❑ THE GROWING DEVELOPING COUNTRY APPETITE FOR OIL AND NATURAL GAS

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Projected sharp increases in energy use by the developing world, particularly developing Asia, combined with rising U.S. oil and gas demand could strain global energy systems and environmental conditions, says Jaffe. As a result, she says, the diplomatic, strategic, and trading focus of certain Asian states may shift, leading to a strengthening of economic and political ties among individual Asian states, major Middle Eastern oil-exporting countries, and African oil states. She argues that to deal with the challenges such links could pose, the United States must enhance cooperation with its global partners to develop new energy sources, energy-efficient technologies, and cleaner, alternative fuels — both to reduce international tensions and to promote its own energy security. These efforts also would be critical to ensuring a brighter future for poor countries lacking access to affordable energy, she says.

For the past two decades, growth in the developing world has led to a sharp increase in world energy use. That growth, combined with rising U.S. oil and gas demand, could strain global energy systems and environmental conditions as the 21st century progresses.

The quest for energy will create new economic and strategic challenges as well as alter geopolitical relations. The outcome of these developments will depend on policy choices made by the key players in the developing world and by the United States. Territorial concerns and nationalism remain defining issues in international relations. This means that energy security for all must be managed carefully lest other pathologies spread into deliberations in the energy area.

DEVELOPING WORLD ENERGY USE

Populations will continue to grow much faster in developing countries than in the rest of the world. By 2030, the share of the world's population living in developing regions could reach 81 percent, according to United Nations projections. Coupled with fast economic expansion projected for emerging markets, rapid population growth will lead to dramatic increases in energy demand in the developing world.

According to projections of the International Energy Agency's (IEA) *World Energy Outlook 2002*, by the year 2030 global primary energy demand will be nearly two-thirds above the levels of 2000, reaching 15.3 billion tons of oil equivalent per year by the end of the forecast period, with developing countries accounting for 62 percent of the rise. Similarly, the U.S. Energy Information Administration (EIA) forcasts that by 2025, energy use in the developing world will have almost doubled.

Because the emerging economies are projected to rely increasingly on coal and other fossil fuels, they will contribute much more to worldwide carbon dioxide emissions as their demand for energy quickly grows. Developing countries are forecast to account for two-thirds of the projected increase in carbon dioxide emissions, which according to many scientists contribute to global warming. Four major countries alone — Indonesia, China, India, and Brazil — will emit 2 billion tons of carbon annually by 2010, creating special challenges for international cooperation on climate issues. The United States and other industrialized nations need to engage these countries in multilateral climate initiatives such as research and development of cleaner energy technologies.

Growth in Latin America, where primary energy demand is expected to nearly double by 2015 from 1999 levels, will also contribute significantly to future geopolitics of energy. Rather than serving as a major supply region for the United States, Latin America could also find itself as a major consuming region, needing to be included in international emergency stockpiling systems and alternative energy initiatives.

Explosive growth in Asia is expected to contribute significantly to the rise in use of energy by the developing world and have the greatest impact on world oil use, thus playing the largest role in shifting oil geopolitical trends. In developing Asian countries, where an average annual growth rate of 3 percent is projected for energy use as compared with a 1.7 percent for the entire global economy, energy demand is expected to more than

double in the next two decades. According to IEA projections, demand in the region will account for 69 percent of the total projected increase in developing world consumption and almost 40 percent of the increase for total world energy consumption.

Asia's rapid economic growth, explosive urbanization, dramatic expansion in the transportation sector, and politically important electrification programs will have a dramatic effect on the region's dependence on imported energy. Absent significant growth in renewable energy supplies and/or new energy technologies, consumption of crude oil and natural gas in Asia will rise substantially and with it significant environmental challenges. Given the inadequate resource endowment of the region and the region's already high dependence on imported oil supplies, it is anticipated that Asia will exert an increasing pull on the Middle East and Russia in coming years.

According to *Oil Market Intelliegence 2001*, published by the Energy Intelligence Group, an independent research service, Asia's oil use, which exceeds 20 million barrels per day (b/d), is already larger than that in the United States. By 2010, total Asian oil consumption could reach 25-30 million b/d, most of which will have to be imported from outside the region. China alone can be expected to see its oil imports rise from around 1.4 million b/d in 1999 to 3-5 million b/d by 2010. This has awakened fears in Tokyo, Seoul, and New Delhi about competition or even confrontation over energy supplies and lines of transport.

