

CHINA
in the
Global Context

WCRamsay October 28, 2013

This is Political and Urgent



A Very High Cost

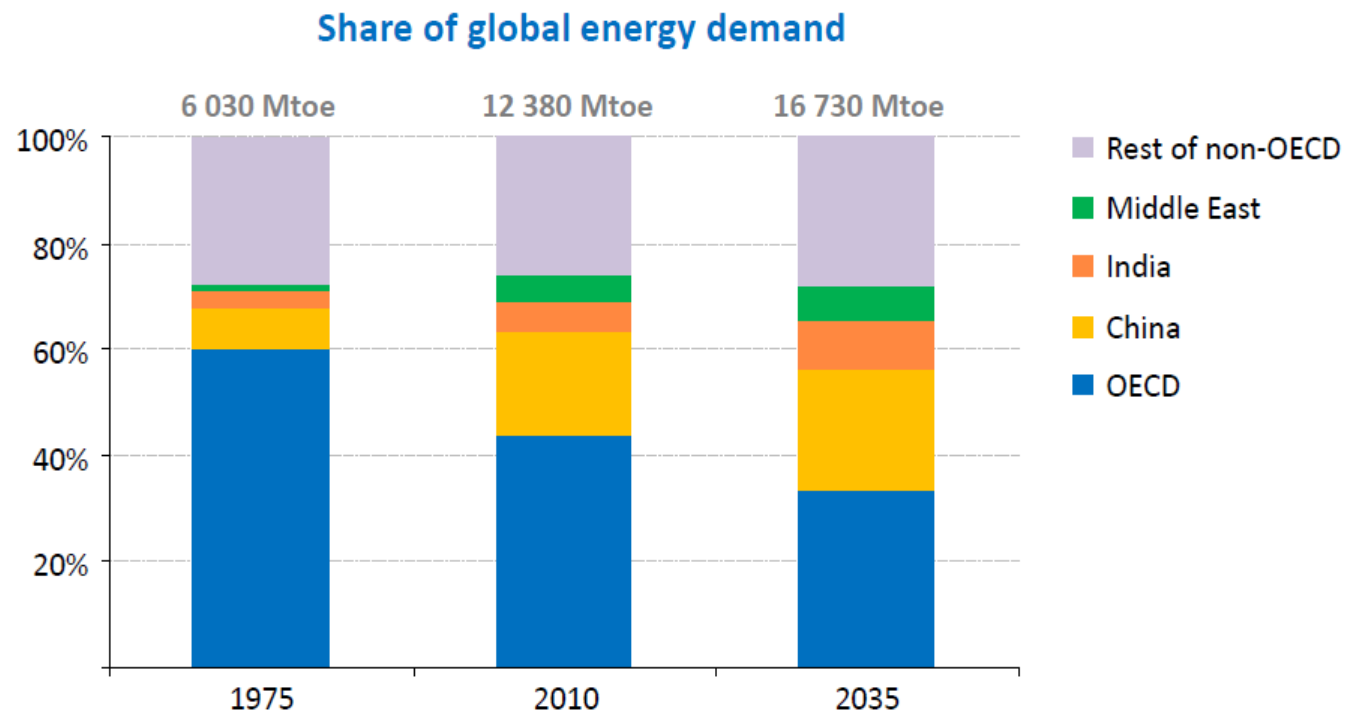
Solid Fuels in households

420,000 premature deaths annually

Outdoor Air Pollution in Cities

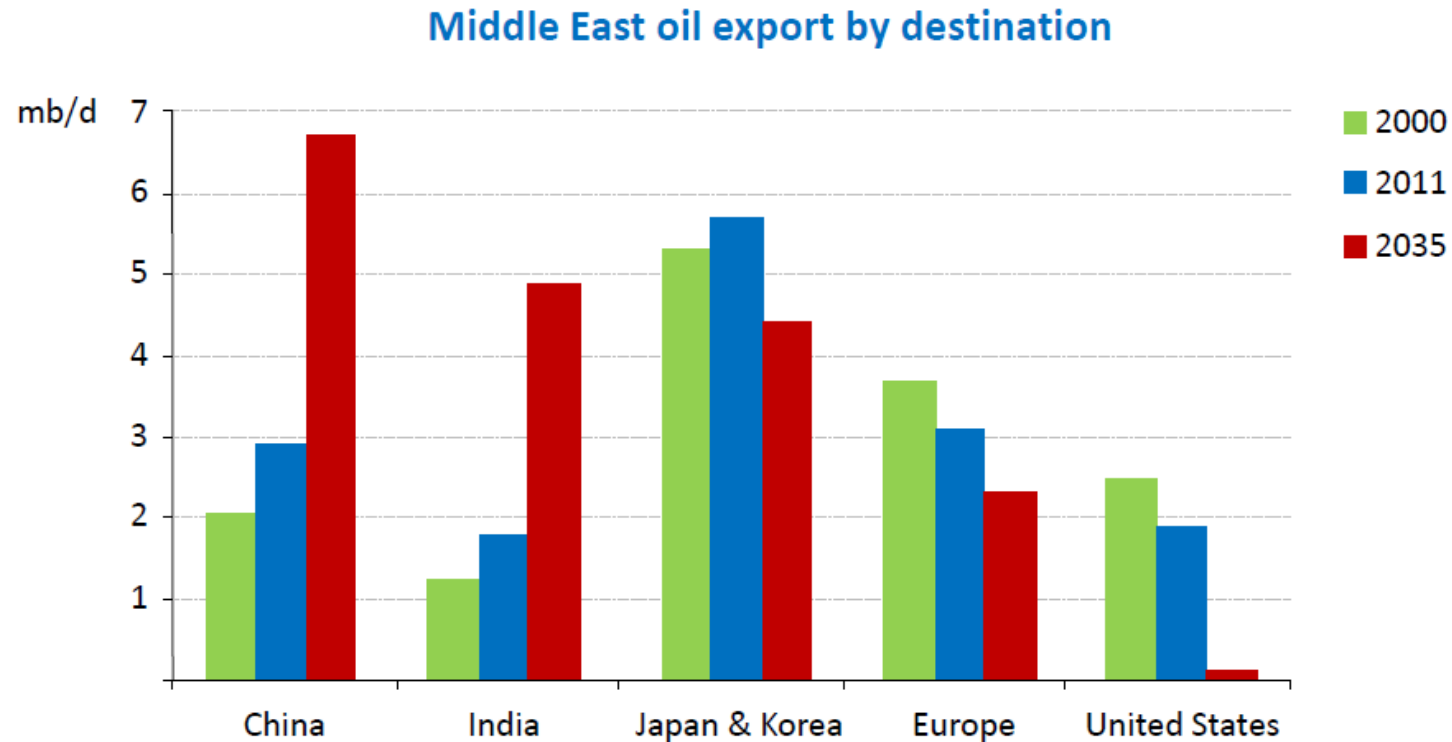
