



Well Enhancement Services, LLC

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Greenspan on Energy

Alan Greenspan, Chairman of the Federal Reserve Board, spoke to the Economic Club of New York recently on the energy situation, calling the oil and gas price surges of the past two years "the most immediately prominent" major shocks to the American economy over the past twenty years.

In the long term, Greenspan is optimistic about the market's ability to adjust.

World markets for oil and natural gas have been subject to a degree of strain over the past year not experienced for a generation. Increased demand and lagging additions to productive capacity have combined to eliminate a significant amount of the slack in energy markets that was essential in containing energy prices between 1985 and 2000. [...]

But if history is any guide, should higher prices persist, energy use over time will continue to decline relative to gross domestic product (GDP). In the wake of sharply higher prices, the energy intensity of the United States economy has been reduced about half since the early 1970s. Much of that displacement was achieved by 1985. Progress in reducing energy intensity has continued since then, but at a lessened pace. [...]

With real energy prices again on the rise, more-rapid decreases in the intensity of use in the years ahead seem virtually inevitable. As would be expected, long-term demand elasticities have proved noticeably higher than those evident in the short term.

Altering the magnitude and manner of U.S. energy consumption will significantly affect the path of the U.S. economy over the long term...The recent shift in expectations, however, has been substantial enough and persistent enough to direct business-investment decisions in favor of energy-cost reduction.

Of critical importance will be the extent to which the more than 200 million light vehicles on U.S. highways, which consume 11 percent of total world oil production, become more fuel efficient as vehicle buyers choose the lower fuel costs of lighter or hybrid vehicles.

Greenspan is, of course, an economist, and reflects the default economist's view that rising prices will stimulate newer technologies and enhanced recovery leading to additional production (ignoring, to a certain extent, the geological limitations of a non-renewable resource—i.e., production peaks).

To be sure, world oil supplies and productive capacity continue to expand. Major advances in recovery rates from existing reservoirs have enhanced proved reserves despite ever-fewer discoveries of major oil fields. [...]

The failure of oil prices to rise as projected in the late 1970s is a testament to the power of markets and the technologies they foster. Today, despite its recent surge, the average price of crude oil in real terms is still only three-quarters of the price peak of February 1981. Moreover, the effect of the current surge in oil prices, though noticeable, is likely to prove less consequential to economic growth and inflation than in the 1970s. Since the end of 2003, the rise in the value of imported oil—essentially a tax on U.S. residents—has amounted to about ¾ percent of GDP. The effects were far larger in the crises of the 1970s. But, obviously, the



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risk of more-serious negative consequences would intensify if oil prices were to move materially higher.

Ultimately, however, he turns to alternatives to conventional crude.

But because of inexorably rising demand, these improved technologies have been unable to prevent the underlying long-term prices of oil and natural gas in the United States from rising.

Conversion of the vast Athabasca oil sands reserves in Alberta to productive capacity has been slow. But at current market prices they have become competitive. Moreover, new technologies are facilitating U.S. production of so-called unconventional gas reserves, such as tight sands gas, shale gas, and coalbed methane. Production from unconventional sources has more than doubled since 1990 and currently accounts for roughly one-third of U.S. dry gas production. According to projections from the Energy Information Administration, most of the growth in the domestic supply of natural gas over the next twenty years will come from unconventional sources. In many respects, the unconventional is increasingly becoming the conventional.

Not even in the most wildly optimistic projections about the capabilities of unconventional oil (oil sands, extra-heavy-oil, shale) does their production offset the decline in conventional—and more easily produced—crude. Implicit in his approach is a recognition that the price band for fuel and energy has made a permanent jump higher—the unconventional may become conventional, but it won't be cheap, nor as plentiful as the "old" conventional was.

He then turns to the issue of potential substitution, made more attractive by that rising price band.

Clearly, limited substitution possibilities across fuels have resulted in persistent cost differentials, but those very differentials inspire the technologies that, over time, reduce such limitations. A clear example is gas-to-liquids (GTL) technology, which converts natural gas to high-quality naphtha and diesel fuel.

Given the large-scale production facilities that are currently being contemplated, GTL is poised to become an increasingly important component of the world's energy supply. Current projections of production however remain modest. GTL promises to add a good measure of flexibility in the way that natural gas resources are utilized. In addition, given the concerns over the long-term adequacy of liquid production capacity from conventional oil reserves, gas to liquids may provide an attractive, competitively priced, option for making use of stranded gas, which, for lack of access to transportation infrastructure, cannot be brought to market.

Ultimately, it boils down to the time available to make the changes that need to be made.

Innovation is already altering the power source of motor vehicles, and much research is directed at reducing gasoline requirements. Moreover, new technologies to preserve existing conventional oil reserves will emerge in the years ahead. We will begin the transition to the next major sources of energy perhaps before midcentury as production from conventional oil reservoirs, according to central tendency scenarios of the Energy Information Administration,