
MEMORANDUM TO THE PRESIDENT

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SECRETARY OF ENERGY

SUBJECT: POLICY STRATEGIES ADDRESSING THE NEED FOR LNG

DATE: 12/1/2004

Statements by Federal Reserve Chairman Alan Greenspan before the Committee on Energy and Commerce last summer indicated that recent trends in natural gas prices may have significant economic consequences. Growing demand has clashed with tight domestic supplies and limited options for importation. Unlike oil, the gas trade in the United States is largely regional, and worldwide trade in liquefied natural gas (LNG) is currently only a limited safety valve for our nation. The four existing LNG import terminals can provide no more than 3% of total natural gas demand and are all on the East Coast. These facts have led to a doubling in average gas wellhead prices since 1999. Tighter regional markets such as California's have experienced market volatility with quintupled prices in the same period.

Without growth in LNG imports, the situation will continue to degrade. Yet many barriers impede private development of new LNG terminals. Indeed, the current environment of existing regulation and public opposition may all but stifle the amount of new construction necessary. Policy change is required; a new policy should sanction and encourage public private partnerships (PPPs) between industry and the Department of Defense (DoD). Together, the private sector and the DoD can develop LNG import facilities at coastal military bases, providing secure entry points for imported natural gas.

DOMESTIC NATURAL GAS USE

Natural gas price increases and volatility have a marked effect on the energy sector and economic activity in general. Natural gas was the source of nearly a quarter of all energy sources consumed in 2002. Overall, as a versatile, efficient and clean burning fuel, gas is an integral economic player.

Current Uses

Natural gas is implicated in various forms of energy transformation and direct use. In 2000-2002, virtually all the new electricity generating capacity installed was natural gas fired. Over the past decades, as natural gas combined-cycle electricity production has matured, electrical utilities have turned to the fuel to meet growing electricity demand efficiently and cost-effectively. Gas facilities are easier to permit environmentally, as the fuel produces less air pollution. They are also inexpensive and easy to build.

Widespread reticulated gas has also prompted fuel switching from oil to gas boilers in domestic and commercial heating applications. This switch has reduced the nation's dependence on foreign oil while improving urban air quality. Gas is being tapped as the fuel for new combined heat and power (CHP) applications providing electricity, heat and cooling for large commercial and industrial power users, especially as electricity prices have increased in states such as California.

Natural gas is also the principal ingredient in ammonia fertilizers, constituting 75 percent of their cash cost. Ammonia fertilizers increased in price by 60% from 2000 to 2003, adding 10 cents to the production cost of a bushel of corn.

Future Production Options

The Energy Information Administration's 2004 Annual Energy Outlook (AEO) predicts gas consumption will grow at a rate of 1.4% per year until 2025. To meet this growth, the AEO predicts growth in domestic production of 1% per year, Canadian imports of 3% per year, and LNG imports of 15% per year.

A decade ago, most planners believed domestic natural gas extraction could meet growing demand. However, the relative maturity of gas exploration in the lower 48 states and the evidence of the 1999-2000 price increases indicate that growth in domestic production will not keep pace. Any growth in production will likely come from unconventional sources such as coal beds or sandstone and shale formations. Unconventional sources have higher production costs, though 30 percent of domestic production in 2002 was unconventional. Government incentives exist to promote development of unconventional resources; however, over 40 percent of these reserves are inaccessible to production because of environmental legislation, wilderness area or parkland designation, or other lease restrictions. Even if this acreage were accessible, non-conventional reserves, even with subsidies, are often more costly than LNG.

Planners have long assumed that imports of gas from Canada will continue to make up the United States production-demand differential into the future. However, a recent downward assessment of gas reserves by the Canada National Energy Board coupled with increased use of natural gas in Canadian tar sands oil production makes such an outcome less likely.

Declining growth in domestic production and Canadian imports means that without LNG imports, gas prices will skyrocket and consumption will decline. The resulting substitution of oil or coal for gas will have significant economic and environmental consequences.