300,000 premature deaths annually

India and China Dominate to 2035



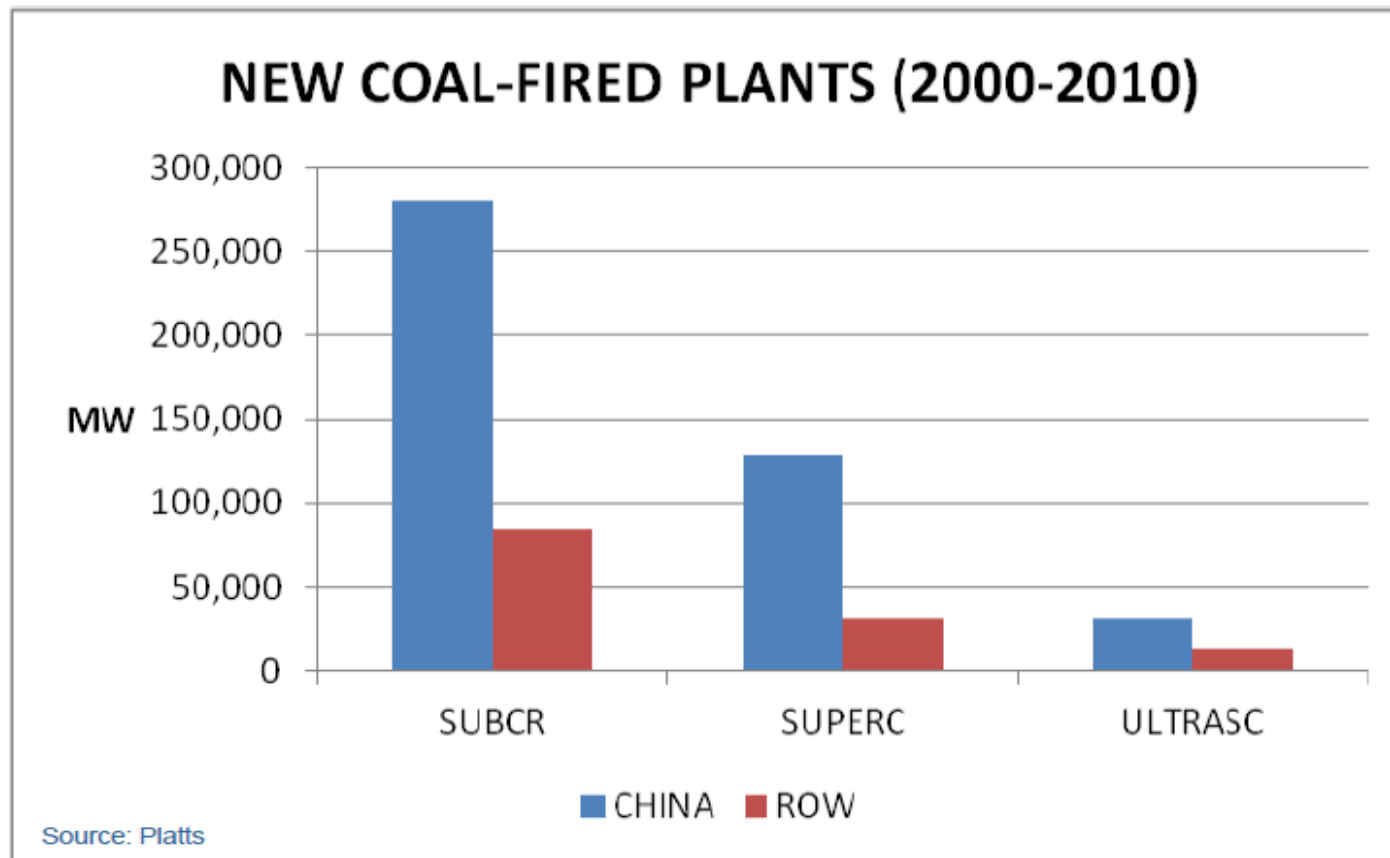
Global energy demand rises by over one-third in the period to 2035, underpinned by rising living standards in China, India & the Middle East

