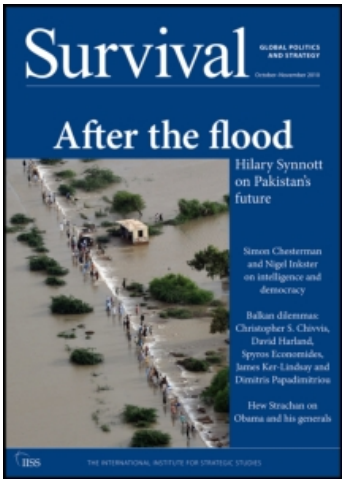

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A Strategic View of Energy Futures

Mathew Burrows and Gregory F. Treverton

The market price for oil is, with minor exceptions, global, and which oil goes where is mostly a convenience of transport. Assertions of the form 'we import *x*% of our oil from region *y*' or 'we depend on foreign sources for *z*% of our energy' are neither provocative nor thoughtful – they are strategic nonsense. Energy security is about much more than where the oil comes from.

While higher prices at the pump are a nuisance for consumers, they are only a minor drag on rich economies. In the last century, price spikes did reduce US growth, especially since those spikes tended to last for several years.[1] Now, however, the US economy is much less energy intensive, though very big spikes might still have a significant effect. The big strategic issues are not high prices at home but political effects abroad: which countries will be the big winners and which the big losers, what challenges both winners and losers will pose for international security and global welfare, and the implications of changes in the global oil and gas markets, especially the control of resources by national oil companies.

While prices have fallen from their peaks in summer 2006, they still are more than double what they were in 2003. While lower prices are possible, it would be prudent for the United States and other industrial nations to prepare for a more challenging world of high prices and tight markets. Without efforts to prepare, subvert or hedge, such a world would not be a pretty picture and could seriously compound whatever other problems have to be dealt with at the time. Whatever else may be said about Russia – or Iran, or Venezuela – they do seem to have energy strategies, while the United States, for example, seems mostly to have an energy lament.[2]

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Risk management

Will prices stay in the $50–70 per barrel range, or go even higher? The honest answer is: no one knows. The uncertainties are enormous. Certainly, spikes in prices over $100 are thinkable: imagine the impact of a major US (or Israeli) attack on Iran. The case for lower prices – though not again $20 a barrel – forecasts something akin to the 1970s and 1980s: global growth slows, while higher prices call forth more energy supply all around – from natural gas, from marginal new oil exporters in Africa and Central Asia, and from unconventional sources such as Canada's tar sands. At the same time those high prices promote greater energy efficiency. The big question mark is how fast China and India can and will reduce the high energy intensity of their own rapid growth. Another is how rapidly new conventional and unconventional energy resources can come on line.

The case for continued tight markets and high prices basically argues that those things won't happen, at least not quickly enough. Car fleets, for instance, turn over more slowly than they did in the 1970s, and rich countries have already taken some of the most painless conservation measures. Moreover, international oil companies, with their technological and management skills, are no longer in charge; producer countries and their national oil companies have control over nearly three-quarters of the world's proven oil reserves. What is very different now from the 1970s can be summed up in a few words: China and India, fast-growing economies consuming lots of energy.

And things are different now because of the post-1970s experience: then, high oil prices fell, undercutting investments in new sources. International oil companies are still reluctant to embark on big new investments because of fears that the past will repeat itself and those investments won't turn a profit. ExxonMobil projections, for instance, presume that very high prices will not prevail, and so production from unconventional energy sources will grow only slowly.[3]

As a result, with demand growing and resources concentrated in a smaller number of countries – Mexico might become a net oil importer by 2020, for example – the global market will see an increasing portion of its oil coming from, first, the Middle East and the Gulf but, second, Russia and the Caspian countries, and also West Africa. The drivers of the lower-price future – from efficiency to Canadian tar sands – can moderate the dependence but cannot make up for the growing gaps between demand and downward production in most non-OPEC and non-Persian Gulf OPEC countries. In a high price/tight market scenario, depletion will occur even faster.

