

Geostrategic Implications of Unconventional Oil and Natural Gas

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U.S. oil and gas production is on the rise due to the remarkable surge in unconventional oil and gas development. The widespread realization of the economic, technological, and commercial viability of these tremendous oil and gas resources within North America and the potential for transferring this production success to other parts of the world with similar resources may alter the global energy landscape in several important ways. Speculation about the full extent of the geostrategic implications of this newly realized resource endowment runs the gamut: some analysts suggest that it will fundamentally change the geopolitical dimensions of energy that have prevailed over the last forty years, while others posit that the revolution will be short-lived both in terms of its production potential and resulting geostrategic impacts. There is even less consensus about what potential changes in energy relationships might mean more broadly for key international relationships and geopolitical dynamics.

Despite this uncertainty, more rigorous thought should be put toward examinations of possible futures and their resulting implications. Such exercises, while admittedly speculative, will help to clarify the areas in which policymakers should focus their attention, and in which they may be able to take actions to shape possible outcomes more favorably or to hedge against potential vulnerabilities. CSIS is initiating such an examination and looks forward to partnering with other interested stakeholders on what must be just one component of a broader consideration going forward.

The Energy Landscape

In order to gauge the strategic significance of these new energy resources, one must consider the unconventional oil and gas revolution alongside a number of other existing trends in global energy supply and demand. These include the decline of developed economies' energy consumption due to slowdowns in economic growth, greater efficiency and increased reliance on alternative fuels, the post-Fukushima environment for nuclear energy generation, the investments being made in deepwater, arctic, and other frontier oil and gas resources, concern over environmental stewardship, climate change, and the desire for clean energy technologies, the rise of new and dynamic energy consuming countries with varied strategic interests and state-owned companies, the relevance of old institutions of governance and cooperation, and a host of other nontechnical issues. Moreover, the production of unconventional oil and gas resources is at an early stage and a great deal is still unknown when it comes to the long-term production profiles, business cases, and sustainability of these resources. Therefore, when it comes to extrapolating long-term trends from an energy phenomenon of only the last several years, it is difficult to be confident of what the future might bring.

The United States has always been a resource abundant country with ample energy, agriculture, water, mineral, and human capital resources and it has used those resources to fuel its economic growth. Over the last several decades, the size and pace of that growth has driven increased reliance on imported oil and natural gas. This growing import dependence and the reality of our vulnerability to the often volatile global oil markets (and the long-held view that import dependence and price volatility would only deepen over time) cultivated a notion that the United States was a relatively resource constrained and energy-insecure country.

Ever since the 1973 Arab oil embargo the United States—despite its standing as one of the world's largest oil and natural gas producers, with abundant coal, hydropower, and nuclear resources, and some of the world's most stable trading relationships with its North American neighbors Canada and Mexico—has been increasingly preoccupied with the geostrategic implications of its dependence on foreign energy sources, the interdependent nature of global energy markets, and the energy vulnerabilities of our key allies, especially in relation to the stability of global energy markets. The United States and other major energy consuming countries have reacted to these concerns by creating global energy institutions like the

International Energy Agency, set up a system of global strategic stocks (including the U.S. Strategic Petroleum Reserve), promoted free trade and open investment climates for energy goods and services, removed price controls in the United States, protected sea lanes and trade routes, encouraged integrated energy infrastructure where possible, created a system of policies and programs to drive greater levels of energy efficiency, and began to invest more systematically in new energy technologies and sources.

Particularly over the last decade, the global energy landscape began to shift in even more influential ways. The world's most developed economies (and largest energy consumers) were beginning to slow down and the sudden onset of unforeseen growth rates in rapidly emerging developing economies, most notably China, came as an unprecedented demand side shock to the system. As the world's energy providers struggled to match demand with new supplies, prices for energy and other commodities rose across the board and some analysts and policymakers began to question the adequacy of the resource base or ability to get energy products to market in sufficient quantities to keep energy prices at a manageable level. Despite ample evidence that energy supplies were sufficient in terms of resources underground, the "above ground issues" (political instability, unwillingness of the world's major oil and gas resource holders to allow and provide timely investment into their area of sovereign resources, technological complexity, unwelcome or inconsistent investment frameworks, etc.) fed the so-called "scarcity mindset" that prevailed for much of the early to mid-2000s. The vast majority of conventional global oil and gas resources exist in the Middle East and Russia/Eurasia while demand centers continued to be in OECD economies of Europe, North America, developed Asia, and the rapidly emerging Asian consumers, China and India. Not only did this dichotomy raise a host of issues with regard to producer and consumer country dynamics, but it also introduced uncertainty about whether growing consumers like China and India would find use in supporting the global energy norms and institutions that were started in the 1970s. State-run oil and gas companies, not only in major producing countries like Saudi Arabia, Venezuela, and Russia, but also in China and India, started to evolve new strategies for investing in resources around the world, undercutting the efforts and access of the large, private, integrated oil and gas companies.