LIQUEFIED NATURAL GAS

LNG transport is a convenient way to bring the trillions of cubic feet of natural gas stranded around the world to market. In 2002, 14 countries exported LNG to 12 nations across the globe on 151 tankers. Six percent of that gas was traded on a short term spot market, and the remainder exchanged hands on long term contracts. Tankers transport liquid gas at temperatures of -265°C under atmospheric pressure. Significant quantities of gas are also stored in liquid form throughout the world; in the United States alone there are over 100 such facilities. LNG trade is growing

worldwide---LNG represented 25 percent of international gas trade in 2003. Costs for liquefaction and tankers have dropped in recent decades, prompting further interest in LNG technology.

Domestic History

The first LNG plant was built in West Virginia in 1912. The technology was commercialized in 1940s as a storage form. By 1969, the US was exporting LNG from Alaska to Japan. Japan continues to be a major consumer of LNG; nearly 100 percent of the gas it consumes is imported from Alaska or Indonesia.

From 1971 to 1980, four LNG regasification terminals were built in Louisiana, Georgia, Maryland, and Boston. These primarily provided gas imports from Algeria. By 1980, Algerian price manipulation and dropping domestic gas prices led the private sector to mothball all but two of the plants. However, today, with rising gas demand and prices, all the terminals are open and operating near capacity. Currently, the majority of LNG arriving at the terminals comes from Trinidad and Tobago, with Qatar, Algeria, Nigeria, and Australia other major exporters.

Safety

When compared to refineries and petrochemical plants, the LNG industry has an enviable safety record. Over 40 years, 35,000 tanker voyages covering more than 65 million miles have delivered their cargoes without major accidents, spills or safety problems. Tankers often come within proximity of large populations without incident; in 2000, one cargo entered Tokyo Bay every 20 hours while a tanker entered Boston harbor once a week.

Early in its development, two major incidents left a mark on the industry. In 1944, during WWII steel shortages, an insufficient grade of steel was used to house a tank of LNG in Cleveland. It failed shortly after commissioning, resulting in a spill of liquid gas. Vaporizing liquid spread throughout the streets and sewers and ignited, resulting in the death of 128 people. A survey concluded that if the tank had been constructed to current codes, the accident would never have

occurred. Properly designed steel tanks currently in use boast more than 35 years of successful operation without a single crack.

In 1979, another LNG leak occurred at the Cove Point, MD import terminal. The liquid passed through 200 feet of underground conduit and vaporized gas ignited in an electrical substation, killing one person and causing \$3 million in damages. The incident resulted in three major code changes.

These accidents have left a lasting impression, and the fear of terrorism has only added to fears of LNG accidents and explosions. Recent LNG security initiatives by the Coast Guard, the Office of Pipeline Safety, the Transportation Security Agency, and the Federal Energy Regulatory Commission have all worked towards securing and managing the risks of LNG facilities. Recent studies have concluded that such risks, while significant, are not as serious as the public believes.

Why LNG?

LNG facilities sited around the United States will provide a much needed relief valve for the gas market. Indeed, even today's limited LNG import capacity helps mitigate unwieldy price spikes. The cost of LNG is reasonable; it has fallen to levels quite competitive with current domestic wellhead prices. Cheaper, less volatile gas markets will aid industry investment decisions, and allow for continued growth of the use of natural gas. LNG is essential to continue providing efficient and clean energy services for consumers and industry. Without LNG, high and volatile gas prices may impede the beneficial reduction of energy and emission intensity accompanying gas use, a trend our nation has enjoyed over the past decades.

