

Industry Perspective: National Industry Implications of GHG Policy

The Tennessee Climate Change Dialogue
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Dr. TK Swift
Chief Economist



The Business of Chemistry in Tennessee

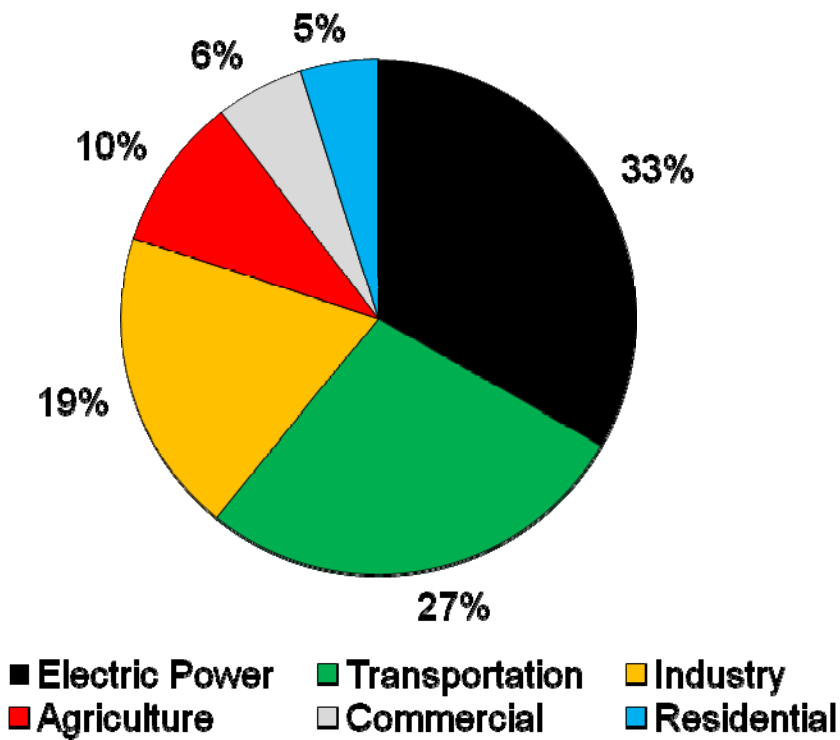


- The business of chemistry:
 - Making life healthier, safer and more productive
 - Innovative and knowledge intensive
 - Environmentally responsible
- One of largest industries in Tennessee, with \$13.4 billion in revenues (14th largest) from 279 plant facilities
- A leading exporter generating \$3.25 billion in exports
- Over 26,000 good jobs (average salary/wage of over \$62,900) and each creates 4.0 others, for a total of 131,000 jobs generated in Tennessee

