

# *Leveling the Carbon Playing Field*

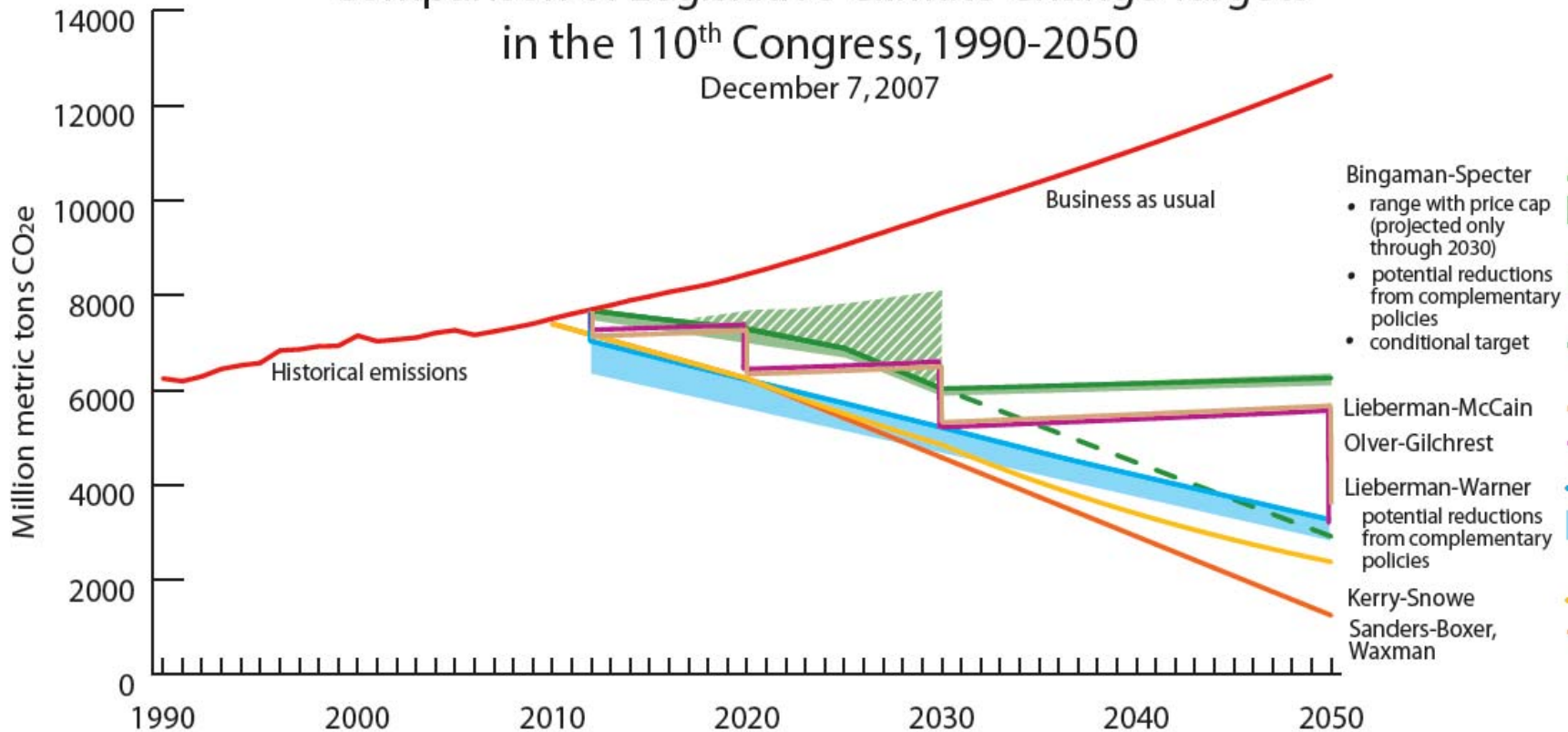
Beijing, September 2008



**Rob Bradley**  
**Climate, Energy and Pollution Program**  
**World Resources Institute**  
**[rbradley@wri.org](mailto:rbradley@wri.org)**  
**<http://www.wri.org>**

# Comparison of Legislative Climate Change Targets in the 110<sup>th</sup> Congress, 1990-2050

December 7, 2007



 WORLD RESOURCES INSTITUTE

For a full discussion of underlying methodology, assumptions and references, please see <http://www.wri.org/usclimatetargets>. WRI does not endorse any of these bills. This analysis is intended to fairly and accurately compare explicit carbon caps in Congressional climate proposals and uses underlying data that may differ from other analyses. Data post-2030 may be derived from extrapolation of EIA projections.

