INFERENTIAL FOCUS

BRIEFING

IF 3325 December 20, 2012

SCRAMBLING THE GLOBAL ENERGY MARKET

NEW CAPABILITIES, NEW DYNAMICS ALTER THE QUEST FOR ENERGY

CONTEXT & DYNAMICS

Talk of *"the peak of oil" has peaked. Energy is suddenly abundant, and the U.S. is now the largest producer of natural gas in the world. New realities are shaking the foundations of the global energy market that has taken shape over the past half century. New technologies, new efficiencies, new threats and new players are forcing changes in the supply, distribution, security and geopolitics of energy. Over time, these changes are likely to force shifts in political power, economic strength, diplomatic alliances and social stability. To borrow a phrase: This is huge!*

OPPORTUNITIES

- *Companies producing equipment for new energy production capabilities (e.g., oil sands, hydraulic fracking) and especially those creating systems that are easier on the environment (e.g., wastewater treatment and recycling) for these new capabilities will benefit.*
- *Energy efficiency technologies will continue to attract customers.*
- *LNG shipping technology and related infrastructure construction capabilities will become more important.*
- *With its flexibility and mobility, Qatar seems to have leverage vis-à-vis Russia in the global natural-gas market.*

RISKS

- *Countries losing market share in global energy markets will likely endure economic slowdowns at home, with unclear consequences for political and economic stability (e.g., Russia's recent political crackdown suggests that Moscow already anticipates mounting pressure).*
- *The geopolitics that has evolved around the global energy market is set to undergo a considerable restructuring, with new pressures, conflicts and alliances emerging as consumers and producers shift around.*
- *Water usage for hydraulic fracturing could create political & social problems in countries starving for energy and short on water (e.g., China), and environmental pressures on the process could increase internationally.*
- *Last year, natural gas was equal to coal as the top electricity-producing fuel in the U.S. (each generating roughly 32 percent of U.S. electricity), the first time any energy source challenged coal's predominance. That challenge will increase over the long term, although coal shipments to China in the near term could be lucrative.*

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Some Curious Goings-on

Leaders in Washington must realize, explained a recent editorial in the United Arab Emirates' *Gulf Times*, that "[Arab Gulf countries are] no longer the little duckling of the last century, desperately in need of Uncle Sam's protection….[We are] preparing for the post-America world." (*The Week*, 12/14/12)

Although the UAE writer was complaining of America's position concerning the role of Islamists in regional power, the conclusion that local leaders were preparing for a post-America region has much more validity when applied to the region's oil and natural-gas wealth. Four recent observations encapsulate what is taking place in the world's energy patch.

◆ The U.S. has become the world's fastest-growing producer of energy, with oil production expanding by 500,000 barrels per day each year for three years (2009-2011) and then increasing by 900,000 this past year. Also, expansive hydraulic fracturing ("fracking") operations are making the country the world's largest producer of natural gas. Last year, refined-oil exports from the U.S. exceeded imports for the first time since the government started keeping comprehensive statistics, in 1993.

These observations suggest, respectively, that significant global changes are under way in the supply, distribution, security and geopolitics of energy.

◆ Qatargas, the world's largest liquid-natural-gas (LNG) company, recently launched a Q-Max LNG vessel, with a massive capacity of 266,000 cubic meters and with an onboard regasification plant that can unload its cargo straight into a port's gas pipelines, thereby saving the receiving country the cost of building regasification plants.

◆ In August, three-quarters of the computer system controlling Saudi Arabia's state-oil company (Aramco) malfunctioned, heralding what would become the largest cyberattack on a private energy facility to date. Before it ended, the attack had disabled 30,000 computers and destroyed their memory, resulting in what U.S. Secretary of Defense Leon Panetta called "probably the most destructive attack the private sector has seen to date."

◆ The U.S., which is steadily converting from a net importer of energy to a net exporter, has less and less interest in buttressing what could be an increasingly expensive Carter Doctrine, which has been official Washington policy since 1979 and which claims that a threat to Middle Eastern oil supplies is a threat to U.S. national security.

(*Governing*, 11/12; *New York Times*, 12/13/12; *Middle East*, 11/12 and 12/12)

These observations suggest, respectively, that significant global changes are under way in the supply, distribution, security and geopolitics of energy. In turn, these changes portend shifts in several countries' political power, economic strength, diplomatic alliances and social stability. In short, the Scrambling of the Global Energy Market challenges existing conditions in several parts of the world.

"I don't need to be with someone all the time. Being pursued is enough."

