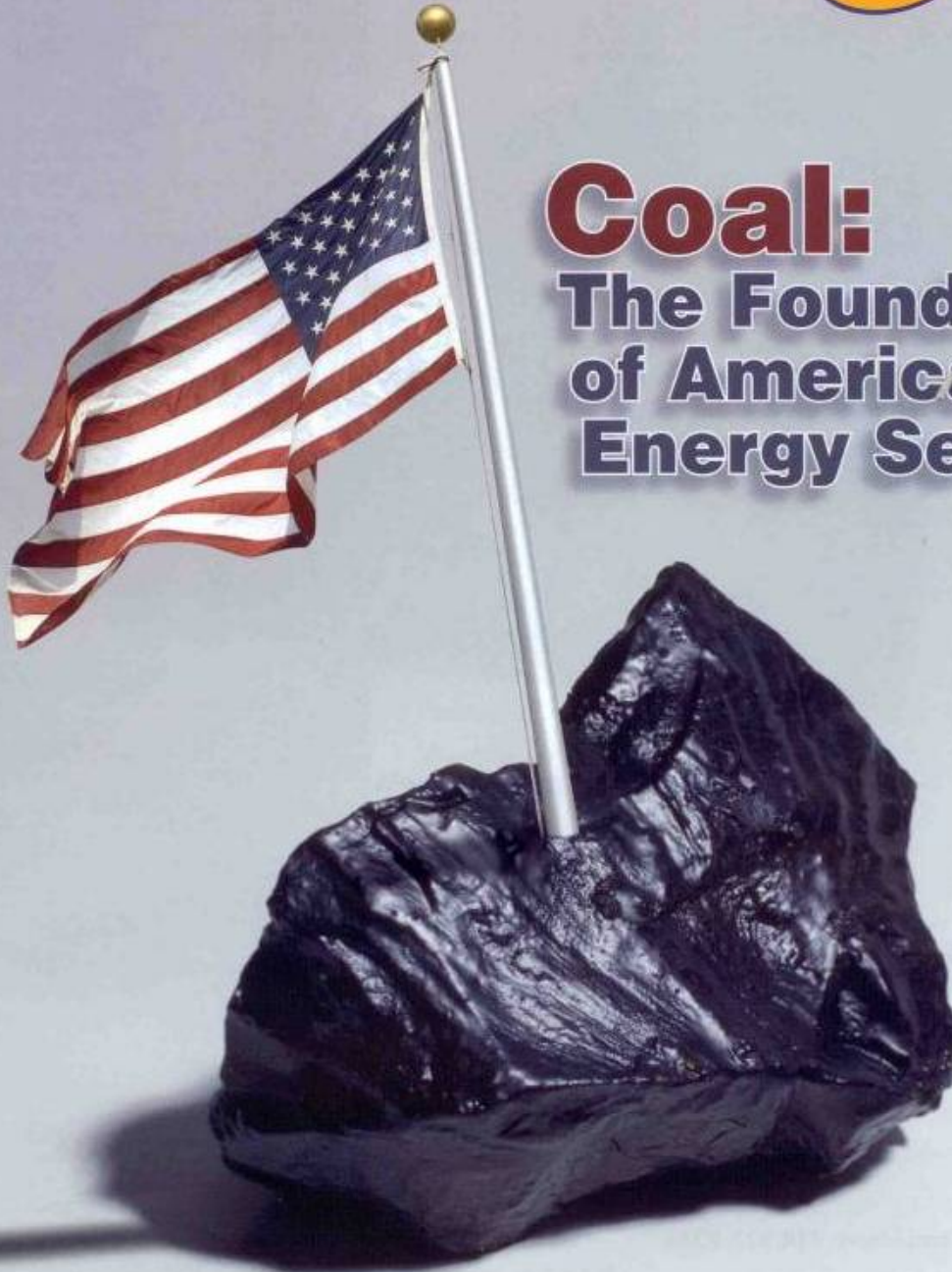


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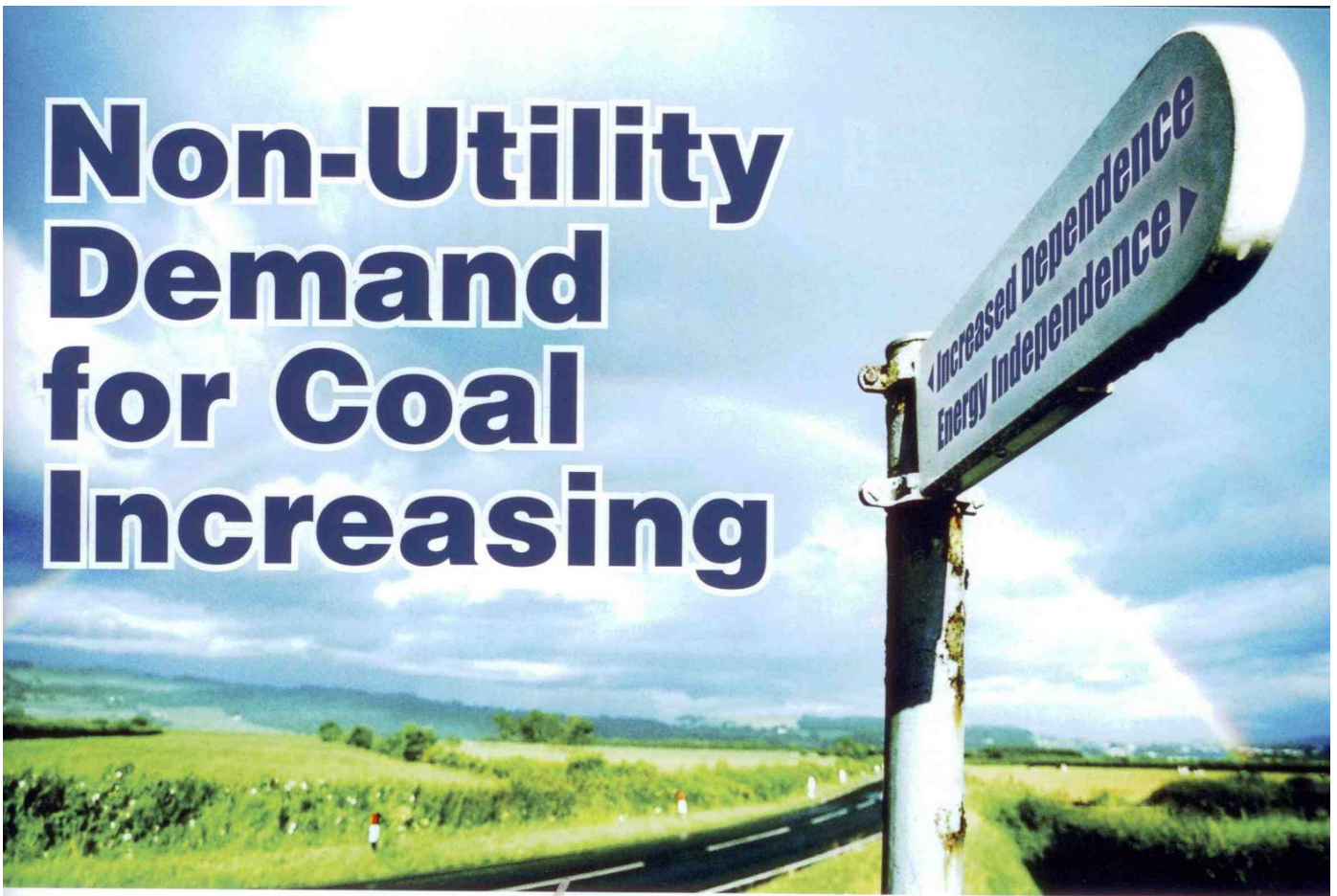
ECONOMIC, ABUNDANT/SECURE AND ENVIRONMENTALLY SOUND

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Coal:
**The Foundation
of American
Energy Security**

Non-Utility Demand for Coal Increasing



By Jeff H. Hassannia, Diversified Energy Corporation

The U.S. is standing at an energy crossroads. The easy path leads in a direction where the status quo is maintained—continued dependence on overseas energy sources, little technical innovation, and a genuine lack of long-term commitment. The second path, more likely a mountain climb, points to a radically new approach—a long-term, diverse, and committed plan of attack to secure the nation's energy independence.

There should be little question as to the path the nation must undertake; it is one that should have been taken many years ago. While the details can be argued, there are unquestionable factual trends that point to a near-term U.S. (if not global) energy crisis, one that may very well be upon us now or very shortly. This challenge is prevalent in two areas that will prove especially burdensome to average Americans and business—transportation fuel and natural gas costs. It is in these areas that on-going issues with supply and demand, geopolitical instability, and the environment make coal particularly attractive.

