEN GENERATION)



Global Power Supply:

figure 5.7: global: total electricity supply costs & specific electricity generation costs under two scenarios

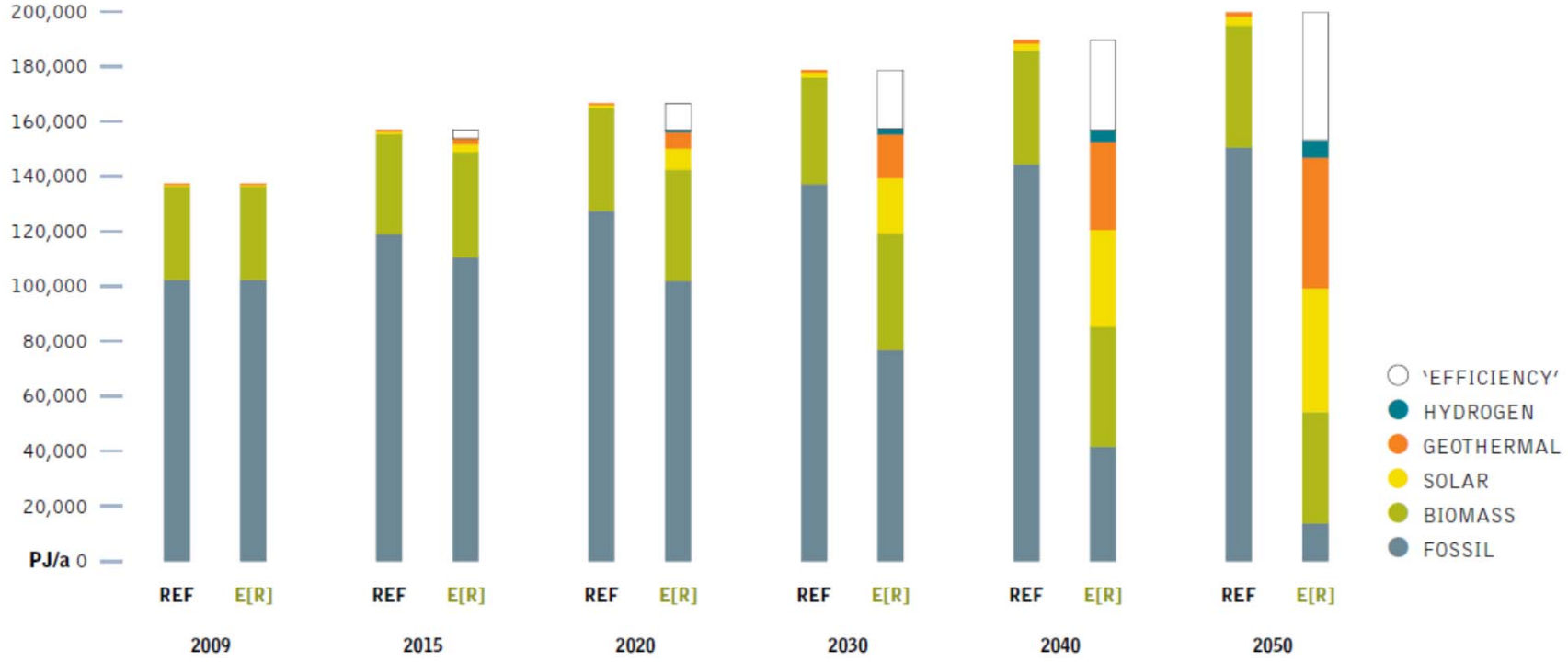


Global Heat Supply:

2009: 25% Renewables

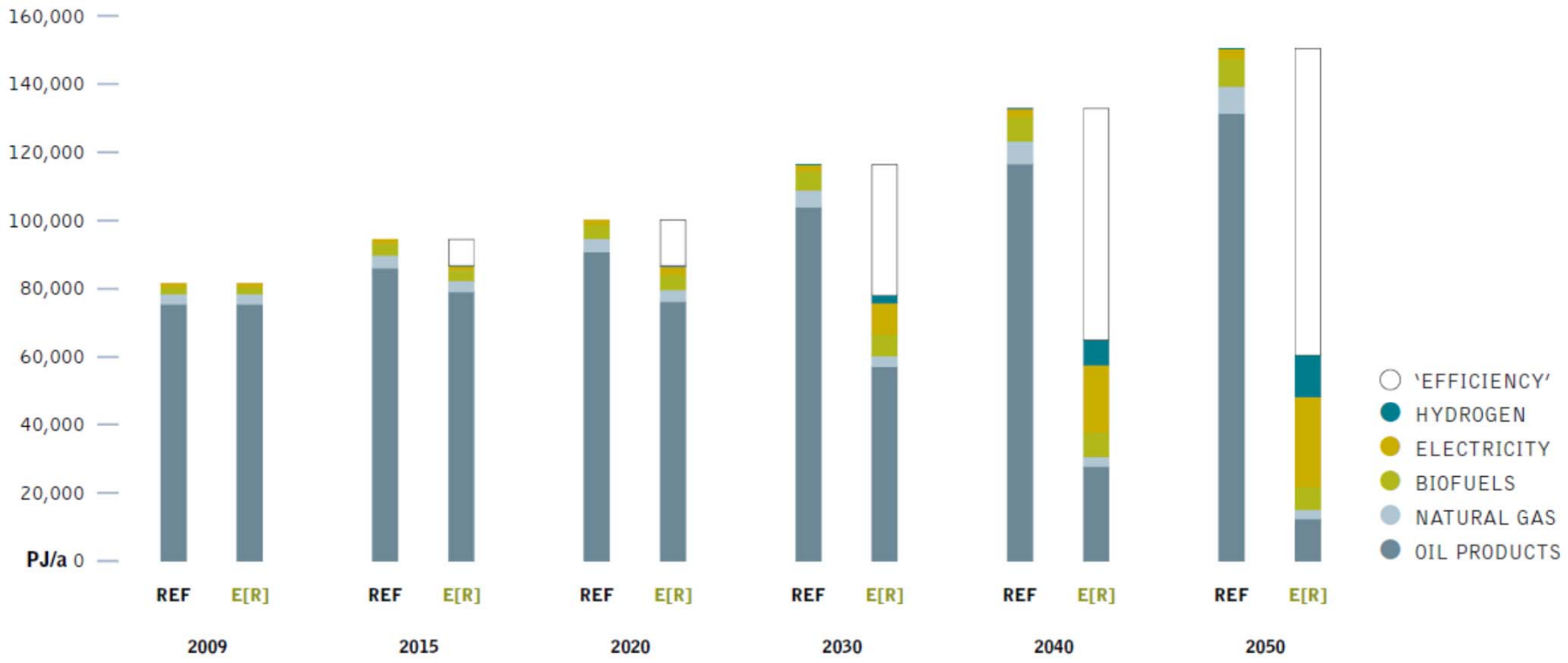
2020:35% - 2050:91%

figure 5.10: global: heat supply structure under the reference scenario and the energy [r]evolution scenario ('EFFICIENCY': REDUCTION COMPARED TO THE REFERENCE SCENARIO)



