



# The Rise of China Energy and Environmental Implications

KELLY SIMS GALLAGHER  
Energy Technology Innovation Policy  
Harvard Kennedy School  
[www.energytechnologypolicy.org](http://www.energytechnologypolicy.org)

# Outline

- China's energy demand in context
- Domestic energy and environmental challenges and centrality of coal
- The rise of China's influence on world energy prices and environmental conditions
- Confronting the climate-change challenge
- Concluding thoughts and prospects for international energy cooperation with China

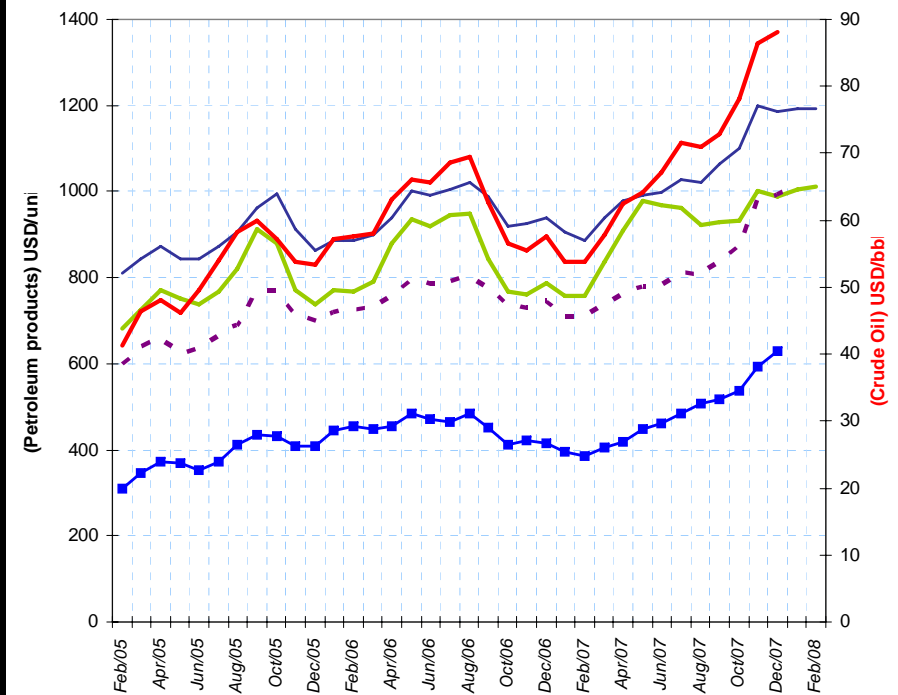
# Energy Comparisons

	USA	China	China/USA
Total energy consumption, 2006 (Mtoe)	2326	1697	72%
Net oil imports, 2006 (M bbl/day)	12.3	3.4	28%
Total oil consumption, 2006 (M bbl/day)	20.6	7.4	36%
Electricity capacity, 2007 (GW)	992	713	63%
Coal consumption, 2006 (Mtoe)	567	1193	210%
Reserves (percent of world)			
<i>Coal</i>	27%	13%	
<i>Oil</i>	2%	1%	
<i>Gas</i>	3%	1%	
Passenger cars (cars, pickups, SUVs), millions, 2007	~230	~30	13%
Total carbon dioxide emissions, 2007 (billion tonnes)	~6	~6	100%
Population	300 million	1.3 billion	433%