More Oil to Asia

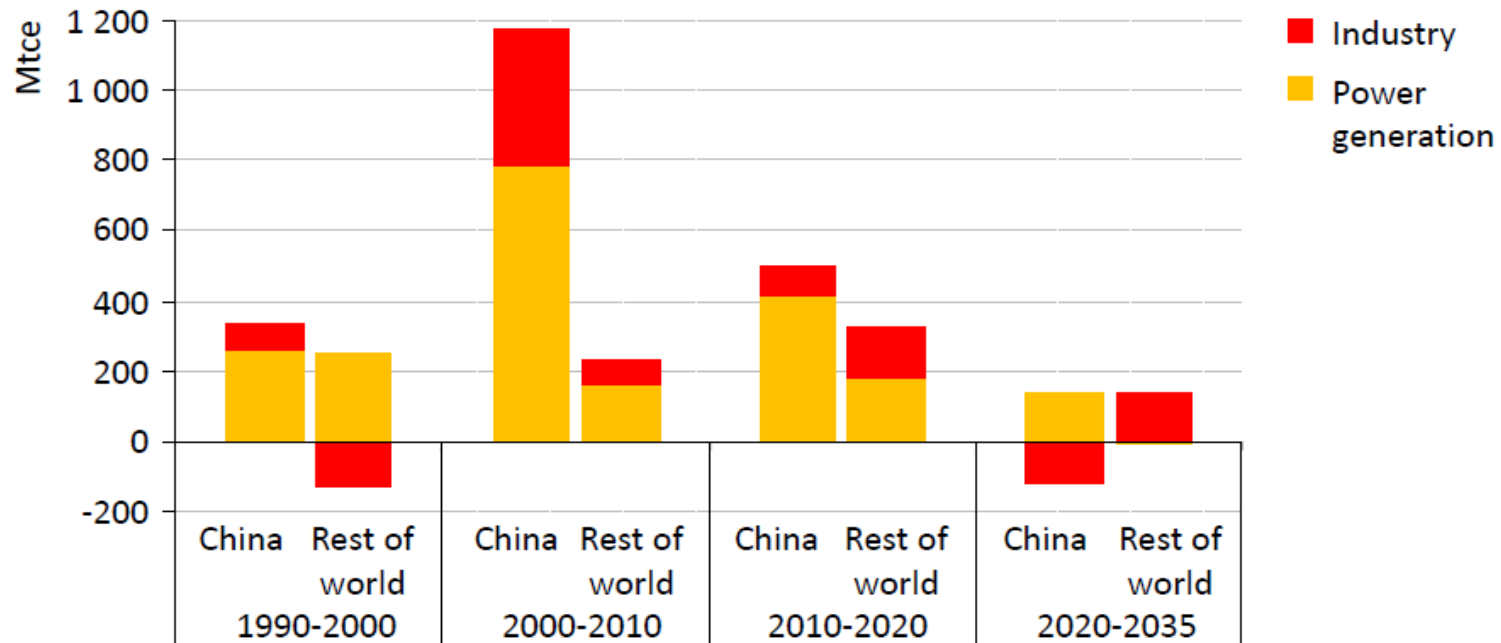


***By 2035, almost 90% of Middle Eastern oil exports go to Asia;
North America's emergence as a net exporter accelerates the eastward shift in trade***

