Building America by Balancing Energy Policy

by Andrew Liveris
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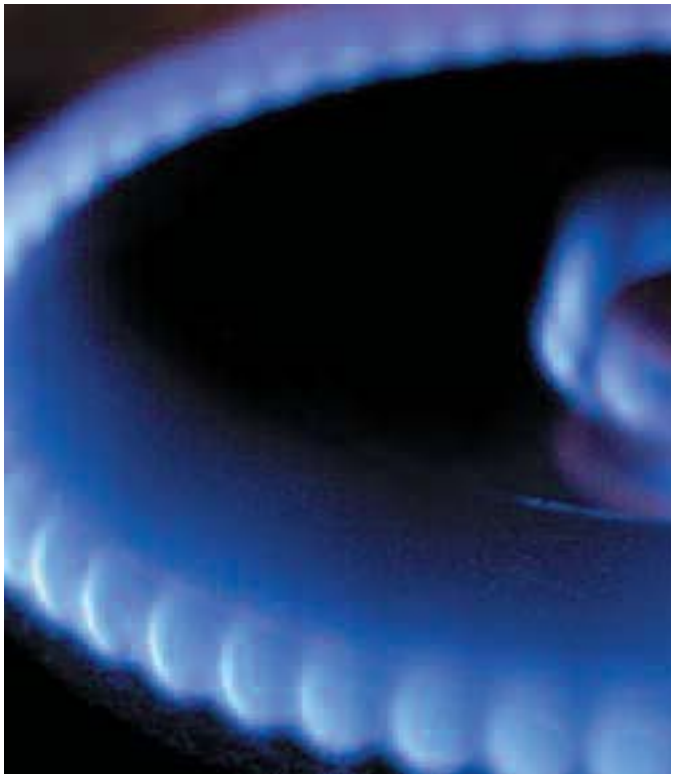
When most consumers think about energy crises in the U.S. they think about rising gasoline prices or the potential for widespread power outages. What fewer realize is that one of the most formidable challenges to U.S. competitiveness, and to the nation's economy today, is the staggering cost of U.S. natural gas.

The U.S. has created an unnecessary crisis in natural gas, a limited resource that is used as a fuel and a raw material for everything from fertilizer to pharmaceuticals and electric power supplies. Government policies have encouraged the use of natural gas as a clean fuel, yet supply has not kept pace with demand because other government policies have restricted access to domestic reserves. The resulting supply/demand imbalance has made U.S. natural gas prices the highest in the world, three to four times historical levels, and prices are projected to stay at these heights for the foreseeable future. For five out of the past six years these unprecedented price levels have threatened the global competitiveness of U.S. manufacturers. Under severe pressure from rising energy costs, manufacturers have been forced to take drastic actions to control their own destinies – including shutting down plants, eliminating jobs and shifting some production overseas to countries where natural gas is more affordable.

The nation's chemical industry, which uses natural gas as both an energy source and a feedstock, has been hit especially hard by high and volatile U.S. natural gas prices. The industry's natural gas bill has increased by $10 billion in two years, according to the American



Chemistry Council. At the same time, the U.S. chemical industry has lost more than $50 billion in business to lower cost chemical operations in other countries – and nearly 100,000 well-paying American jobs have disappeared since 2000. Chemical companies were forced to close 70 facilities in the U.S. in 2004 alone, and an additional 40 facilities are already tagged for shutdown. Yet the industry has not stopped investing in new plants. Of the 120 chemical plants currently being built around the world with price tags of $1 billion or more, only one is in the U.S. China, by comparison, will gain 50. Only a decade ago, the U.S. was the world's top spot for manufacturing chemical products. Today, due in large part to high energy and feedstock costs, the U.S. is no longer viewed as an attractive region for growth. Once a net exporter of the essential goods and services produced by the nation's chemical industry, the U.S. is now a net importer.

Worse yet, the impact of U.S. natural gas price shocks has now rippled out to all sectors of the nation's economy. In a December 2004 report, the Consumer Federation of America predicted that "the average home heating bill for a natural gas household will top $1,000 for the first time in U.S. history", based on Department of Energy projections for the 2004-2005 heating season. In addition to paying record high home heating bills in winter, residential consumers will increasingly feel the impact of rising natural gas prices in the form of more expensive food and higher prices for most consumer products.