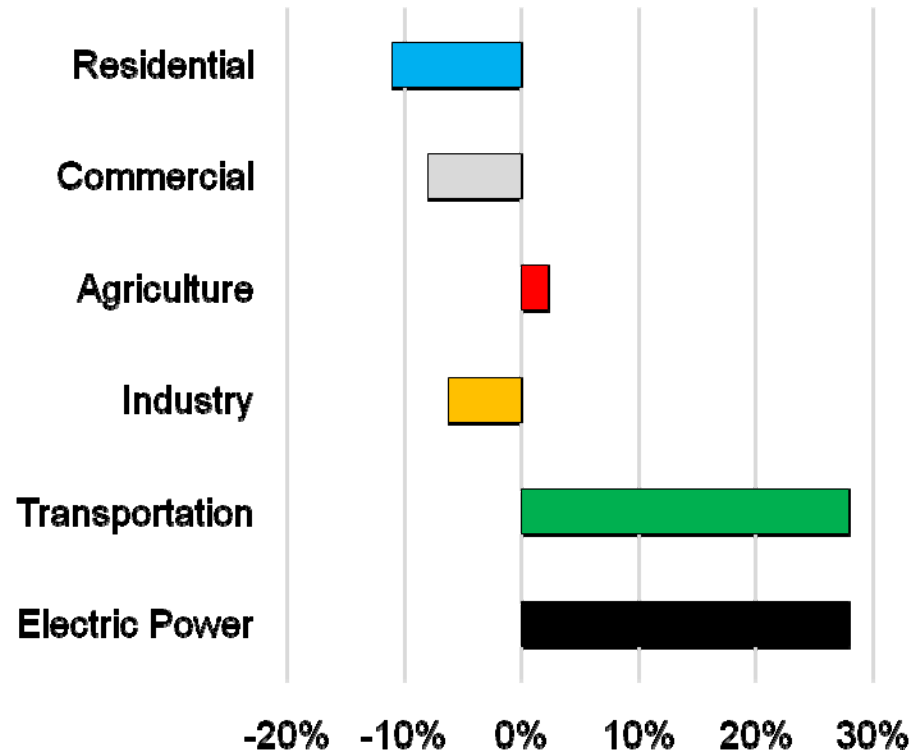


GHG Emissions by Sector

Gross GHG Emissions by Sector, 2006

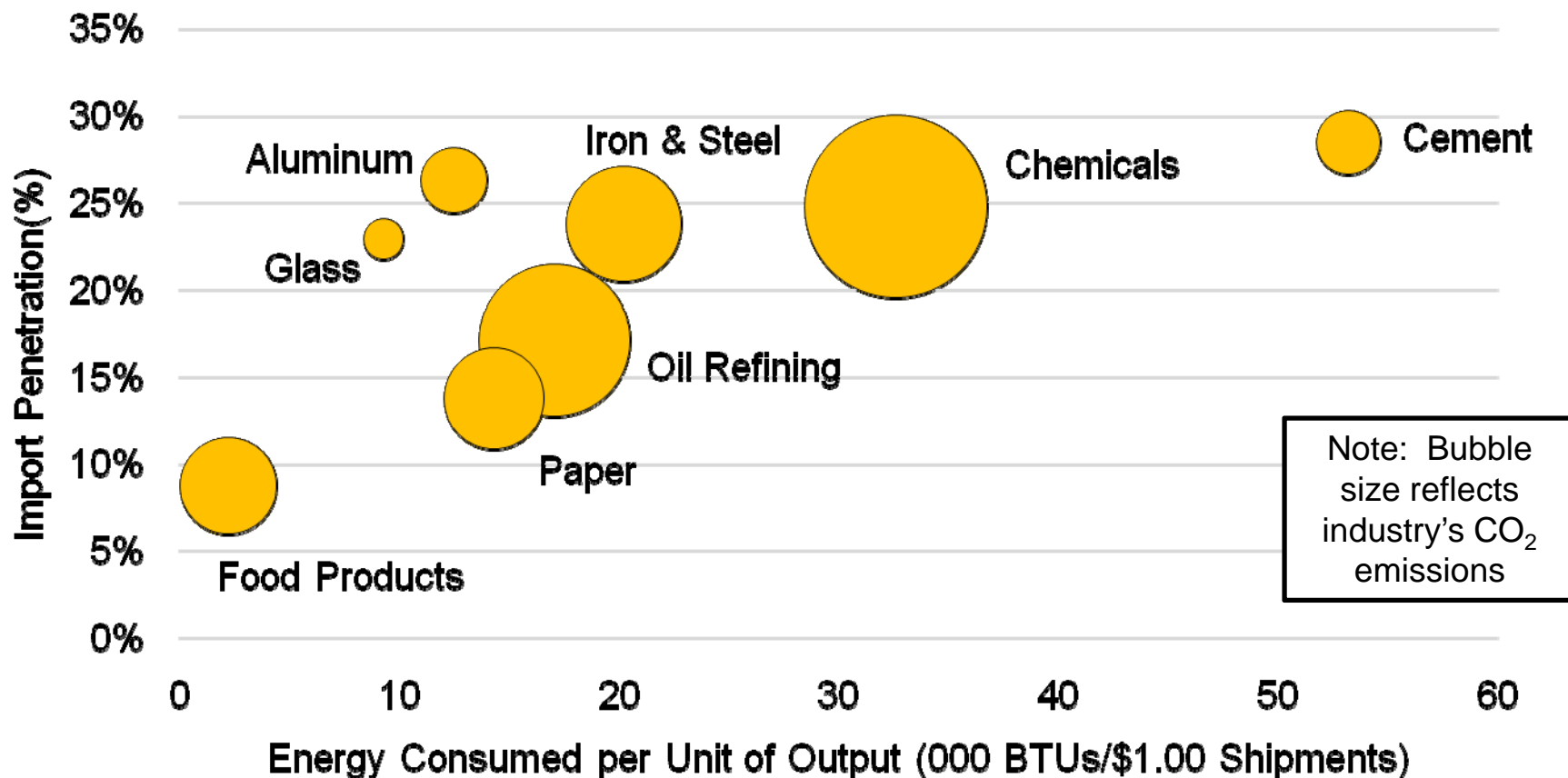


1990-06 Growth in GHG Emissions by Sector





