American Chemistry: **Essential to Climate Solutions**

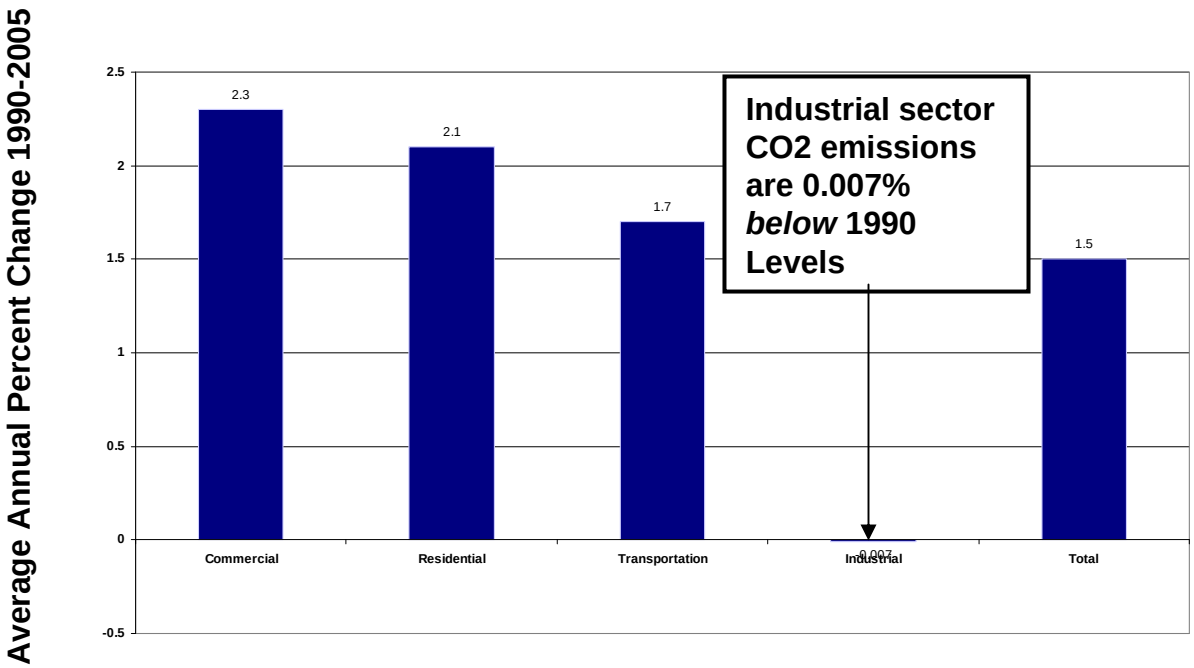
"*We Use Energy to Save Energy*"

American Chemistry Council℠

U.S. Business of Chemistry

- One of **America's largest industries** - $635 billion
- **Nearly 900,000 good U.S. jobs** (each creates 5.5 others – 5.7 million jobs, 4% of U.S. workforce)
- Presence in **all states**; 9,300+ companies, 13,500 facilities
- Directly generates **2% of GDP**; Products found in **96% of manufactured goods**
- America's **#1 exporter** ($135 billion)
- Pays **$23.8 billion** in federal, state and local income taxes
- **Innovative** and **knowledge-intensive**:
  - One of the largest in **private R&D** ($26 billion)
  - **1 out of 8 U.S. patents** issued
  - Highest share of **knowledge workers** (47%)

