



# The geopolitics of energy

**Oil producers are working at close to capacity. Consequently, increasing energy demand is likely to reshape the petroleum industry.** By Amy Myers Jaffe, Wallace S Wilson fellow for energy studies, James A Baker III Institute for Public Policy, Rice University



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**E**NERGY IS a basic necessity for human activity and economic and social development. Yet global strategies for how to meet the world's basic need for its rapidly growing population are sorely lacking. A lack of energy services is directly correlated with key elements of poverty, including low education levels and the restriction of opportunities to achieve subsistence.

Populations will grow much faster in developing countries than in the rest of the world. By 2030, the share of the world's population living in the developing regions could hit 81%, according to the UN. Coupled with fast economic expansion forecast for emerging markets, rapid population growth will lead to a dramatic rise in energy demand in the developing world.

This quest for energy will bring new economic and strategic challenges for the international system. Continued sharp increases in energy use by the developing world, particularly in Asia's emerging economies, combined with strong US energy use, are putting a strain on energy infrastructure and creating an energy-trade dynamic that is altering geopolitical relations.

## Hitting the limits

Years of rapid world oil-demand growth have coincided with tightening restrictions inside the OECD on building energy facilities, limiting investment in new infrastructure. Oil-producing countries, suffering from national budget deficits and in some cases blocked from access to equipment and capital by US or international economic sanctions, have also been reluctant to invest heavily in facilities. The result has been the creation of production capacity shortages at critical links in the energy supply chain across the world, but particularly in the US, where regulations and permitting processes for the construction of energy infrastructure have been the most onerous.

Acute production-capacity shortages are evident in many markets. Opec is operating at 99% of its capacity compared with 90% in 2001 and 80% in 1990, just before Iraq's invasion of Kuwait. At the same time, competitive pressures have prompted the industry to reduce commercial refined products stocks to 25-year operational lows, leaving little cushion to absorb a blow to the supply chain.

World refining capacity is also close to full utilisation, with key regions such as the US, the European Union (EU) and China operating at above 90% utilisation, compared with 75-85% in 1990. World demand for refined products totalled 81m barrels a day (b/d) in fourth-quarter 2004, against world refining capacity of 84m b/d (of which 4m b/d of

Russian capacity has no commercial outlet), leaving products inventory build-ups a key role to play in balancing supply and demand.

Pipeline constraints in key regions, such as North America and Russia, also affect oil and gas flows to major demand centres. The operation of the energy system at levels so close to capacity limitations means unexpected outages can quickly lead to price spikes and even regional physical shortages.

## Developing world growth

Rising energy demand in the developing world, combined with rising US needs, is altering the geopolitical landscape. Territorial concerns and nationalism remain defining issues in international relations, meaning energy security for all must be managed carefully.

Growth in Latin America, where primary energy demand is expected to nearly double by 2015 from 1999 levels, will mean the region becomes a major consumer rather than a net oil and gas exporter. Rather than serving as a traditional supply region for the US, Latin America will be forging its own ties with local and distant oil and gas suppliers.

## Explosive growth in Asia, if sustained, will contribute most significantly to the rise in energy use and play the largest role in shifting oil's geopolitical trends

But it is explosive growth in Asia, if sustained, which will contribute most significantly to the rise in energy use and play the largest role in shifting oil's geopolitical trends. Energy demand in Asia is expected to more than double in the next two decades. According to IEA projections, Asian demand could account for almost 70% of the total projected increase for the developing world and about 40% of the increase in total world energy consumption. Asia's rapid economic expansion, explosive urbanisation, shooting demand for private transportation and politically important electrification programmes will have a dramatic effect on the region's dependence on imported energy.

A rapid growth rate for developing Asia is consistent with that seen during the period from 1970 to 1994 when Asian energy demand rose by 400% in absolute terms and the region's staggering economic growth promoted a 274% increase in the amount of oil used over the 24-year period, compared with an average rise for the rest of the world of 63%. Asia will exert an increasing pull on Middle Eastern, Russian and African oil and gas supplies in coming years, leading to a strengthening of economic and political



ties among individual Asian states and the major oil exporting countries in the Mideast Gulf and Africa.