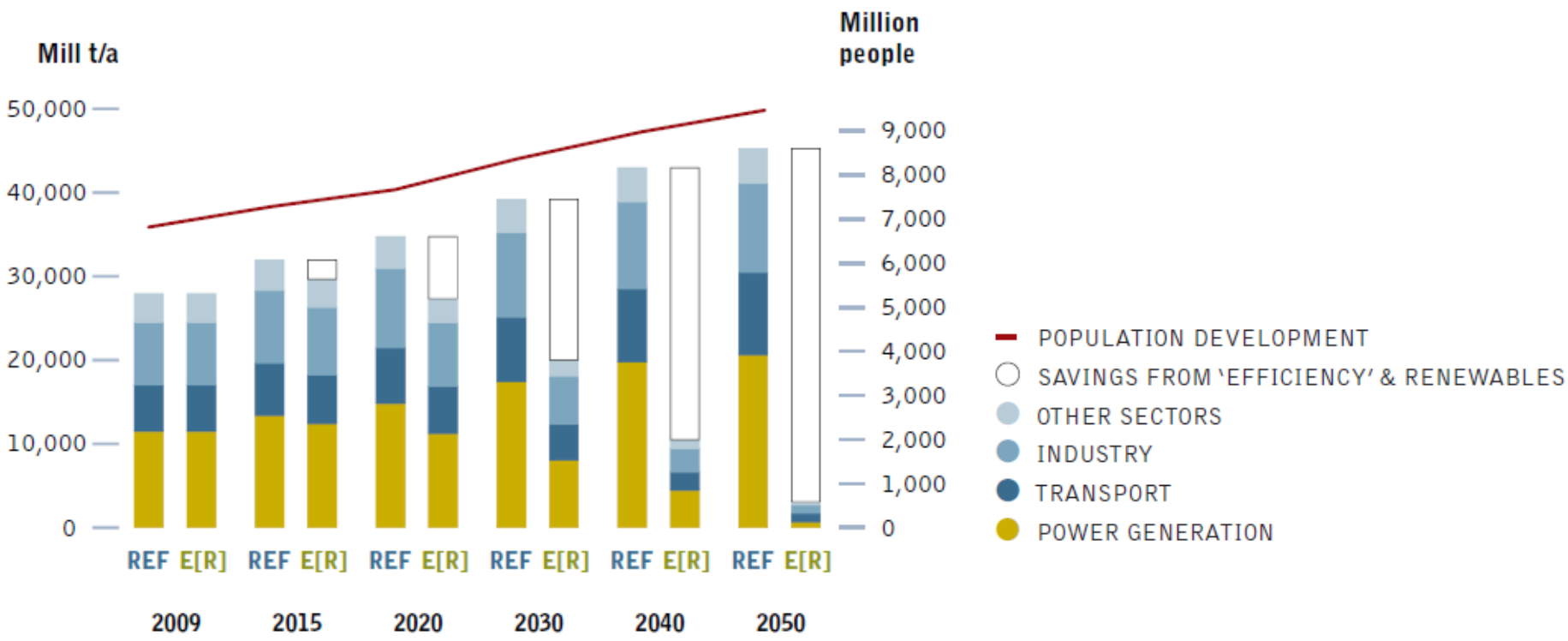
E[R] Transport

figure 5.13: global: final energy consumption for transport under the reference scenario and the energy [r]evolution scenario



Saving the Climate

figure 5.16: global: development of CO_2 emissions by sector under the energy [r]evolution scenario ('EFFICIENCY' = REDUCTION COMPARED TO THE REFERENCE SCENARIO)



Investments vs Fuel cost Savings

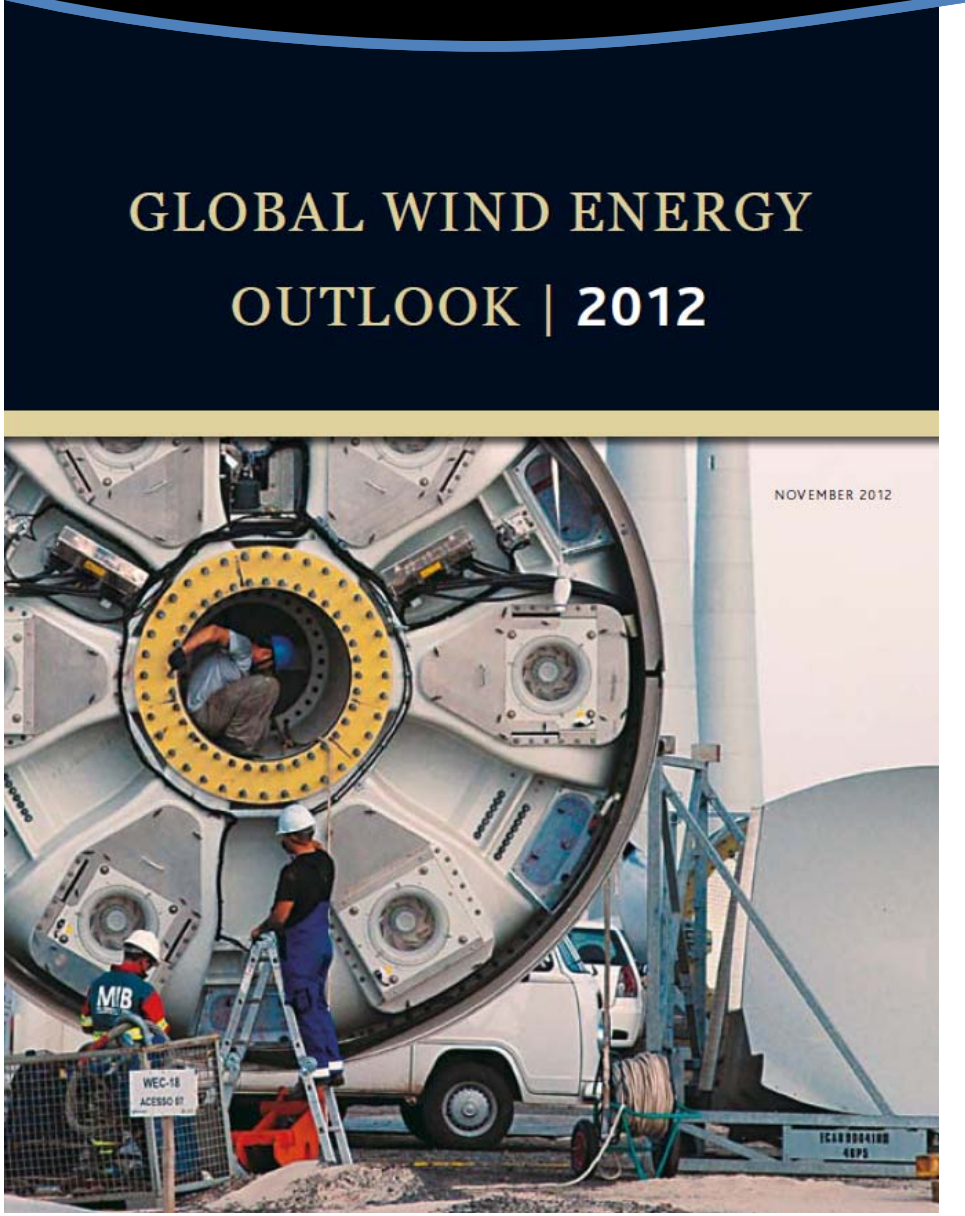
table 5.2: global: investment costs for electricity generation and fuel cost savings under the energy [r]evolution scenario compared to the reference scenario

