

*“Renewable Energy Sources - Current
Status and Future Prospects”*
Athens, November 23rd , 2011

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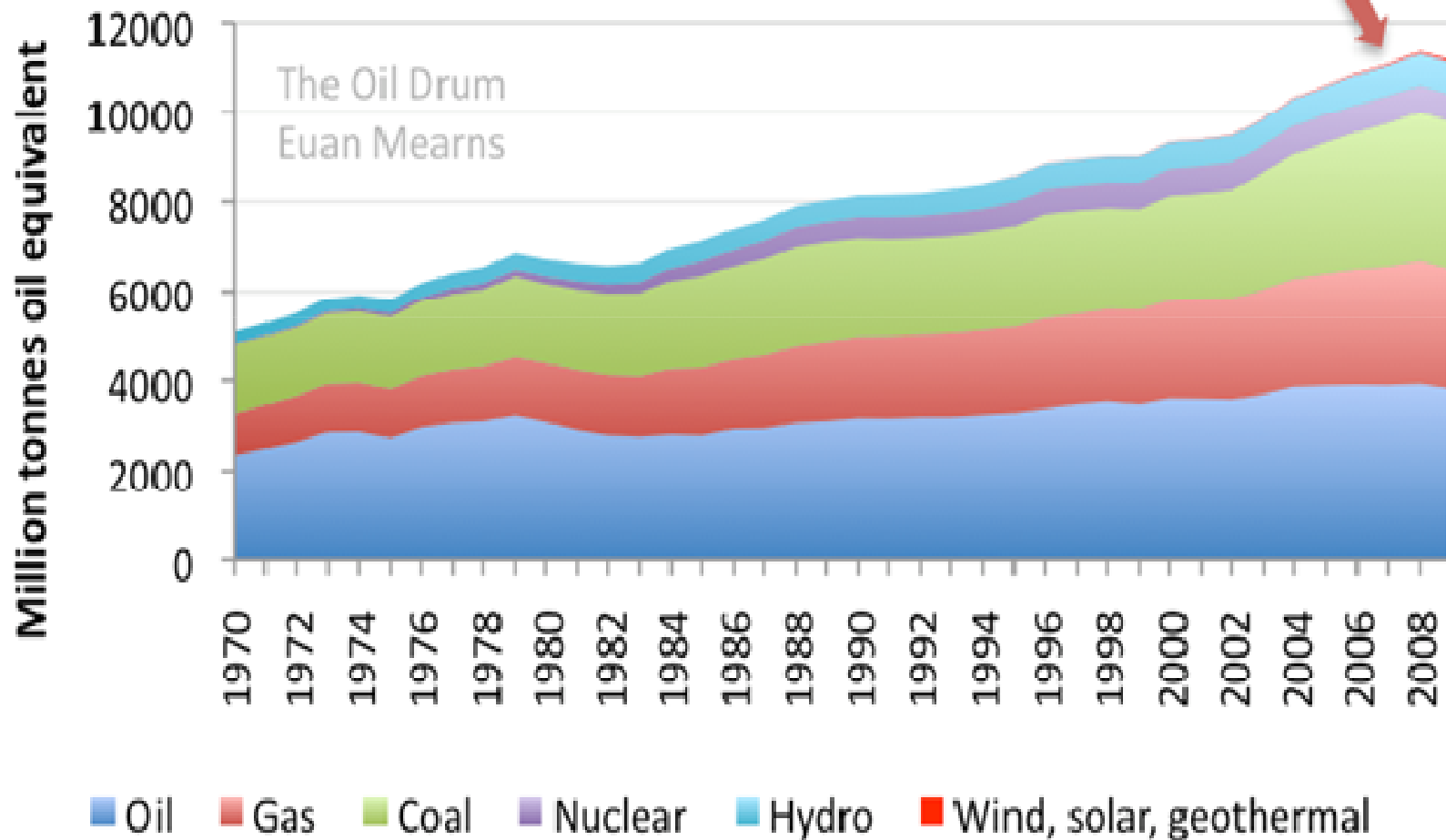
at the 16th National Energy Conference “Energy & Development 2011”