A Closer Look at the Supply of Energy

Gazprom recently gave BASF's Wintershall unit in Germany a quarter share of two blocks in the Urengy gas field in western Siberia in exchange for stakes in three European gas-trading businesses, one of which supplies roughly 20 percent of the German gas market. The trade of known reserves in exchange for operational distribution capabilities suggests that Gazprom is concerned about its position in European markets and is seeking to retain structural control of that market. (*Financial Times*, 11/15/12)

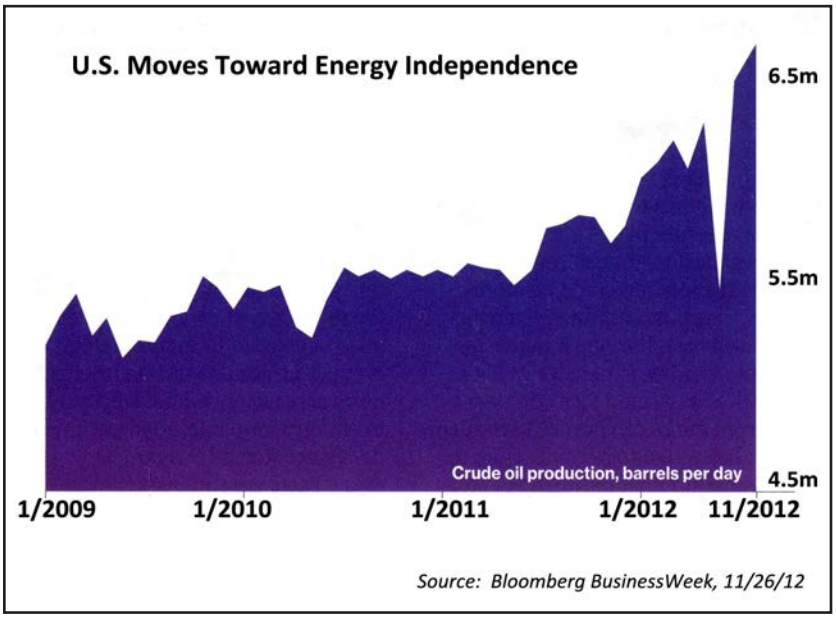
Gazprom's concern arises from changes in energy supply and the actions of those who have that supply. Significant gas and oil resources have become available in the U.S. – and potentially other places, as well – because of a well-drilling technology called fracking. The abundant natural gas and oil being produced with this technology have essentially eliminated the U.S. LNG import market. Consequently, Qatar has redirected its sizable gas exports to Europe, a major shift in supply patterns that has threatened what, in the past, has been a Russian monopoly of supply, delivered via pipelines. In addition, Qatari companies now deliver more than 5 million metric tons of LNG to China, once an attractive target for Russian natural gas. In short, rising supply has major players in the old energy patch scrambling to secure shares in rapidly shifting global markets. (*Middle East*, 11/12)

Russia would like Qatar to focus its exports on Asia and leave Europe to Russia with its structured, long-term contracts and existing distribution network. Introducing Qatari LNG deliveries to the spot market diminishes the price and market control that Russian suppliers have enjoyed because of the pipeline monopoly. With the availability of new sources for natural gas and the reality that American gas prices are one-third that of Russia's, because Gazprom ties its gas prices to the price of oil, Europeans have been demanding price reductions. That pressure has forced Gazprom's hand, and after providing second-quarter discounts to Europe equal to $4.25 billion, the Russian energy giant reported that its profits had declined 50 percent in the period. (*Bloomberg Businessweek*, 11/12/12; *Scientific American*, 10/12)

Gazprom has offered 10 percent discounts on new accounts, angering those in Eastern Europe who are still locked in to Russia's more profitable long-term contracts. Lawsuits are flying, with the Russians settling one suit with Poland's PGNiG, agreeing to rebates equal to $930 million, and appealing another case, which resulted in a verdict that, should it be sustained, would cost Gazprom hundreds of millions of euros. (*Bloomberg Businessweek*, 11/12/12)

Development of a vibrant LNG-based spot market for natural gas has increased Beijing's ability to play suppliers against each other for price breaks. As a result, the planned pipeline connecting Russian fields with China, touted widely when first announced, is now on hold, mostly because Beijing has refused to accept Moscow's pricing. Qatar, which already supplies 34 million metric tons of LNG to Asia, is seeking to take advantage of Russia's oil-based pricing and ramp up supply to China closer to 50 million metric tons in the next five years. China, for its part, will seek to further diversify its sources, bringing in new supplies from Australia as well as Canada and the U.S. in the near future, all with the intention of mitigating the price. (*Middle East*, 11/12)