China alone is expected to see oil imports rise from around 1.4m b/d in 1999 to 3m-5m 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. In the US, debate about the effect of China's rivalry for energy supply on US energy security is gaining momentum. China's proactive oil diplomacy and foreign oil and gas campaign, for example, has raised concerns in some quarters that this emerging international power, because of its growing need for oil, could become susceptible to political pressures from oil-producing states and take aggressive measures to block the availability of energy supplies to other consuming nations.

### Opec policies pivotal

At its 30 January 2005 meeting, Opec suspended its official \$22-28 a barrel oil-price target, signalling the cartel's intention to pursue higher prices. Opec claims the economic trends of 2004 show that oil priced at \$50/b, or even \$60/b, could be good for both consuming and producing countries.

If the increase in prices promoted by Opec is sustained, it will probably contribute to a widening economic gap between industrial societies, which can absorb these costs, and the developing world. According to a 2002 study by the IEA, this kind of business-as-usual scenario – under which the world's dependence on Opec increases over time – will mean that 1.4 billion people will still be without modern energy services in 2030.

### For the past 30 years, developing countries have been borrowing billions of dollars from international institutions to help them pay for oil they cannot afford

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 will worsen over time if Opec stays on its present course. Already, the rise in oil import bills represents one to three times the level of foreign assistance received by many less developed countries, darkening the outlook for their populations.

Against the backdrop of tightening oil markets and rising monopoly power within Opec, resource nationalism is on the rise. Expectations are that the world will become more dependent on oil and gas from Opec sources after 2010. The US Department of Energy predicts the call on Opec crude could rise from 28m b/d (of total demand of 78m b/d) in 1998 to 60m b/d in 2020 (of total demand of 117m b/d), with most supply coming from the Middle East, especially Saudi Arabia.

To maintain stable oil markets, a major expansion of Opec resources is required, but Opec's production capacity has fallen, not risen, over the last 20 years, calling into question whether the needed expansions

will take place. Opec has been slow to respond to the latest run-up in oil prices with major capacity expansion programmes, arguing that the world turns its back on oil producers when low oil prices benefit the international community, but harm the national budgets of oil-dependent economies.

Opec's ability and drive to protect and, when possible, increase revenues gained momentum after the 1998 oil-price collapse. Opec countries became concerned about their own economic performance, which lagged in the 1990s relative to other nations. By the end of the last decade, Opec rejected the notion that low oil prices were good for everyone. For key member nations, where oil revenues were critical, the effect of falling oil prices was perceived as far greater than the effect of higher prices on Western oil importers, whose oil import bill is only a fraction of their total trade. Oil-importing countries gained this advantage partly because of policies taken in the 1970s and 1980s to diversify to other fuels, or to tax oil use to hold down demand growth.

### Limited capital

But Opec's failure to expand its capacity is not only the result of a binding strategy. In recent years, many of the national oil companies (NOCs) managing resources within the cartel have had difficulty organising the capital, technology and human-resource capabilities required to find and develop significant new reserves. Other national needs have taken priority, limiting the amount of capital available to NOCs for hydrocarbons development.

There are a few exceptions. A 2003 Deutsche Bank report shows Algeria increased its conventional crude output from 0.8m b/d, four years ago, to 1.4m b/d in 2004. Nigeria expects output to grow by 100,000 b/d a year, until 2007, if domestic political challenges can be overcome. And Saudi Arabia has begun expansions of several oilfields for the first time in more than a decade. The Qatif field added 0.5m b/d of Arab Light capacity in autumn 2004, while work at the Khurais field will contribute up to an additional 1m b/d of capacity, in addition to some new

**Oil production in Bohai Bay, China. The country's oil demand is expected to soar to up to 5m b/d by 2010, far outstripping domestic production**  
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flows from the Haradh section of the Ghawar field. But new investments could be significantly offset by capacity declines at older Saudi fields.