Existing Barriers

As of April this year, 38 LNG terminals were proposed in North America. Of these, preliminary approval exists for 5; barring significant public opposition, one of them may be operational by 2007. Siting and building LNG terminals is a costly and lengthy process that requires coordination of dozens of federal, state and local agencies. The California Energy Commission

estimates project investors need to obtain 100 permits just to begin constructing proposed LNG facilities. On top of this, a wary and at times misinformed public can further stall and block proposals two years into the permitting process. The following Federal Agencies often interact with the permitting process of an LNG facility:

- Federal Energy Regulatory Commission
- US Army Corps of Engineers
- Environmental Protection Agency
- United States Coast Guard
- Department of Transportation
- Federal Aviation Administration
- Department of the Interior
- Historic Resource Review
- Department of Commerce

Similar agencies interact with the permitting process at the state and local level. All told, investors undaunted by the impressive capital investment required by LNG facilities often balk at the investment risk of the permitting process.

POLICY PROPOSAL

Without substantial federal intervention, new LNG import facilities will continue to be mired in reams of paperwork and permitting processes at the federal, state, and local level. This memo proposes one quick and attractive solution to bringing LNG facilities online in a timely and secure manner: promoting PPP LNG infrastructure development on coastal military bases countrywide.

By siting LNG facilities on military land, it may be possible to avoid state and local permitting processes altogether, saving years and millions of dollars for private investors. Certainly, public comment and local involvement is necessary, but many of the public objections to LNG terminals may be overcome simply by placing LNG terminals on bases.

Fears over the security risks of LNG terminals associated with terrorism can be mitigated by placing such installations under the watchful gaze of the military. Military harbors and berths are

under constant surveillance by default, and thus are free from the risks of civilian boaters. Indeed, in a DoD PPP scheme, LNG vessels will be the safest as they come to port, the point of their voyage considered most dangerous by the public.

Citizens will be reassured over the safety hazards of LNG, as well—the DoD is certainly well versed in proper handling of hazardous materials and cargo. And environmental concerns are less critical on military bases, especially when compared to the construction of LNG facilities on National Parkland or other protected foreshore properties.

The DoD may benefit from such a PPP as well. Although this type of PPP venture is novel, the leasing of federal and military land for commercial purposes is not. In this case, the Department of Defense (DoD) will be able to profit both by leasing land to interested investors and a sales tax on imported gas if it wished. Also, the DoD has control over nearly 12.7 million acres of land—more than even a \$400 billion dollar defense budget can maintain. As the Rand Corporation stated in its report *Seeking Nontraditional Approaches to Collaborating and Partnering with Industry*, “PPPs are one means of putting the Army’s property to good use and in a manner that provides the additional resources necessary for the effective stewardship of the vast holdings entrusted to the Army.”

Alternatives

If the DoD declines to construct LNG facilities via PPP agreements, there is still much to be gained by restructuring government oversight of import terminal construction. Designating FERC as a single lead agency and minimizing duplicate paperwork at the local/state/federal levels will be helpful. Currently, offshore LNG facilities are under the auspices of the Coast Guard and face entirely different regulations and permitting structures. To align all projects into one process will minimize regulatory waste and project delays.

Additionally, public misinformation must be curbed. No matter how streamlined the permitting process becomes, public commentary and interest group lobbying against LNG terminals is dictated by public knowledge. The Department of Energy should work with relevant state agencies

to provide accurate descriptions of the risks and benefits of LNG, along with the higher energy costs in a no-LNG scenario.

CONCLUSION

High natural gas prices are affecting our economy's competitiveness and our citizen's heating and electricity bills. Our nation's gas market is distorted by tight supplies and restricted transport. When compared to Europe, with North Slope gas fields, Russian pipelines, and Mediterranean LNG terminals, the United States gas market is inflexible and prone to volatility. The creation of a large number of LNG terminals throughout the United States' regional gas markets will bring lower and more stable energy costs to industry and consumers with environmental benefits over a no-LNG alternative.

The DoD can provide a secure home for these facilities and reap the financial benefit of LNG trade by entering into PPPs with interested energy companies to create LNG import facilities at coastal military bases. To do so would speed the development of LNG terminals, aid the military in supporting its massive landholdings, and help ensure America's energy future.