Most of the world's new coal-fired power plants have been built in China

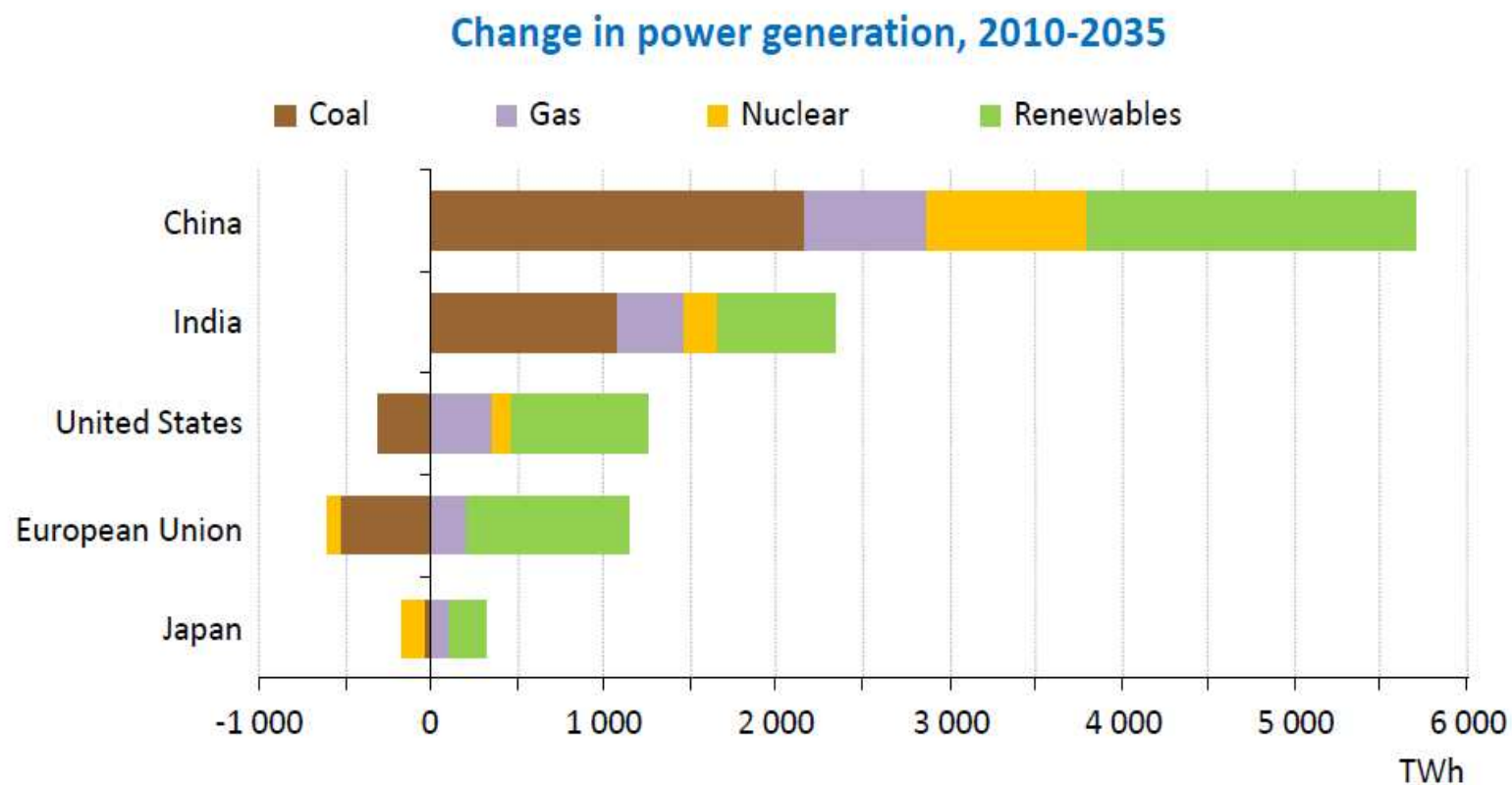


China in World Coal Trade