CO_2 Emissions Increasing in All U.S. Sectors *Except* Industrial



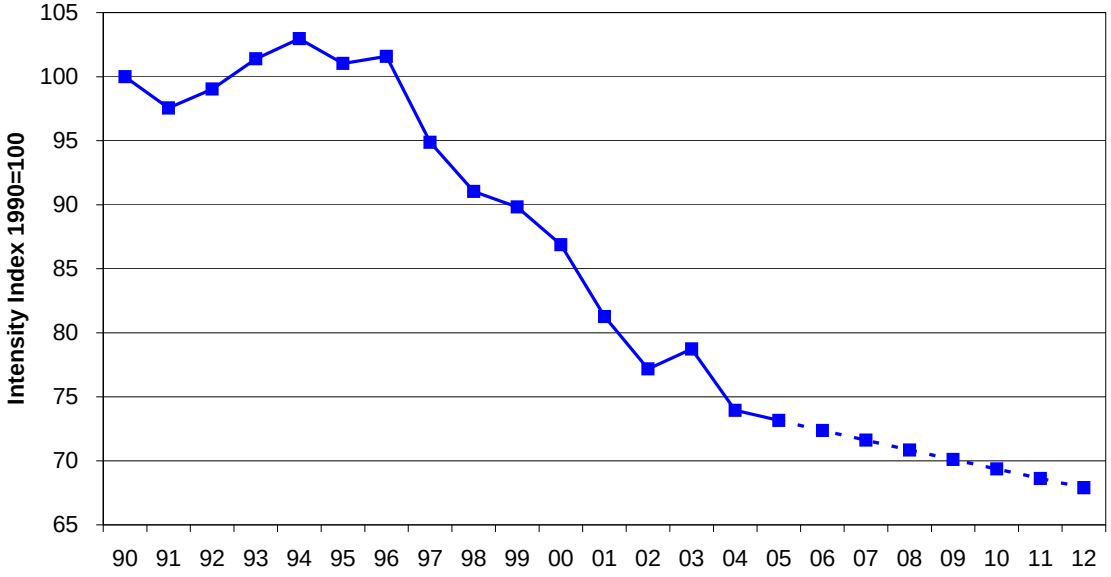
Commercial: Up 2.3%
Residential: Up 2.1%
Transportation: Up 1.7%
Industrial: *Down* .007%
TOTAL: Up 1.5 percent

Sources: EIA Emissions of Greenhouse Gases in the United States 2005; GDP data from Bureau of Economic Analysis. Each sector includes allocated electricity.

U.S. Business of Chemistry Has Significantly Reduced Our GHG Emissions and Intensity

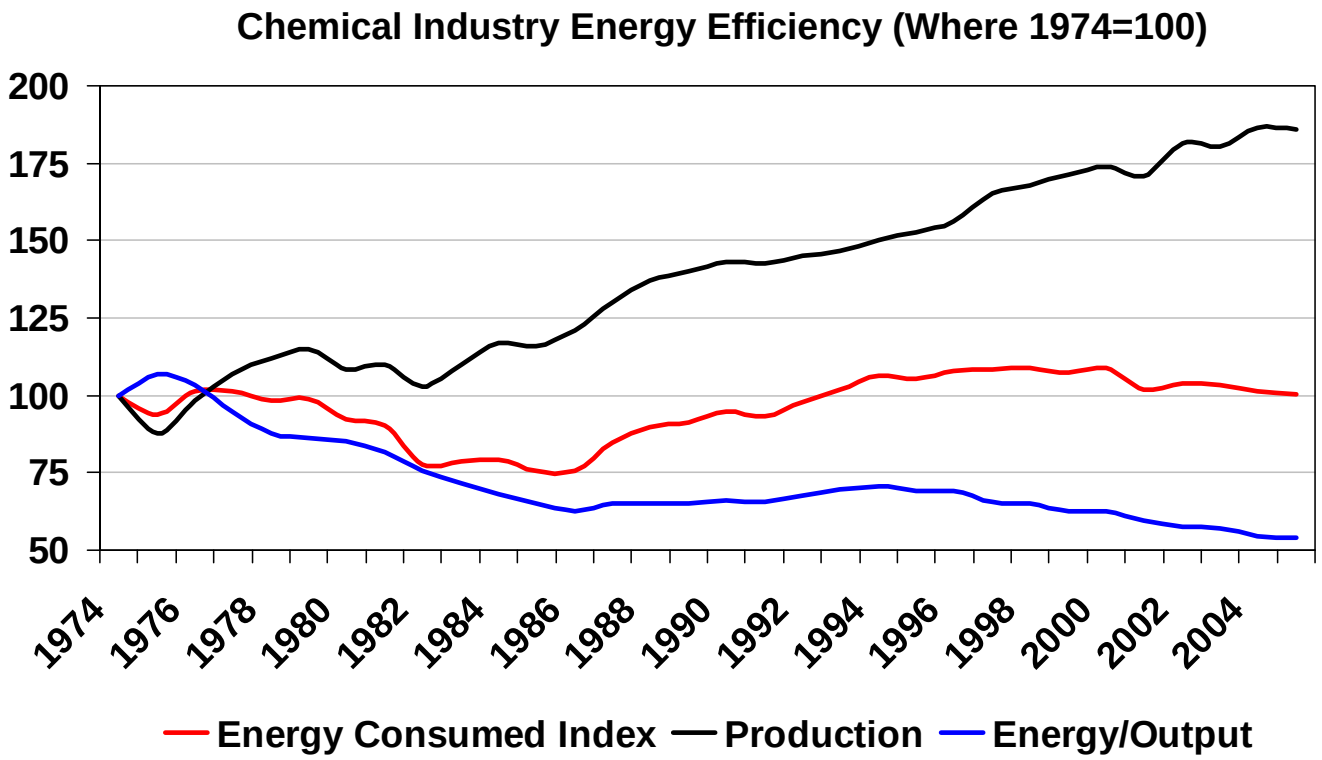
- Between 1990 and 2006, ***our greenhouse gas emissions fell dramatically.***
- Direct greenhouse gas emissions: Excluding indirect (or embedded) carbon dioxide emissions from purchased electricity, ***our GHG emissions fell 12.5% in absolute terms between 1990 and 2006***, a reduction that would have exceeded the Kyoto Protocol target for the U.S. (7%) and the EU (8%). During the same period, chemical industry production rose 41%. As a result, ***GHG emissions intensity improved 38%.***
- Indirect greenhouse gas emissions: Including indirect (or embedded) carbon dioxide emissions from purchased electricity, ***our GHG emissions fell 7% between 1990 and 2006***, a level that matches the Kyoto Protocol target for the U.S. (7%). During the same period, chemical industry production rose 41%. As a result, ***GHG emissions intensity improved 34%.***