The growing concern over resource scarcity, relentless demand growth, and the resulting potential for a new and higher floor for global energy prices created an enabling environment for an increasingly mainstream awareness about the need to tackle the problem of global climate change. If fossil-based energy sources were increasingly unstable and unreliable (and by inference more expensive), then a move toward traditionally more expensive low carbon energy sources (more efficient technologies and systems, wind, solar, geothermal, biomass, and nuclear) had a greater chance of contributing a larger share of global energy supplies, thereby reducing climate change causing greenhouse gas emissions.

Between 2007 and 2009 the geopolitical dynamics of energy took on a discernibly new feel, with traditional fossil-based energy producers concerned about this apparent growth in global willingness to seriously consider alternative sources of energy. Among major consuming regions, including Europe, Asia, and even the United States investing in new clean energy technology development and deployment was viewed as a major economic, environmental, and security strategy. The United States sought to obtain energy self-sufficiency through increased use in biofuels, hybrid and electric vehicles, and to take part in a global nuclear renaissance to decarbonize the power sector. U.S. politicians campaigned on lower U.S. reliance on places in the world like the Middle East, Venezuela, and Nigeria. For their part, European politicians sought to finally break their dependence on imports from Russia.

However, in the last several years the energy world has continued to change. The global financial crisis and economic downturn, combined with the perceived stalling out of the international climate regime, followed by an unprecedented nuclear disaster in Fukushima, Japan, and the worst deepwater oil spill in U.S. history have all served to once again alter the geopolitical landscape vis-à-vis energy. While the lower levels of economic growth have given energy companies more time to invest and bring online energy resources in anticipation of future growth, it has also exacerbated the transition to new geopolitical dynamics, with some rapidly emerging economies experiencing a faster, more robust return to economic

growth and increased energy consumption and an increased ability to spend money at home and abroad to further cultivate resources.

Perhaps the most fundamental change to emerge over this timeframe has been the widespread realization of the economic, technological, and commercial viability of the tremendous oil and natural gas resources within North America and the potential for transferring this production success to other parts of the world with similar resources. These developments may alter the global energy landscape in several important ways.

Domestically, the combination of high natural gas prices in 2006-2008, a permissive regulatory and resource ownership structure, technological know-how, and industry composition have allowed U.S. oil and gas producers to achieve and improve production processes and unlock abundant hydrocarbon resource production potential that were previously believed to be uneconomic. The resulting transformation has been overwhelming.

According to the latest outlook from the International Energy Agency, the United States will overtake Saudi Arabia as the largest oil producer in 2017, will surpass Russia as the largest natural gas producer in 2015, will be energy self-sufficient in 25 years, and could be a [net oil exporter by 2030](#). Even the more conservative estimates from the U.S. Energy Information Administration (EIA) recognize a substantial shift. The EIA forecasts a future where the United States moves from a net importer of 50 percent of liquids in 2010 to between 22 and 36 percent in 2035, depending on a range of factors. On the gas side, the EIA estimates that the United States will be a [net gas exporter by 2020](#).

Previously, the United States was regarded as a primary future destination for global natural gas exports (i.e. a natural gas importer). In 2003, the Energy Information Administration's forecast that U.S. gas imports would more than double from 3.7 trillion cubic feet in 2001 to [7.8 trillion cubic feet in 2025](#). The U.S. Department of Energy currently has fifteen applications for natural gas export terminals and nearly \$80 billion worth of petrochemical manufacturing has moved back to the United States to take advantage of cheap and abundant gas. The same sort of transformation is happening on the oil side. In 2011, refined petroleum products exports exceeded imports for the first time [in over six decades](#), and became the [top U.S. export commodity](#). Oil production in core unconventional oil producing regions is progressing so quickly that pipeline infrastructure cannot keep pace. Oil is now increasingly being shipped by rail to get product to market to alleviate the oil price disconnect with global markets that has resulted from this infrastructure lag. Not since before the energy shocks of the 1970s has the United States thought of itself as an energy abundant nation.