INVESTMENT COSTS	$	2011 - 2020	2021 - 2030	2031 - 2040	2041 - 2050	2011 - 2050	2011 - 2050 AVERAGE PER ANNUM
DIFFERENCE E[R] VERSUS REF							
Conventional (fossil & nuclear)	billion $	-1,780	-2,310	-2,108	-2,108	-8,508	-213
Renewables	billion $	4,596	8,087	10,896	10,896	36,720	918
Total	billion $	2,816	5,777	8,788	8,788	28,213	705

CUMULATIVE FUEL COST SAVINGS							
SAVINGS CUMULATIVE E[R] VERSUS REF							
Fuel oil	billion $/a	304	1,088	1,252	1,107	3,750	94
Gas	billion $/a	-209.1	1,837	7,731	16,886	26,244	656
Hard coal	billion $/a	625	3,152	7,155	11,140	22,072	552
Lignite	billion $/a	42	185	245	259	731	18
Total	billion $/a	762	6,262	16,382	29,390	52,797	1,320

GWEC
GLOBAL WIND ENERGY COUNCIL

Beijing | Brussels | London



Key findings:

- 2010 and 2011 markets ahead of Moderate scenario;

- 2012-2016 growth updated to reflect actual development;

- IEA scenario more positive: 573 GW for 2020 – was 573 GW for 2030 two years ago;

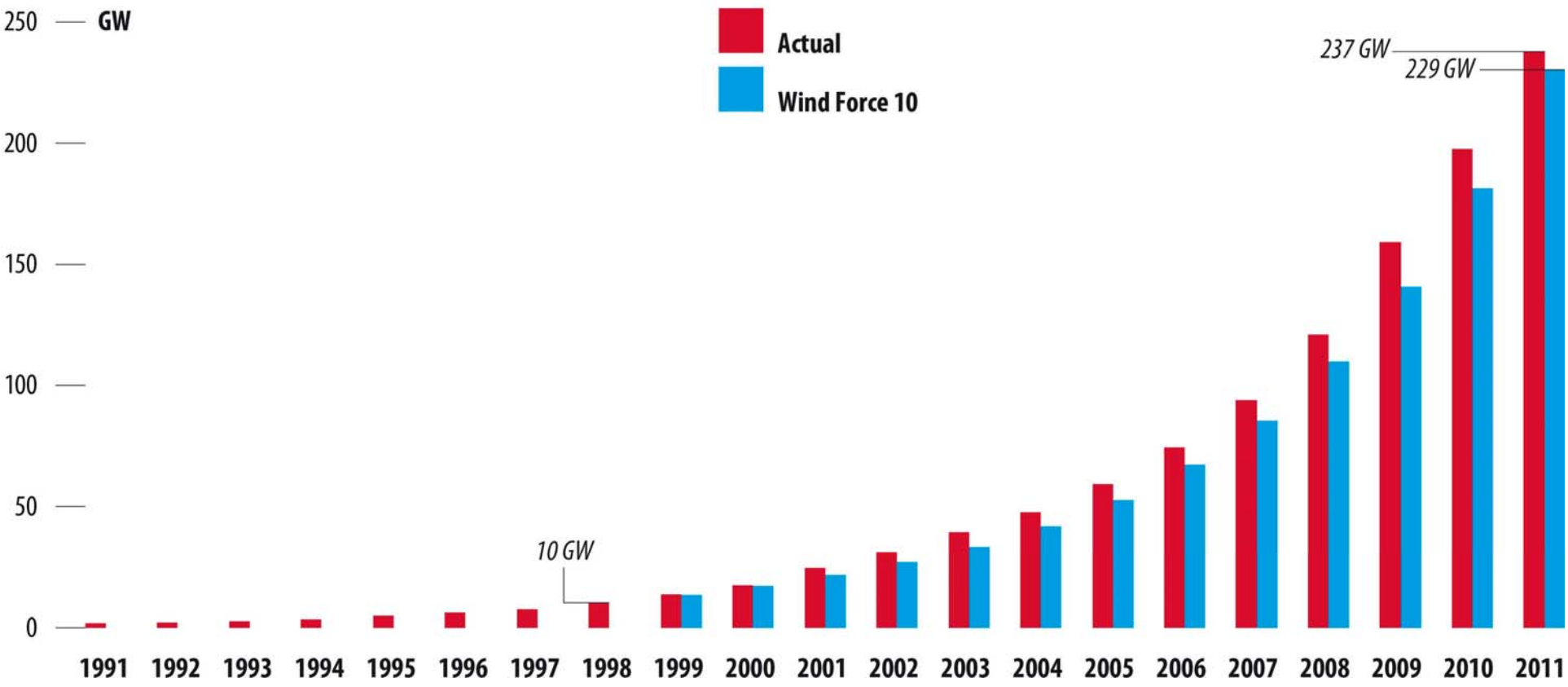
-Reflects increasing credibility of wind power with key international bodies;