New world, new players

Two of the big winners are Iran and Russia. Modelling indicates that Tehran will have plenty of oil revenue, and that alone will make Iran more powerful, even if it does not modernise its energy production systems.[4] Revenues from existing production and prices will, however, give it an opportunity to boost production and profits, should it choose. If the situation in Iraq stabilises it would provide the world with increased oil production, and the question is whether Saudi Arabia could expand its production capacity to regain its market-steering ability and counter Iran. For Iran, internal reform is likely to be the first casualty of higher prices. In the past, high oil prices have been bad for reform, providing existing regimes with the wherewithal to buy off internal dissent, and sparing them the need to fashion policies or transparency that might otherwise be necessary to attract outside investment.

Internal reform is likely to be the first casualty of higher prices

Russia will be the largest natural-gas exporter in the world in 2020. Some estimates have Europe importing more than 40% of its gas needs from Russia by 2015.[5] It is unclear whether Russia can play the role it wants as supplier to both Europe and Asia, but experts have underestimated Gazprom's potential to meet its production goals in the past. In any event, increased global demand for clean fuels is a boon for Russia even if it cannot boost production.

Much of Russia's behaviour is consistent with simply maximising energy revenues. Yet the specifics, along with other Russian actions, suggest a broader strategy – using oil and gas, in particular, to build clout in Europe's club, the European Union, while also increasing its influence in its 'near abroad' of the former Soviet Union and spreading its reach into Asia. Its interest in exerting control in the near abroad has been evident in its negotiations with neighbours in the last several years. Gazprom indicated it would end subsidies to neighbours, doubling the price to a level comparable to what Russia charges its Western European customers. But it did not increase the price for Armenia, which surrendered control of a pipeline, and it negotiated a lower price for Ukraine, whose leaders it regarded as more pro-Moscow than their predecessors, with whom Russia had squabbled in 2005.

In assessing the geopolitical connections, it is worth remembering that gas is different from oil. While the nature of the gas trade is changing, 91% of natural gas in 2003 was sold on long-term contracts with prices indexed to oil; even most liquefied natural gas (LNG) is also sold on such a basis, so the tankers are mostly 'floating pipelines'. Thus, the key linkages revolve around pipelines, and Russia will remain central. Russian control over much

of the Eurasian pipeline infrastructure also strengthens its position. Its interest in investing in Western European power companies and farther afield in North African gas projects suggests that Russia's leaders and industry officials already have a strategic view of Russian interests that focuses on energy (as well, perhaps, as viewing upstream and downstream vertical integration as good for profits). It will take more than a decade for LNG to develop into a global market and become fungible like oil. In the meantime, Russian leverage is likely to grow.[6]

Time will tell how successful Russia's strategy can be. In trying to turn the competition for resources to its strategic advantage, Russia may not know where to stop in using crude threats, blackmail and all means of bribery and corruption to exert its sway over a swath of Central Asia and Europe. It seems to seek a revived nineteenth-century-like sphere of influence. The 2005–06 dispute between Ukraine and Russia over gas supplies illustrated just how complicated the bargaining stakes can be, despite Russia's dominance. In the end, Russia had to compromise because 90% of its gas exports to Europe flow through Ukraine. Ukraine and Russia's close ally Belarus have therefore refused to sell their pipeline networks to Russia. To counter Ukraine's position, the North Europe Gas Pipeline, due to be constructed by 2010, will link Russia directly to Germany, cutting Ukraine out.

In other regions, high prices also may tempt countries to a resource nationalism that is ultimately self-defeating. Mexico is in many respects the ultimate resource nationalist, with a constitution that forbids private ownership of petroleum resources and a state monopoly that is both extremely inefficient and politically powerful domestically, with links to unions. Nationalism may turn Mexico into a net energy importer sooner than would otherwise be the case. In Venezuela Hugo Chávez aspires to build a hemispheric grouping at least independent of, and perhaps counter to, the United States, with oil as his instrument. Thus far, however, he has done more noise-making – such as offering subsidised heating oil to poor American consumers – than coalition building. When the Bolivian government of Evo Morales nationalised the gas industry in May 2006, the immediate question was not Bolivia's influence but whether it could negotiate settlements with the foreign companies, especially Brazil's Petrobras, that would keep those foreign companies willing to continue operations in Bolivia. Petrobras controlled 45% of Bolivia's reserves and had around $1.5 billion invested there, as well as two major refineries.[7] In the end, the companies did agree to increase their revenue sharing with the government, but the episode is not likely to increase their enthusiasm for expanded exploration or production.