Unconventional oil and gas supplies now provide the fastest growing source of new U.S. hydrocarbon production and are expected to make up the bulk of the production growth going forward. According to a widely quoted study commissioned by the EIA, similar unconventional oil and gas resource potential exists in China, Europe, Russia, the Middle East, Canada, and Latin America. While the commercial frameworks (regulatory structure, mineral rights, industry structure, fiscal regimes, infrastructure, markets, governance, environmental concerns, etc.) vary regionally, most analysts conclude that at least some production of these resources will come online in the next two decades but that some countries will get there much faster than others.

Possible implications of energy shifts

While predictions of the precise trajectory of U.S. development of the newfound resources vary, it is clear that recent developments will undoubtedly have geopolitical implications for many relationships within and beyond global energy markets. Shifts in energy supply demand balances in key countries are already beginning to bring about a rewiring of the global energy map. How might these changes unfold? There are a number of potential interactions that could be affected.

The first is the overall balance of power between and among energy suppliers and consumers. Energy has always been an important factor in international relationships. Countries with ample energy resources are often able to generate wealth either through selling those energy resources to other countries or using the energy to fuel domestic economic development and strong institutions. Countries that lack basic energy resources often have to rely on other countries for the energy that fuels their economy, or find ways to use alternative sources of energy to rely upon. In times of resource scarcity or conflict, this “have” versus “have not” dynamic can be a crucial determinant in perceptions of power. While energy-related balance of power relationships are often thought of as confrontational in nature (e.g. Arab oil embargo of the 1970s) they also have a stabilizing effect on countries through the mutual dependence brought about by trade (e.g. ongoing oil trade relationship between the United States and Venezuela since 2000s despite worsening bilateral relations). The potential to produce significant quantities of oil and natural gas from unconventional oil and gas basins may indeed rebalance what was presumed to be a shift in energy resources holders to a small number of regions in the world, namely Eurasia and the Middle East.

Inherent in many of the regional geopolitical dynamics to be explored is this idea of relative balance of power. Whether the United States will increase its relative economic strength because of this new energy resource is unclear. What about countries like China or Argentina, whose ability to exploit vast new domestic resources is not yet apparent? And then there are questions about how countries like Russia or Saudi Arabia, with their own natural resource bases, might respond in terms of their own production or domestic consumption in light of this new resource. The uncertainty is compounded in both nations by challenges in terms of their domestic economic dependence on oil as source of revenue, political capital, and social coherence. And then there are the countries without this new resource—will they be disadvantaged or will they benefit from shifting energy dynamics?

Within a broad survey of international shifts, there are also dynamics within key regions that are almost certain to be affected, Asia first and foremost among them. Asian countries could be affected by the unconventional revolution in a number of ways. First, as the world’s fastest growing energy consumer, less competition for resources with the United States or the prospect of U.S. exports means a general alleviation of price and supply pressure absent other external changes. Second, the presence of unconventional oil and gas resources in a number of Asian countries (China is thought to have the largest unconventional gas resource base in the world) has the potential to counteract the energy rebalancing that has been taking place towards Asia as the new export demand center. This reality could shift the current pattern of global investments, erode the current impetus for closer Middle East-Asia relations, and perhaps shift the focus of Chinese and Indian state-owned energy companies back to their domestic investments.

Conversely, the inability or unwillingness to produce these resources, combined with the U.S. abundance could accelerate the current trends of greater Middle East-Asia ties and Asia as the primary destination for global energy exports. Major strategic issues for the region include, among many others, the effects of unconventional gas resources in China on regional gas trade dynamics, the interaction between unconventional gas and the future of nuclear power development, natural gas trade’s effects on pricing and potential leverage this might offer Asia vis-à-vis Middle Eastern gas producers.

The potential shifts in the Western Hemisphere are no less profound. Several notable energy analysts have all suggested that the new unconventional resources could yield a rebalancing of the energy map toward greater self-sufficiency for the Western Hemisphere, or even potential energy independence for North America, although each has a difference in opinion as to the timing, nature, and perhaps geopolitical significance of this change. This vision is predicated on a very positive set of circumstances for the production of unconventional oil and gas in North America. It also rests on an optimistic outlook for production of Brazil’s pre-salt oil resources, Mexico’s ability to reform their oil and gas sector to attract investment and stem the decades -old decline in production, a change of trajectory in Venezuela’s domestic and international political priorities in addition to its oil production profile, and an Argentine government willing to invest in its own abundant unconventional resources. While this vision of the

future may not play out exactly, the underpinnings for a major regional shift are clearly present. As one notable and long-time Western Hemisphere energy analyst recently noted, North America used to be the major energy consumer in the hemisphere. Trade flows from North to South have now nearly reversed across a wide range of energy sources, including natural gas, refined products, and biofuels.