Presentation Outline

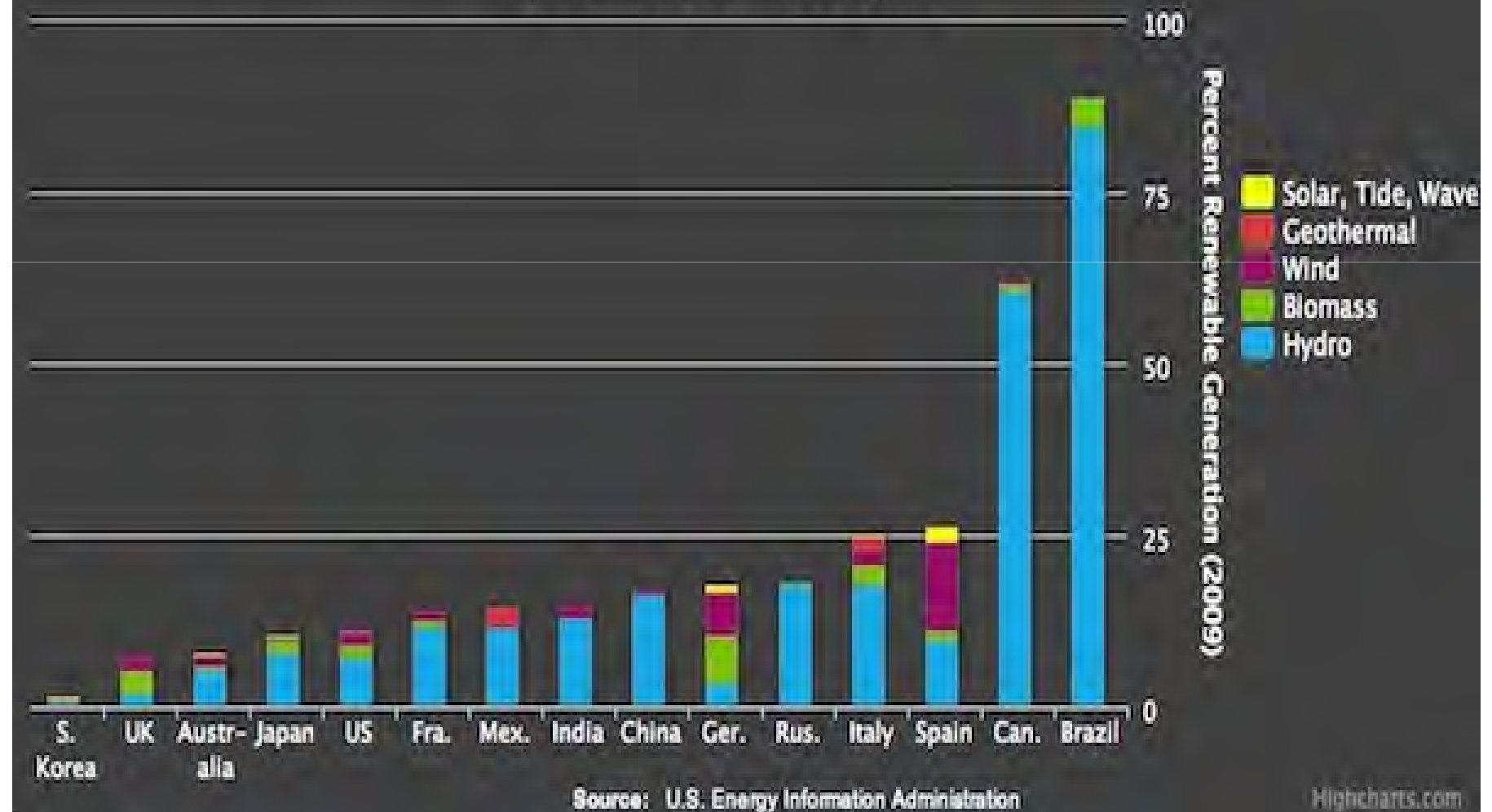


- Renewable Energy Sources - The Global Image
- Global RES Investments
- European Targets & Existing RES Installations
- SE Europe's RES Potential
- Wind, PV and Solar Thermal in SE Europe
- Estimated Investments in RES

