



**TESTIMONY OF THE AMERICAN CHEMISTRY
COUNCIL ON THE

IMPACT OF HIGH ENERGY COSTS ON CONSUMERS
AND PUBLIC**

Presented to

Energy and Mineral Resources Subcommittee

May 19, 2005

The American Chemistry Council is pleased to submit this testimony on the impact of high energy costs – especially natural gas – on consumers and the public. ACC represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC members are committed to improved environmental, health and safety performance through Responsible Care, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a \$504 billion enterprise and a key element of the nation's economy. It is one of the nation's largest exporters, accounting for ten cents out of every dollar in U.S. exports. Chemistry companies are among the biggest investors in research and development. Safety and security have always been primary concerns of ACC members, and they have intensified their efforts, working closely with government agencies to improve security and to defend against any threat to the nation's critical infrastructure.

The unbalanced and volatile U.S. natural gas market has had a severe impact on the chemical industry. Today, U.S. natural gas prices are the highest in the world – over \$7 per million BTUs, versus \$5.25 in Europe, \$4.50 in China and Japan and \$1.25 or less in the Middle East and Russia.

The chemical industry is the backbone of our nation's manufacturing sector. It is the largest industrial user of natural gas. The chemical industry uses natural gas for heat and power, but also as a raw material, a key ingredient, used to make thousands of products that consumers use every day.

The chemical industry has been especially hard hit – its natural gas costs increased by \$10 billion over the past two years, it has lost more than \$50 billion in business to overseas operations, and watched more than 100,000 jobs (1/10th of the U.S. chemical workforce) disappear since 2000.

Business Week magazine published a story in its May 2, 2005 edition entitled, “No Longer the Lab of the World, US Chemical Plants Closing in Drove as Production Heads Abroad.” This carefully researched article provides ample evidence of the severe damage historically high natural gas prices have had on the U.S. chemical industry, and by extension the entire U.S. manufacturing sector. The following excerpts from the *Business Week* article graphically illustrate the quandary the chemical industry is in:

- **“Only a decade ago the U.S. was the world’s top spot for making chemicals.....Today none of that is true....And in a crippling reversal, U.S. natural gas prices are the highest in the world.”**
- **“Chemical companies closed 70 facilities in the U.S. in 2004 and already have tagged 40 more for shutdown....Industry employment is now below 880,000, down from over 1 million as recently as 2002.”**
- **“..of 120 chemical plans being built around the world with price tags of \$1 billion or more, just one...is in the U.S.....China, by comparison, has 50. The U.S. has gone from a privileged position to where it’s hard to find a rationale to put anything here.”**
- **“As recently as 1997, the U.S. posted a trade surplus in chemicals of almost \$20 billion... (now) the nation’s balance of trade in chemicals, a rock-steady surplus for 80 years, has become a deficit.”**
- **“For the U.S., the likely results are less investment, fewer jobs, and fewer scientific discoveries....Innovation may be the nation’s next casualty. Production facilities need engineers to run them and scientists to do workaday research. So as capital investment migrates, these tasks will too.”**
- **“Across the industry, capital investment is being herded away from the U.S. toward the Middle East and Asia....while U.S. plants are being turned over to salvagers.”**

According to figures published by the U.S. Commerce Department on April 12, 2005 the U.S. trade deficit has risen to an all-time monthly high of \$61 billion – lending further evidence to the exodus of manufacturing from the U.S. The chemical industry once had the nation’s most favorable balance of trade – nearly \$20 billion in the 1990’s, but now posts a \$4 billion deficit.

As bad as the natural gas crisis is today, it is expected to deepen, further widening the gap between supply and demand. Experts predict demand will far outpace supply by nearly 10

trillion cubic feet (TCF) in the future. Today the U.S. consumes roughly 22 TCF, and predictions are by 2010 demand will be over 25 TCF and by 2025 will top 30 TCF. What actions are being taken today to prevent this decade's growth in demand for natural gas from requiring further demand destruction from the industrial sector?

Higher Natural Gas Prices Shift Chemical Industry Investment Overseas

The May 2, 2005 edition of *Business Week* magazine article succinctly provided ample evidence of the severe damage historically high natural gas prices have had on the U.S. chemical industry and how it has promoted a shift in production overseas.

With a mature market and the movement of customer industries overseas, companies are shifting investments toward regions offering lower feedstock costs (and cost of production) as well as in markets experiencing a higher degree of dynamism. The absence of a comprehensive US energy policy ensuring adequate and diverse supplies will retard investment (and subsequent job creation) in the United States. This is equivalent to "capital flight."

