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The Challenge of High Priced Oil

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Several years ago, Vice President Cheney headed an energy task force to develop an energy policy for the Bush administration. The secrecy of the deliberations, and the alleged influence of energy industry lobbyists was challenged in the courts, which ultimately allowed Vice President Cheney to keep the deliberations and industry input secret. *See In re Cheney*, 406 F.3d 723 (D.C. Cir. 2005). Tragically, this opaque approach to energy policy has suppressed any realistic national conversation over the stark facts of the world energy markets: the era of low-cost fossil fuel is at an end and with it antique thinking built on the bedrock of inexpensive fossil fuel. This essay proposes that our nation's energy policy is divorced from the realities of the global energy market. The Energy Policy Act of 2005, signed into law by President Bush this August, essentially reaffirms Bush administration policy that will expand our enormous reliance on imported oil. This will weaken our economy, intensify global competition for oil, increase risk of political unrest, require us to depend on ever more fragile energy supply chains, increase environmental problems from air pollution and climate change, and further widen extremes in world poverty. The economic, environmental, and social risks from ignoring reality are potentially catastrophic, and suggest a future of fierce conflict over energy availability and development constraints.

This essay presents snapshots of a few starkly contrasting energy facts that illustrate facets of the world's energy reality. As environmental, energy and resource lawyers, we must seriously consider what these facts mean for us, our children, and grandchildren. We must dispassionately and intelligently decide whether our laws are up to the challenges of the coming decades and, if not, how our laws must be changed. Will our laws enable us to shift from a economy dependent on low energy prices (further subsidized by the lack of internalization into energy prices of the environmental externalities of energy use) to one where we can prosper in a peaceful world where oil is dear?

My thesis is that the conventional notion that the United States or any other nation can improve its economic output by following a high-intensity, low-efficiency fossil fuel development path is no longer viable. I suggest that to reject this statement is akin to believing, as in the fable, that the naked emperor is clothed. World market conditions and long-term energy trends do not support any reasonable expectation that oil prices will appreciably drop for any sustained period of time. On the contrary, all indications point to a steady, inevitable rise, interrupted by short-term, possibly extreme, price spikes, followed by modest price drops.

The oil supply facts are stark. According to INTERNATIONAL ENERGY AGENCY, WORLD ENERGY OUTLOOK 2004 (2004), daily global demand for petroleum rose to 82.4 million barrels per day (mb/day) with supply barely keeping pace at 84 mb/day. International Energy Agency's (IEA) OIL MARKET REPORT (Oct. 12, 2004) revealed that the Organization of Petroleum Exporting Countries (OPEC), driven by petroleum prices above US $50 per barrel, supplied a record 29.9 mb/day (as a result of renewed Iraq oil production), but OPEC's sustainable spare capacity is very small, less than 1 mb/day. Because short-term demand is highly inelastic, small disruptions in supply can trigger rapid increases in the market price. In 2004, the loss of 0.475 mb/day in the Gulf of Mexico due to Hurricane Ivan and worry about possible civil unrest in the Niger Delta helped drive spot market oil prices up about $5 per barrel (about 10% of its spot market price). In 2005, loss of production due to Hurricane Katrina drove prices to above $70 per barrel.

Underlying demand for oil is also rising. Quite simply, if the world continues to follow business-as-usual energy policies, IEA projects that by 2030 the world's energy needs will be almost 30 percent higher than they are now, with two-thirds of the increased demand coming from developing countries' economic and population growth. China's emerging and voracious appetite for oil, which has grown about 50 percent since 2001, is particularly significant. China's oil demand, now 6.3 mb/day in late 2004, is projected to rise to 6.9 mb/day by the end of 2005. However, its domestic oil production is stuck at 3.5 mb/day. Thus, China must import 2.4 mb/day, an amount

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equal to the entire output of Nigeria or the United Arab Emirates. Nor is China's demand likely to diminish: China seeks to double its economic output by 2020 and expand its fledgling car market to 100 million vehicles.

In the United States, oil demand is 20.6 mb/day and steadily growing, but our declining domestic production is now only 7.3 mb/d. The result is that the United States must import 13.3 mb/day. If we follow our business-as-usual approach, our imports will rise as demand tracks its present growth path of 2 percent to 3 percent per year, and as production continues to drop since the U.S. peak some thirty years ago. Even if the United States were to open the Arctic National Wildlife Refuge (ANWR) to drilling (a highly controversial proposal), its contribution to world supply would be trivial. Median estimates are that the area contains 10.3 mb technically recoverable reserves if there is no major thawing of permafrost (which has already begun) of which 3.2 billion barrels (bbl) are economically recoverable. NATIONAL RESEARCH COUNCIL, CUMULATIVE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES ON ALASKA'S NORTH SLOPE (2003) 56, *available at* www.nap.edu. Thus, ANWR could only meet current world demand for thirty-eight days.