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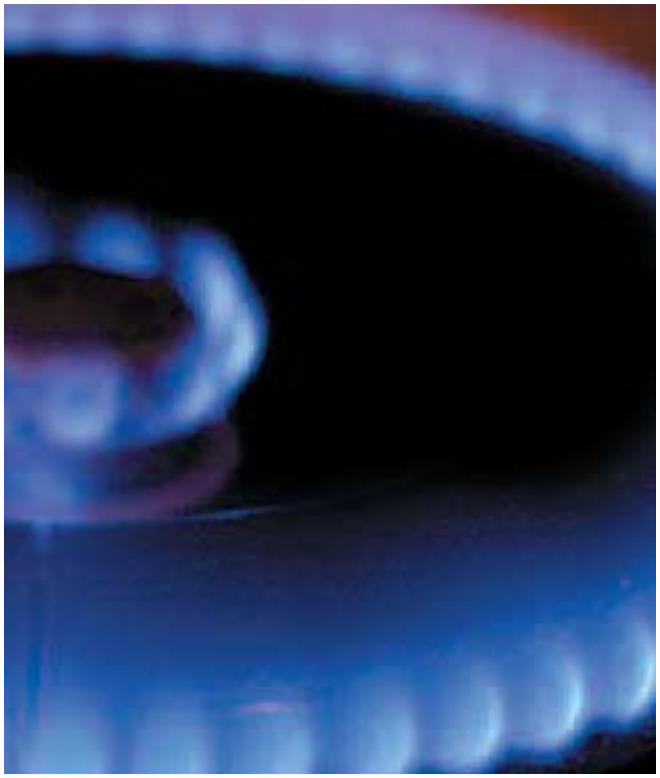

Forward thinking U.S. manufacturers continue to do everything in their power to mitigate the impact of rising energy costs. However, to get the most out of our U.S. assets and to continue to serve our U.S. customers, we need a new energy policy in the United States. A continuation of the current policy imbalance is untenable for U.S. energy consumers – and potentially disastrous for the nation's economy.

The Dawn of the Natural Gas Crisis

The U.S. natural gas and electric power crises had their beginnings in the 1990s. At that time the U.S. had a small surplus of natural gas due to an increase in power capacity based on coal and nuclear production methods. However, growing public concerns about air pollution – combined with fears about the safety of nuclear power plants – led to an increased desire among policy makers to promote alternatives to coal and nuclear energy. Natural gas seemed a logical part of the answer, with its relatively lower emissions and perceived safety compared with nuclear power.

By the end of the 1990s, natural gas had been positioned as the "growth fuel" for electric power generation. The 1999 National Petroleum Council Report forecasted that there would be no problem meeting growing natural gas demand. According to that report, domestic gas production in the U.S. would increase from 19 trillion cubic feet (TCF) in 1998, to 22 TCF by 2005, and 25 TCF by 2010. Eighteen pages worth of signatories agreed with these forecasts. So what actually happened? In 2004 domestic natural gas production dropped below 19 TCF – and production continues to decline. With regard to consumption, the year 2000 saw natural gas consumption of 23.3 TCF – a high point of sorts. The next five years were marked by what economists refer to as "demand destruction" – as those consumers with the least willingness or ability to pay for the limited supply of U.S. natural gas found themselves being squeezed out of the market. Gas consumption dropped to 21.8 TCF by 2004, but only as factories and jobs began to move offshore. Natural gas became a growth fuel – for a declining future.

There is an obvious problem. Power generation is large and growing ever larger. Natural gas production peaked back in 1971 in the U.S. Tying the future of the most critical energy resource – electric power – to a declining resource is a clear path to economic disaster.

The Path to a Balanced Energy Future

It is an immutable fact that the world population is growing, and everyone and every country desire economic growth. People of the world demand better standards of living. Globally, economic growth is now created with smaller increases in energy consumption than in previous decades. But energy consumption still increases when economic growth occurs – in every region, in every time period. Just as growth requires more food, water, and medical services, it also requires more energy. This undeniable fact of life must be dealt with – and the growing demand for energy among residential, agricultural and industrial consumers must be met.

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While manufacturers are doing everything in their power to mitigate the negative impact of extreme and volatile natural gas prices, the reality is that only our elected officials can resolve the fundamental policy imbalance that created this crisis.