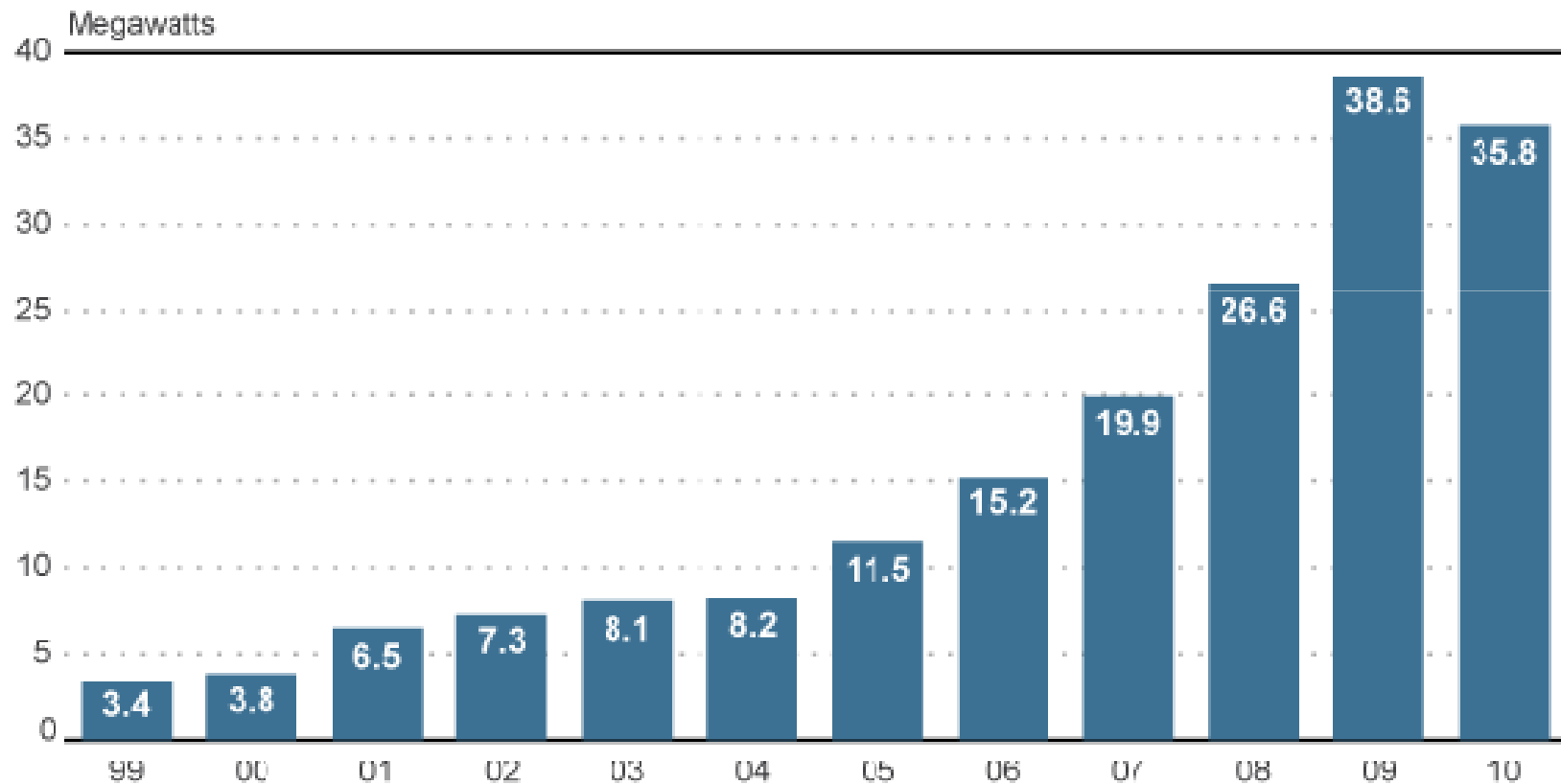
World primary energy production



Renewable Electricity Generation as a Percent of Total Generation Top 15 Electricity Producers In 2009