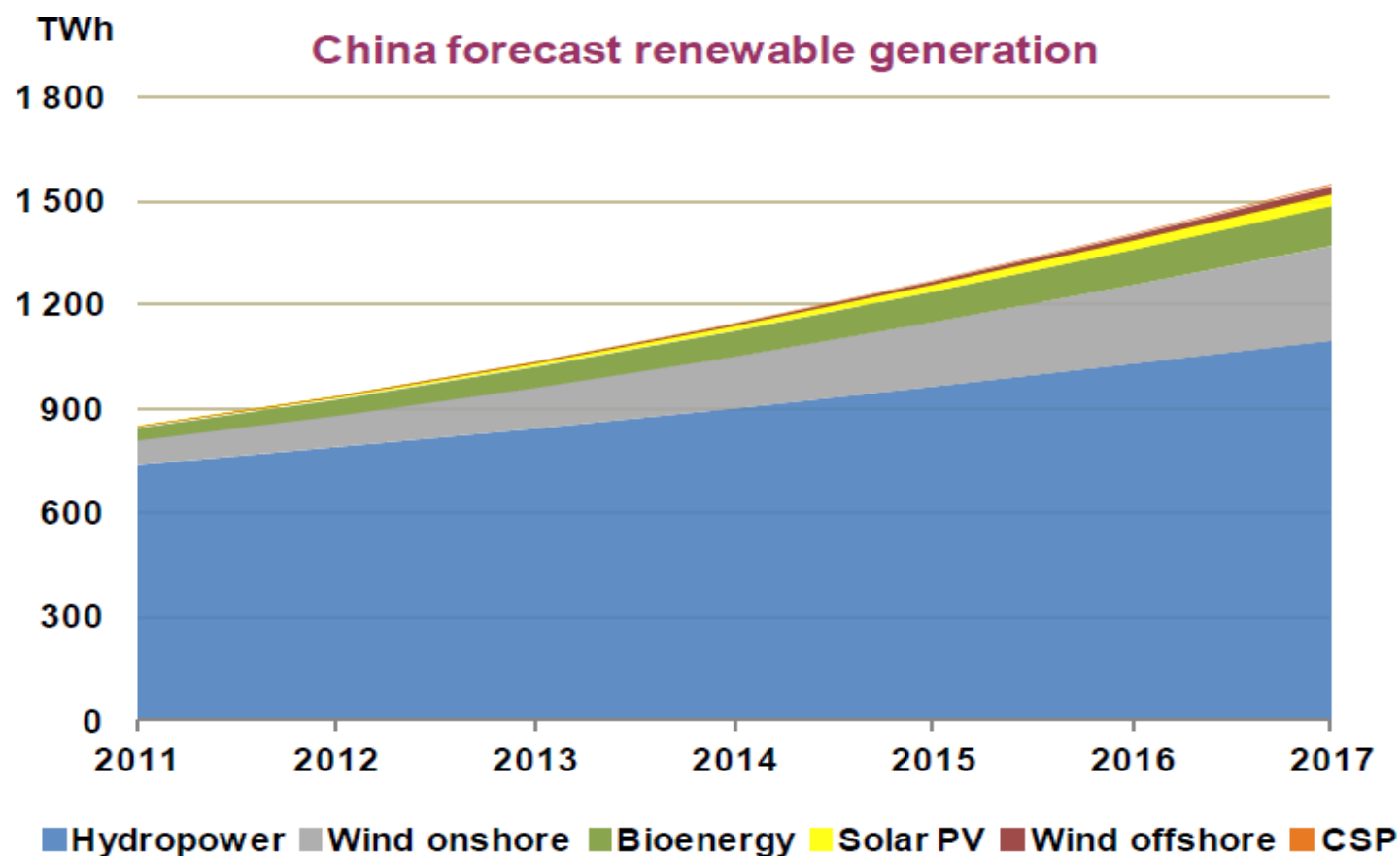
China's share in international coal markets increased by 18 percentage points over 2001-2011, accounting for 80% of coal demand growth