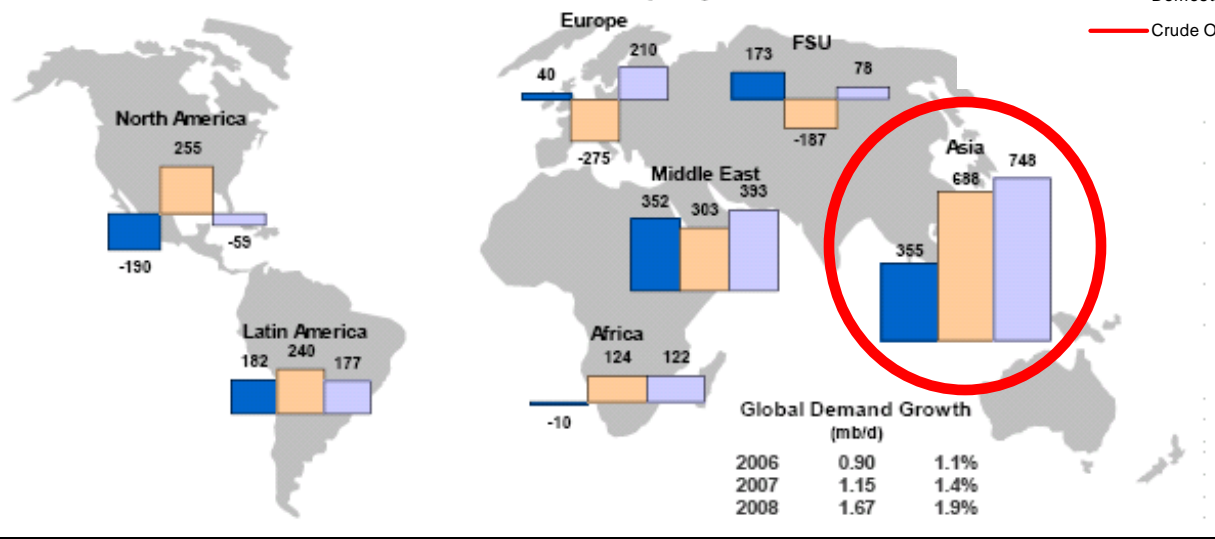
AFP

# Global Oil Demand Growth and Oil Prices



- Gasoline (US\$/1000L)
- Automotive Diesel (US\$/1000L)
- Domestic Heating Oil (US\$/1000L)
- Fuel Oil for Industry (US\$/Tonne)
- Crude Oil (US\$/bbl)

Global Demand Growth 2006/2007/2008  
thousand barrels per day

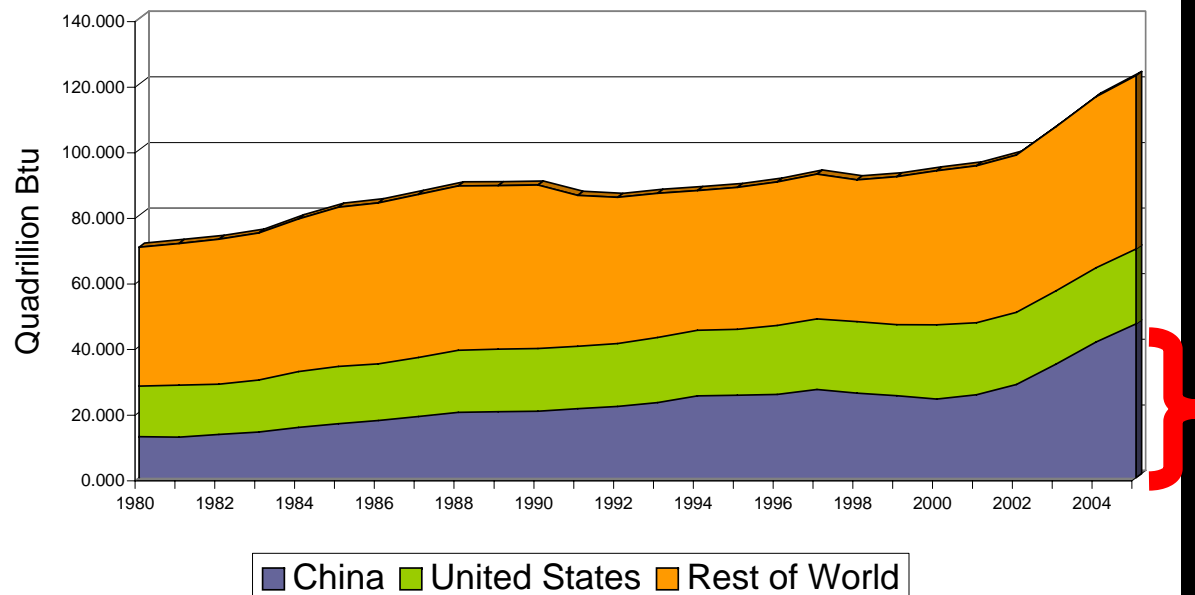


Statistics, International Energy Agency, February 2008 (above); and Oil Market Report, IEA, February 2008 (left)