Losers

If the potential big winners include Russia and Iran, the big losers are the poor countries. If prices stay high, growth in the rich countries will decline, but only by about 0.5–1%, because of continuing declines in the energy intensity of economic growth.[8] Poor countries, however, will be disadvantaged by higher prices even if those prices do not produce a global economic slowdown. A slowdown would be bad for everyone, but higher prices alone will hit the poor countries especially hard, curtailing development prospects with consequences ranging from state failure and new terrorist havens to large-scale migration. Countries in the Horn of Africa would be especially vulnerable to higher energy prices.

Other countries with even greater geopolitical importance, particularly Pakistan, will suffer diminished political and social cohesion due to diminished economic prospects; the high-price future would cost Pakistan $400bn over the 25 years between 2005 and 2030, or a tenth of cumulative GDP over the same period.[9] But whatever the actual cost, higher energy prices are likely to have a significant effect on socioeconomic prospects in an economy that does not work well in any case, and at a critical time when the nation's demographic curve, or youth bulge, has not yet flattened out. Because Pakistan is a nuclear state and remains – in parts of its territory – a terrorist safe haven, the consequences of a political and social implosion are obvious. Providing foreign assistance to help such countries withstand the worst effects is likely to seriously challenge Western donors, including the United States. Developing countries with more robust financial reserves, like China and India, will not be hurt nearly as much, but they also face difficult choices. Modelling indicates that in China's case high prices have a significant long-term cost in growth, lowering gross domestic product 14% compared to the low-price scenario. More Chinese are left in poverty and, more importantly for the environment, high prices in oil and gas increase the use of coal, meaning that more carbon dioxide is pumped into the atmosphere. Chinese investments in efficiency measures could help mitigate the problems, but would entail structural changes that would not be easy. Investments in renewable energy might also be mitigating, but only if the costs were more than compensated by the benefits.

The newly oil-rich could also turn into losers if they do not use their revenues wisely. Our models confirm the effect of a 'resource curse': while increased revenues in the present may convey the illusion of enrichment, over the longer run producers could be worse off. The curse runs well beyond the 'Dutch disease' – a resource boom driving up exchange rates, thereby hurting competitiveness. High prices and easy money also dull incentives for investment, which ultimately hurts production, so that suppliers may actually end up with less

aggregate revenue 20 years out than they would have had given lower price levels over the same term.

Moreover, energy riches have increased internal inequality, and even become objects of conflict. Thirty-four less-developed countries rely on such resources for at least 30% of their export revenues. Countries in this category include emerging natural-gas suppliers like Azerbaijan, Turkmenistan and Uzbekistan, as well as many countries in sub-Saharan Africa, including Sudan, Chad, Equatorial Guinea, Côte d'Ivoire and Congo-Brazzaville.

Reversing democracy's third wave?

In a world with high energy prices and tight energy markets, political reform and liberalisation may also suffer. As mid-level producers reach production plateaus, more of the major producers will be authoritarian, and the identification of authoritarianism with energy production will grow. Surely, Russia's new oil wealth has greased President Vladimir Putin's path to recentralising power; he has systematically re-nationalised the resources hived off into private hands during Boris Yeltsin's tenure. Authoritarian leaders in producer states have historically been able to buy off opposition, cementing control with better provision of services and welfare payments to the broad public.