This on-going geographical shift in spending by American chemical companies is evidenced by the allocation of capital budgets among American Chemistry Council member companies. Every few years, The American Chemistry Council conducts a survey of long-term geographic investment intentions (US vs. foreign locations) and results from the latest reveal significant changes in distribution patterns.

Geographic Focus of US Basic & Specialty Chemical Company Capital Budgets (Unless noted otherwise, % share of total)

	<u>2004</u>	<u>2009</u>	<u>Change in Share</u>
United States	71.1	58.6	-12.5
Canada	2.3	2.7	0.4
Japan	0.6	0.7	0.1
Western Europe	16.6	16.7	0.1
Central & Eastern Europe	0.5	1.7	1.2
China	2.9	9.1	6.2
Asian NICs	1.9	5.0	3.1
Other Asia	0.3	0.8	0.5
Mexico	1.4	1.6	0.2
Latin America	1.9	2.2	0.3
Africa & Middle East	0.6	0.9	0.3
Total	100.0	100.0	

American chemical companies are planning to significantly boost their investments in the Asia/Pacific regions. This region's share of the capital budget will nearly triple during the five-year period from 2004 to 2009. Investments in China in particular will increase (threefold) as a share of capital budgets. Strong expansion of the share going to the Asian NICs and other Asian nations will gain as a share of total capital budgets. Even Japan will witness slightly higher investment. US chemical companies plan to allocate greater capital investment in Africa & the Middle East, Central & Eastern Europe, Mexico and Latin America. Canada (with abundant hydrocarbon resources) and Western Europe will receive a larger share of capital. All of the aforementioned expansions of share will occur at the expense of projects in the United States.

How did we get in this predicament? Concerns with the nation's overall air quality led the federal government to encourage use of cleaner burning fuels in the 1990's. Electric utilities switched from burning coal to natural gas, and today electricity generation consumes 25% of all domestic natural gas.

Ironically, at the same time the federal government policies encouraged greater use of natural gas, it also imposed moratoria on large sources of domestic natural gas supplies out of environmental concerns. Today much of our nation's sizeable natural gas reserves are off-limits to exploration and production, despite the fact that today's technology can safely remove natural gas with minimal disruption to the surrounding environment.

The situation the chemical industry faces today is reversible – if Congress takes action to restore natural gas to globally competitive prices. Thankfully, it appears that some in the U.S. Congress are starting to realize that our nation is in the depths of an energy crisis and are taking steps to address the crisis so that our nation's eroding chemical and manufacturing base is revitalized and returned to being the robust engine that drives our economy.

In early April 2005, Senators Lamar Alexander (R-TN) and Tim Johnson (D-SD) introduced bipartisan legislation, S. 726, The Natural Gas Price Reduction Act which recognizes the enormity of the nation's natural gas crisis and provides the keys to bringing the problem under control.

Senator Alexander and Johnson demonstrate a thorough understanding of the steps needed to address the natural gas crisis. The bill proposes to:

- Curb consumption of natural gas by aggressively implementing a number of energy efficiency measures;
- Invest in development and implementation of new technologies, such as coal gasification;
- Improve the system for storing and transporting natural gas; and
- Create greater access to our own domestic sources of natural gas.