GEOPOLITICAL REPERCUSSIONS

The diplomatic, strategic, and trading focus of certain Asian states can be expected to shift in light of growing energy import requirements, leading to a strengthening of economic and political ties among individual Asian states, major Middle Eastern oil-exporting countries, and African oil states. Such links could pose new challenges to the West both in terms of arbitrating emerging regional conflicts and in rivalry for secure energy supplies, especially in times of supply disruption, war, or other kinds of emergencies. China's proactive oil diplomacy and foreign oil and gas investment campaign, for example, has raised concerns in some quarters that the emerging international power, because of its growing need for oil, could become susceptible to pressures from oil-producing states seeking sophisticated weapons systems or weapons of mass destruction.

Environmental concerns could exacerbate energy security fears, creating other kinds of strains on the international political system. Thus, the benefits of multilateral cooperation between the West and the developing world in forging joint solutions to energy supply and environmental challenges are compelling. It should be considered a high priority for international diplomatic efforts.

The potentially steep costs of confrontation over energy supplies and environmental degradation are pushing some Asian nations to develop more energy-efficient technologies and alternative forms of energy. More likely for the near term, however, will be a move to diversify both the forms of energy used and the sources from which supplies come.

There is huge potential for increased engagement by the United States in enhancing cooperation to develop new energy-efficient technologies and cleaner, alternative fuels both to ensure peace and stability on the world stage and to promote its own national efforts to secure a brighter energy future.

For all the focus on economic growth in Asia, the consistent growth in U.S. oil imports is an overwhelming factor in global oil markets. U.S. net imports rose from 6.79 million b/d in 1991 to 10.2 million b/d in 2000. Global oil trade, that is the amount of oil exported from one country to another, rose from 33.3 million b/d to 42.6 million b/d over that same period. This means that America's oil imports alone represented over one-third of the increase in oil traded worldwide over the past 10 years. As for oil trade with the Organization of Petroleum Exporting Countries (OPEC), the U.S. import market was even more significant — over 50 percent of OPEC's output gains between the years 1991 and 2000 wound up in the United States. Current U.S. oil demand is about 20 million b/d, of which only 40 percent is produced domestically.

MEETING THE NEEDS OF THE POOR

Cooperation in finding new energy sources and cleaner, more efficient technologies, besides being a valuable means to reduce the risks of international tensions and conflict, is critical to ensuring a brighter future for the developing world and reducing poverty and disease in many parts of the globe. Currently, more than a quarter of the world's population has no access to electricity and two-fifths are forced to rely mainly on traditional biomass

— firewood and animal waste — to meet basic cooking and heating needs. About 80 percent of these populations are located in India and sub-Saharan Africa. Four out of five people lacking modern energy services live in rural areas. Indoor air pollution from traditional biomass energy is responsible for the premature death of over two million women and children a year worldwide from respiratory infections, according to the World Health Organization (WHO).

Continued reliance on oil under the growth scenarios outlined above would leave the international community more dependent on oil from OPEC countries, with harmful consequences for the world's poor. While it has often been argued that the U.S. economy can absorb the rising oil prices that might result from OPEC's gaining a higher market share of world demand, a gradual increase in energy costs would likely contribute to a widening economic gap between industrial societies and the developing world. Without a major technological breakthrough, over 1.4 billion people will still be without modern electricity in 2030 under a business-as-usual oil demand scenario — only 200 million fewer than today, according to a 2002 study by the IEA. Moreover, for the past 30 years, developing countries have been borrowing billions of dollars from international institutions such as the International Monetary Fund and World Bank to help them pay for oil they cannot afford. This trend would likely worsen if reliance on OPEC were to increase over time.

Ironically, OPEC countries' policies of promoting increasingly higher oil prices that contribute to massive indebtedness in the developing world have not helped raise the living standards of their own populations. In certain countries, oil revenues have been squandered in official corruption or used to fund military adventurism, international terrorism, or major weapons acquisition programs. Lower energy costs, brought about by new discoveries or breakthroughs in energy efficiency or alternative energy sources, might force such regimes to pursue economic diversification more rigorously, and in the few cases where it might apply, limit capital for programs contrary to U.S. interests.