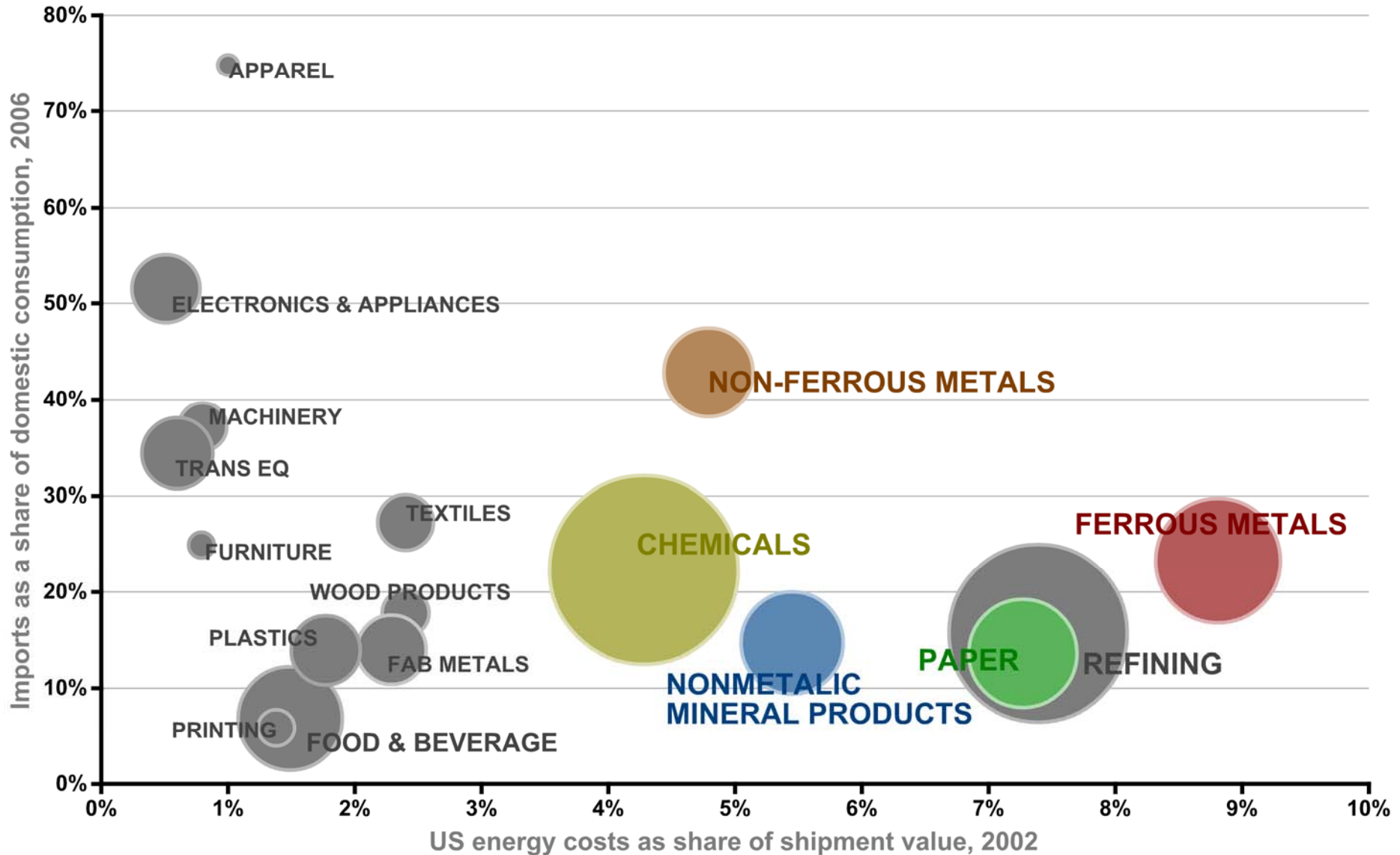
# Trade measures in US climate policy



- Concern about heavy industry jobs is politically central
- Prevent “leakage” of emissions
- Encourage trading partners to take action on climate

# Industry Exposure to Climate Costs

Carbon-intensity and trade exposure



Source: BEA, EIA and CSA estimates. Circle size indicates 2002 US CO2 emissions

# Sector and Product Coverage

## 2005

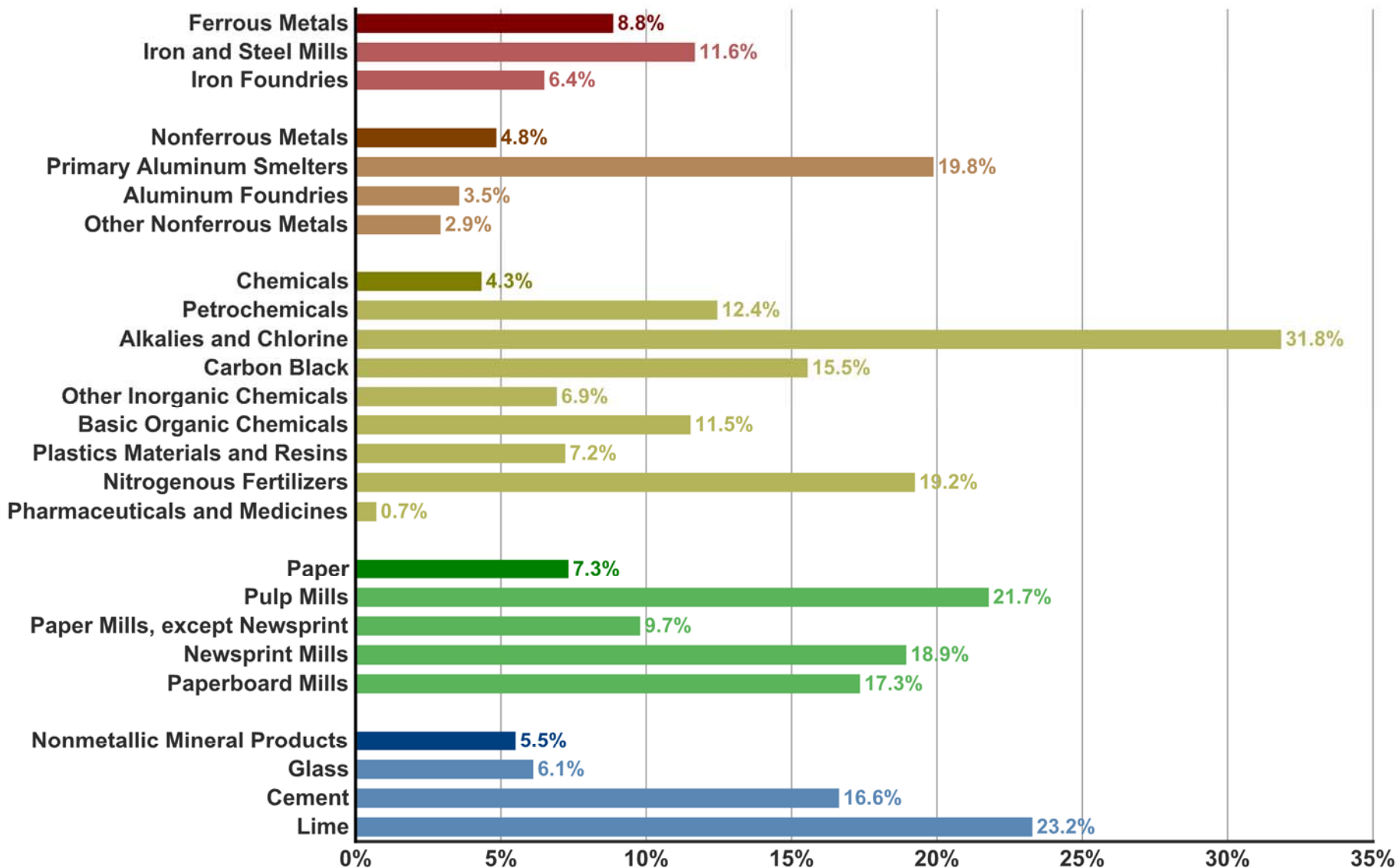
<b>Ferrous Metals</b> <i>Steel ingots, bars, rods, plates, sheets, tubes</i>	<b>36 mtCO2</b> 0.62%	<b>96 mmtCO2</b> 1.65%	<b>\$36.7 billion*</b> 0.29%	<b>250,100</b> 0.19%
<b>Non-ferrous Metals</b> <i>Aluminum ingots, bars, rods, plates, sheets, tubes</i>	<b>15 mmtCO2</b> 0.25%	<b>75 mmtCO2</b> 1.29%	<b>\$24.4 billion*</b> 0.20%	<b>144,200</b> 0.11%
<b>Chemicals</b> <i>Olefins, Aromatics, Inorganics, Ammonia</i>	<b>146 mmtCO2</b> 2.50%	<b>377 mmtCO2</b> 6.48%	<b>\$209.2 billion</b> 1.68%	<b>872,100</b> 0.65%
<b>Paper &amp; Pulp</b> <i>Paper and Paperboard, cut and un-cut</i>	<b>64 mmtCO2</b> 1.11%	<b>159 mmtCO2</b> 2.74%	<b>\$54.6 billion</b> 0.44%	<b>484,200</b> 0.36%
<b>Non-metal Mineral Products</b> <i>Hydraulic cement</i>	<b>66 mmtCO2</b> 1.14%	<b>97 mmtCO2</b> 1.66%	<b>\$53.3 billion</b> 0.43%	<b>505,300</b> 0.38%
<b>Sub-total</b>	<b>327 mmtCO2</b> 5.62%	<b>804 mmtCO2</b> 13.82%	<b>\$378.2 billion</b> 3.04%	<b>2,253,900</b> 1.69%

Source: IEA, BEA, BLS and ILO. Emission data is 2004, Employment and GDP data is 2005.