Power -The Biggest Challenge

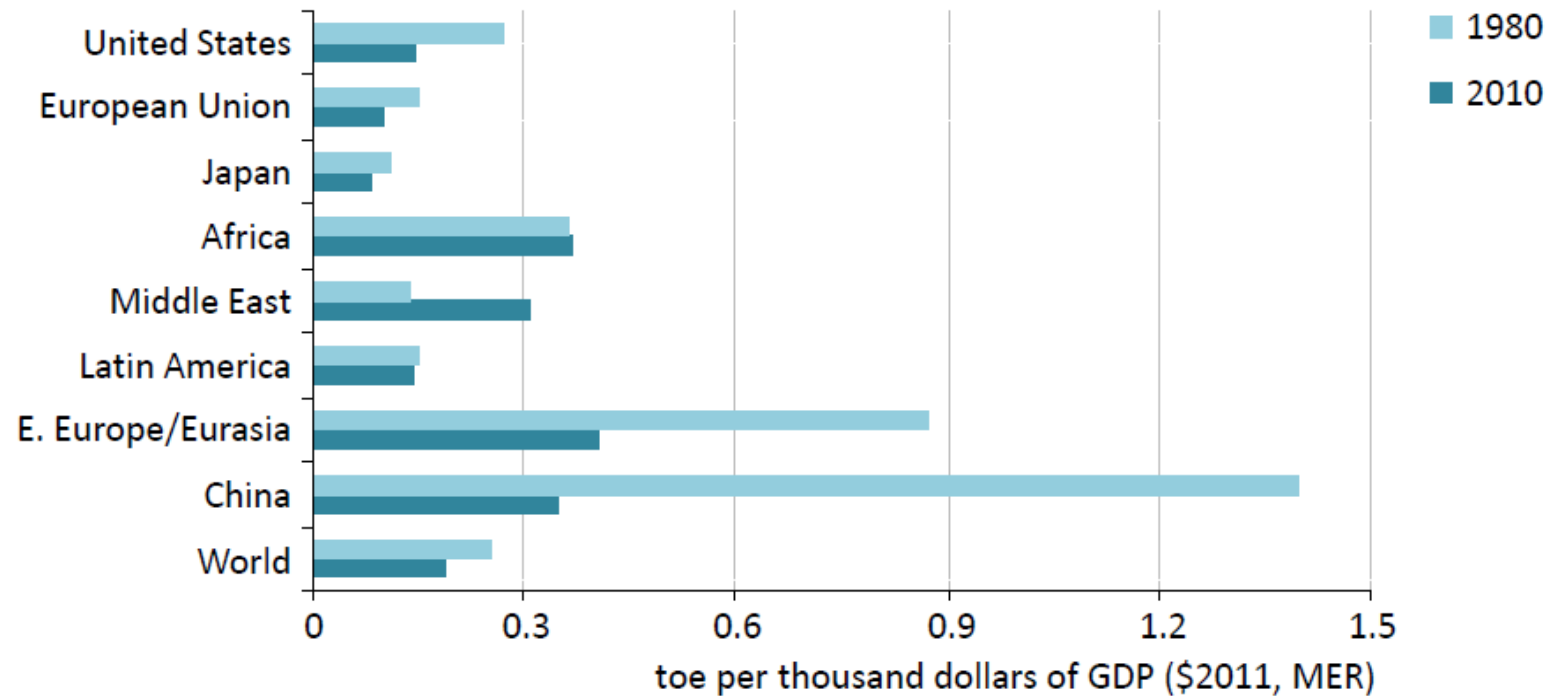


The need for electricity in emerging economies drives a 70% increase in worldwide demand, with China & India accounting for over half of the global growth

China: 40% of global renewable electricity growth to 2017



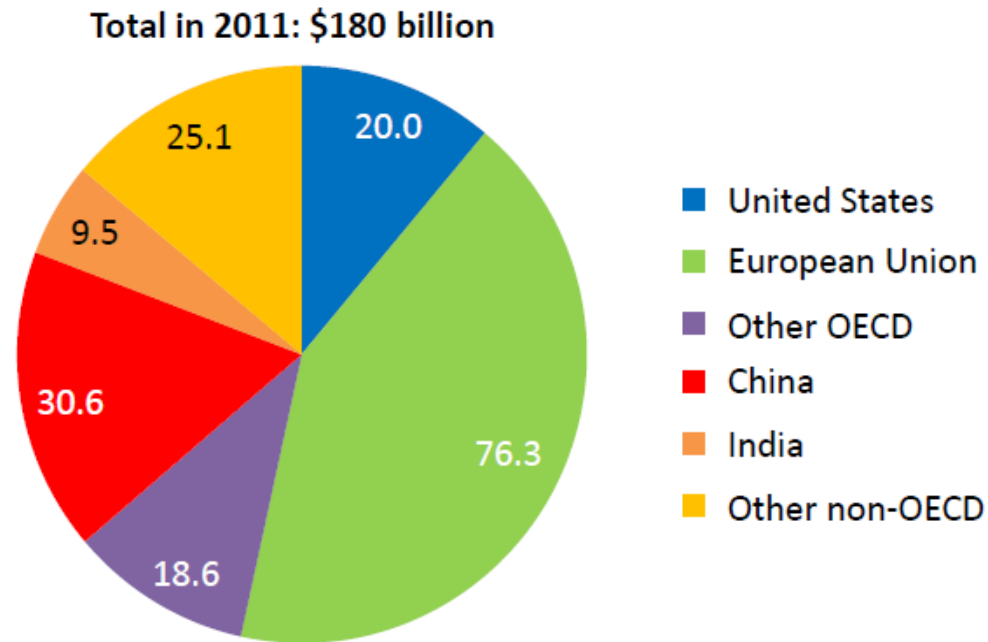
Harvesting Efficiency Potential



Energy intensities are converging: the ratio among the highest & lowest values has declined from a factor of nine in the 1980s to just under five currently

Efficiency is Cheapest Barrel

Investment in energy efficiency by country & region



Investment in projects aimed mainly at improving energy efficiency was \$180 billion in 2011, compared with \$600 billion to expand or maintain fossil fuel supply

12th Five-Year Plan for Energy Development (2011-2015)

Indicative

- Cap total primary energy use: **2800 Mtoe**
- Cap total electricity use: **6150 TWh**
- Foreign oil dependency rate: **61%**