Chemical Industry Greenhouse Gas Intensity Trends



U.S. Business of Chemistry Has Significantly Improved Our Energy Efficiency

- **We've *improved energy efficiency by 46% since 1974*, and 27% since 1990.**
- **ACC requires our member companies to report energy efficiency and GHG intensity data to us, and *we publicly report aggregate performance* – the only industry group to do so.**



Source: ACC

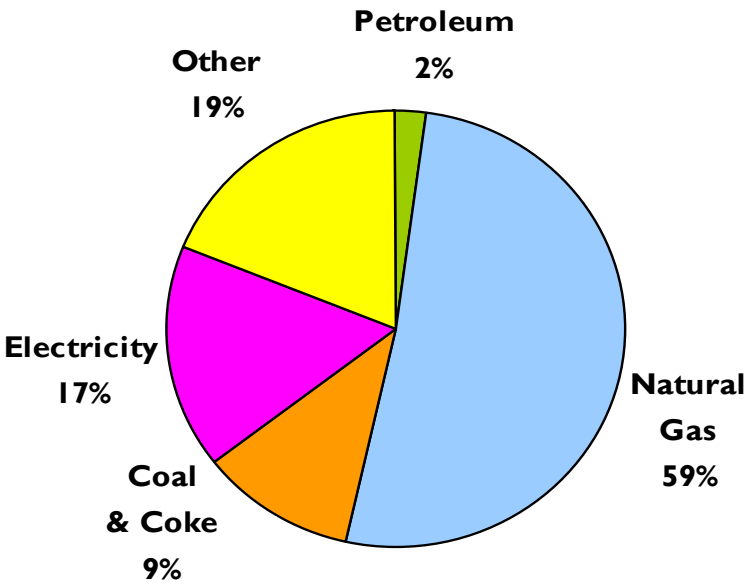
U.S. Business of Chemistry <u>Helps the U.S. Economy Be More Energy-Efficient</u>

- Our industry is **<u>essential to America's energy efficiency</u>**.
- **<u>We use energy to save energy: We make products that go into energy-saving materials used throughout the U.S. economy</u>** (e.g. insulation, weatherization equipment, lightweight vehicle parts, lubricants, coatings, appliances – even windmill blades and solar panels).
- For example, **<u>plastic insulation in buildings</u>** **<u>saves more than 8 units of energy for every unit consumed to produce it</u>**. (An estimated 6.2 quadrillion BTUs of energy is saved annually from plastic insulation in buildings, while its production consumes the equivalent of 0.7 quadrillion BTUs annually). *(Source: US Energy Consumption by End Use 2007 Forecast, U.S. Energy Information Administration).*