SITC Codes of included products (version 2): Steel (672, 673, 674, 675, 676, 677, 678, 679), Chemicals (51111, 51112, 51113, 51122, 51123, 51124, 51211, 52218, 52323, 52213, 52251), Cement (6612), Aluminum (6841, 6842), Paper (641, 642)

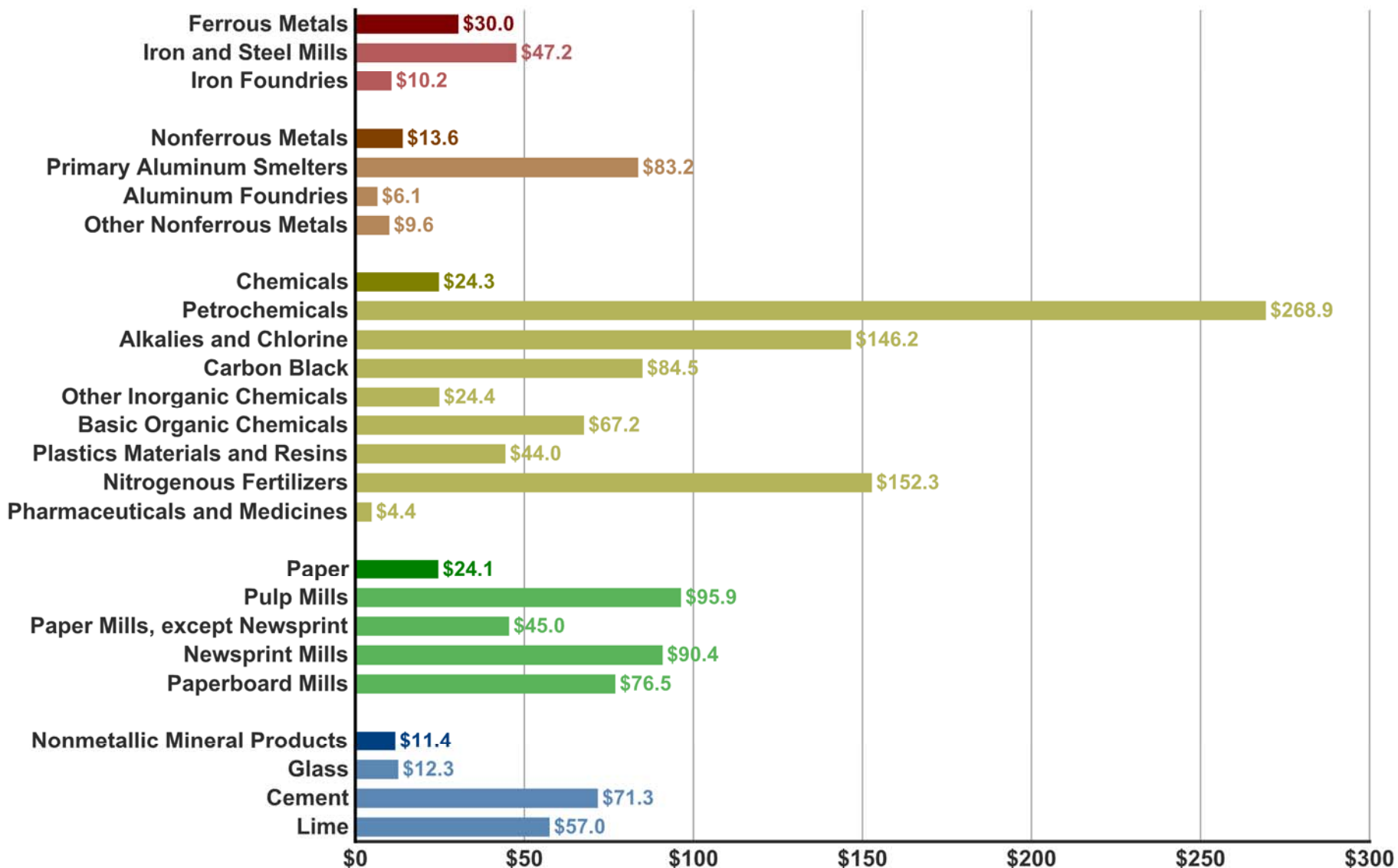
# Energy Costs as Share of Shipment Value