Democratic states tend to be more economically developed across a range of indicators including per capita gross domestic product, literacy, penetration of modern goods, and urbanisation, and economic growth seems to cause democracy rather than the other way around.[10] Data suggest that the highest likelihood of an autocratic unwinding may be where per capita gross domestic product is in a middling range between $7,000 and $12,000. However, above a certain threshold – $10,000 is a useful reference point – both democratic and authoritarian regimes tend to stabilise, making either unwinding or back-sliding less likely. This might help explain why some countries with advanced economies, such as Singapore, remain authoritarian, and why Saudi Arabia does as well.[11]

Interestingly, modelling projects a vast increase in Russian per capita gross domestic product from almost $8,000 (at purchasing power parity) in 2000 to upwards of $20–30,000 by 2030. On that score the auguries for the future of democracy in Russia may be mixed. Increases should reinforce pressures toward democracy, yet if the rise is big enough and fast enough, the regime will have resources to buy off opponents, and so autocratic arrangements may stabilise.

On the other side of the ledger, higher oil prices may level off incomes in key importing states from Mexico to China, hurting the middle class just as expectations are growing. Chinese officials appear only too aware of the possible social and political disruptions a slowdown in economic growth could

generate. It is also unclear whether such disruptions would be beneficial for political liberalisation. On one hand, dented expectations might produce a surge in resentment that could overturn the Communist Party's grip in China. On the other hand, long-term consolidation of democratic reform has often hinged on stable or brightening economic conditions in which a middle class can develop and flourish.

Given the likelihood that higher prices will not unleash democratisation and could in fact retard indigenous reform movements, Western democracies need to think now about how to refine democracy promotion efforts to account for these trends. Now, as in the 1970s when Washington cosied up to the Saudi regime in the interest of energy security, it will be all too tempting to give big oil producers a bye on governance. Yet assessing Saudi Arabia from a post-11 September perspective provides strong arguments for pressing governance and democracy concerns in relations with that country.

Energy versus environment

This litany of winners and losers only begins to scratch the surface of the effects of higher energy prices, particularly as those effects will interact with other trends. Resort by desperate consumers to abundant sources of coal as an alternative to oil is likely to pit energy demand against growing environmental concerns. Reports by the Intergovernmental Panel on Climate Change and other groups indicate that dangerous climate change is unlikely to occur within the next 15–20 years,[12] but analyses of future impacts and the first signs of what can result from a warmer world (like polar ice loss or more extreme droughts and floods) will continue to stoke fears of failing to reduce the emissions that cause global warming. Indeed, the growing opinion of many experts is that the United States will 'get religion' on global warming within the next decade or so.

Global warming will produce another political cleavage

However the US debate turns out, global warming will produce another political cleavage, this time between the rich countries and rapidly developing economies like China and India. The currently wealthy want measures that will put limits on everyone, at least eventually, while the rapidly developing argue that they should not be penalised for coming late to the party. They should be allowed a phase of energy-intensive growth like the one the rich countries went through.

Modelling again suggests that the developing countries may experience a one–two punch if energy and environment come to a crux at the same time. For

instance, while northern Europe may benefit in agricultural productivity from global warming, in Africa water scarcity will be exacerbated almost everywhere. China and India have far more resources than other developing countries to stave off the worst effects of higher energy prices, but in order to avoid complete slowdown in economic growth they are likely to turn to domestic sources – coal – for electricity generation. China is already building a new generation of coal-fired plants, without clean fuel technology, so China's citizens will suffer the effects of local air pollution and the world will suffer the effects of greenhouse gas emissions.

Strange deals … and stranger bedfellows?

With countries like China and India growing increasingly dependent on imports and eager to assure supplies, there will be more competition for resources, and the changing balance will have a political face. There are already signs of this trend: China has named a Middle East peace envoy and in November 2006 hosted an African summit attended by leaders from 48 of Africa's 53 countries. Saudi Arabia also appears interested in enhancing ties eastward. As China and India see the quest for energy as imperative, they may leap into global roles that they otherwise would have shrunk from for fear of getting distracted from their primary focus on economic modernisation. But politics will follow economics, and energy needs may lead them down unanticipated political paths.