Industry Exposure to GHG Costs: Energy Intensity and Imports



Note: Bubble size reflects industry's CO₂ emissions



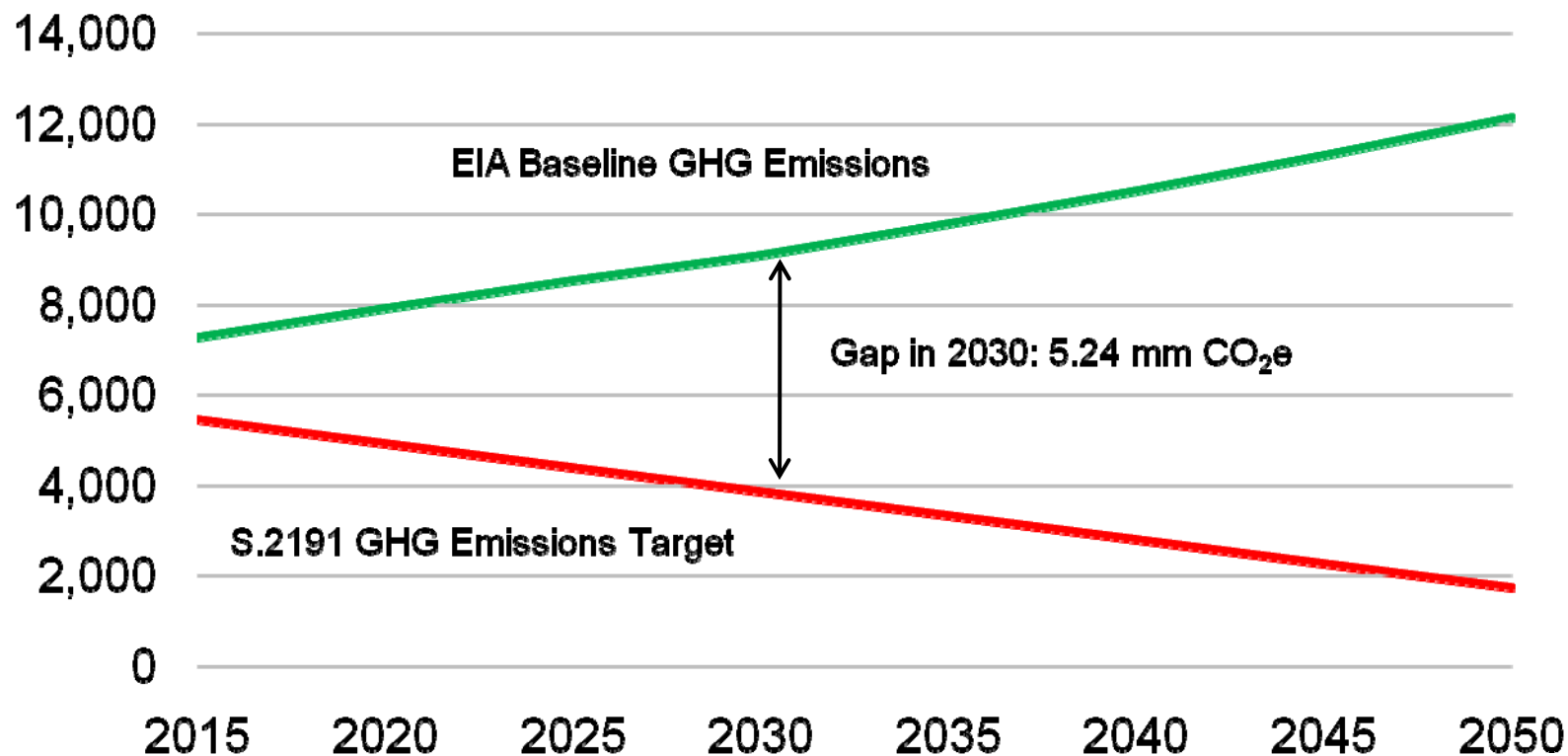
US Per Capita Emissions: Effort Required to Meet S.2191 Targets