# Global Coal Demand Growth and Coal Prices

## World Coal Consumption

Data Source: Energy Information Administration, U.S. DOE, 9/17/07



## Catching fire

The price per metric ton for coal out of Newcastle, Australia, is a key benchmark for the Asian market



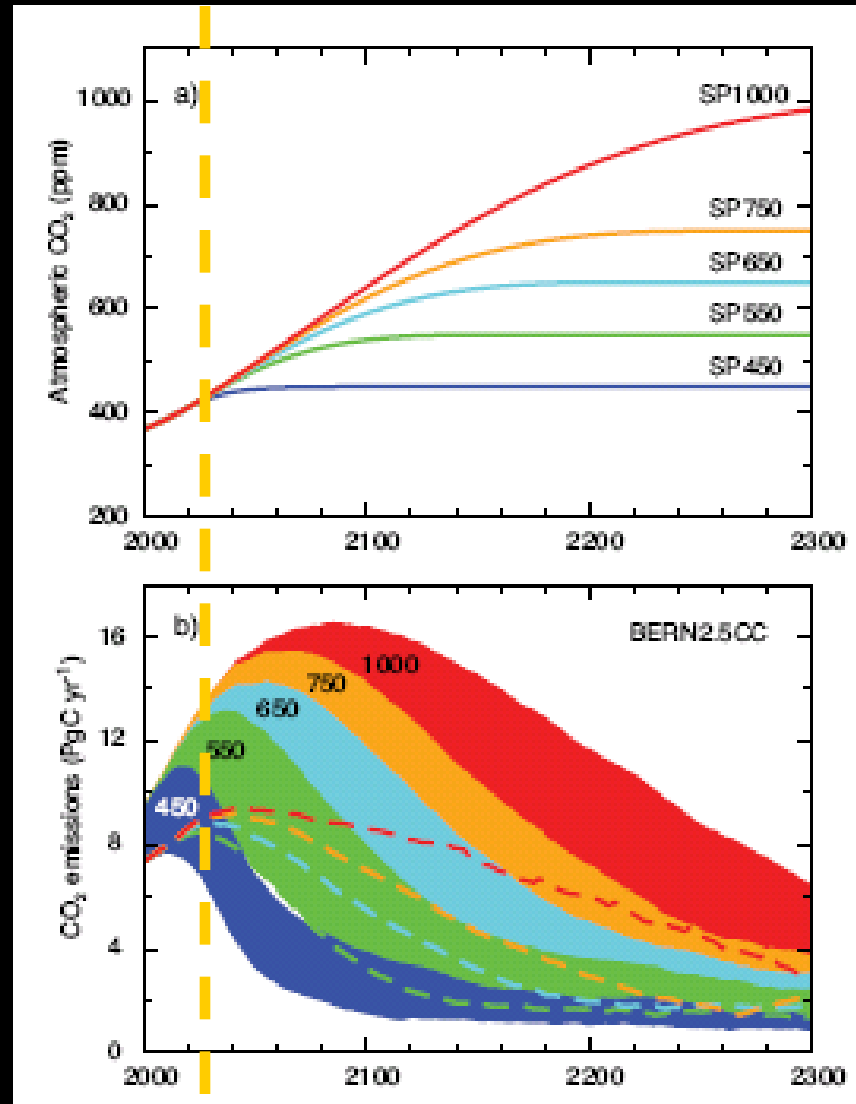
Source: globalCOAL

Oster, S., "China Spurs Coal-Price Surge," WSJ, February 12, 2008 (above); EIA, "International Coal Consumption Tables," 2007 (left)