- Even stronger than predicted growth in Asia, mainly in China, but that is stabilizing';

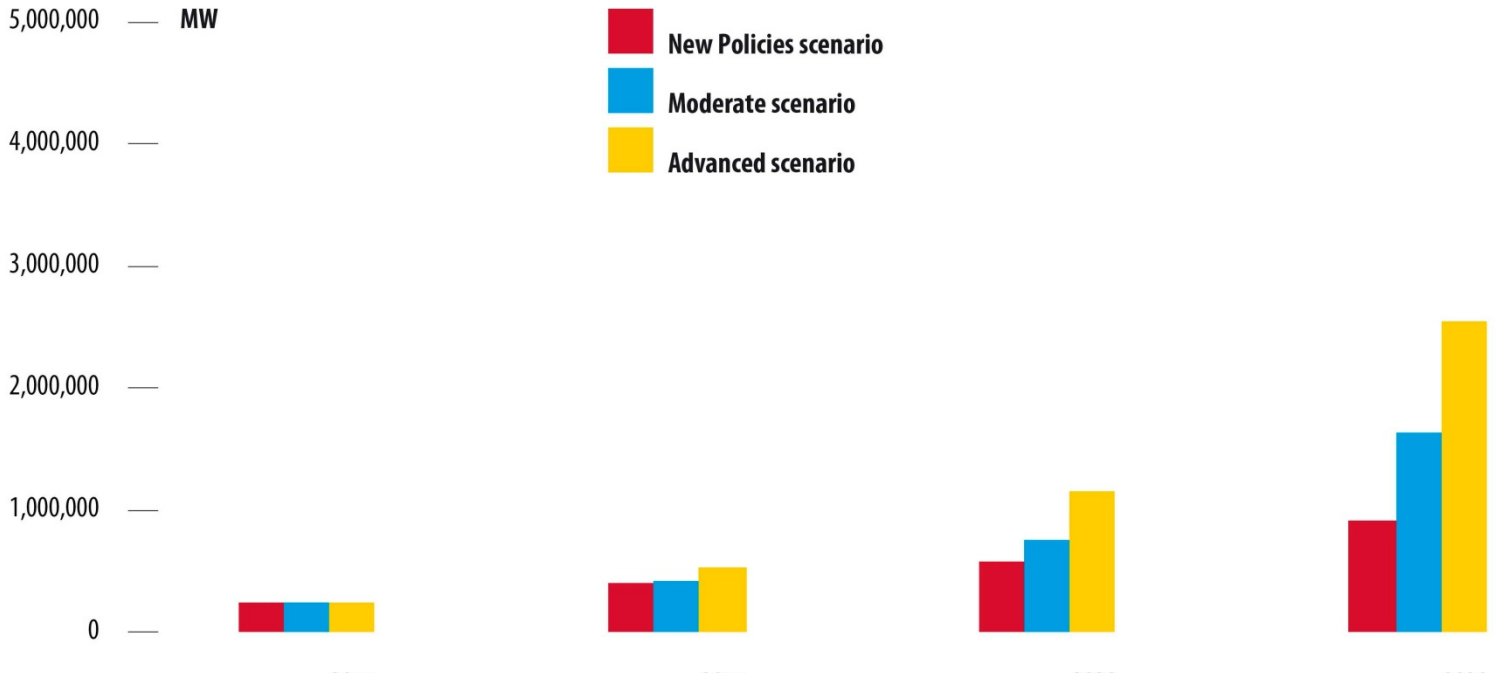
- Key emerging markets: Brazil, Mexico, India, South Africa.