Supplies have flourished, triggering a market-share battle that currently includes gas but, as new findings, including ultra-deep wells, are exploited in the U.S., Brazil, the Congo, Ghana and elsewhere, will likely affect oil markets, as well. Iraq, which has not re-entered the quota system of the Organization of Petroleum Exporting Countries (OPEC), now has oil production in excess of 3 million barrels per day, its highest level of production in decades, enabling it to surpass Iran as OPEC's second-largest producer. Also, in the first 11 months of 2012, U.S. oil production increased 15 percent, pushing overall production to its highest level since 1994. (*Current History*, 12/12; *Bloomberg Businessweek*, 11/26/12)



A wide range of Middle Eastern energy producers, including the UAE, Qatar, Kuwait, Bahrain, Saudi Arabia and Iran, have plans to construct nuclear-energy plants for domestic use, hoping, thereby, to free oil reserves for selling abroad. Saudi Arabia, for instance, plans to have thirteen nuclear-power plants operating by 2030, which means it would like to export more of its oil to global markets. Overall, energy producers are seeing their markets change rapidly and new competitors surface with abandon. As a result, old-line producers are scrambling to hold market position, secure contracts and nurture new markets. (*Foreign Policy*, 12/12; *Middle East*, 12/12)

A Closer Look at the Distribution of Energy

Suppliers are scrambling and that means distribution is getting jumbled. New capabilities, such as Qatar's recently launched degasifying tanker, could rapidly expand LNG markets to places once dependent on pipeline delivery only. Meanwhile, consuming countries are getting smarter about playing the field for better prices. This is challenging both the idea of long-term contracts as the only vehicle for gas purchases and the pipeline system itself, which has been supported by those long-term contracts. The advent of a real spot market as well as ample new supplies has altered pricing considerably and is also playing havoc with distribution capabilities.

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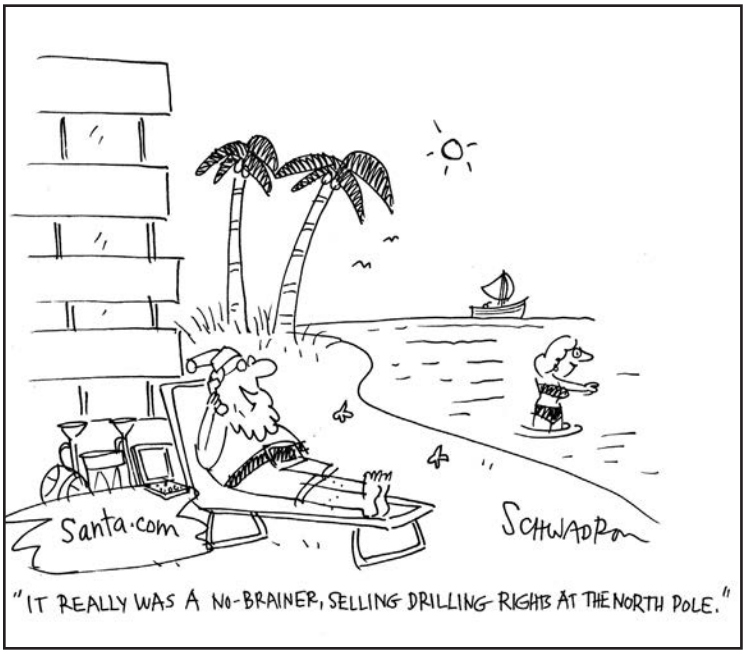
Trains, ships and pipelines are the means of conveyance for most energy supplies. Both trains and pipelines involve massive infrastructure projects spread across the land, requiring long-term contracts to make them viable. Russia's multiple gas pipelines into Europe, feeding from the north and the south, required years to construct and considerable deal-making to fill with supply. The risk of pipeline systems was clear when the White House blocked construction of an oil pipeline from Canada's Athabasca oil sands project to refineries in the American south. The Canadians have resubmitted a proposal with fewer environmental risks, but even with a stamp of governmental approval, it will take years and substantial money to construct. Similar noise and environmental troubles have halted the expansion of the rail project that would bring many more shipments of coal from Wyoming and Montana to ports in the Northwest for export to China and elsewhere. The cities of Portland and Seattle have both nixed using their ports for such expansion of coal exports. (*Foreign Policy*, 12/12; *Governing*, 11/12)

LNG distribution is more flexible. With added supply and relatively inexpensive field-development costs, the flexibility advantage is affecting markets. Already, Qatar's LNG deliveries have stolen market share from Russia's pipeline service in Belgium, France, Spain and Italy. Moreover, 85 percent of gas being traded on England's National Balancing Point (NBP) natural-gas market has Qatari origins. (*Middle East*, 11/12)

This kind of shift in distribution systems means that the third energy delivery system – shipping – is becoming more important. China has developed its "string of pearls" ports from the Middle East to its coastal areas as a means of assuring a delivery pathway, and military patrols from several countries keep oil and gas shipping lanes open around the horn of Africa, through the Straits of Malaga and the Straits of Hormuz.