For oil prices simply to remain at present levels, around $60 per barrel, the world's oil supply must expand to match growing global demand for oil, and there can be no serious supply disruptions. However, because oil will increasingly be imported from distant suppliers, many if not most of whom are in politically unstable regions, the world's oil supply market will become more fragile, less elastic, and highly sensitive to any supply disruption, whether from accident, weather, terrorism, labor disputes, political disputes, or even piracy. IEA, GLOBAL ENERGY OUTLOOK 2004 at 29.

Whether supply growth can match IEA's projected demand growth by 2030 to 121 mb/day in an ever more fragile world market is debatable. IEA estimates that to meet the world's energy needs in 2030 will require a $16 trillion investment. The oil supply component of this challenge will be $3 trillion by 2030 for additional oilfields (mostly to offset production declines in existing oil fields), pipelines, tankers, and refineries. The remaining $13 trillion will be needed, according to IEA, to expand electricity infrastructure. Although this huge investment will expand electrification, especially in Asia, IEA notes that "the ranks of the electricity-deprived . . . will continue to swell in Africa" and 2.6 billion people will unsustainably rely on traditional biomass fuels for cooking and heating.

This reality is both harsh, and unfair. At the same time that developing countries seek, and need, rapid economic expansion, the world must curtail anthropogenic emissions of greenhouse gases. Most of the warming is driven by increased atmospheric concentrations of carbon dioxide (CO_2), and most of this CO_2 is released by burning fossil fuels. Thus, to limit increases in and ultimately reduce atmospheric CO_2 concentration, fossil fuel use must be reduced. So, not only will high market prices economically limit fossil fuel use, but environmental imperatives will add to the pressures to reduce fossil fuel use.

Developing countries, such as those in sub-Saharan Africa can legitimately complain that it is utterly inequitable to expect them to sacrifice industrial development to mitigate climate change, when Africa's role in emitting greenhouse gases has been relatively insignificant. Africa's equity argument is supported by past emissions data. From 1800 to 2000, Africa's cumulative CO_2 emissions were just 1.7 percent of the world's total, and on a per capita basis, CO_2 emissions in Africa are just one-tenth the world average, and one-fiftieth that of the United States. WORLD RESOURCES INSTITUTE, WORLD RESOURCES 2002–2004 (2003) Data Table 7. This disparity in CO_2 emissions is paralleled by the disparity between Africa and the world with respect to the nature of fuel that is used.

Unfortunately, most of Africa's energy comes from the land—through inefficient burning of firewood and animal and agricultural waste for cooking. Not only is traditional charcoal and wood-burning remarkably inefficient (improved cook stoves such as the Kenyan Ceramic Jiko reduce daily charcoal use almost 50 percent, but the stoves are not widely disseminated) but it also creates enormously unhealthy indoor pollution and is unsustainable. In virtually all of sub-Saharan Africa, with the exception of South Africa, traditional fuels—firewood, crop residue, and biomass—are the single largest source of energy. World Resources Institute (WRI) data reveals that developed countries average only 2.6 percent of energy from traditional sources; developing countries outside Africa average 23 percent, whereas sub-Saharan Africa (excluding South Africa) is, tragically, dependent on traditional fuels for 87 percent of its energy. Ironically, even in oil-rich sub-Saharan nations, most people depend upon traditional fuels for their survival. For example, 83 percent of all energy use in Nigeria is from traditional fuels even though Nigeria is one of the largest oil producers in the world. Poverty, severe respiratory illness, and environmental destruction parallel these trends. Finally, where fossil fuels are available, they are often in an unhealthy form, such as leaded gasoline and high-sulfur fuels.

Electricity is not available across most of sub-Saharan Africa. Even in China, with its huge population denominator, per capita electricity is more than ten times that of the average sub-Saharan nation. Electrification rates in sub-Saharan Africa are also the lowest of any region in the world. Electrification in rural Africa is astonishingly low—most households in Africa do not have access to electricity, and where electricity is available, it is relatively expensive; generally it is priced at levels similar to United States' retail prices.

To understand America's energy challenges we must appreciate the demand pressures and supply constraints around the world. Tight market supplies and demands from the developed world and emerging economies such

as China's are well integrated into market prices. What is not well appreciated is that the demand potential in sub-Saharan Africa is also enormous, even if the region's economies improve only modestly. Unless we want a world rife with poverty and political unrest, a world covered in coal carbon black and sulfur dioxide, a world whose climate is rapidly warming, and an American economy hobbled by blind reliance on high-priced oil, the United States must find new ways to use energy much more efficiently and to harness the abundant solar renewable resources that cover the earth. To do this we must abandon the time-honored assumption that oil is limitless and cheap—if only we had enough wells. Instead we must entirely rethink our energy policy and laws so that we can prosper in a new energy reality.