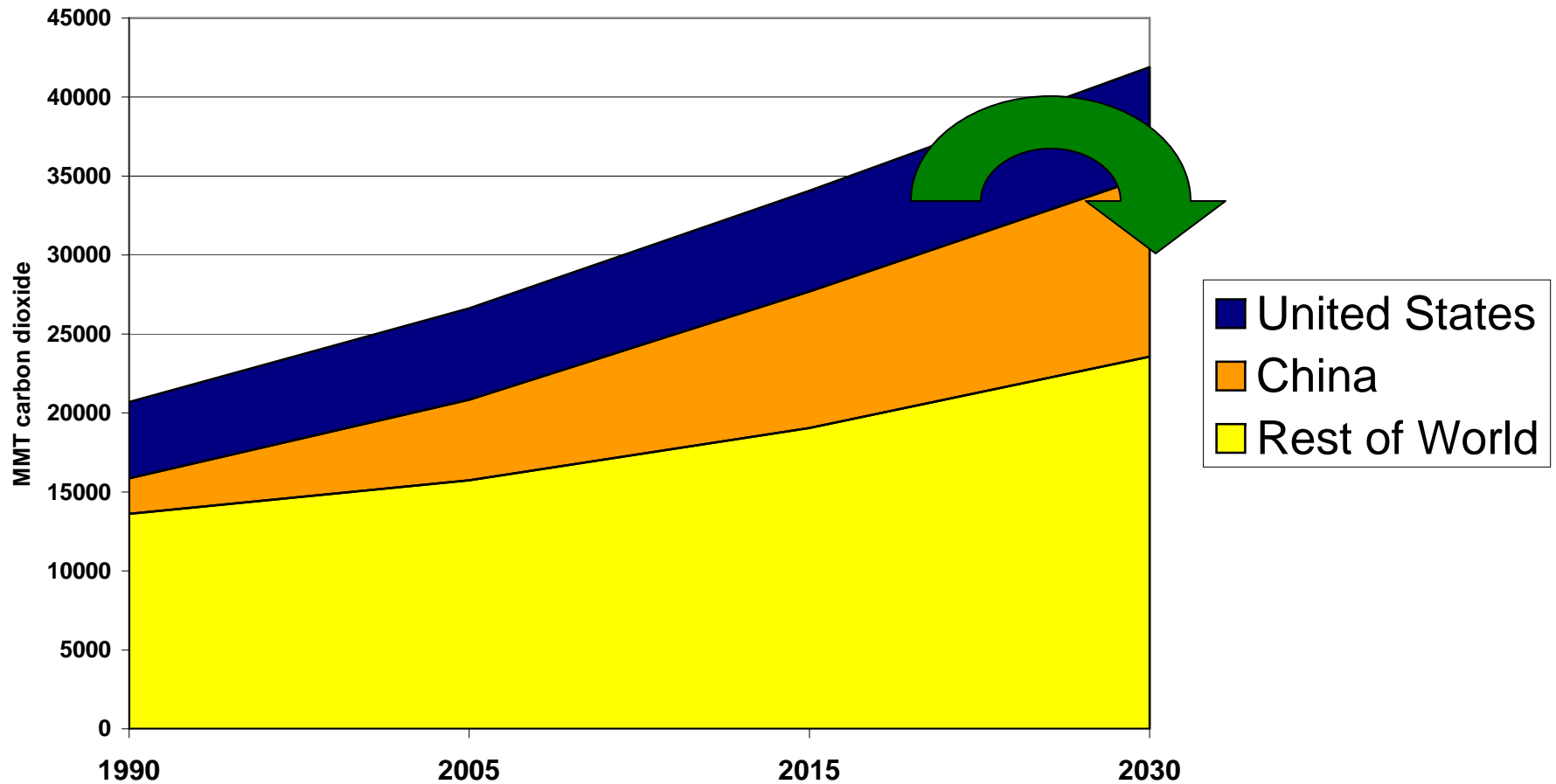
# Climate Change Stabilization Scenarios