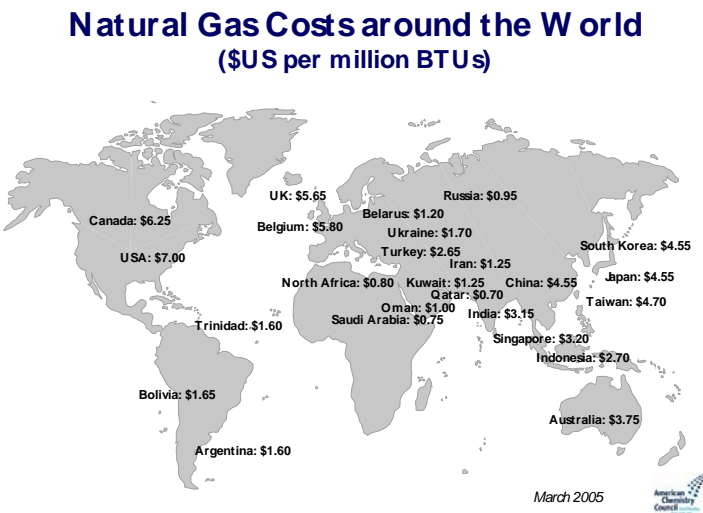
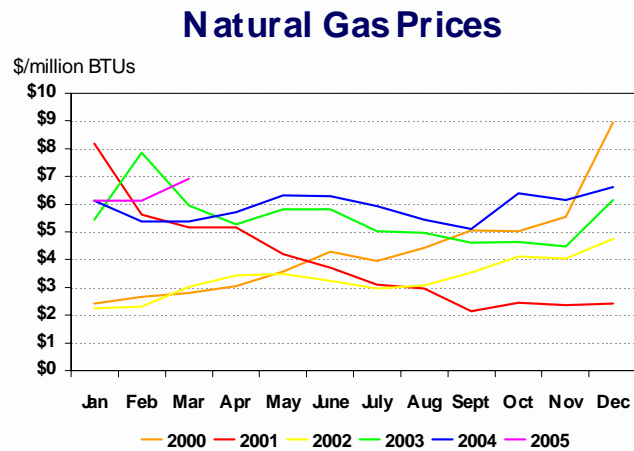
The American Chemistry Council applauds the introduction of S. 726. It is an important step towards enacting a sorely needed balanced national energy plan. ACC has urged the Senate Energy & Natural Resources Committee to fully adopt S. 726 as it writes its comprehensive energy legislation.

Every day that Congress fails to confront and address this crisis, more jobs are lost to foreign operations and more residential consumers must choose between heat or food. Only Congress can solve these problems and put the long-term economic future of the nation back on track.

Since late-2000, there have been two major spikes in natural gas prices and recently, prices have settled in the range of about \$7.00 per million BTUs. This is triple historical levels. The figure to the right illustrates how prices have generally trended upwards since 2000.

More recently, high oil prices have affected natural gas prices as well and prices have generally been above \$7.00 per million BTUs. The United States now has the highest natural gas costs in the world, as the accompanying figure titled “Natural Gas Costs around the World” illustrates. The data in the figure are for mid-March.

Fundamentally, the problem is one of demand for natural gas exceeding available supply. This has resulted in record natural gas prices in the United States and the highest natural gas prices in the world. During the last decade various environmental and other government policies have promoted the use of natural gas. At the same time, little was done to foster supply of natural gas. Natural gas demand is growing in all sectors but underlying economics suggest a fundamental imbalance in natural gas supply and demand that is unlikely to recede in the short-term. However, growing demand by electric utilities is resulting in demand destruction in the industrial sector. Utilities are generally allowed by state regulators to fully pass on their additional fuel costs to customers. Industrial companies, however, face international competition and have generally not been able to pass on these costs. This results in utilities’ gas demand being somewhat price insensitive and has resulted in plant closures and job losses among the



industrial sector. This demand destruction is illustrated in the above figure titled “Natural Gas Consumption Trends by Sector”. The source is the March 2005 *Short-Term Energy Outlook* prepared by the Energy Information Administration (EIA) of the US Department of Energy. Moreover, the EIA projects even further increases in natural gas prices. Actions of ACC member companies would question the availability of natural gas needed to increase industrial demand as projected by the EIA. We have member companies that use natural gas as a raw material with plans to shut down U.S. production facilities and import these products across this period. The gravity of the current natural gas imbalance is so pronounced that Federal Reserve Chairman Alan Greenspan has raised concerns about the issue.

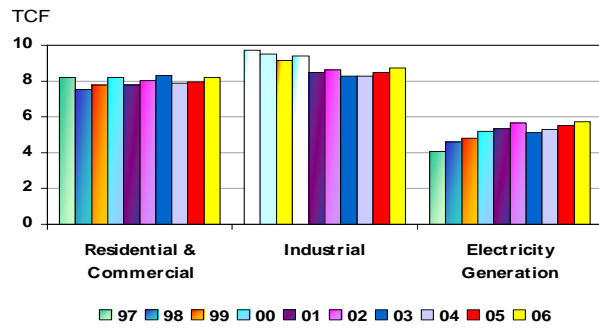
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The Effects of Higher Natural Gas Prices Quantified

To better understand the role of natural gas price shocks on the economy, the American Chemistry Council used the Oxford Economic Forecasting (OEF) Global Model to examine the effects of large run-ups in natural gas prices on the U.S. economy. The OEF Global Model is a quarterly linked international econometric model that provides an analyst with the ability to examine how economies react to shocks to the economic environment, perform scenario analyses and produce forecasts. The model contains independent price, production and consumption variables for oil and natural gas, which can be changed to produce customized simulations. The model is linked to the OEF international industrial model.