While pipelines and trains will continue to distribute energy, the importance of shipping vessels and shipping lanes will continue to increase, as energy distribution becomes less localized, more international and increasingly competitive as more and more supply finds its way to international markets.



A Closer Look at the Security of Energy

Distribution is a vulnerable point in energy deployment. The oil pipeline in Colombia has been attacked by guerrillas so many times that locals have started referring to it as "the flute." Similarly, shipping provides an attractive arena for terrorist or pirate attacks, which is why six countries, including nominal adversaries such as the U.S. and Iran, have placed military vessels east of Africa to coordinate activities to slow rampant piracy on the high seas.

The U.S. Department of Homeland Security recently completed a study that revealed how an attack on just six well-chosen power stations could knock out essentially all energy-distribution systems east of the Mississippi River.

The most challenging risks in the energy industry have recently surfaced less in the area of energy distribution than in energy production, specifically from cyberattacks. The Stuxnet and Duku computer virus attacks that disabled Iran's nuclear facilities as well as the devastating Mini-Flame virus attack on Iran's critical Kharg Island oil-production facility this past May and then Iran's apparent retaliatory attacks in August, first on Saudi's oil production system and then on Qatar's RasGas, all reveal quite emphatically that cyberwarfare has come to the energy industry. The Shamoon virus used in the Saudi and Qatar attacks was used again to attack several financial institutions this past fall. Escalation will likely continue and could well lead to a cyberequivalent of the nuclear world's mutually assured destruction condition – unless, of course, non-state actors are behind the cyberattacks. (*Middle East*, 12/12)

But the cyberwarriors' focus on energy production hardly leaves energy distribution invulnerable. Given that electrical-grid systems are strategic components of most countries' infrastructure, vulnerable parts of national grids could be the next cybertarget.

The U.S. Department of Homeland Security recently completed a study that revealed how an attack on just six well-chosen power stations could knock out essentially all energy-distribution systems east of the Mississippi River. To put that in context, the U.S. has 3,500 different utility companies, 6,000 separate power plants and roughly 300,000 miles of wires. Because of the interlaced nature of some of these lines, finding

just six stations that sit at the center of the systems could trigger a cascading effect that would black out half the country. A National Academy of Science study, *Terrorism and the Electric Power Delivery System*, which was written in 2007 but only recently made public because of the increasing number of revealed risks and vulnerabilities in the electrical system, noted, "Considering that a systematically designed and executed terrorist attack could cause disruptions that were even more widespread and longer in duration [than the massive eastern U.S. blackout of 2003], it is no stretch of the imagination to think that such attacks could entail costs of hundreds of billions of dollars… [resulting in] turmoil, widespread public fear, and an image of helplessness." To a terrorist, that is a highly attractive outcome. (*Washington Monthly*, 11/12; *Forbes*, 11/16/12)

"Oh, are you attacking from home today?"

A Closer Look at the Geopolitics of Energy

Several levels of irony pervade the shifting geopolitical realities of energy. Even as the U.S. is becoming much less dependent on energy from the Middle East, it continues to spend billions of dollars on military forces deployed to secure Middle Eastern energy, the price of which could start dropping when U.S. energy exports reach global markets. Such a U.S. military presence seems to assure OPEC shipments to Asia and, increasingly, to China, which, for its part, continues to fund American debt, thereby enabling the U.S. military to maintain the Middle Eastern deployment. That convoluted logic becomes even more tangled in light of the recently announced U.S. "pivot" of military focus from the Middle East to Asia, specifically to guard against what Washington believes are China's expansionist interests in that region.

Looked at through a clearer lens, however, the energy scramble is shifting geopolitical interests of most players in the energy game. Russia no longer has Europe locked up through installed pipelines, and its practice of linking the price of natural gas to that of oil faces pressure from competing sources that do not share that linkage. China, which gets roughly half of its total oil imports from the Middle East, seeks to reduce price risk pressure and is expanding its range of sources to assure supply and gain negotiating positions on price. Beijing has been content to enjoy the benefits of another country's stabilizing military presence, but should Washington pull back its forces, China does not have the capability to defend its interests in the region…yet. That could lead to some interesting negotiations between the U.S. and China, especially since Chinese investors have recently been looking favorably at supporting energy development in the U.S. Indeed, has the U.S. role in the region shifted from energy policy to political policy, from securing energy resources in line with the Carter Doctrine to enforcing political will in the region, especially in regard to Iran, Syria and elsewhere? (*Middle East*, 12/12)

> The energy scramble is shifting geopolitical interests of most players in the energy game.