GWEO forecasts vs. real market development

1999 *WIND FORCE 10* BLUEPRINT AND ACTUAL DEVELOPMENT. TOTAL GW WIND CAPACITY INSTALLED GLOBALLY

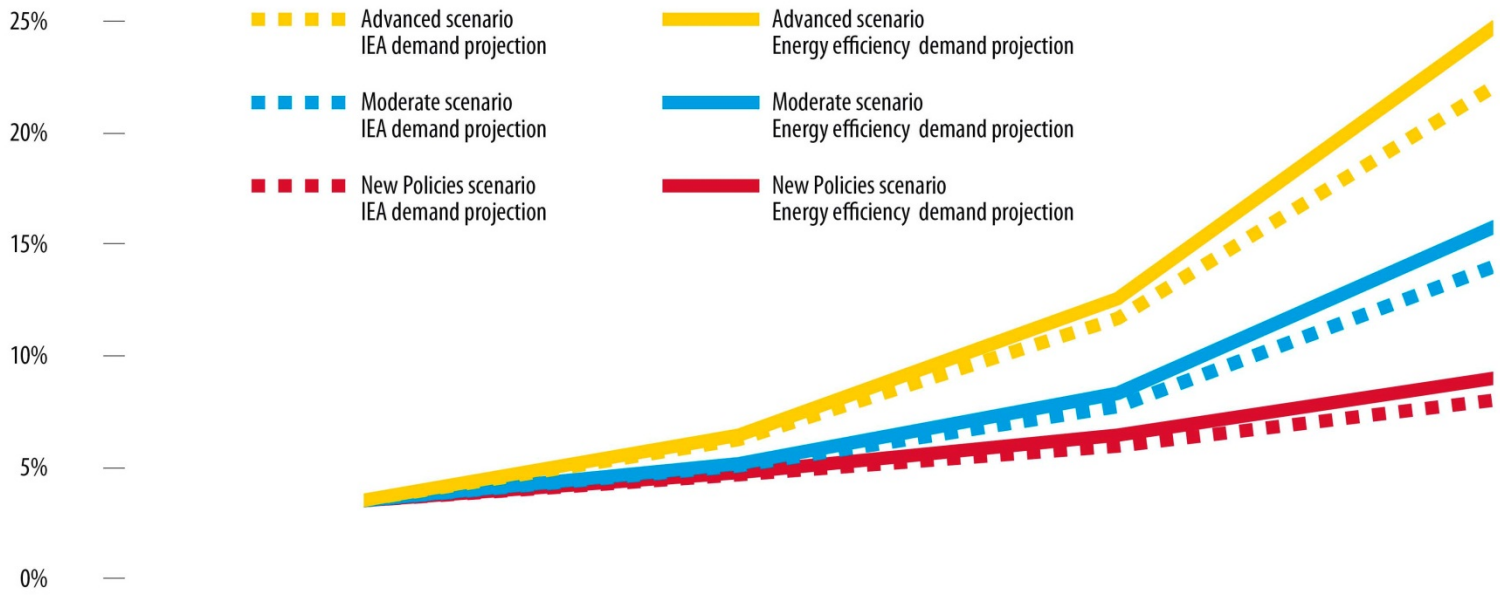


GLOBAL CUMULATIVE WIND POWER CAPACITY



	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

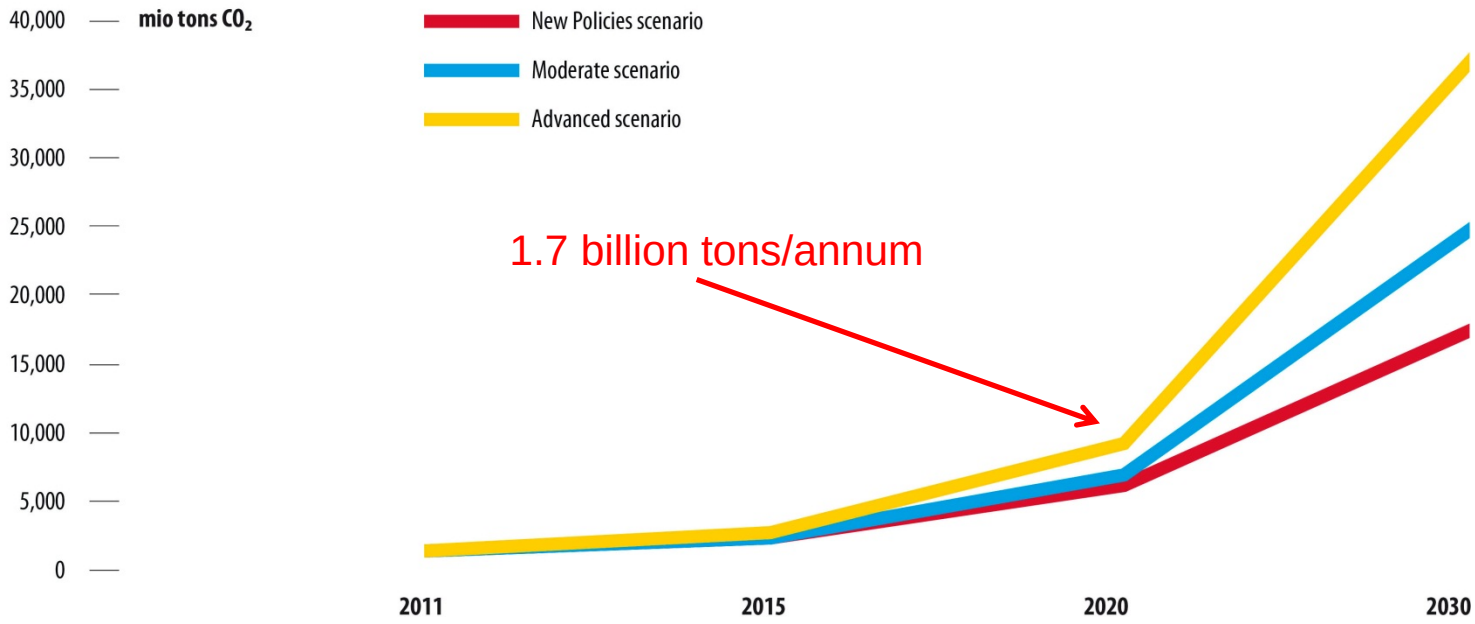
WIND POWER SHARE OF GLOBAL ELECTRICITY DEMAND



	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 CO2 EMISSIONS REDUCTIONS



ANNUAL AND CUMULATIVE CO2 EMISSIONS REDUCTIONS

		2011	2015	2020	2030
New Policies scenario					
Annual CO2 savings	million tons	350	586	863	1,447
Cumulative CO2 savings	million tons	1,368	2,316	6,095	17,522
Moderate scenario					
Annual CO2 savings	million tons	350	626	1,118	2,550
Cumulative CO2 savings	million tons	1,368	2,411	6,958	24,979
Advanced scenario					
Annual CO2 savings	million tons	350	781	1,692	4,007
Cumulative CO2 savings	million tons	1,368	2,690	9,254	37,504