2002



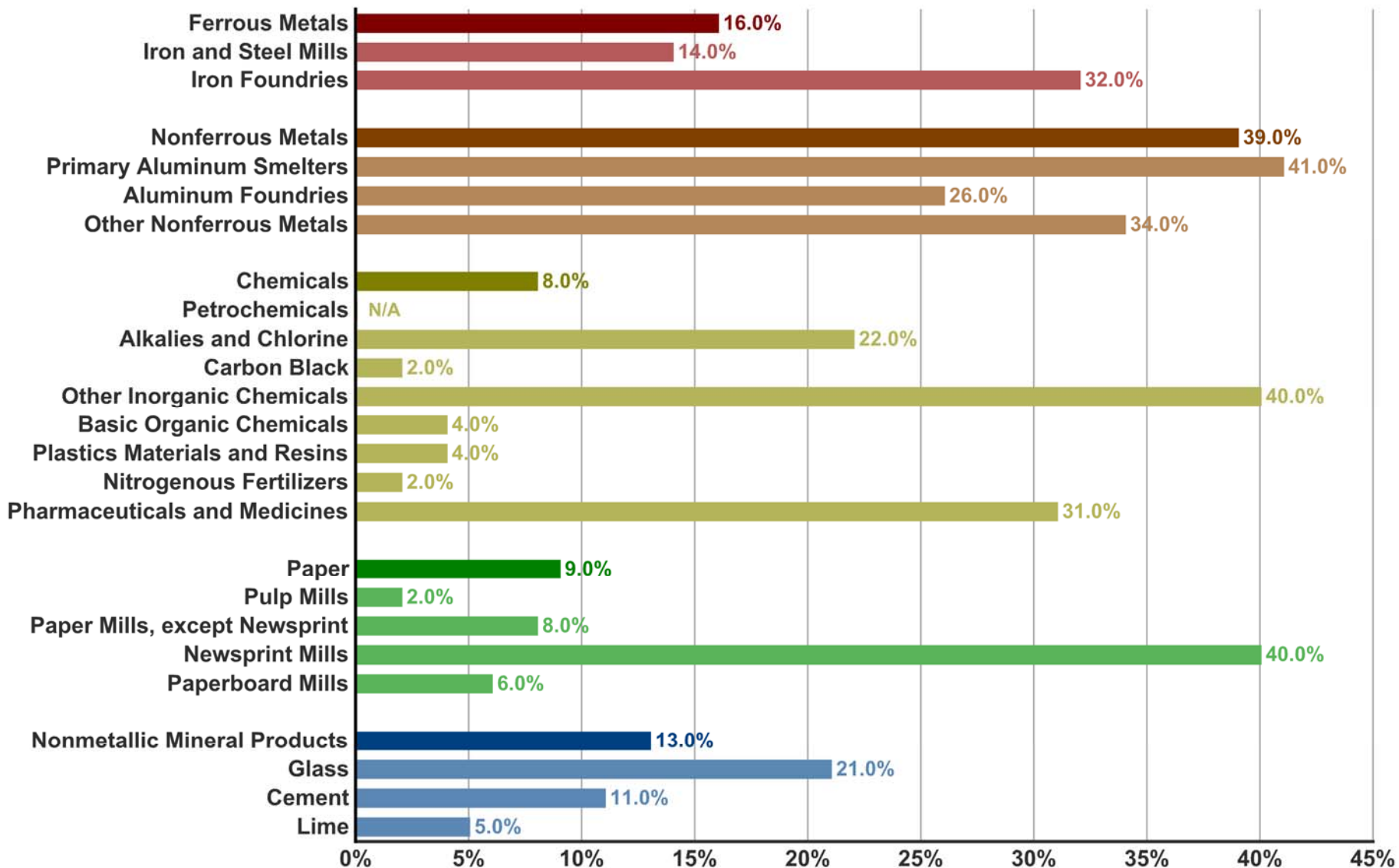
# Energy Costs per Employee

thousand USD, 2002



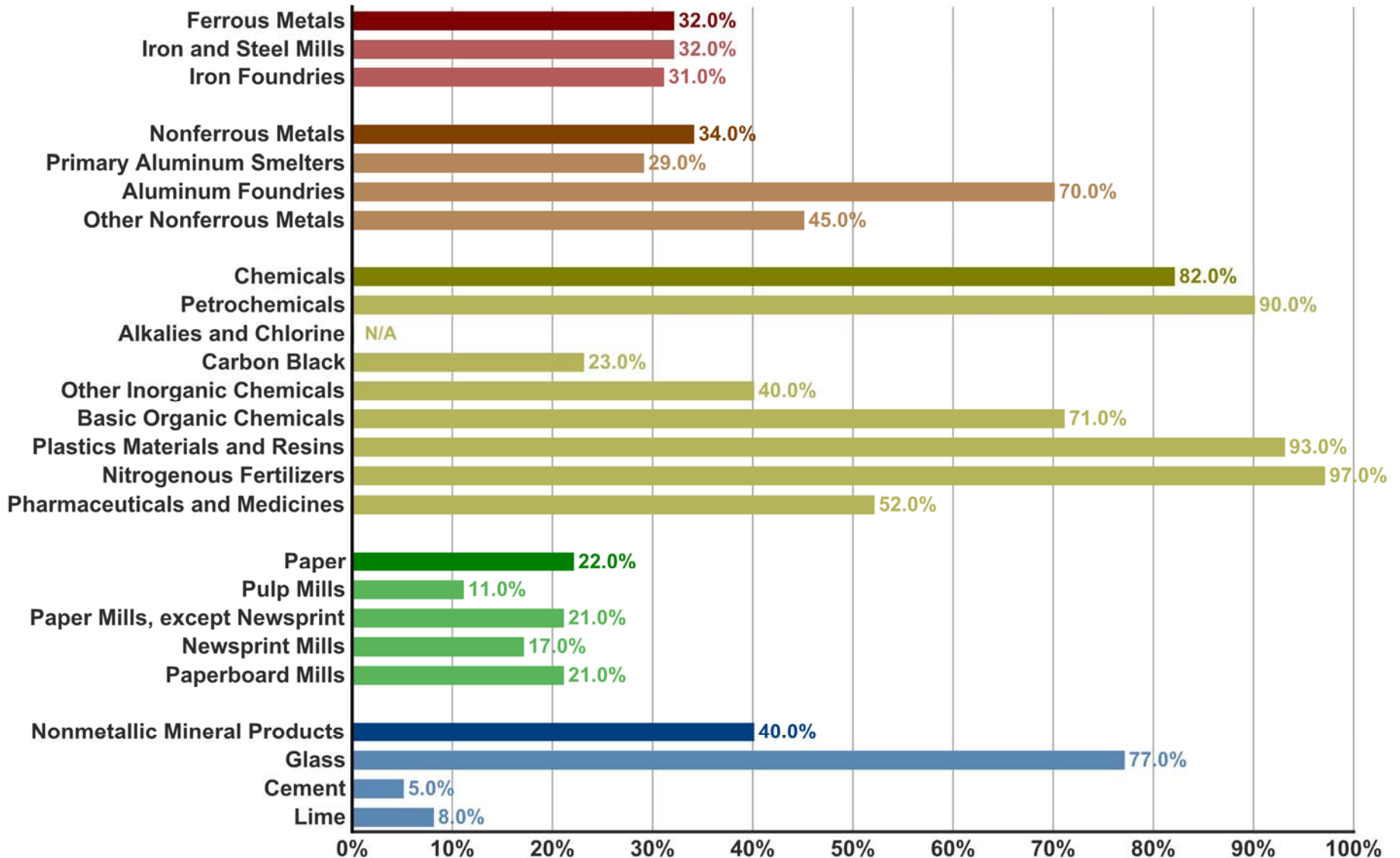
# Net Electricity as Share of Total Energy Consumption