Europe, although still mired in economic troubles, has found some economic relief in energy sourcing, as more suppliers surface and as the spot market becomes more prominent. Given that Europeans pay among the highest prices for energy in the developed world, such a change in the market would be noteworthy. Much of its good fortune, however, depends on how Qatar and Russia decide to approach global markets. What will Russia offer Qatar in return for backing away from supplying LNG to Europe? Can Moscow's offer be

sufficient to overcome the opportunity that Doha sees in Europe, especially with the kinds of incentives to Qatar that Europeans might also provide?

These kinds of questions highlight one simple point: The scramble in the energy industry is jumbling diplomatic and geopolitical arrangements.

"We pride ourselves on running the business the same way my great-grandfather did. Deals are still made with a handshake, and enforced by big, scary men who enjoy breaking bones slowly!"

The Fifth Arena: Demand

Conservation and efficiency could well liberate even more energy supplies in the years ahead. U.S. energy usage is in structural decline, as automobile usage lessens and more-efficient cars (and planes) reach the market. Energy usage in Europe is likely to follow such a decline, even after the region's economic troubles lessen. In addition, alternative energy supplies, while not likely to replace traditional sources, will continue to shift demand in small increments from carbon-based fuels.

For the past few years, we have been discussing "The Effects of Large Numbers," the idea that with economic expansion accelerating in developing countries, significantly large numbers of those countries' citizens are moving into the consumer classes, creating greater demand for products, services… and energy. We have also mentioned the early stages of a growing economic alliance between Japan and China. Japan, it should be remembered, tripled its economic output in the three-plus decades, following the OPEC oil embargo of 1973, without increasing its industrial energy use at all. In short, Japan has efficiency and conservation technologies that could greatly benefit China. If Beijing takes advantage of this new resource for efficiency, China could manage to produce the kind of growth it needs to keep its populace content and not require the levels of energy supplies that would be needed if it grew at the same pace with its current inefficient techniques (see "A 'New Japan'? Real Economic Changes to a Tradition-Bound Culture," **IF 3307**, 4/12/12).

Not only is technology expanding opportunities to increase energy supplies, it is also increasing energy-use efficiency.

Such potential sits at the core of technology-driven changes in energy production. Not only is technology expanding opportunities to increase energy supplies, it is also increasing energy-use efficiency and providing new ways to conserve the energy that is produced. Together, these realities suggest that OPEC will likely need to lower its quotas, although new production could challenge the cartel's ability to control global prices. Also, it suggests that countries focusing on efficiency and conservation will get much more from their energy expenditures, and overall, that will put downward pressure on energy prices.

Besides price, institutional customers are seeking reliability of supply, and for many such institutions, microgrids are providing workable backup resources. Such small, self-contained and locally controlled electric grids all tie into mainstream electrical grids, but should the larger grid go down, these micro-energy-generation systems can independently supply energy to a school, a plant or a neighborhood. At present, roughly 270 such systems are in place worldwide, but as cyberattacks and weather-related disruptions become more commonplace, mission-critical operations are likely to find these kinds of grids appealing. (*Governing*, 11/12)

The changes in energy supply, distribution, security and geopolitics are being felt worldwide and are just starting to force decisions at the top levels of governments around the world. Globalization has flattened and/or increased prices for many products around the world, as more and more markets are stocked by similar producers worldwide, resulting in prices seemingly moving toward a shared mean. That is what is starting to happen to natural gas. As wider distribution of LNG becomes a reality, more countries will be able to take advantage of spot-market pricing, weakening the once unbreakable stranglehold of pipeline-based distributors. Moreover, security, which once meant soldiers on the ground protecting specific energy-sensitive sites, now means overcoming digital vulnerability and energy-flow disruptions that soldiers on the ground cannot prevent.

All of this is now substantially altering long-term relations among many countries. Whether or not the UAE's editorialist is correct in prescribing preparation for a "post-America" era in the Middle East, it seems clear that things are changing rapidly in the global energy arena. The Scrambling of the Global Energy Market is altering the global quest for energy, and that reality is being felt in economic, diplomatic and military arenas.