**2030**



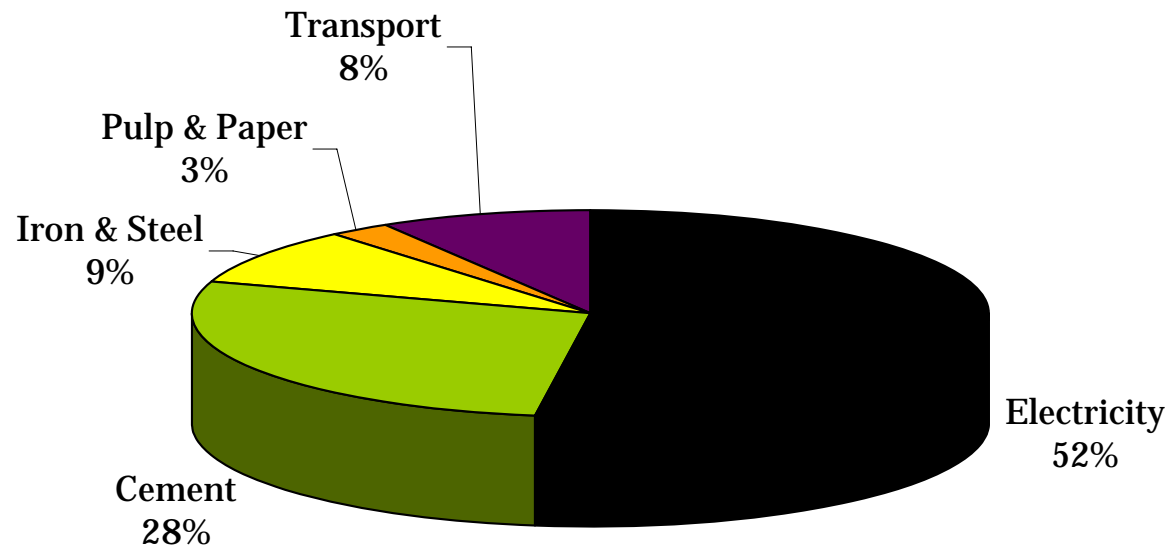
# Projections of CO<sub>2</sub> Emissions Through 2030