Year	Historical / Baseline Emissions				High Cost Case		
	GHG Emissions (mm TCO _{2e})	Population (millions)	per capita GHG Emissions	% Δ	S.2191 Targets	Required per capita GHG Emissions	% Δ
1990	6,147	249	24.7				
2000	6,978	282	24.7	0.1%			
2015	7,733	322	24.0	-2.9%	5,463	17.0	
2020	8,175	336	24.3	1.4%	4,931	14.7	-13.4%
2030	9,189	364	25.3	3.8%	3,869	10.6	-27.5%



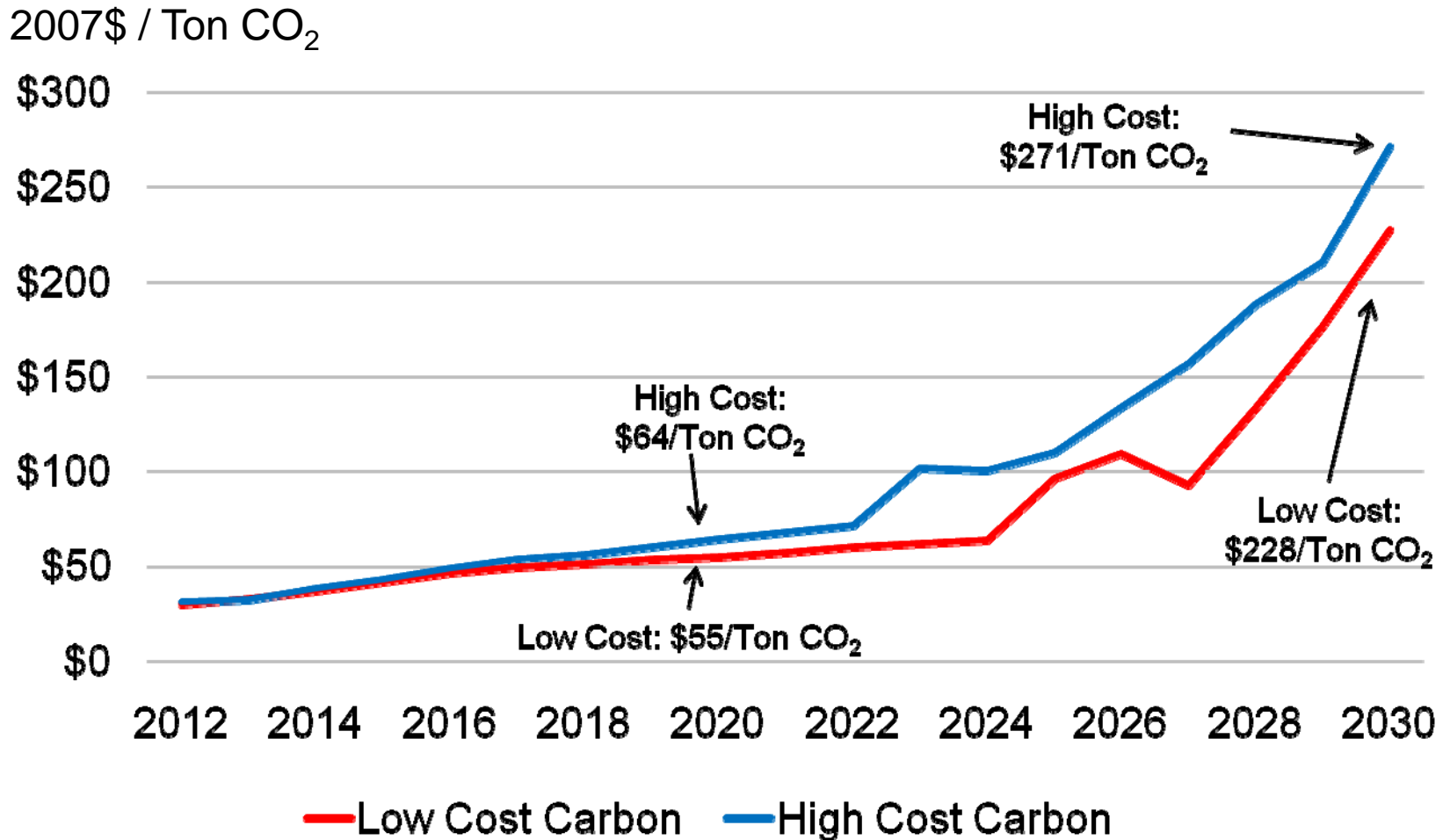
Trends in GHG Emissions: EIA Baseline vs. S.2191 Targets