Changing the natural gas price assumptions and then comparing the results of the model solution with a baseline simulates the effects of higher natural gas prices. The current analysis examines the effects of a sustained natural gas price rise of roughly \$3.50 per million BTUs over prior levels. This is roughly what has occurred since the first spike in natural gas costs.

The results of economic modeling suggest that the effects of sustained higher natural gas prices have a negative effect on the US economy. The following table presents the deviation from the base case that occurs with these sustained higher prices. Unless noted otherwise, the data are presented as a deviation from the baseline expressed as percentage points.

Natural Gas Consumption Trends By Sector



Source: EIA Short-Term Energy Outlook (3-05)

**Deviation from Base Case:
The Case of Sustained High Natural Gas Prices
(Unless noted otherwise, percentage point deviation from base case)**

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>
Growth in Gross Domestic Product (GDP)	-0.2	-0.3	-0.4
Growth in Consumer Spending	-0.3	-0.5	-0.3
Growth in Disposable Personal Income (DPI)	-0.5	-0.3	-0.1
Savings Rate	-0.3	-0.2	-0.1
Non-Farm Employment (thousands)	-99	-330	-549
Unemployment Rate	neg	+0.2	+0.3
Inflation – Consumer Prices	+0.4	+0.3	0.0
Current Account Balance (billions)	-\$15.7	-\$25.2	-\$37.2
Federal Budget Balance (billions)	-\$9.4	-\$21.1	-\$28.2
Short-Term Interest Rates (basis points)	+14	+29	+15
Long-Term Interest Rates (basis points)	+12	+29	+23
Growth in Industrial Production	-0.1	-0.4	-0.7
Production – Total US Chemical Industry	-0.1	-0.8	-1.1
Production – Basic Chemicals	-0.3	-1.5	-3.2

Higher natural gas prices act much like a tax on consumers, depressing disposable personal incomes and savings, and ultimately consumer spending, which accounts for two-thirds of the economy. The results of the analysis indicate a decline in aggregate demand in combination with the shock to the supply side. This results in a lower economic growth rate, about 0.3% less per year. With a \$12 trillion economy, that's about \$36 billion in reduced GDP.

Econometric evidence indicates that lower economic growth results in lessened job creation (about 325,000 fewer jobs on average during the first three years) and a higher unemployment rate. At the same time, inflation as measured by the consumer price index would accelerate and interest rates would rise.

Rapidly rising US natural gas prices adversely affect the industrial sector, resulting in less production and lower capacity utilization. In turn, this affects profits and corporate cash flow and coupled with higher interest rates, would lead to lower business investment (or capital spending). The most recent recession was led by a severe downturn in capital spending. Higher natural gas prices have the effect of hampering capital spending so needed for a sustained economic expansion. It is capital spending that is critical to fostering long-term productivity growth and rising incomes and wealth.

In addition, the current account balance deteriorates, as would the federal deficit and deficits run by state and local governments. The deterioration in government balances

occurs as tax receipts fall short of expectations and as higher unemployment increases benefit claims. Most state and local governments are currently facing fiscal difficulties and the Federal government is running record deficits. The analysis suggests that the current account balance deteriorates by over \$35 billion after three years as does the Federal deficit (by about \$28 billion) as tax receipts fall short of expectations because of lower economic growth and as higher unemployment increases benefit claims.

For energy-intensive sectors such as farming, cement, aluminum, steel and chemicals, the effects would be even more severe. For the business of chemistry, the effects would be felt across all segments. Basic chemicals would face severe competitive disadvantages as over 70% of feedstocks are derived from natural gas. Exports would falter and imports would rise. In addition, lessened industrial activity would result in lower demand. Over the extended period, the basic chemicals segment suffers the most.

Effects on Industry

Higher natural gas prices in particular affect the competitiveness of industries using natural gas as input for fuel and power and as raw material. This occurs because natural gas markets are generally national (or regional) in nature. As a result, exporting industries in the United States and Canada face higher costs vis-à-vis competing nations, as the latter do not incur these costs. Natural gas is generally a regional market (e.g., North America) as it is not widely traded globally. Thus, natural gas markets outside of North America are largely unaffected. For energy-intensive sectors such as farming, cement, aluminum, steel and chemicals, the effects are quite severe.