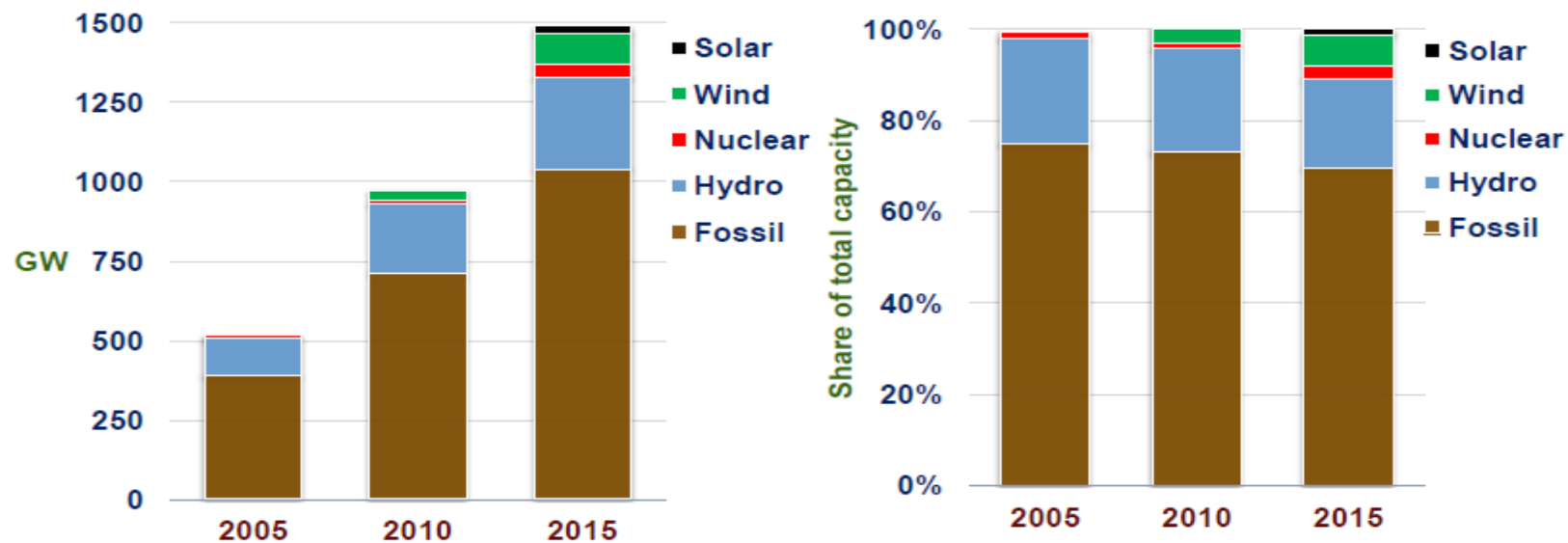
Mandatory

- Non-fossil share, primary energy supply: **11.4%**
- Energy consumption per unit GDP: **-16%**
- CO₂ emissions per unit GDP: **-17%**