Million Metric Tons CO₂ Equivalent





Macroeconomic Impact of S.2191: Carbon Allowance Price




Source: ACCF/NAM



Cost Implications of Carbon Allowance Values

	Low Cost Case			High Cost Case		
	2014	2020	2030	2014	2020	2030
Rise in Gasoline Prices	13%	20%	77%	50%	69%	145%
Rise in Residential Electricity Prices	13%	28%	101%	14%	33%	129%
Rise in Industrial Electricity Prices	11%	28%	101%	12%	34%	129%
Rise in Industrial Natural Gas Prices	36%	26%	108%	40%	36%	146%

Source: ACCF/NAM



Effects of S.2191 on the USA Compared to Baseline Forecast

	Low Cost Case			High Cost Case		
	2014	2020	2030	2014	2020	2030
Loss in GDP	-0.8%	-0.8%	-2.6%	-1.6%	-1.1%	-2.7%
Loss in Jobs (millions)	-0.85	-1.22	-3.04	-1.86	-1.80	-4.05
Loss in Household Income (2007\$)	-\$1,010	-\$739	-\$4,022	-\$2,779	-\$2,927	-\$6,752

Source: ACCF/NAM



Cost Implications of Carbon Allowance Values in Tennessee

	Low Cost Case		High Cost Case	
	2020	2030	2020	2030
Rise in Retail Gasoline Prices (\$/gallon)	\$0.27 (21%)	\$2.21 (74%)	\$2.30 (70%)	\$5.30 (144%)
Rise in Residential Electricity Prices (cents per KWh)	\$1.31 (32%)	\$8.22 (122%)	\$3.22 (40%)	\$13.55 (159%)
Rise in Residential Natural Gas Prices (\$/mm BTUs)	\$0.76 (25%)	\$9.60 (99%)	\$3.75 (35%)	\$17.00 (142%)