Data source: IEA, World Energy Outlook 2007

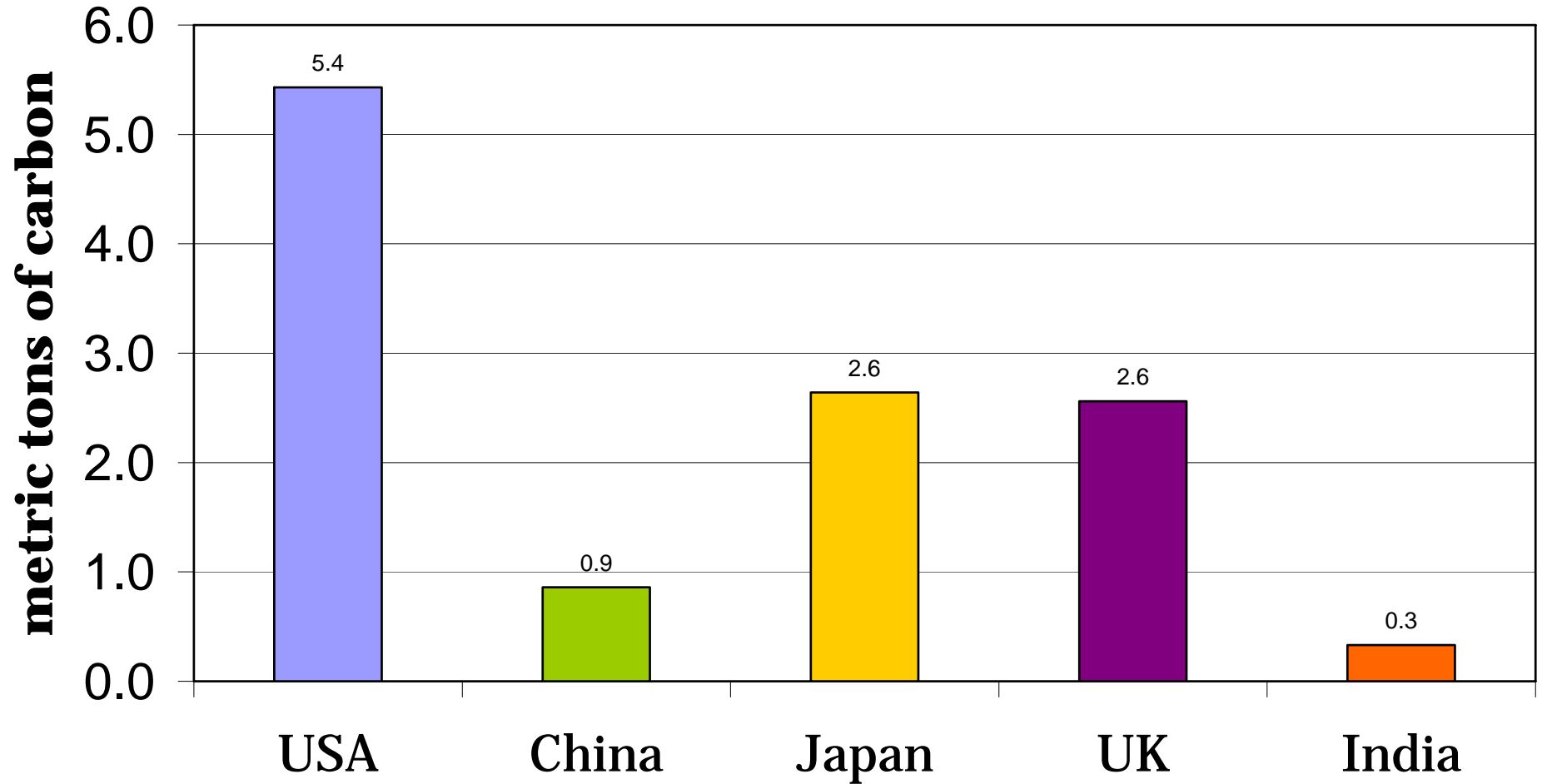
# China's GHG Emissions Profile

## China's Carbon Dioxide Emissions By Sector, 2000



Data Sources: Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory; Center for Clean Air Policy, "Greenhouse Gas Mitigation in China," November 2006 .

# Per Capita Carbon Emissions from Fossil-Fuel Burning 2003



# Coal Emissions

	2005			2030 BAU		
	Total Emissions (Gt CO <sub>2</sub> )	Coal Emissions (% of total)	Coal as fraction of global emissions	Emissions (Gt CO <sub>2</sub> )	Coal Emissions (% of total)	Coal emissions as fraction of global emissions
United States	5.8	2.1 (36%)	8%	6.8	2.7 (39%)	6%
China	5	4.1 (82%)	16%	11.4	8.9 (78%)	21%
World	26	11 (42%)	42%	41.9	18.7 (45%)	45%



# Transport Emissions from Oil

	2005			2030 BAU		
	Total Emissions (Gt CO <sub>2</sub> )	Transport emissions from oil (% of total)	Transport as % of global emissions	Emissions (Gt CO <sub>2</sub> )	Transport emissions from oil (% of total)	Transport as % of global
United States	5.8	2.5 (43%)	9%	6.8	2.8 (41%)	7%
China	5.1	0.32 (6%)	1%	11.4	1.2 (11%)	3%
World	26.6	5.2	20%	41.9	8.0	19%

# Capital Costs of Advanced Coal in China in 2006