### Industrial countries' response

If Opec fails to meet market requirements and begins to collect increasingly larger rents from consuming countries, wealthier industrial nations are likely to respond by considering alternative energy sources and enhancing energy-efficiency strategies. Japan and the EU countries have managed, through high consumer taxes, to end oil-demand growth. In both cases, total demand growth is expected to fall to the range of 0.1-0.2% a year.

Focus is emerging in consuming countries, both in the West and in Asia, on promoting renewable energy sources, clean coal and innovative automotive technologies. The EU directive on renewable energy sets a target of 12% of energy and 22% of electricity generation from renewables by 2010. Even China, with the highest energy-use growth rate in the world, has set a target of 10% renewable energy by 2010. Clean Edge, a research firm in Oakland, California, predicts world spending on renewable energy will jump to \$89bn by 2012, from \$10bn in 2004.

If more aggressive conservation-oriented policies were adopted in the US, Canada and Asia, the effect on energy markets would be dramatic. The consistent growth in US oil imports has been an overwhelming factor in global oil markets – representing over a third of the increase in world oil trade between 1990 and 2000. US oil demand is about 20m b/d, or about a quarter of total world demand.

### A shift in US energy policy

Signs of a shift in US energy policy are emerging, if not at the national level, then certainly at a state and local level. Renewable-portfolio standard laws are being implemented in over 20 densely populated states, while over 17 states have set up renewable energy funds to subsidise or promote development of new renewable technologies. California, for example, has targeted 20% of electricity generation from renewable sources by 2017.

US states are also tackling the difficult issue of automobile efficiency. The California Air Resources Board has approved regulations that mandate the motor industry to cut exhaust emissions from cars and light trucks by 25% and from larger trucks and sport utility vehicles by 18% by 2016. California represents over 10% of the US automobile market, ensuring some manufacturers will comply to preserve market share. The programme will force hybrid and hydrogen fuel-cell vehicles into California's market as the state's emissions goals will not be met without significant improvements in operating efficiencies for individual cars.

To meet the regulations, motor manufactures say they will have to make cars with an average fuel economy that is 35-50% higher than at present. The California standards are likely to be challenged by the industry in court, but if they stand, will probably be introduced in other like-minded states, such as New

York, New Jersey and Connecticut. If that happens, analysts say carmakers will change production plans, as these states together will represent a critical mass of the US market. For every gallon of improved mileage performance in the US car fleet, national oil demand is reduced by over 300,000 b/d.

Beyond these US initiatives, there is considerable room for enhanced energy efficiencies in other major energy-consuming societies. As 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 subsidised energy supplies (the cost of which is becoming more onerous to governments), oil demand savings can be dramatic, especially in the power generation and household sectors. The continued drive towards energy market liberalisation around the world, especially in areas other than the transport sector, could have a significant effect on the rise in primary energy requirements in the developing world.

### A research effort, led by the industrialised world, would yield benefits for all by reducing energy poverty and promoting global environmental protection

The US and other industrial countries can do a great deal more to enhance the institutional mechanisms that favour markets over political intervention by oil producers. The rules of global oil trade and investment must be brought into harmony with the rules governing trade in manufacturing and services. This would mean building on open trade and investment within the IEA countries and discriminating against countries that do not permit foreign investment in the development of their energy resources and that limit exports to manipulate prices.

Liberalisation and open access for investment in all international energy resources would mean their timely development rather than worrisome delays. Without global norms across the oil sector, the world experiences supply limitations related to capital and political motivations that can cripple the global economy and perpetuate poverty in energy-poor countries.

Co-operative international research and development can promote effective energy policy and lay the groundwork for technology breakthroughs in clean, distributed energy sources that can benefit populations in the developing world. Such research should be aimed at revolutionising advances in solar-derived fuel, wind power, clean coal, hydrogen, fuel cells and batteries, and a new electricity grid that can tie all these power sources together. Such a research effort, led by the industrialised world, would yield benefits for all by reducing energy poverty and promoting global environmental protection. □

*The Growing Developing World Country Appetite for Oil and Natural Gas, Economic Perspectives, May 2004.*  
<http://usinfo.state.gov/journals/ites/0504/ijee/jaffe.html>