2002



# Natural Gas as Share of Total Energy Consumption

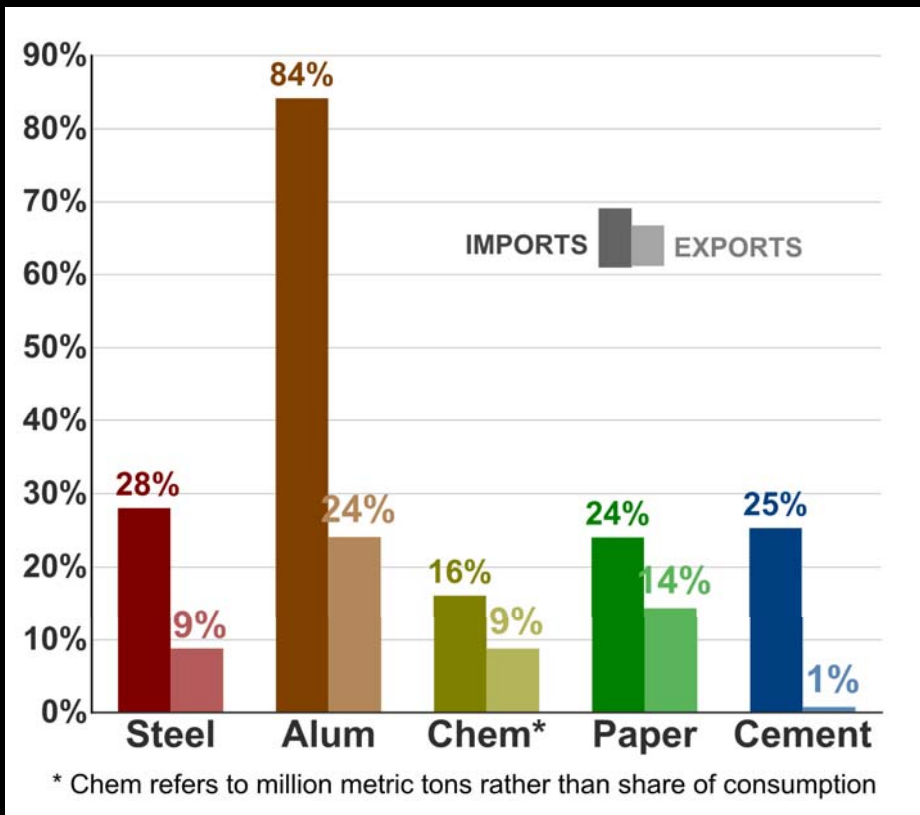
2002



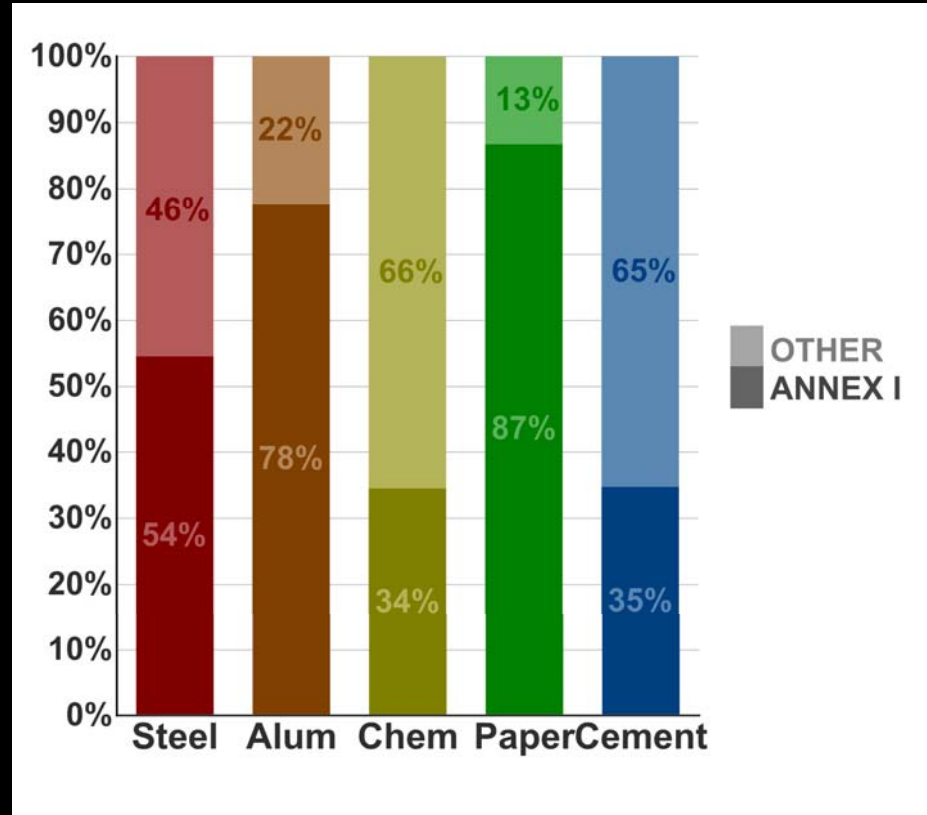
# Carbon-Intensive Imports

by source and share of domestic consumption

## As Share of Consumption



## By Country of Origin



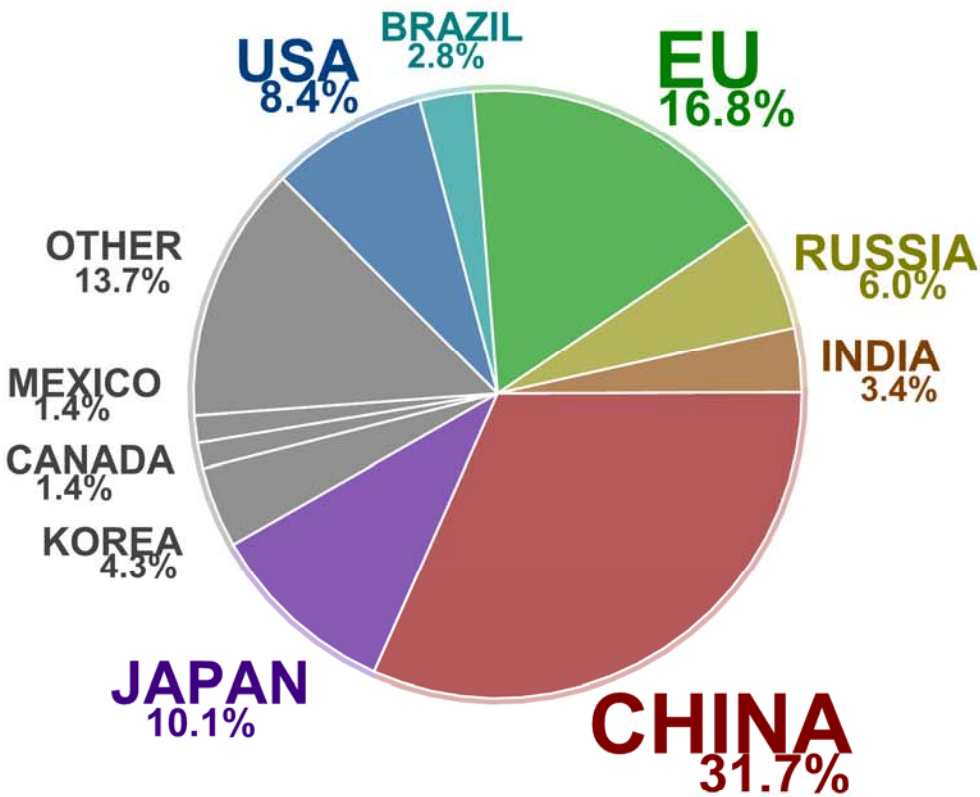
# US Imports by Origin

2005

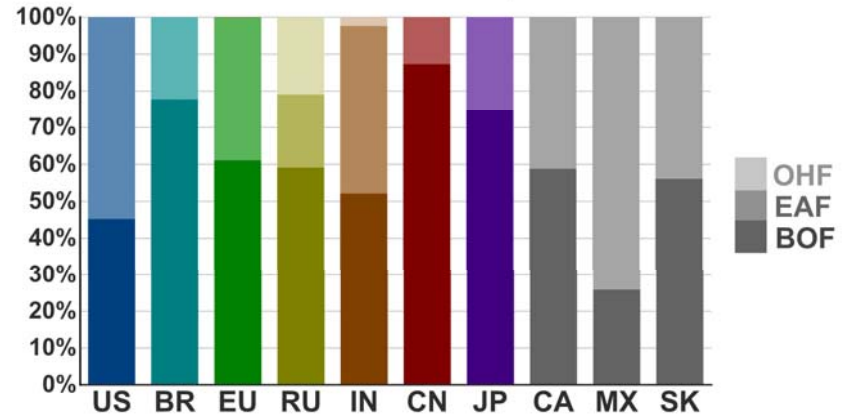
Steel		Aluminum		Chemicals		Paper		Cement	
Source	Share	Source	Share	Source	Share	Source	Share	Source	Share
Canada	18.56%	Canada	51.02%	Trinidad	41.58%	Canada	66.89%	Canada	16.06%
EU	17.25%	Russia	17.08%	Canada	19.30%	EU	16.82%	China	14.04%
Mexico	13.08%	EU	6.24%	Ukraine	7.34%	China	3.53%	EU	13.87%
Brazil	8.24%	OPEC	5.10%	OPEC	6.60%	Korea	2.24%	OPEC	9.97%
China	7.11%	Brazil	3.79%	EU	4.49%	Mexico	2.20%	Thailand	8.60%
Korea	5.67%	China	3.07%	Korea	4.36%	Brazil	1.84%	Greece	8.28%
Russia	5.12%	S. Africa	2.50%	Brazil	3.79%	Chile	1.50%	Korea	7.94%
Turkey	4.16%	Tajikistan	2.43%	Russia	3.19%	Japan	0.96%	Mexico	6.49%
Japan	4.12%	Argentina	1.54%	Eq. Guinea	2.76%	Norway	0.85%	Columbia	5.49%
India	2.70%	Australia	1.27%	Chile	1.52%	OPEC	0.71%	Peru	3.11%
<b>54.42%</b>		<b>77.57%</b>		<b>34.46%</b>		<b>86.66%</b>		<b>34.61%</b>	