According to the Energy Information Agency's (EIA) Outlook 2006, global energy growth is expected to rise at a robust 3.8 percent/year through 2030 (the "projection period"). A central driver behind this growth is an expected tripling of energy demand in Asia during this period. Oil and natural gas demand growth are especially strong. Global oil consumption was recently up 3.4 percent, the fastest growth since 1978, and is expected to grow from 80 million barrels/day to 118 million barrels/day during the projection period. And, as surprising as it may seem, this is a slow-down from earlier projections because oil prices have jumped 35 percent since last year's report. Beyond oil, natural gas continues to be one of the fastest growing energy sources—with demand expected to double over the projection period.

What's Driving Demand?

The fundamental causes driving these demand projections, simply, can be attributed mostly to a continued boom in world population, an acceleration

of growth in many of the less mature economies around the world, and China and India. According to the United Nations, the world is expected to grow in the range of 60—75 million persons annually from 2005—2030. More than 50 percent of this growth can be attributed to Asia (for example, China and India are expected to add roughly 8 and 16 million persons/year through 2010, respectively). To put this last fact in perspective, the combined annual population growth in China and India alone is greater than the entire population of Texas, by far the most populated state.

This global population expansion is being exacerbated by a solid trend in worldwide gross domestic product (GDP) growth. Over the projection period the global GDP is expected to double. It is easy to get buried in the numbers and lose site of the forest for the trees, so just a few more facts—one-third of the world's population is still without electricity, the current worldwide per capita GDP is only \$6,000, and China's car ownership is expected to grow seven-fold

over the next 25 years. Given all of these facts on economic growth potential, it is easy to see how the energy demand forecasts seem quite plausible.

These demands will put enormous new pressures on conventional fuels that can't possibly be met entirely by traditional energy sources. The facts point to the very real possibility the world has reached (or is close to reaching) its pinnacle of crude oil production—much of the world's major oil fields (like the North Sea, Kuwait's Burgan Field, and Cantarell Mexico) are all on the decline. Most experts, including M. King Hubbert and his Peak Oil theory, agree the long-term trends look bleak for crude oil supplies. At home, the supply issues are similar—the U.S. has been a net importer of crude oil for over 50 years, continues to experience a dwindling of domestic production, and has not opened a new refinery in over three decades. How can industry ever expect to get past these supply constraints to meet a forecasted 40 percent increase in crude oil demand in the U.S. by 2030?

Beyond oil, the U.S. is also facing challenges meeting its natural gas demands.



This is demonstrated by new pressures to reopen deepwater drilling activities and a call to build a massive gas import infrastructure in the form of Liquid Natural Gas (LNG) terminals.

In addition to supply and demand challenges, the U.S. energy outlook is also being affected by on-going geopolitical instability and environmental concerns. Most of the world's currently retrievable

petroleum supplies are in regions ripe with conflict, tension, and future political and economic uncertainty. Last year 68 percent of U.S. imports of crude oil came from OPEC and the Persian Gulf region—these supply sources cannot be guaranteed. Coupled with this is continued evidence linking many of the older fossil fuel processing techniques with environmental damage. These forces—supply

and demand, geopolitical instability, and the environment—must drive a call to new energy approaches.

Coal and advanced processing technologies offer the U.S. one excellent near-term solution. With hundreds of years of proven coal reserves within the borders of the U.S., this abundance of supply enables commodity-like pricing with less volatility and more stability. The ability to extract coal has also improved by advancements in mining and reclamation techniques. One trip through the mined lignite fields in North Dakota will leave you thoroughly impressed with advanced reclamation processes. There have also been recent advancements in technologies to cleanly and efficiently turn coal into non-utility energy sources, like transportation fuels and natural gas.

Recently there have been a series of major technical advancements in the utilization of coal—building off the fundamentals that had lacked modernization for more than 60 years. The Department of Energy and industry have been pushing major advances in coal gasification, liquefaction, Fischer-Tropsch, and carbon dioxide sequestration technologies that deliver cleaner, more

efficient, and less costly systems. These advances offer the opportunity to transform coal into a variety of useful transportation fuels (like gasoline, diesel, and jet fuel) or various gases and chemicals. It is quite possible that coal could someday soon provide a major portion of our petroleum import needs by providing an affordable source of transportation fuels and natural gas. In fact, the Department of Defense is already exploring the use of coal to take a bite out of their almost \$10-billion annual fuel cost.

One of many examples of new technologies is an advanced molten metals gasifier being matured by Diversified Energy Corporation that could offer significant capital cost reductions and very high efficiencies.

In sum, coal could provide the U.S. a stable source of critical energy and a national security hedge against an over-dependence on international sources of crude oil and natural gas. The path the U.S. should choose is quite clear. ♦

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