How to get back on the high-growth track

Short to medium term

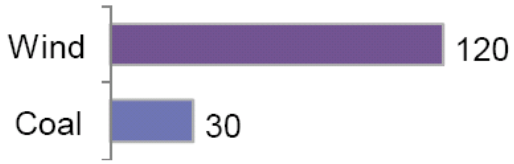
- An end to the ***partisan bickering*** over energy policy in the US which creates the destructive boom-bust cycles in that critical market;
- Resolution of ***grid*, *certification, transparency and quality*** issues in China;
- Flushing the free allocations out of the European Emissions Trading System;
- A **re-vitalization of the carbon markets** – the Kyoto Protocol's Clean Development Mechanism has more than 100 GW of wind energy projects in the pipeline, but…
- The political courage on the part of at least some governments to tackle the ***subsidies issue*** in the conventional energy sector;
- Perhaps most importantly, ***stable, bankable policy*** in as many national energy markets as possible.

Challenges (1)

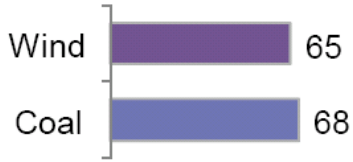
Perceptions

LEVELIZED COSTS: BEST NEW WIND VS NEW COAL ($/MWh)

Perception:



Reality:

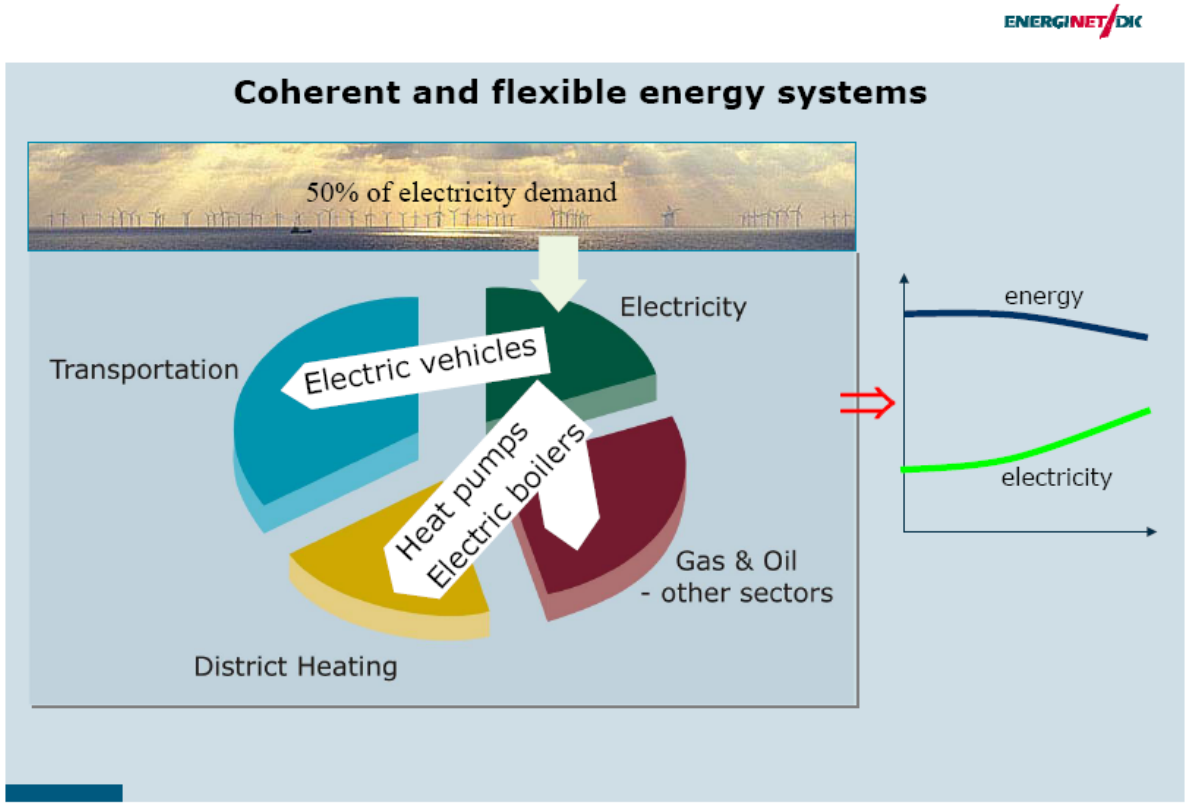


- New coal must cover cost of capital
- New coal requires advanced pollution control
- Wind turbines back to 2005 prices, but now perform much better
- Wind bankability has driven down cost of capital
- Coal suffers from carbon price risk

Source: Bloomberg New Energy Finance

Challenges (2)

Integration/transformation



Challenges (3)

- *de-risking* wind investments to attract (more) institutional investments;

- *hydro-fracking,* shale gas in the US; artificially low gas prices…

- Generally sluggish or negative demand growth in most of the OECD;

- How to work *with* solar PV rather than being pitted against them;

Challenges (4)

- Having intelligent (and very public) discussions about intelligent support for RE against a background of massively increasing fossil fuel subsidies;

- Having intelligent discussions about the long term future of the energy system against a background of widespread economic crisis/uncertainty

- How to convince policy makers that protectionist measures/trade barriers hurt everyone (including their own industry) in the long run.

New Markets

Latin America: Brazil and Mexico, followed by…?

Africa: Egypt, Morocco and Tunisia; now Kenya, Tanzania and Ethiopia. South Africa underway.

Asia: Mongolia, Viet Nam, Thailand, Sri Lanka. Japan?

Conclusions

- Asian market driving global growth – Asia is power hungry
- European market solid for now
- North America uncertain and volatile
- Largest growth markets are India and Brazil
- Downward price pressure continues
- Trade barriers/new protectionism?
- Key emerging markets in Africa and non-C/I Asia
- International commodity price volatility returns/remains a problem.

Looking Ahead (1)

2013 will be a tough year, with the single largest variable how far the US market will fall, how soon it will recover and what will be the trajectory; Canada and Mexico continue to grow.

China, India – modest recovery from 'off' 2012 – new markets in Asia begin to contribute

Europe – stable, with growth in offshore and eastern markets offsetting dire markets in S. europe

Latin America – Brazil plus…?

Africa – market 'returns' in Morocco, Tunisia…Egypt? South Africa gets underway and Ethiopia continues to lead.

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;

- '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

GWEC
GLOBAL WIND ENERGY COUNCIL

Beijing | Brussels | London

Thank you!

For more information:

Steve Sawyer
steve.sawyer@gwec.net