# Global Steel Production

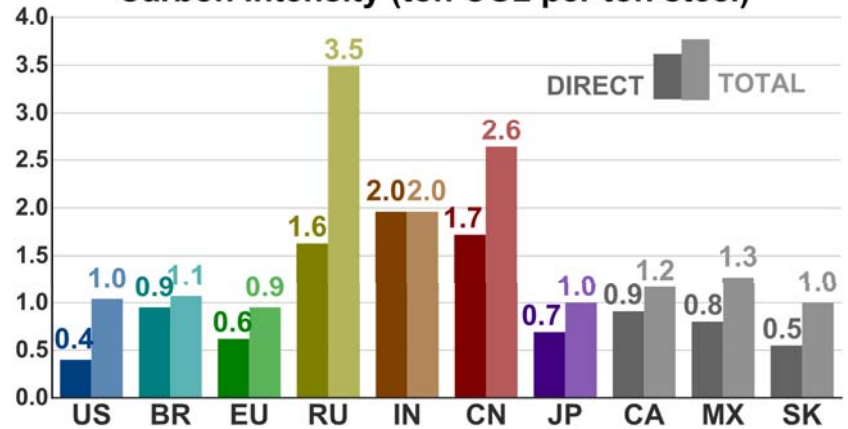
million tons of crude steel, 2005



## Steel Production by Process

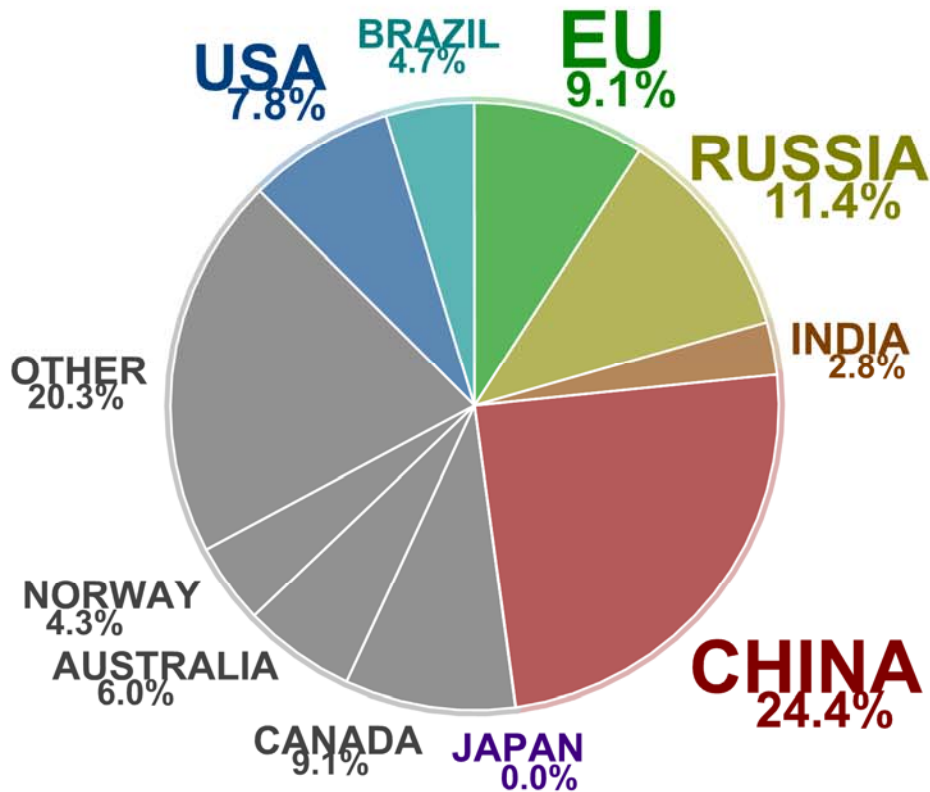


## Carbon Intensity (ton CO2 per ton steel)

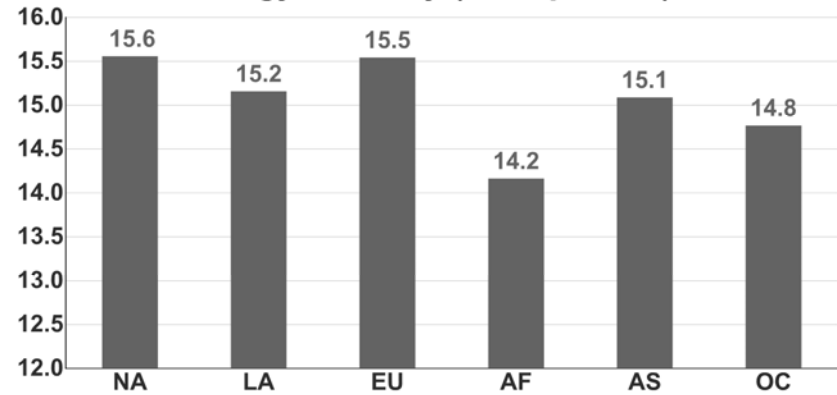


# Global Aluminum Production

million tons of primary aluminum, 2005

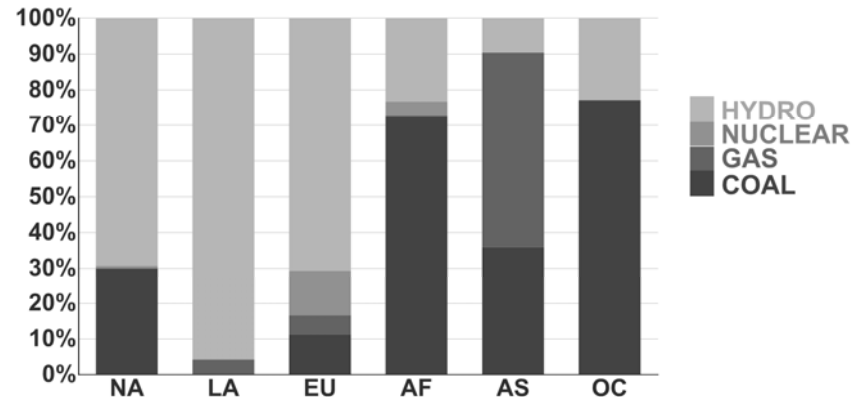


## Energy Intensity (mwh per ton)



NA: North America, LA: Latin America, EU: Europe AF: Africa, AS: Asia, OC: Oceania