Source: ACCF/NAM



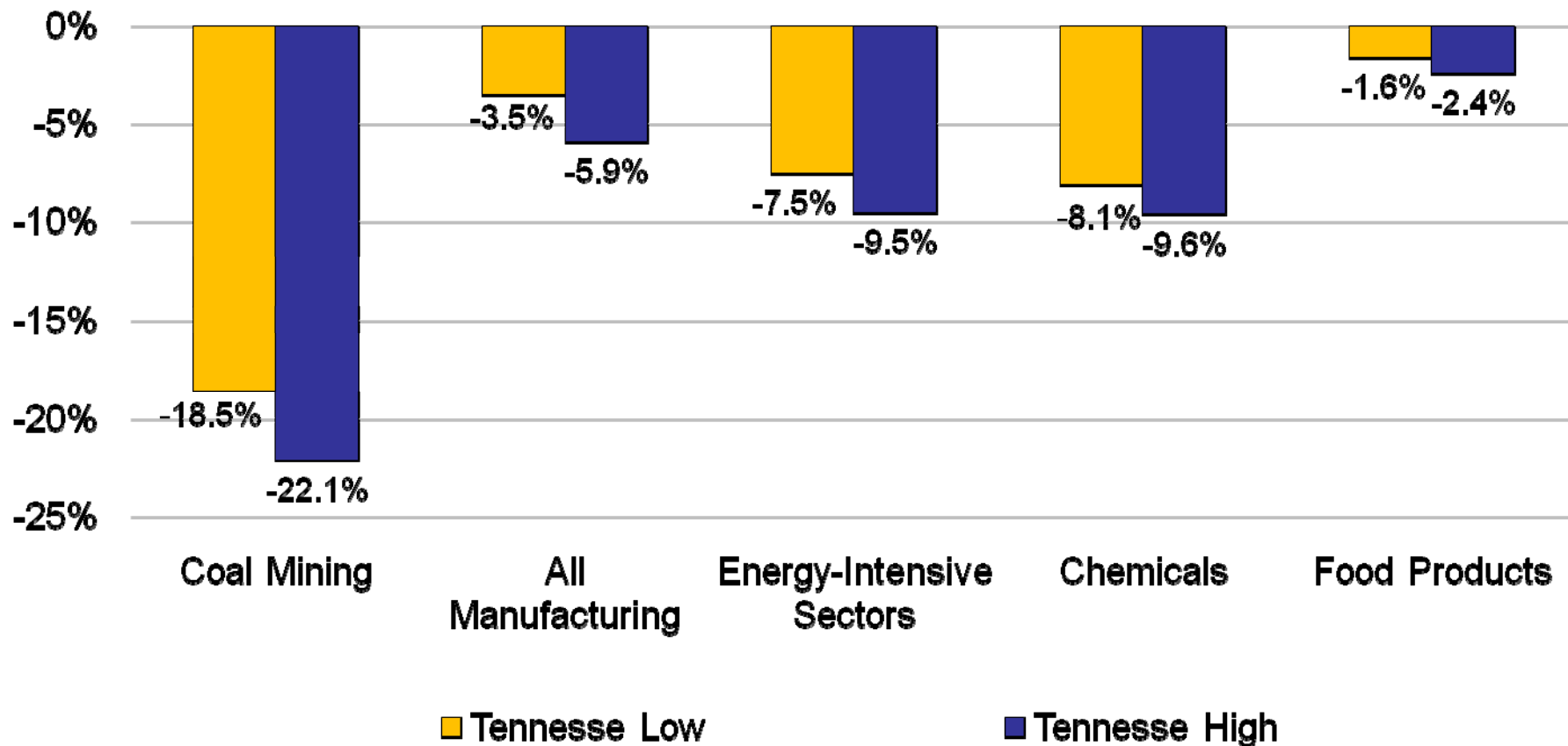
Effects of S.2191 on Tennessee Compared to Baseline Forecast

	Low Cost Case		High Cost Case	
	2020	2030	2020	2030
Loss in GSP (million 2007\$)	-\$2,805	-\$10,347	-\$3,888	-\$12,216
Loss in Jobs	-23,000	-60,000	-35,000	-80,000
Loss in Household Income (2007\$)	-\$906	-\$3,859	-\$2,937	-\$7,037

Effects on Tennessee Industry Shipments in 2020 (Compared to Baseline Forecast)