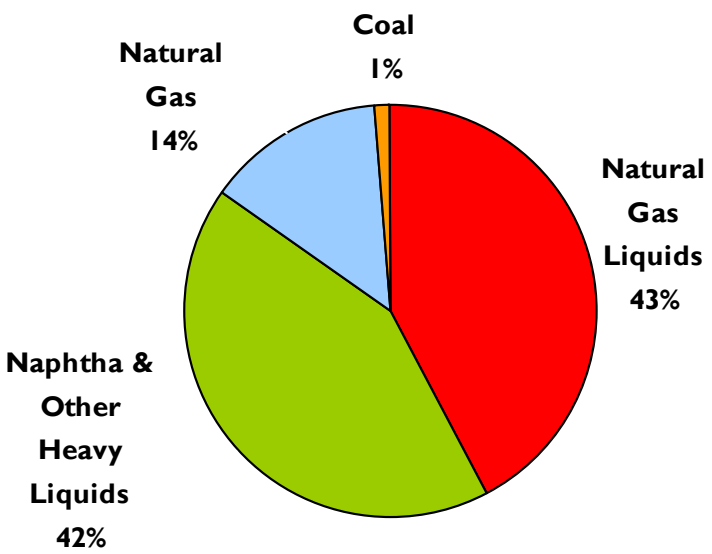
Natural Gas is Vital to Chemical Industry

The chemical industry's use of natural gas is unusual in that we use it as a *raw material…*So our use of natural gas *yields energy savings* for the U.S. economy in the form of energy efficiency products.

For Fuel and Power



As Raw Material, or "Feedstock"

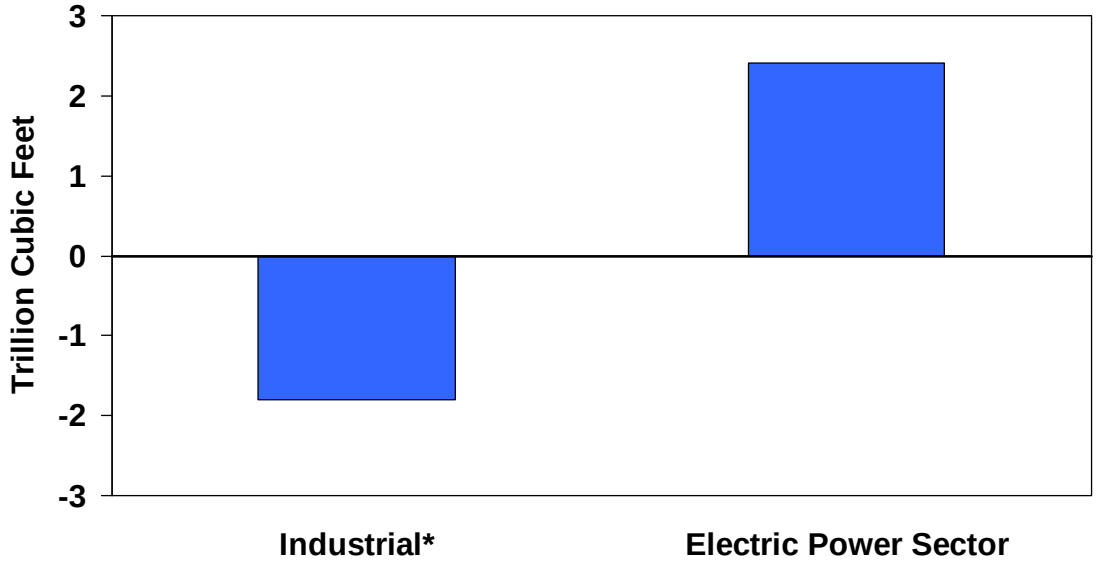


Source: ACC

Policy Concerns

- ***The electric power sector (utilities)*** **and** ***industrials*** **are locked in a "zero sum game" for scarce domestic natural gas supplies.**
- **Any increased natural gas consumption by utilities comes** ***at the expense of industrials.***
- **Climate proposals that cause utilities/non-manufacturing to** ***"fuel switch" to natural gas*** **would increase this effect.**