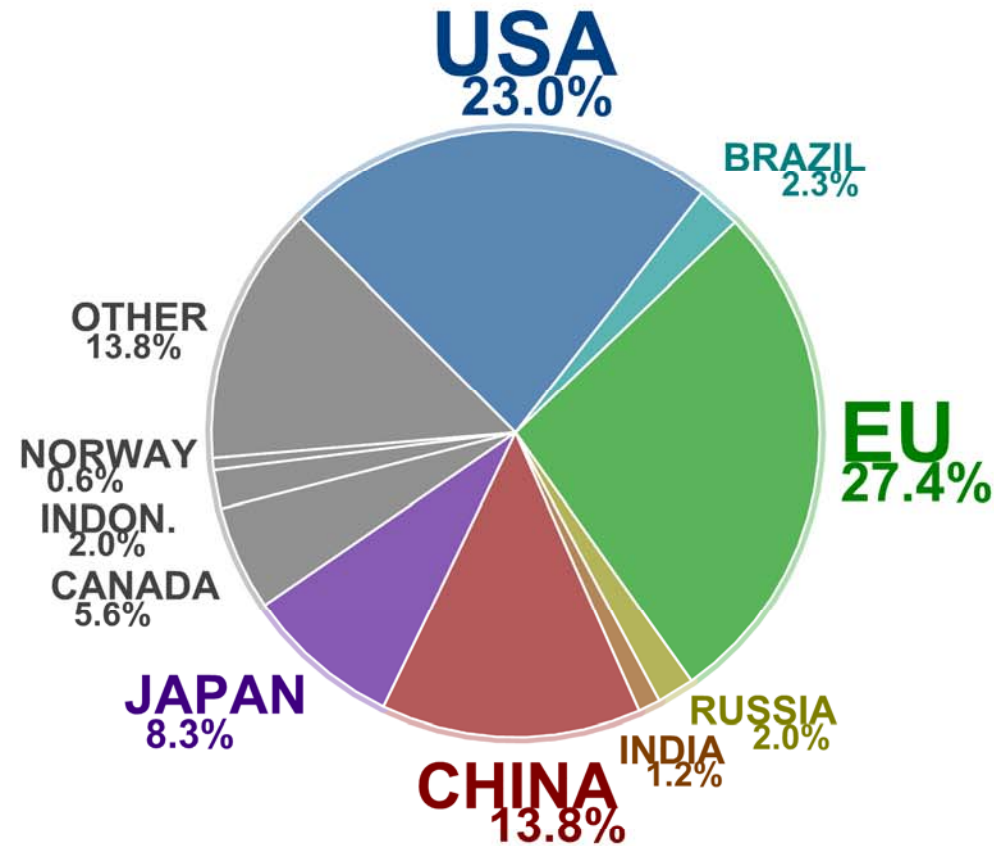
## Power Gen Fuel Source



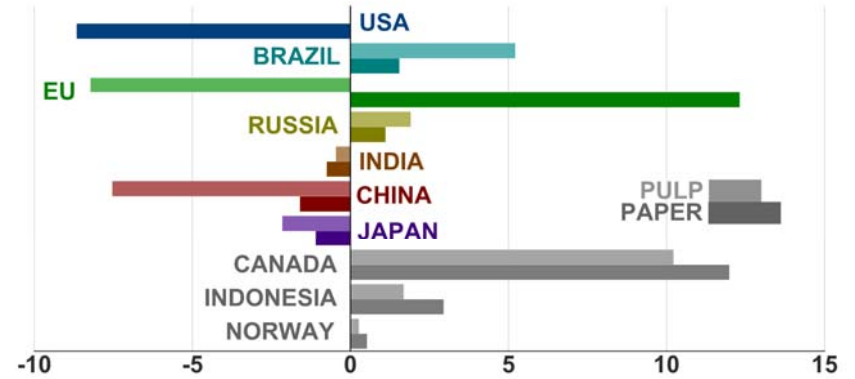
NA: North America, LA: Latin America, EU: Europe, AF: Africa, AS: Asia, OC: Oceania

# Global Paper Production

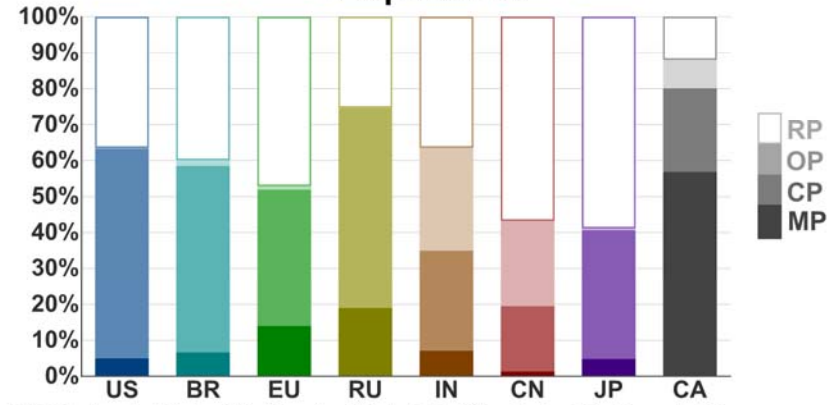
million tons, 2005



Trade Balance (million tons)