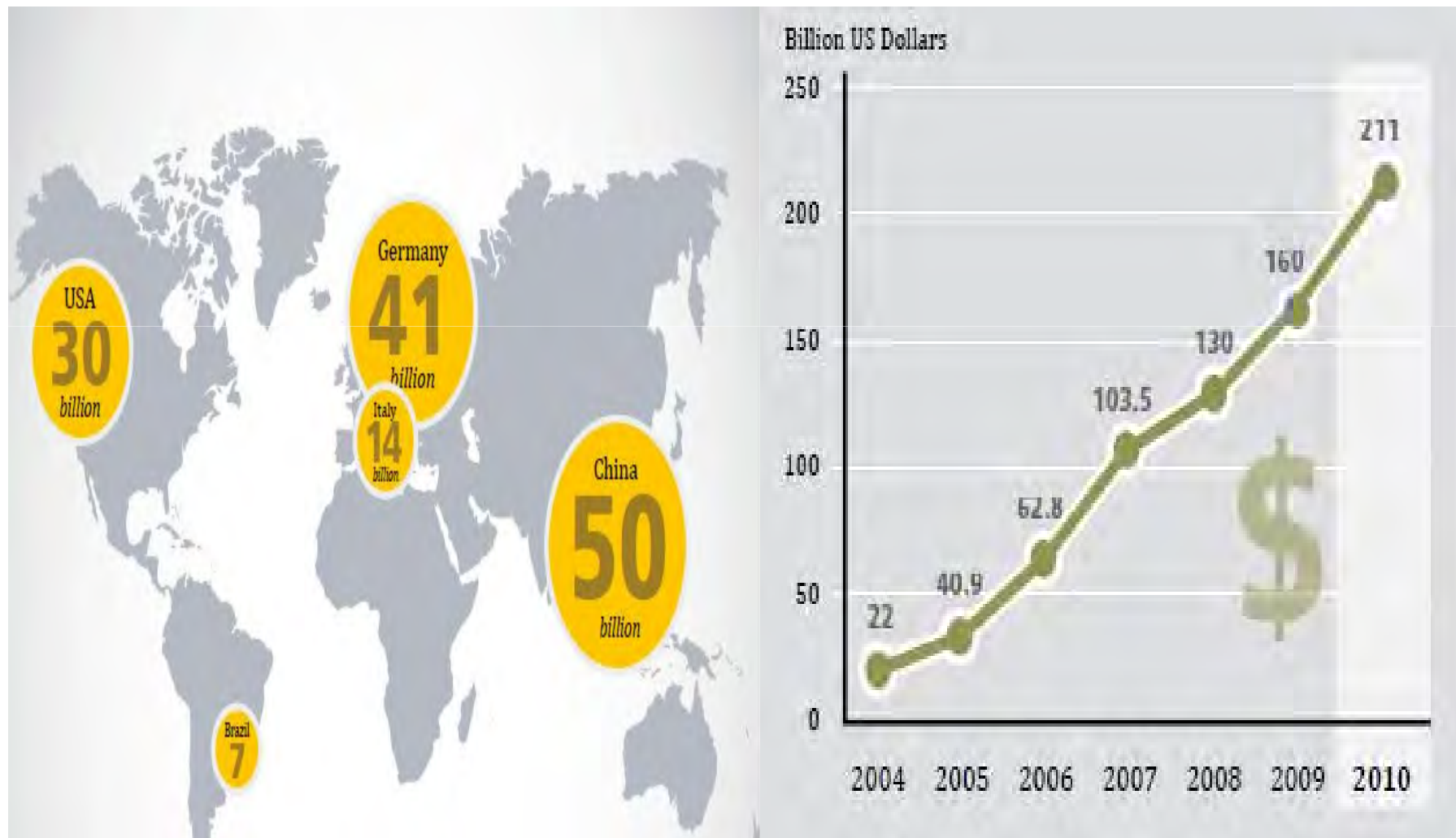


Global wind power installation market