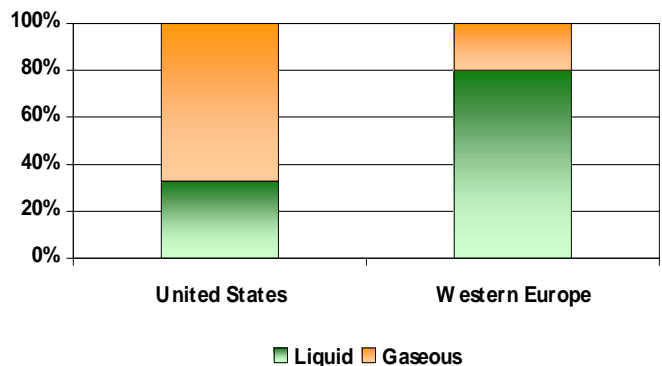
Rising natural gas costs have been one factor in the exploding manufactured goods deficit, which increased from \$330.2 billion in 1999 to a record \$612.1 billion deficit in 2004. During the period from 1999 to 2004, manufacturing sector payrolls declined 17%, about 3.0 million people.

Effects on the Chemical Industry

The US chemical industry is the largest industrial user of natural gas, consuming one-eighth of total natural gas demand. Higher natural gas prices in particular severely diminish the competitiveness of the industry as it uses natural gas not only as inputs for fuel and power, but also as a raw material (feedstocks).

Worldwide the feedstocks for most petrochemicals are ultimately derived from either oil or natural gas. Oil includes heavy liquids such as naphtha and gas oil. Natural gas includes natural gas liquids such as ethane, propane, and butane. The price of a feedstock is largely

Liquid vs. Gas Ethylene Feedstocks
(% of total)



determined by the price of oil or natural gas. Unlike oil and naphtha, which can be imported or exported in large quantities, natural gas markets are generally regionally constrained because of physical limitations in moving natural gas over long distances. Oil and naphtha prices are determined in a global market.

Rising natural gas prices directly affect the natural gas liquids market. Both ethane and propane, widely used in the United States as feedstock, have fuel value and can be left in the gas stream along with methane, to sell as natural gas. Methane is another constituent of natural gas. Besides its thermal value, it's directly used to produce methanol as well. As an alternative to fuel, ethane, propane and butane can be processed into liquids to be sold as feedstock. Because prices of these feedstocks rise in proportion with natural gas prices, a petrochemical producer has to offer more than the equivalent fuel value plus processing cost to induce a gas processor to remove the liquids and shrink the natural gas stream.

Rising natural gas prices directly affect the natural gas liquids market. Higher natural gas liquid (ethane, propane, etc.) feedstock costs can place much of the Gulf Coast-based petrochemical production in a position of diminished competitiveness relative to other major producing regions. In the US, 70% of ethylene, for example, is derived from natural gas liquids while in Western Europe, 70% is derived from naphtha, gas oil and other light distillate oil-based products. These competing nations face raw materials costs that reflect global, not the regional markets affecting natural gas prices in North America. U.S. petrochemical facilities are based on converting natural gas liquids and cannot be economically converted to use other feedstocks. This is a significant driver for new investment capital being spent in other regions and reducing exports from the U.S.

The US net trade position in chemicals swung from an \$8.3 billion surplus in 1999 (before the first natural gas price spike) to a deficit of \$9.6 billion in 2003. In 2004, rising global demand improved the trade deficit to \$3.6 billion. We anticipate further erosion in the net trade position as new petrochemical facilities are built in regions of the world with lower raw material costs.

Not only do high natural gas prices affect the chemical industry directly, but to the extent that these prices contribute to the deterioration of competitiveness in downstream end-use customer industries (rising imports and movement overseas), the chemical industry is also negatively affected. The chemistry content of this is measurable and during the period since the first natural gas price hike (1999-2004), the business lost from these end-use customers totaled \$25.8 billion. Combined with the \$11.9 billion swing in the trade position, this represents \$37.7 billion in lost sales.

During this period, chemical industry employment fell by 96,000, about 10%. Losses occurred in virtually every state. The decline has continued and based on data from the Bureau of Labor Statistics now exceeds 105,000 jobs.

As a provider of raw materials to other manufacturers, the chemical industry is often looked on as a harbinger of what lies ahead for those companies. Unfortunately, it's only

a matter of time until the plant closings, job losses, vanishing trade surplus and capital investment flight experienced in chemicals spreads to all of its downstream customers.