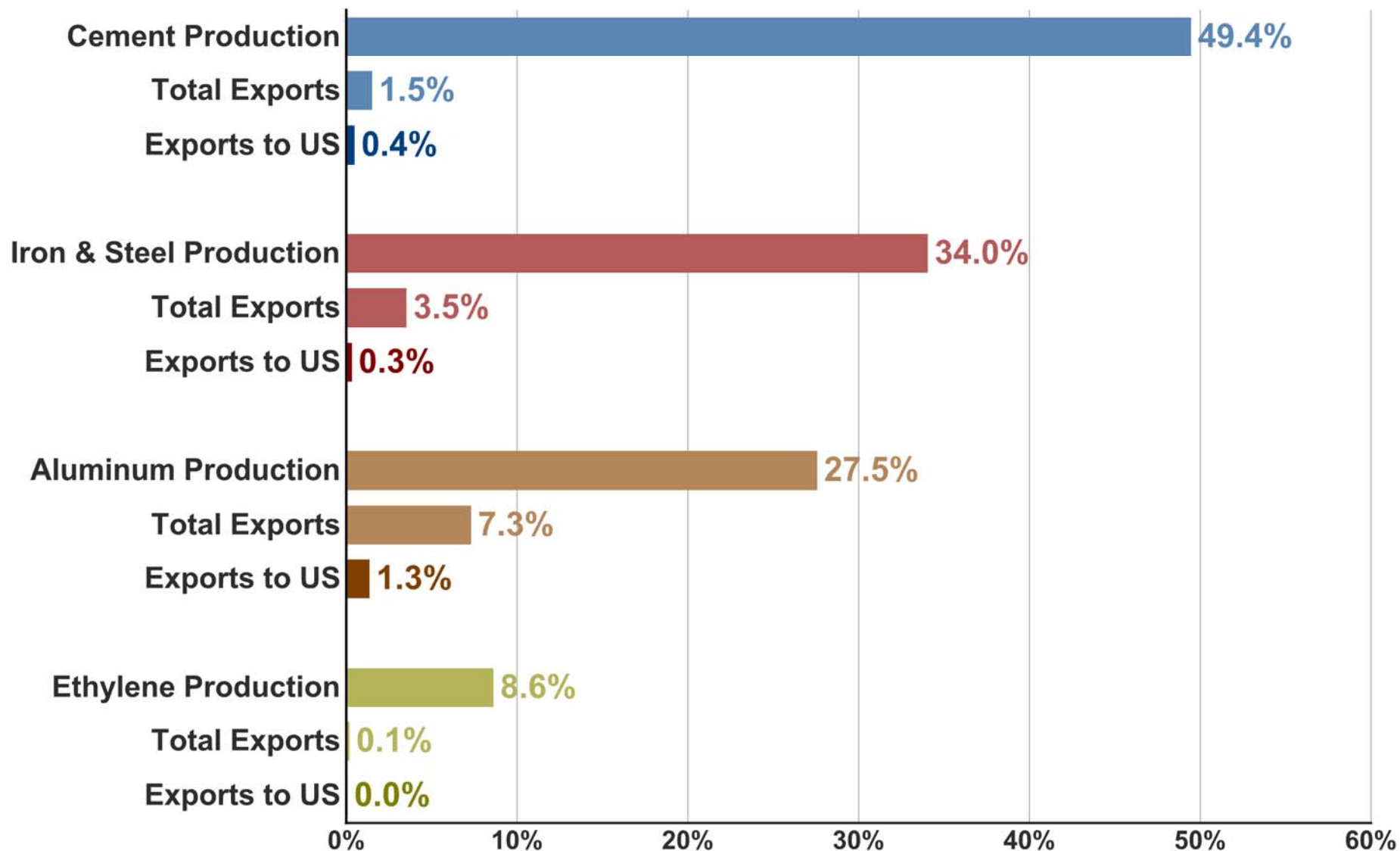
Pulp Source



MP: Mechanical Pulp, CP: Chemical Pulp, OP: Other Pulp, RP: Recycled Paper

# China: Both the Producer and the Market

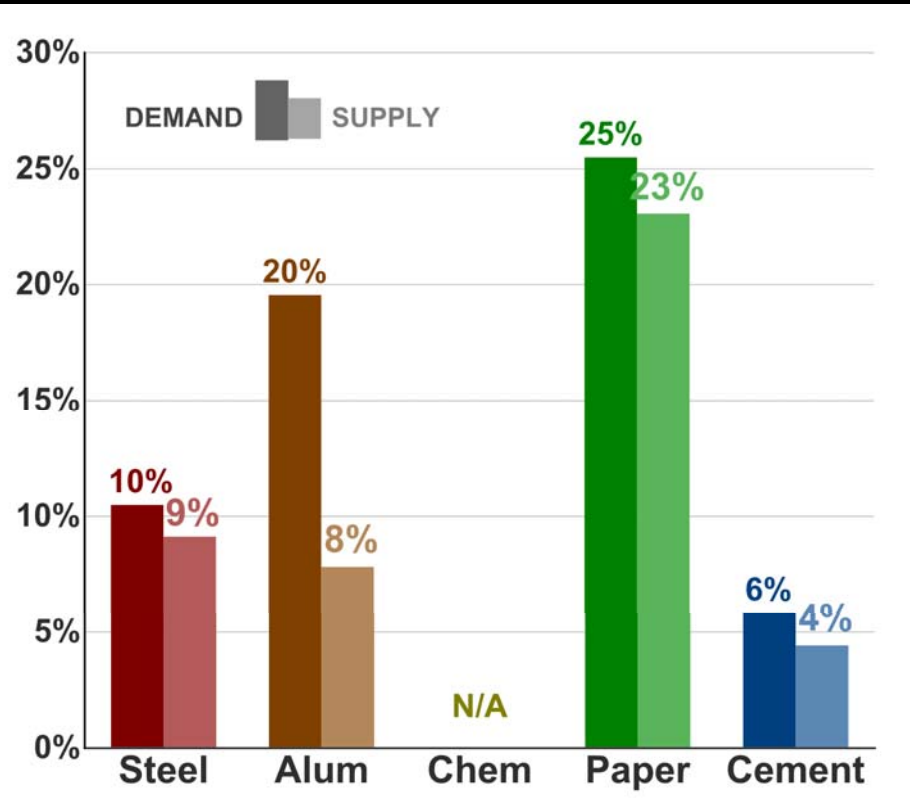
Production, total exports and exports to the US as a share of global production



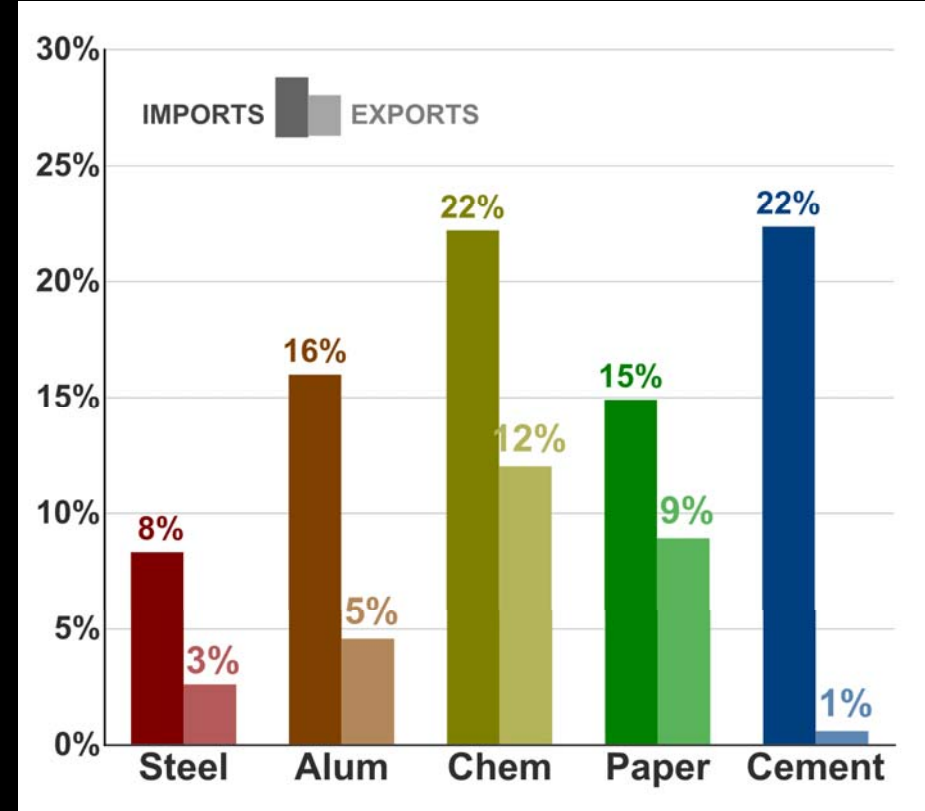
# The Extent of US Trade Leverage

## US Imports as Share of Global Trade and Production

### US Supply and Demand as Share of Global Total



### US Imports and Exports as Share of Global Trade





# Bali and sectors

- Developing country mitigation actions
- Technology development and transfer
- International sectoral approaches

# Developing country actions

Art. 1 (b) (ii)

Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, **supported and enabled by technology, financing and capacity-building**, in a measurable, reportable and verifiable manner;





# Conclusions

- There is real potential for multilateral engagement in international instruments.
- US policy will aim to protect energy intensive sectors against relocation.
- At present the trade measures being proposed are unlikely to be effective on their own.