National passions, or fears, do not always make for rational international behaviour. China has invested too much money in pursuit of energy supplies for too little return, and 'sweetheart' deals often amount to paying too much for resources when the market will continue to be there churning out supplies. Chinese investments, primarily in Africa but also in Latin America, have totalled $7bn (aided by Chinese policies that keep the cost of capital very low). However, those deals have netted China control of only 400,000 barrels per day (in contrast to the 3.9 million controlled by the top three US companies). Rivalry takes on a life of its own, impelling decision-makers to act on the basis of 'me too' rather than market logic. The United States is now setting a bad example in trade and investment protectionism – for example in rejecting a Chinese bid for the California-based oil company Unocal. India, Japan and South Korea increasingly ape China in the quest for energy assets.

Despite the global economics of oil, the commercial rivalry over sources in Africa, Latin America and offshore in East Asia will intensify. It will spill over into the geopolitical arena, as resource competition among consuming nations becomes the reverse of the resource nationalism coin. Though these new sources are unlikely to offset lost production, nor more than temper increasing dependence

on Gulf oil, countries will still see it as in their interest to compete for resources, and will try to nail down sources of supply through sweetheart deals.

Pipelines and waterways could increasingly become objects of national security concern, and governments controlling those pipelines or sea lanes may need to be protected if they come under outside threat or from internal opposition forces. In particular, a new 'Great Game' in Central Asia is emerging, in which Russia, China and the United States compete. For Russia, particularly, Central Asian gas appears an increasingly crucial element over which it must exert control if it is to meet its obligations to the West along with its ambitions to supply natural gas to Asia.

The changing energy landscape has already given rise to speculation about potential new linkages or partnerships.[13] Already China has forged a Sudan connection, and it has paid a price in international opinion for appearing to shield that country, and more recently Chad – another new marginal oil supplier – from international scrutiny and pressure. China, Russia and perhaps Iran comprise one potential new axis of oil. Yet the durability of strategic partnerships between China and Russia, Russia and Iran, or India and Iran is questionable. At first glance China and Russia would seem to be natural partners, with China badly needing oil and gas, and Russia having both. Yet it is not at all clear that Russia will actually have enough energy to supply, nor that China will want to rely too much on Moscow. Constant jockeying and rivalry will most likely characterise these new partnerships. This is not necessarily good news for the United States and its allies, since with everyone scrambling, energy could drive the international agenda and other concerns – from terrorism to non-proliferation – could take a back seat. The rivalry will, however, at least counterbalance some of the more fevered speculation about new strategic partnerships.

China has forged a Sudan connection

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Growing demand and higher prices will not by themselves determine how the world unfolds over the next 15 years. How the winners exploit and use their resources will be an additional, important component. Equally, how consumers position themselves will be a significant ingredient, so there is room for manoeuvre where interests of consuming nations, and the United States in particular, can be advanced.

The United States needs to pay as much attention to energy use in the developing world as to its own use, and initiatives to transfer alternative-energy and

energy-efficiency technologies to reduce tensions and increase economic growth should be a key component of policy. This is easier said than done, since most of the technology is in private rather than government hands. But the more the United States can help other countries develop resources and reduce consumption, and in ways compatible with national companies' control of the resources, the better. Unfortunately, helping out the resource-poor will also be necessary to avoid a string of state failures.

Consumer nations should cooperate to limit the negative political spillover of commercial rivalry. China's pouring of money into new and marginal producers in Africa, Asia and Latin America has the advantage of potentially boosting energy production and satisfying greater global demand. However, the political quid pro quos extracted by producers, along with the rivalries engendered among consumers and between consumers and producers in regions like Central Asia, are likely to sour international relations and democratic prospects. In Northeast Asia alone, China, Japan and South Korea all share similar interests as consumers, so that some sort of cooperation would appear logical. Efforts to organise consumer nations after the 1973 oil embargo were not a success, and the effort this time should not be aimed at producers. Rather, consumers could establish some 'rules of the road' to help avoid needless conflict in a high-price and tight-capacity market.