The National Petroleum Council (NPC) recently confirmed that no single energy policy path could, by itself, ease the current demand-supply imbalance. There is no quick fix. In their 2003 report, the NPC recommended a comprehensive and balanced portfolio of initiatives to address the nation's complex energy challenges. This concept was represented in the natural gas bill recently introduced by Senators Lamar Alexander (R-TN) and Tim Johnson (D-SD). Informed consumers and policy makers are increasingly realizing that to resolve the growing U.S. natural gas crisis, we need to reduce demand for natural gas and expand supply. In short, the nation needs a comprehensive and balanced energy policy that focuses on:

- Reducing demand for natural gas – through a major new nationwide focus on energy efficiency and conservation.
- Increasing the nation's natural gas supply – by facilitating siting of LNG terminals; expediting leasing and drilling permits; increasing access to off-shore sources of gas; providing royalty incentives for deep-water drilling; and supporting research into cost-effective ways to recover the nation's large reserve of methane hydrates encouraging fuel diversity – reducing consumer dependence on natural gas through the use of other energy sources,

such as clean coal, and accelerating deployment of renewable energy. It is expected that much-needed provisions to increase nuclear energy production will be added later in the process.

- Supporting infrastructure improvements – by increasing the amount of natural gas storage and transmission pipelines.

Addressing the World's Energy and Climate Change Challenges

The Kyoto Protocol called for a significant absolute decrease in CO_2 and other greenhouse gas emissions by 2012 from 1990 levels. Carbon dioxide is a result of the chemical process that occurs when fossil fuels are burned to make energy. In the short-term, curbing consumption of fossil fuels through an intense focus on energy efficiency and conservation can help reduce demand for natural gas while reducing greenhouse gas emissions. This is a win-win solution for consumers, the environment, and the economy. Programs and policies, needed to mobilize energy efficiency and conservation, are well understood, and can be deployed and adopted rapidly. Aggressive implementation of recommended efficiency policies alone can result in gas savings of about 2 TCF annually by 2010, and over 4.4 TCF annually by 2025. Within The Dow Chemical Company, for example, an intense companywide focus on energy efficiency and conservation resulted in a 21% reduction in our energy intensity by year-end 2004 vs. our 1994 baseline. Dow's direct emissions of CO_2 also dropped by 3.8 Million metric tons between 1994 and 2003, in spite of a 32 percent increase in production, primarily as a result of our energy intensity improvements. Energy efficiency practices and policies are also now being adopted by other leading U.S. manufacturers.

However, while efficiency gains can keep the rate of growth in energy use lower than it otherwise would have been, energy use still continues to grow. Therefore the nation must identify viable energy sources that will further reduce CO_2 emissions on the order of magnitude required by the Kyoto Protocol – while enabling economic growth. Based on existing, proven technologies, nuclear power is one the nation's best options, with its zero emissions – requiring, of course, the resolution of the

spent fuel storage and reprocessing issues.

Nuclear energy production is a critical part of the nation's electric supply, and it is showing signs of returning to life for new capacity, but it is happening too slowly. Environmental groups in the U.S. typically oppose nuclear power as part of the solution to climate change. Alliances are split, and the general public seems largely unaware of nuclear energy's superb safety potential and record. However, nuclear energy opposition is not worldwide. France makes 70% of its power via nuclear production, and advocacy groups find no profit in challenging that. China has announced that it will build 40 new nuclear power plants in the next 15 years, resulting in reduced CO_2 emissions and cleaner air. More than 30 nuclear power plants are in various stages of development worldwide. The U.S. is in an excellent position to build the best plants anywhere – and to set the standard globally.

Certain renewable and alternative energy sources, such as wind power, landfill gas, and solar energy may also help to reduce CO_2 emissions, while diversifying the nation's energy portfolio and alleviating some demand for natural gas. However, these technologies are still relatively small-scale and not cost competitive. In the meantime it is clear that no single renewable or alternative energy source is likely to be the "silver bullet" to address the nation's substantial energy challenges in the foreseeable future. The nation must embrace and promote renewable energy, but everybody must be honest about its limitations.

The "answer" to the natural gas crisis is pretty simple. If you don't have sufficient natural gas, use another, more abundant resource to make power. Use more coal. The United States is the "Saudi Arabia" of coal, along with China. The U.S. produces 60% of its power from coal, but all growth in power production was pushed to gas – at a time when there was a declining supply of gas. Clean coal technologies exist today and could enable the U.S. to tap into its vast coal resources and to supplement the nation's energy resources with fewer emissions overall and less CO_2 impact.