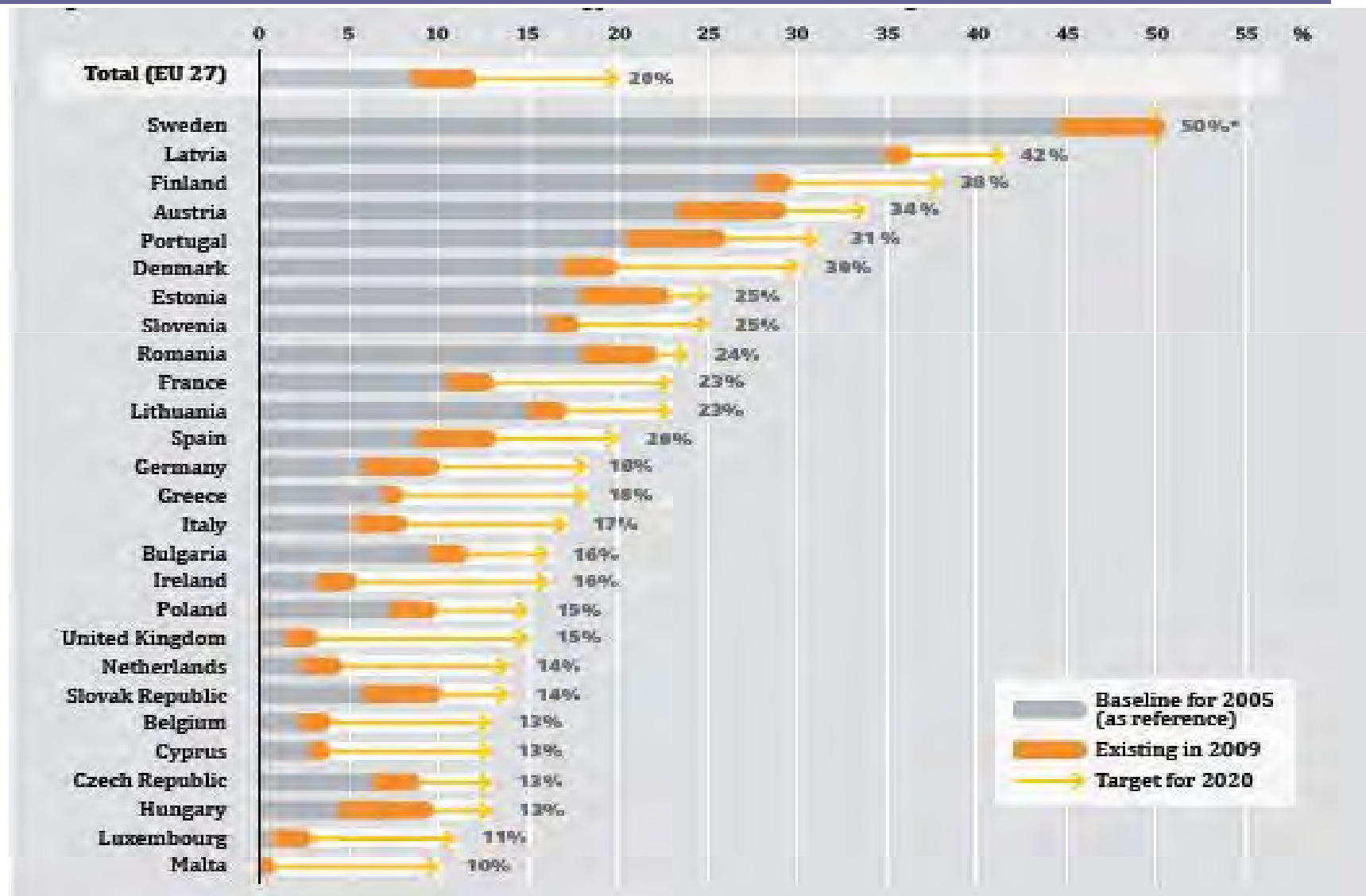


Source: Global Wind Energy Council