Russia's effort to establish a dominant position, if not a regional monopoly, while shortsighted on Moscow's part, is not necessarily sinister, but there are disquieting elements. Besides setting a bad example in making energy the driving force in international politics and igniting a competition over resources, Russian dominance, whether in terms of pipeline networks or energy supply to Europe, is not good for free markets or political liberalisation in Russia itself. Insofar as Russian leaders prefer to deal with authoritarian counterparts in Central Asia, it is unlikely to help prospects there either. European weakness seems to stem in part from the absence of an EU-wide policy, so every country deals with Gazprom separately.

A transatlantic dialogue about combined energy and environmental futures, and their geopolitical implications, would be at the heart of this framework for cooperation. That dialogue, though, would extend to Russia and, ideally, Iran and other large producers. It would also reach out to large consumers, especially China and India, to try to limit the political harm that ensues as all nations look for energy supplies. And it will be imperative to include thinking about how to deal with the poorest countries that will be hardest hit by higher oil prices and how to include energy considerations in policies toward poor but strategically critical countries like Pakistan.

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Notes

1 For instance, in the recession that followed the 1973 oil embargo, US gross domestic product (GDP) fell by 0.7% between 1973 and 1975.

2 This is a central theme of a Council on Foreign Relations Task Force Report, *National Security Consequences of U.S. Oil Dependency*, October 2006, http://www.cfr.org/publication/11683/national_security_consequences_of_us_oil_dependency.html.

3 For the most recent projections, see http://www.exxonmobil.com/corporate/files/corporate/energy_outlook_2006_notes.pdf.

4 The International Futures (IFs) geopolitical model, commissioned by the RAND Corporation and the NIC, was devised and is run by Professor Barry Hughes at the University of Denver. It is a large-scale integrated global modelling system that focuses on the analysis of short- and long-term future issues. It consists of 164 countries for each of which there are seven models: population, economic, agricultural, energy, socio-political, international political, environmental and implicit technology. See http://www.ifs.du.edu for full model and documentation.

5 Russia accounted for 22% of the European Union's gas supply in 2004. Some projections, however, have that share rising to over 50% by 2020. See Hadi Hallouche, 'The Gas Exporting Countries Forum: Is It *Really* a Gas OPEC in the Making', Oxford Institute for Energy Studies, NG 13 (June 2006).

6 See 'The Geopolitics of Natural Gas', Baker Institute Study, no. 29, March 2005.

7 For more detail, see Council on Hemispheric Affairs, Memorandum to the Press, 'Bolivia's Gas Nationalization: Morales Does the Unthinkable – He Carries out his Campaign Pledge', 4 May 2006, http://www.coha.org/NEW_PRESS_RELEASES/New_Press_Releases_2006/06.27_Morales_Nationalization.html.

8 See 'Oil Price Shocks and the World Economy Today', *National Institute Economic Review*, no. 189, July 2004.

9 We used the US Energy Information Administration's 2006 scenarios to calculate the approximate cumulative energy expenditure difference between the low and high prices futures.

10 The seminal article is Seymour Martin Lipset, 'Some Social Requisites of Democracy: Economic Development and Political Legitimacy', *American Political Science Review*, vol. 53, March 1959, pp. 69–105. See also Robert Barro, 'Democracy and Growth', *Journal of Economic Growth*, vol. 1, no.

1, 1996, pp. 1–27; Ross Burkhart and Michael Lewis-Beck, 'Comparative Democracy: The Economic Development Thesis', *American Political Science Review*, vol. 88, 1994, pp. 903–10.

11 Adam Przeworski and Fernando Limongi, 'Modernization: Theories and Facts', *World Politics*, vol. 49, no. 2, 1997, pp. 159–60; Adam Przeworski et al., 'What Makes Democracies Endure?', *Journal of Democracy*, vol. 7, no. 1, 1996.

12 The IPCC report is available at http://www.ipcc.ch/.

13 See, for instance, Flynt Leverett with Pierre Noel, 'The New Axis of Oil', *The National Interest,* July 2006.