Accomplishing some of the necessary 2% per year power growth through coal would likely result in more CO_2 production. However it is important to note that China plans to achieve most of its power growth with coal.

When policy makers and others restrict access to the nation's abundant natural gas resources, American consumers, workers, job seekers and the nation's economy suffer.

The growth in coal production in China in 2004 was almost 300 MM tons, reaching approximately 2 billion tons per year. The growth last year in China's coal use equals 30% of the total coal use in the U.S. If the U.S. does not use its domestic coal resources, it will continue to have prohibitive prices for natural gas and power. Losing U.S. jobs and production to China will continue, and ironically, China will use coal to power those factories. And China is not an isolated instance – much of the developing world follows the same plan. New coal-burning power plants have fewer emissions than older plants. R&D efforts are underway to capture and sequester CO_2 from coal-derived power. New plants of all kinds – power plants, chemical plants, auto plants, etc., are cleaner and more efficient than older plants. Growth, and the new plants that must be built to provide for growth, can lead to cleaner air as older plants are replaced. No growth means no new plants.

Increasing Natural Gas Supplies

In spite of everything, natural gas will remain a critical component of the nation's fuel portfolio and our energy future. The natural gas industry is a fine industry with superb technology and the ability to produce gas in an environmentally friendly manner. However natural gas supplies must increase to meet growing demand. When policy makers and others restrict access to the nation's abundant natural gas

resources, American consumers, workers, job seekers and the nation's economy suffer. It is imperative that we protect existing gas production and make the most of sands and resources that have been tapped. The U.S. must also enact measures to allow greater access to the vast, existing gas reserves that have been deemed off-limits due to political pressure, such as the Outer Continental Shelf and Lease 181 in the Gulf of Mexico. Blanket opposition to this is no longer a "free vote." It is costing jobs.

In order to rebuild U.S. manufacturing competitiveness, the U.S. must build a competitive energy infrastructure, including:

- An Alaska natural gas pipeline
- Cleaner coal-burning power plants
- More LNG terminals
- More efficient buildings, appliances and power plants
- Smart meters

Projects such as these would help to address the U.S. natural gas crisis, while helping the nation to regain and preserve more manufacturing jobs.

In general, addressing the nation's energy challenges could make the U.S. more competitive, takes pressure off prices, and enable economic growth. In the near-term, focusing on energy efficiency in the near-term will help reduce energy demand and benefit our environment. Over the longer term, greater supply, fuel diversity and a competitive energy infrastructure will be critical. With benefits for industry, society and the environment, a balanced energy future will positively contribute to the Triple Bottom Line of true success.

Andrew N. Liveris is President and Chief Executive Officer (CEO) of The Dow Chemical Company, Midland, Michigan. Liveris chairs the Office of the Chief Executive, the company's executive leadership team. He was named President and Chief Operating Officer (COO) in November 2003 and named Chief Executive Officer in November 2004.

Liveris' 28-year Dow career has spanned manufacturing, sales, marketing, new business development and management. He joined Dow in 1976 in Melbourne, Australia, and held various production project engineering and marketing positions in Australia, Hong Kong and the U.S. He was named Dow's general manager for all operations in Thailand in 1989.

In 1992, he moved to the U.S. as group business director for Emulsion Polymers and New Ventures. He was appointed general manager and then vice president in 1993 and 1994 respectively for Dow's start-up businesses in Environmental Services. In 1995, he was named president of Dow Chemical Pacific and moved back to Hong Kong. He returned to the U.S. in 1998 as vice president of Specialty Chemicals.

In 2000, Liveris was appointed president of Performance Chemicals Business Group, a $5 billion portfolio that brought together specialty chemical businesses from several acquisitions, including ANGUS Chemical, Hampshire Chemical, Union Carbide, Ascot Plc and, the acrylics business of Celanese AG.

Liveris has been a member of the Board of Directors of Dow since February 2004.

Liveris resides in Midland, Michigan, where he is a board member of Dow Corning Corporation, a member of the Midland advisory board of Comerica Bank and the Board of Trustees of the Herbert H. and Grace A. Dow Foundation.

Liveris graduated with first-class honors with a bachelor's degree in Chemical Engineering from the University of Queensland, Brisbane, Australia. He is a Chartered Engineer and a Fellow of The Institute of Chemical Engineers.