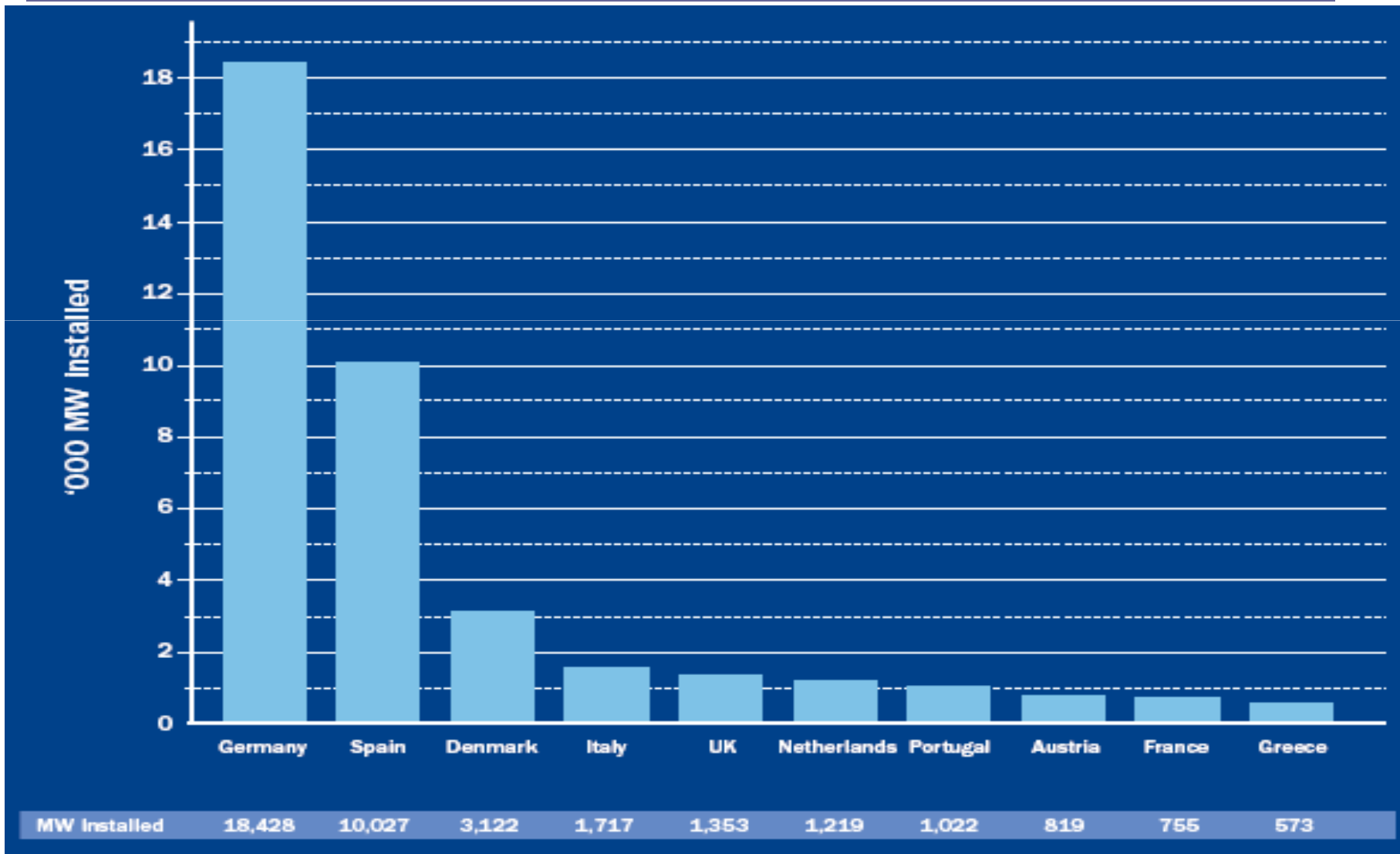
World RES Investments



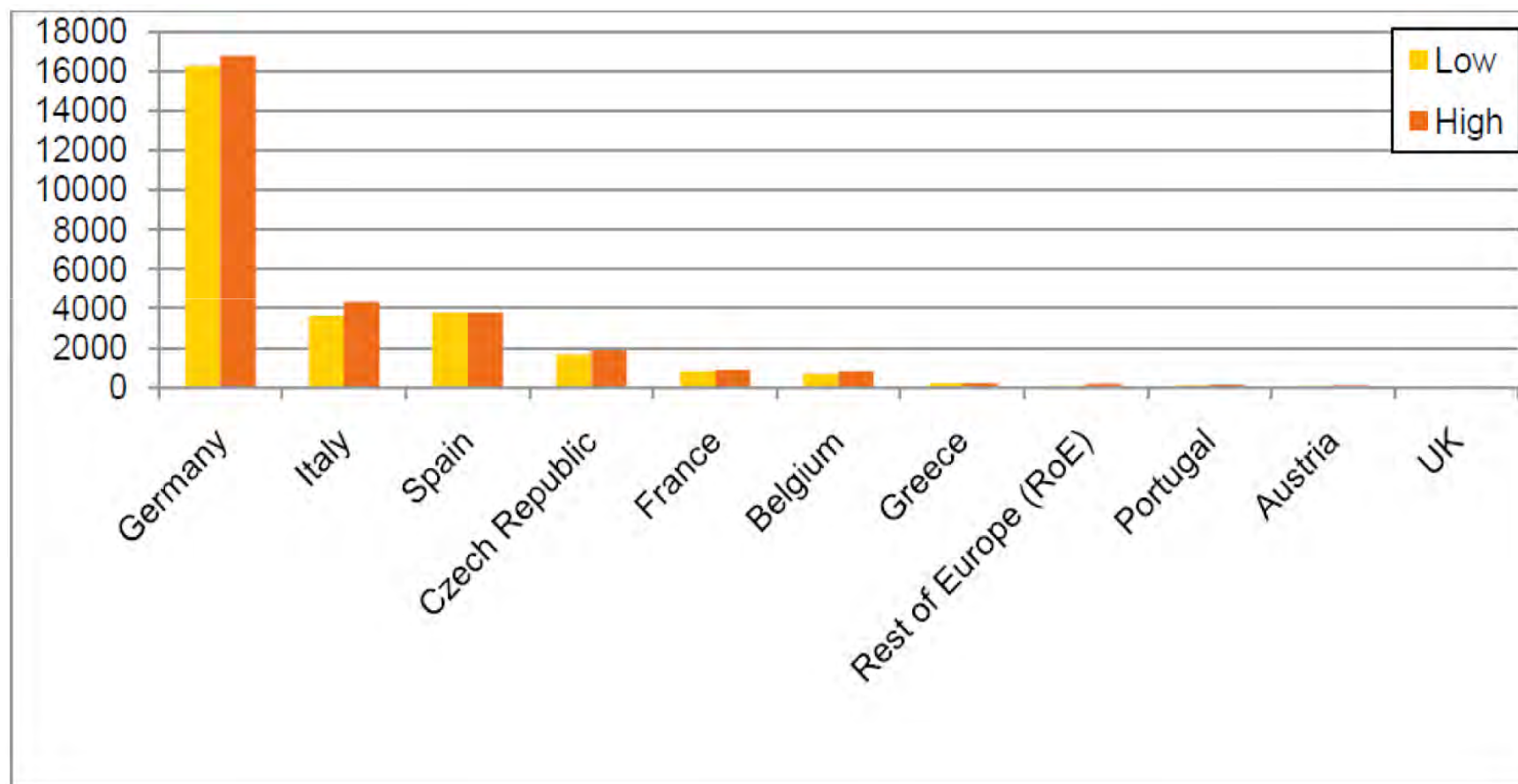
European Policy – Existing Installations and Targets for 2020 targets for 2020