Percent Change from Baseline

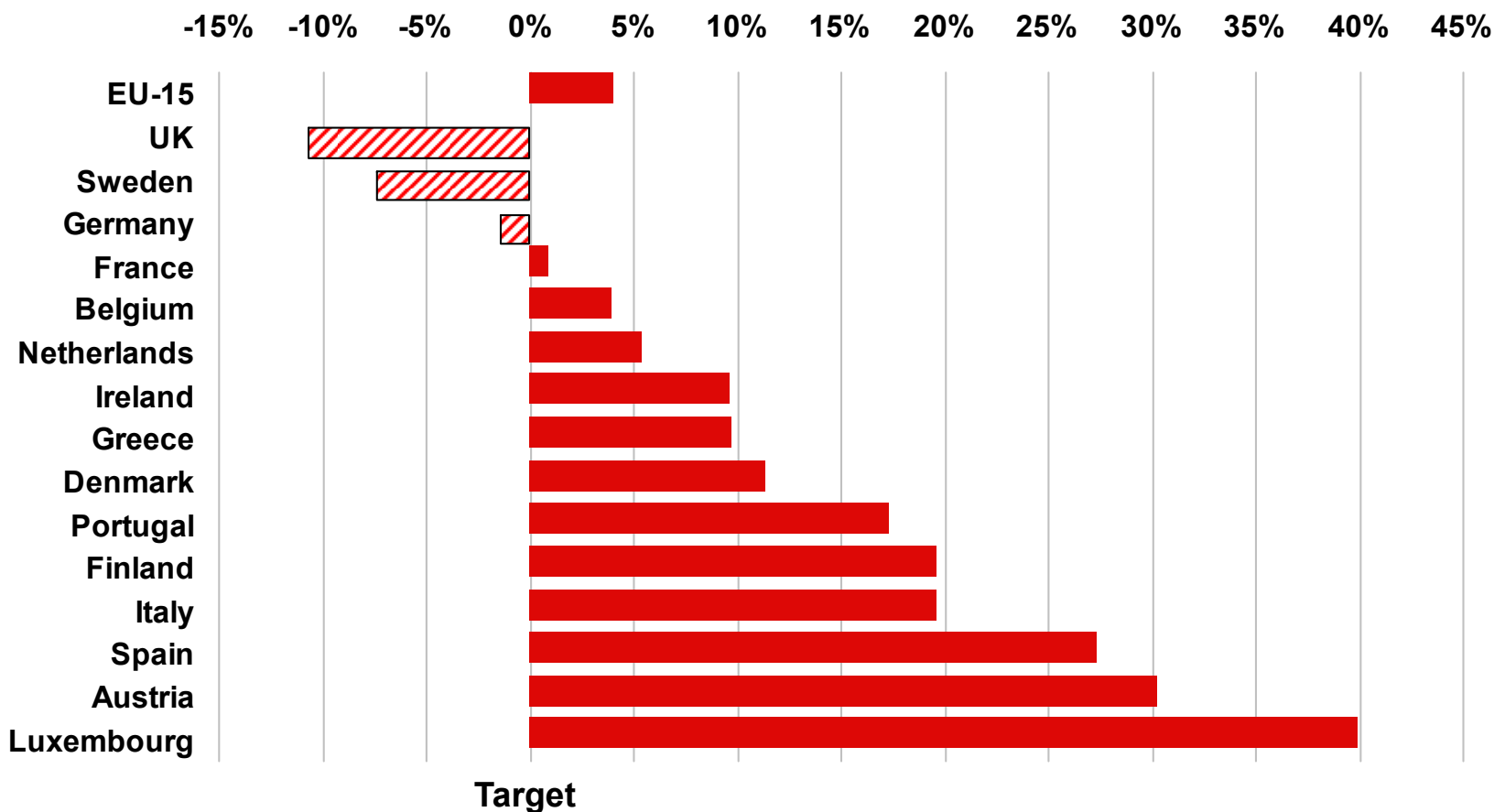




Summary of Costs to Tennessee

- Energy prices rise
- Household income falls as energy and other prices rise
- Economic growth would slow
- Most industries suffer losses in production
- Higher energy costs reduce jobs
- A lasting effect on the economic base of Tennessee and its citizens
 - Low income and others on fixed incomes suffer disproportionately
 - Higher costs for government services, public transportation, etc.
 - Higher costs to Tennessee's 2,360 schools and universities and 176 hospitals