Natural Gas Consumption

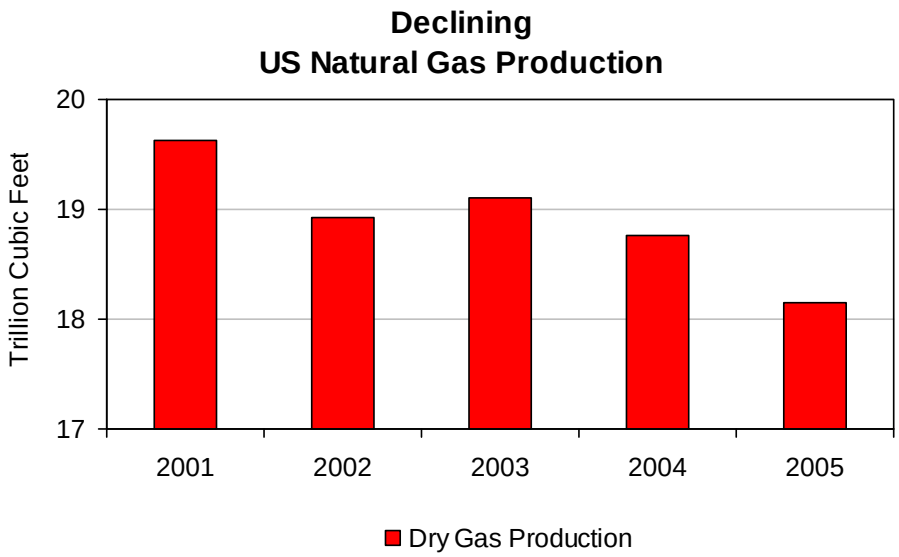


Source: Energy Information Administration

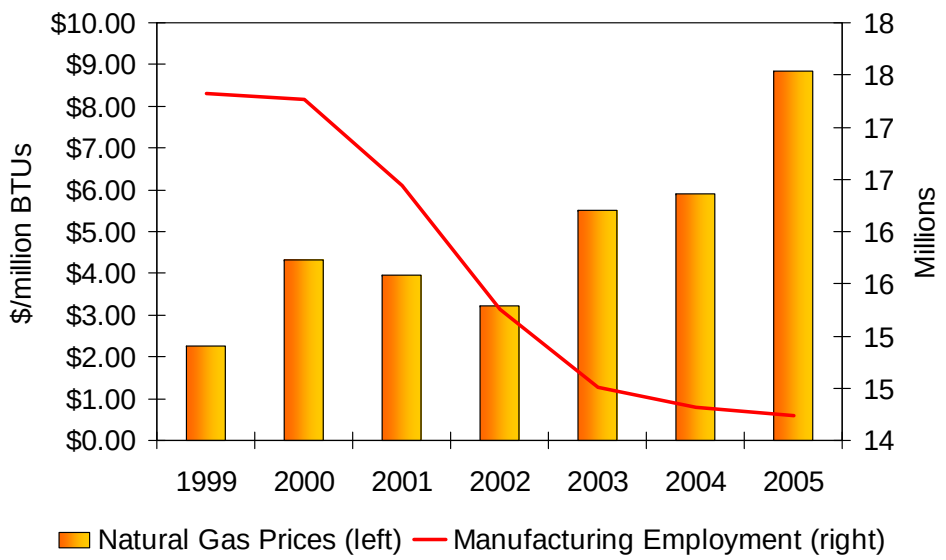
** Excluding lease and plant fuel*

Policy Concerns

- Unlike utilities, chemical makers *compete in global markets* and cannot simply "pass along" higher natural gas costs.
- For us and other natural gas-intensive industries, the result of higher prices is "*demand destruction*," curtailed operations, plant closings and *U.S. job losses*.
- In today's constrained domestic natural gas market, increased demand for natural gas from fuel switching would *increase already-high U.S. natural gas prices*. (Prices have tripled since the year 2000; $425 billion in added costs to consumers; contributed to three million manufacturing jobs lost.)