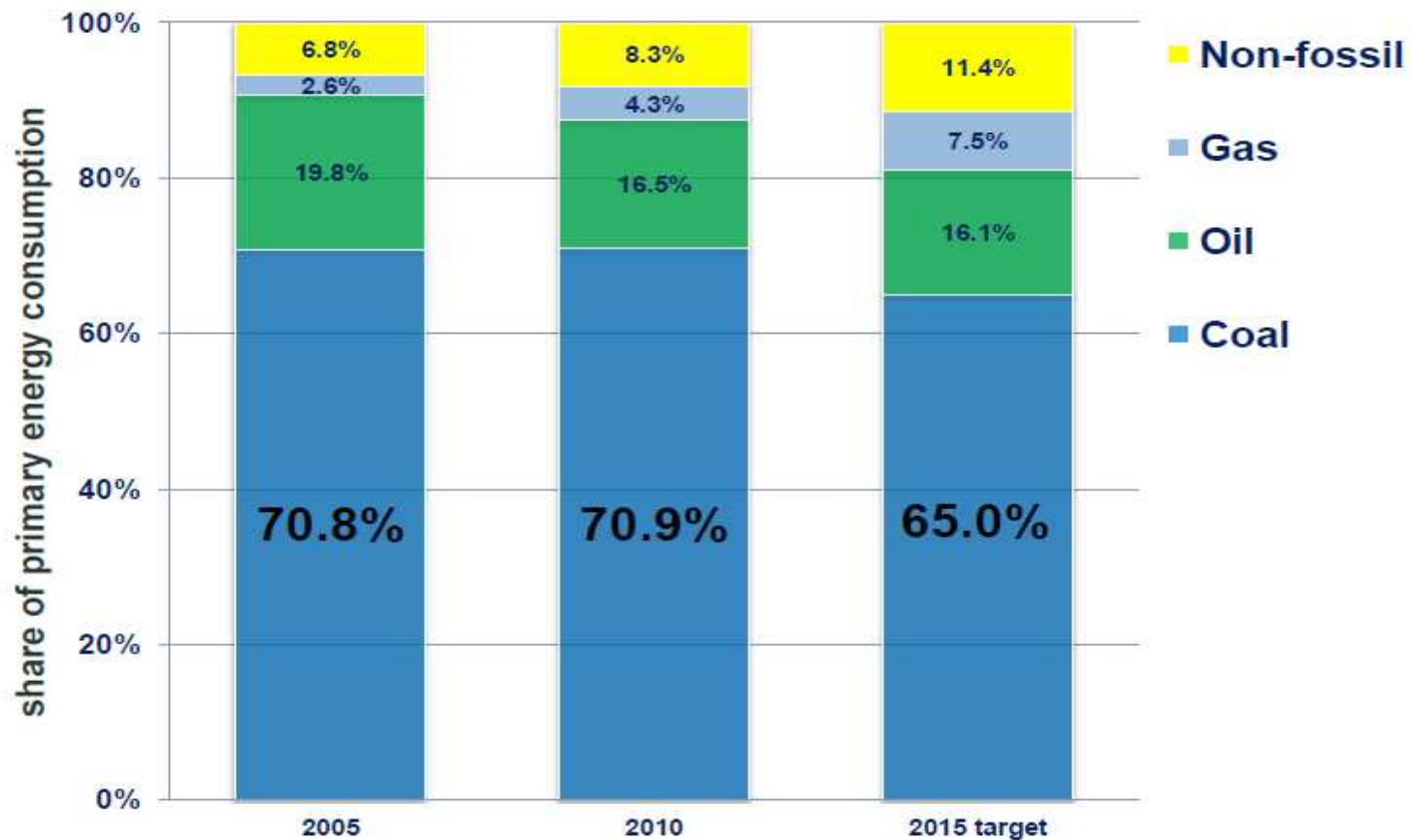
Category	Indicator	Unit	2010 value	2015 target	Annual rate of change*	Type
Quantity of energy consumed and efficiency	total primary energy consumption	million tons of coal equivalent (Mtoe)	3250 (2270 Mtoe)	4000 (2800 Mtoe)	4.3%	indicative
	share of non-fossil energy	percent of total	8.6%	11.4%	[2.8 pct pts]	mandatory
	total electricity consumption	TWh	4200	6150	8.0%	indicative
	energy consumption per unit GDP	toe / million yuan (160,323 USD)	81	68	[-16% total]	mandatory
	fossil power plant fuel use (net)	grams of coal equivalent / kWh	333	323	-0.6%	indicative
overall grid line loss rate	percent	6.5%	6.3%	[-0.2 pct pts]	indicative	
Energy production and supply	domestic primary energy production	Mtoe	2970 (2080 Mtoe)	3660 (2560 Mtoe)	4.3%	indicative
	coal production capacity	Mt coal	3240	4100	4.8%	indicative
	oil production capacity	Mt oil	200	200	0%	indicative
	natural gas production capacity	billion cubic meters	94.8	156.5	10.5%	indicative
	non-fossil energy production capacity	Mtoe	280 (200 Mtoe)	470 (330 Mtoe)	10.9%	indicative
Electricity development	power generation installed capacity	GW	970	1490	9.0%	indicative
	of which: coal-fired	GW	660	960	7.8%	indicative
	hydro	GW	220	290	5.7%	indicative
	nuclear	GW	10.82	40	29.9%	indicative
	gas-fired	GW	26.42	56	16.2%	indicative
	wind	GW	31	100	26.4%	indicative
Protection of ecological environment	CO ₂ emissions per unit GDP				[-17% total]	mandatory
	SO ₂ emissions by coal-fired power plants	g / kWh	2.9	1.5	-12.4%	mandatory
	NO _x emissions by coal-fired power plants	g / kWh	3.4	1.5	-15.1%	Mandatory
Improvement in people's livelihood	residential electricity consumption	kWh/yr	380	620	10.3%	indicative
	Green Energy demonstration countries	number	108	200	13.1%	indicative
	population with access to natural gas	million people	180	250	6.8%	indicative

Key challenges in the power sector

- Solar power to have the highest percentage of increase: 89.5% with newly revised target of 35 GW by 2015
- Deploying safe and efficient nuclear is emphasised
- SO₂ and NO_x emission cap for coal-fired power plants



China's primary energy consumption mix would have to change fast



Thank You

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Assessment of Arctic oil and natural gas potential >

Figure 1. Resource Basins in the Arctic Circle Region



Source: U.S. Geological Survey

Oil and Natural Gas Resources of the Arctic



Arctic Oil and Natural Gas Provinces Map: The United States Geological Survey estimates that over 87% of the Arctic's oil and natural gas resource (about 360 billion barrels oil equivalent) is located in seven Arctic basin provinces: Amerasia Basin, Arctic Alaska Basin, East Barents Basin, East Greenland Basin, West Greenland East Canada Basin, East Greenland Rift Basin, West Siberian Basin and the Yenisey-Khatang Basin. Map by Geology.com and MapResources. [1] [2]



300,000 metric tons
adding 700 tons per day