But here too, while change is already underway, its strategic consequences [are not well understood](#). Major issues include how well U.S. energy policy can keep pace with newly realized American resource wealth, the impact of a short-lived period of resource abundance, the implications of greater resources in the Western Hemisphere (or even just North America) for the global energy relationships that hinge on the current supply/demand balances, and how newly geographically-concentrated resource growth might redraw global energy maps and trade relationships both in terms of production, consumption, refining, petrochemicals, etc., and the resulting effects on key U.S. national interests.

Europe could also see major shifts. Parts of Europe have long been dependent on Russia for oil and gas imports, and some readily accuse Russia of playing politics with that resource dependence. In recent years the EU has tried to assert a common policy internally and externally toward Russia to break down that dependence through changes in infrastructure, market liberalization, and alternative energy sources. Several EU countries have a good deal of unconventional oil and gas resource potential but none are yet positioned to produce those resources in [significant quantities](#). Similar to the situation with Asia, a North American dominant resource revolution could in and of itself have important ramifications for Europe and Russia. Should either region develop its own unconventional oil and gas resources, the changes could be even more significant. In this region, some of the key issues include whether Russia will successfully exploit their vast unconventional resource base, whether changed markets might offer the EU greater leverage with Russia, and what unconventional resource developments might mean for the future of green energy.

Last but not least, the changes are certain to have major implications in the Middle East. Several large Middle East producers make production decisions based on global oil and gas supply/demand dynamics. Saudi Arabia and Qatar, arguably the lowest-cost producers (exclusive of domestic financial needs) of oil and gas respectively, are chief among the countries whose production priorities reflect a desire to create long-term value but who also position themselves as market balancers (swing producers) in very dynamic global markets. Other producers like Iraq and Iran have long been production constrained based on domestic and regional political and security dynamics. Iranian production is on the decline due to the impact of a targeted global sanctions regime and Iraqi production is starting to ramp up, though estimates for potential vary widely. The existence of an entirely new global resource profile changes the reality for these countries not only vis-à-vis their own production potential and global energy prices (which is key to domestic economic strength and stability) but also within OPEC.

Major issues in this region include how individual nations modify their production and the resulting effect on international relationships, the impact of potential shifts in prices and revenues for both internal and external security in numerous countries in the region, as well as the potential for unconventional exploitation within the Middle East itself and the concomitant effects on other energy sources.

U.S. National Security Implications

With this broad array of potential outcomes both globally and within key regions, it is difficult to discern how possible futures might affect U.S. national security interests and policies aimed at supporting them. Energy sources and flows are just one part of a larger fabric of security, economic, political, societal, and military dynamics that make up the security landscape. But it is clear that developments underway in the energy sphere are highly likely to challenge at least some of the current realities underpinning today's decisions and plans. In particular, energy shifts could significantly affect a number of the relationships that shape many of our national security decisions, from the location of overseas military bases to the kinds of specific capabilities and their relative priority going forward.

However, to date the U.S. national security community has focused the bulk of its attention on the *internal* effects of evolving energy markets; that is, how greater energy independence might benefit the U.S. economy as a whole, and how specific technological advances might support U.S. military forces [in particular](#). A more comprehensive regional and global assessment of the impact of energy changes on economic, diplomatic, and security relationships and of how well aligned current U.S. policy is with those potential changes is warranted.

In many cases trends are not yet sufficiently clear to indicate major discontinuities, but a thoughtful examination of potential energy futures can help to illuminate a number of key issues for consideration and monitoring going forward. Some of the major areas that warrant such an examination include the potential for the United States to gain or lose leverage with key global or regional interlocutors, whether energy shifts might enable or restrict the military modernization plans of both friends and potential foes, the potential for planned military partnership activities to both provide insight into and possibly affect energy developments in other nations, and whether energy shifts might result in a different prioritization of key military missions and/or equipment and force structure to perform those missions.

A great deal is still undetermined about how the unconventional oil and gas revolution will unfold. What is clear is that its impacts are already beginning to be felt today and the mere speculation of a new strategic landscape is altering patterns of investment, policy decisions, security calculations, and geopolitical dynamics. More thinking and timely analysis, across the range of issues described above and on a sustained basis, is critically necessary to ensure policymakers have sufficient foundation for decisions that may affect the trajectory, favorably or unfavorably, of changes going forward. CSIS is just beginning such an effort; we would benefit from your insights and involvement in this important endeavor.

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