Source: EIA



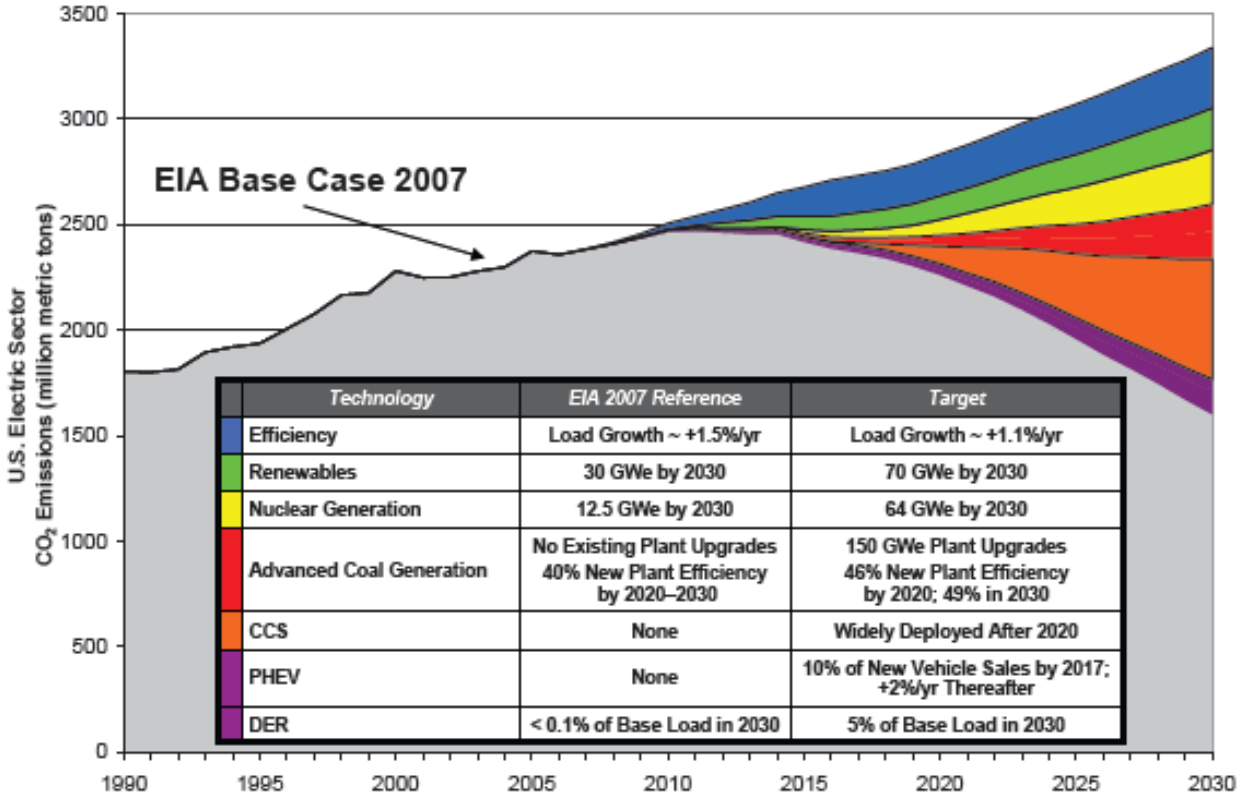
Policy Concerns

- **Other climate policies being considered could *increase natural gas demand, too.***
- **Natural gas is needed to create *renewable fuels* such as ethanol. (Fertilizer's content is 90 percent natural gas, and natural gas is used to process the fuel.)**
- **Natural gas is also used to create *hydrogen* and *ultra-low-sulfur diesel fuel*.**
- **Policies that call for greater production of renewables and other lower-carbon energy sources would *vastly increase demand for natural gas* – additional proof of why we need to *expand the base of domestic natural gas supply*.**

Carbon Capture and Storage (CCS) Will Be Key

"Wedges" to get to lower carbon emissions

CO_2 Reductions … Technical Potential*



Technology	EIA 2007 Reference	Target
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear Generation	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
CCS	None	Widely Deployed After 2020
PHEV	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
DER	< 0.1% of Base Load in 2030	5% of Base Load in 2030

** Achieving all targets is very aggressive, but potentially feasible.*

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Conclusion

- American chemistry is doing our part to ***reduce GHG emissions*** and ***improve GHG emissions intensity*** and ***energy efficiency***.
- We are ***outperforming the world*** and ***other U.S. sectors***.
- Our industry is ***essential to energy efficiency*** throughout the U.S. economy, ***enabling others*** to reduce their GHG emissions.
- The U.S. business of chemistry requires access to secure, affordable supplies of our ***most important raw material – natural gas***.
- Congress should ***avoid climate policies that push utilities into greater natural gas use*** (fuel switching) and drive industrials, operations and jobs out of the U.S. market.