Wind Energy Installed Capacity in Europe (2008)



Cumulative PV installed capacity in Europe in 2010 (MW)





Status of Renewable Energy Sources in S.E. Europe

- Solar Thermal

Well developed markets in Greece, Cyprus and Turkey

- Solar PV

Approximately < 400 MW total PV installed, with Greece being the most developed market, followed by Bulgaria

- Wind

Key players: Greece, Turkey, Bulgaria, Romania Installed Capacity < 4.000 MW

- Mini Hydro

Well developed in Western Balkans. Considerable Potential in Greece and Turkey

- Biomass

Embryonic market for power generation but extensively used for house heating

- Geothermal

Large untapped potential in Greece, Turkey, Bulgaria, Romania, Serbia and Croatia



RES in S.E. Europe

RES in Gross Final Energy Consumption						Target
%	2005	2020	% diff	2030	% diff	2020
Albania	32.6	25.7	2.8	26.0	5.3	?
Bosnia	18.8	20.9	4.7	24.4	7.9	?
Bulgaria	11.1	23.5	12.2	34.3	18.1	16%
Croatia	13.6	16.3	2.9	18.7	5.2	?
Greece	7.6	17.8	7.1	22.5	10.1	20%
FYROM	15.7	22.8	5.8	25.6	10.6	?
Romania	18.9	25.8	6.8	29.0	8.2	24%
Serbia & Montenegro	18.9	19.5	4.3	18.7	5.1	?
Balkans excl. Turkey	14.9	21.4	6.5	24.8	8.9	
Turkey	15.5	13.3	3.7	14.6	5.4	?
All SEE	15.2	17.0	5.6	19.0	7.5	
EU27	8.6	20.0	5.2	22.2	3.8	20%

Renewable Energy Sources in SE Europe



Wind Power Installed Capacity in SE Europe (2010)



Wind power in SE Europe (2009 - 2010)				
Capacity (MW)	Installed 2009	End 2009	Installed 2010	End 2010
Bulgaria	57	177	198	375
Cyprus	0	0	82	82
Greece	102	1,087	123	1,208
Romania	3	14	448	462
Croatia	10	28	61	89
Turkey	343	801	528	1,329
FYROM	0	0	0	0
Total	515	2107	1,440	3,545

Solar Photovoltaic Installed Capacity in SE Europe (2010)



Country	Installed Capacity (MW)
Bulgaria	25.0 (e)
Cyprus	6.0 (e)
Greece	300.0
Romania	2.0 (e)
Turkey	5.0 (e)
Total	348.0

S.E. Europe Renewables – Solar Thermal Market

Installed capacity of solar collectors in 2008 and cumulative capacity

No	Countries	Installed capacity in 2008		Cumulative capacity, end 2008	
		in m ²	in MWth	in m ²	in MWth
1	Bulgaria	6,000	4.2	62,000	43
2	Cyprus	40,550	28	665,300	465
3	Greece	300,000	210	3,550,000	2,485
4	Romania	10,000	7	79,600	56
5	Turkey	NA	NA	12,000,000	8,400



RES Investment Information

S.E. Europe Renewable Energy Investment Information		
Project Sector	Description	Investment Estimate in Million Euros
RES	Small Hydro	SE Europe: 1.900
		Turkey: 5.400
	Wind Farms	SE Europe: 1.850
		Turkey: 8.000
	Photovoltaics	SE Europe: 7.460
		Turkey: 4.000
	Concentrated Solar Power	SE Europe: 350
		Turkey: 400
	Biomass	SE Europe: 920
		Turkey: 500
	Geothermal	SE Europe: 633
		Turkey: 800
	Solar Water Heating	SE Europe: 17.330
		Turkey: 1.300
Total Estimated RES Investment by 2020 (including Turkey)		<u>66.843</u>