A CALL TO ACTION

The United States has many means at its disposal to influence the world energy outlook. With the rise in U.S. oil imports such a significant factor in international energy markets, any change in U.S. policy that can significantly lower the pace of import growth could have a telling impact on OPEC's plans to increase market share as well as limit the environmental consequences of unfettered energy use.

No one doubts that a combination of fiscal instruments and regulations can slow the rate of U.S. increase in demand for oil as a transportation fuel. Needless to say, the United States and Canada, with a much lower consumption base, stand apart from the other Organization for Economic Cooperation and Development (OECD) countries. Japan and European Union (EU) countries have managed, through high consumer taxes, to fundamentally end growth in oil demand. In both cases, total growth for the current decade is expected to fall to the range of 0.1-0.2 percent a year. When it comes to gasoline demand, European consumption is actually falling as consumers opt for more fuel-efficient diesel powered vehicles.

U.S. energy strategies could include modest increases in fuel taxes combined with incentives to use low-sulfur diesel rather than gasoline, thus creating greater efficiencies. Additionally, there could be more regulation of sport utility vehicles, which have been largely exempt from other U.S. efficiency standards. Strategies could include mandates for government fleets to be fueled by natural gas or electric power. A sliding-scale luxury tax on new vehicles based on their mileage performance would be another way to propel more efficient technologies into the marketplace without taxing gasoline per se.

Research and development must also be a major vehicle in promoting effective energy policy. U.S. research and development priorities include the National Nanotechnology Initiative (NNI), the FreedomCar, the Hydrogen Fuel Initiative, and the International Thermonuclear Experimental Reactor project (ITER). President Bush has pledged $1.7 billion over the next five years for these programs, making it a significant push towards hydrogen as a fuel for the future.

However, critics say a commitment of billions of dollars would be needed to promote the fundamental science needed to solve the energy and environmental problems facing the world community in the coming decades. This research effort can be done in collaboration with other major consuming countries, yielding benefits for all and aimed at revolutionizing advances in solar power, wind, clean coal, hydrogen, fusion, new generation fission

reactors, fuel cells, batteries, and a new electrical energy grid, which can tie all these power sources together. Beyond U.S. initiatives, there should be little doubt that there is considerable room for enhanced energy efficiencies in other major energy-consuming societies in the developing world. As major energy-using countries such as Russia, China, India, and Brazil radically alter the economic signals associated with energy costs to inject market-based pricing principles as a replacement for subsidized energy supplies, oil demand savings can be dramatic, especially in the power generation and household sectors. The continued drive toward energy market liberalization around the world, especially in areas other than the transportation sector, could have significant impact on the rise in primary energy requirements in the developing world.

The U.S. government should also take a much more proactive stance vis-à-vis Russia and China with respect to the international energy sector. It could help the United States and other IEA countries break OPEC's hold on the energy market and help these two critical emerging energy powers define their own goals in manners compatible with U.S. objectives. China needs to be encouraged to enhance its plans for strategic stockpiling, and there are ways the United States can assist it in doing so, whether by sponsoring China's membership in the IEA or assisting the development of new regional energy security arrangements.

Finally, the U.S. and other industrial countries can do a great deal more to enhance the institutional mechanisms that favor markets over political intervention by oil producers. The U.S. needs to show leadership by looking seriously at ways to bring the rules of global oil trade and investment in harmony with the rules governing trade in manufactures and services. This would mean building on open trade and investment within the IEA and discriminating actively against those countries that do not permit foreign investment in their energy resources and that limit their exports to manipulate prices. Liberalization and open access for investment in all international energy resources would mean their timely development rather than today's worrisome delays. Without global norms across the oil sector, the world experiences supply limitations related to capital and political motivations that cripple the global economy and perpetuate poverty in the energy-poor countries of Africa and Asia. The example of Russia over the past five years, with its rapid growth in oil production following economic liberalization, should serve as a an example to other still-closed countries of the benefits in enhanced revenues and production. ❑

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