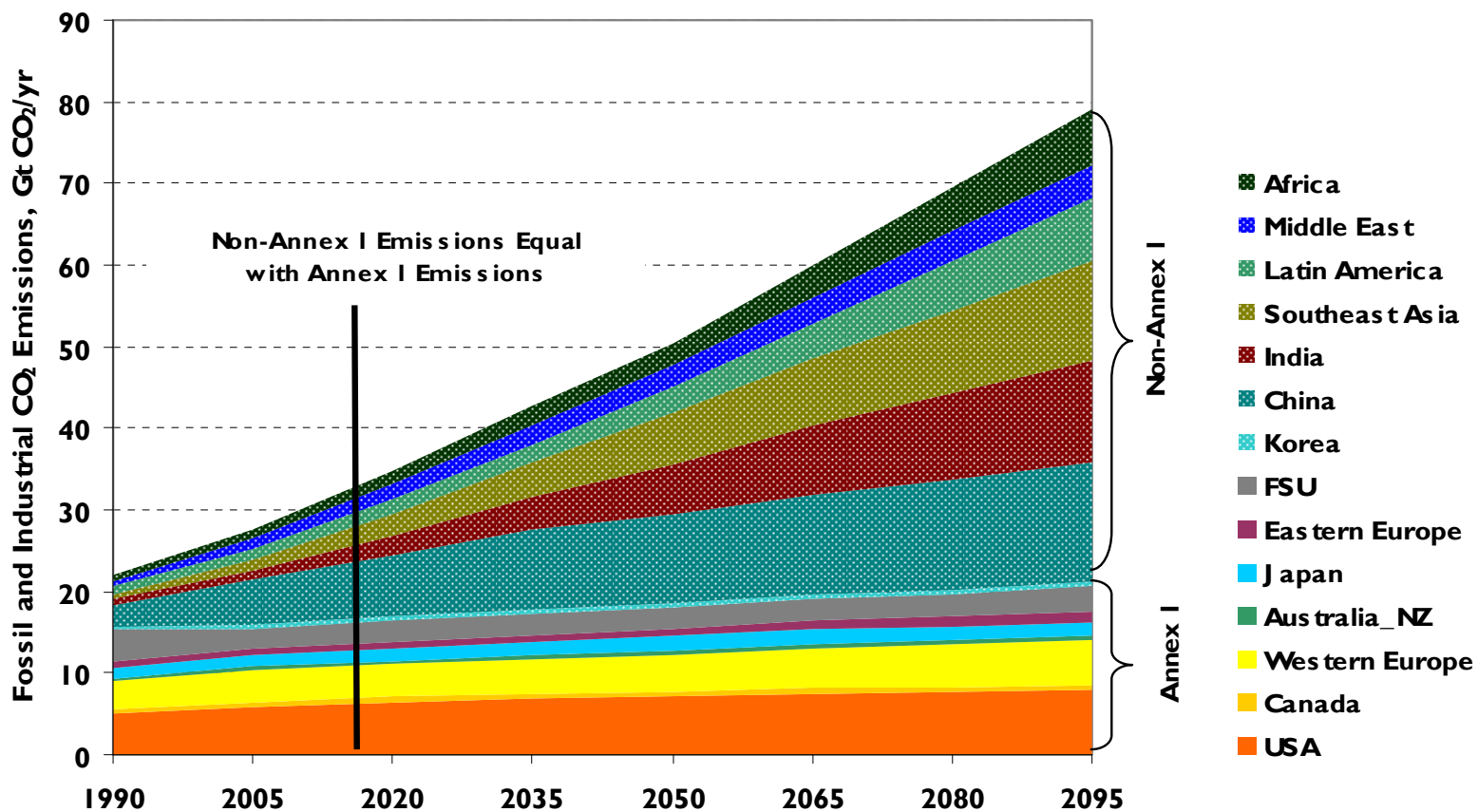
EU Greenhouse Gas Emissions: Gap Between Projections* and Kyoto Targets in 2010



* Projections assume existing measures already in place.
Source: European Environmental Agency, November 2007



World Carbon Dioxide Emissions



Source: Data derived from Global Energy Technology Strategy, Addressing Climate Change: Phase 2 Findings from an International Public-Private Sponsored Research Program, Battelle Memorial Institute, 2007.



Environmental Impact

- Results in a 70% reduction in GHG emissions by 2050
- If USA adopts S.2191 (or something similar) and no other countries adopt emission caps, then global CO₂ concentrations are about 29 ppm lower in 2095 than under the reference scenario
- Global concentrations of CO₂ would be about 4% less under S.2191 without international participation



Strategic Energy Policy

- Many of America's most energy-intensive sectors are improving energy efficiency and reducing greenhouse gas emissions in their own operations. We're leading the way, "walking the talk" and publicly reporting performance.
- Many industries (i.e., American chemistry) are unique: When we use energy, America saves energy. We are part of the climate solution.
- Climate policy must be developed comprehensively with attention to costs and benefits.
- Congress continues to neglect critically needed domestic energy supply. Congress should put access to domestic energy supply on par with efficiency and diversity.



Many US Industries Are Ahead of the Curve on GHG Emissions (The Case of the Chemical Industry)

Index where 1990 = 100

