

THE SATURDAY ESSAY

The New Geopolitics of Energy

Power is shifting from longtime oil giants like Russia and Saudi Arabia to innovators like China—and maybe the U.S.

By Daniel Yergin

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Two years ago, the CEO of a Middle Eastern oil company stopped in Washington, D.C. on his way home from a visit to Silicon Valley. What he wanted to discuss with me over a cup of coffee wasn't the future price of oil or Iran's activities in the Middle East but rather the astonishing thing he had seen in California. "I couldn't believe the number of Teslas," he said. "They were everywhere."

What he saw in all those electric cars was a looming transition that in the decades ahead will shift the world away from using oil, natural gas and coal. The transition will have an enormous global economic impact, but it will also bring about major changes in the map of global power. China is poised to be the big winner, Russia and Middle East oil exporters the big losers. The U.S. is likely to fall somewhere in between.

Enormous efforts are now under way to bring about this shift, but it is likely to take longer, to be more expensive and to require more technical innovation than many now anticipate. For the U.S., there's also the matter of what happens to the more than 10 million jobs that the American oil-and-gas industry now provides.

"Energy transition" has become the shorthand for discussions about the future of energy ever since 195 countries pledged in the 2015 Paris climate agreement to keep global temperatures from rising 2 degrees Celsius above preindustrial temperatures and to make best efforts to cap the rise at closer to 1.5 degrees.

A rapid rise in oil and gas production has given America new influence and choices.

The target for getting there is “net zero carbon” by 2050 or shortly thereafter—a goal already accepted by the European Union, Britain and Japan, among others. Democratic nominee Joe Biden has likewise pledged to put the U.S. on “an irreversible path to...net zero emissions.” In July, he unveiled his vision for an “Equitable Clean Energy Future”—a \$2-trillion climate plan, backed by an “enforcement mechanism,” which aims to eliminate carbon emissions from electricity by 2035 and, in the wider economy, to shift from oil, natural gas and coal (which in 2019 provided 80% of U.S. energy) to solar and wind (which provided 3.7%) and other technologies to get to “net zero carbon” by “no later than 2050.”

The bandwagon is growing. Companies, including some oil and gas and electric power companies, are promising to go “net zero carbon,” major pension funds are adding “Paris goals” to the criteria by which they evaluate investments, banks are cutting back on lending for traditional energy projects and auto makers are planning to go all-electric in the 2030s.

History shows, however, that energy transitions don’t happen quickly. The key moment in the first major transition—from wood to coal—was in January 1709, when an English metalworker named Abraham Darby figured out how to use coal in order, he said, “that a more effective means of iron production may be achieved.” But it took two centuries before coal overtook wood and waste as the world’s No. 1 fuel. Oil was discovered in western Pennsylvania in 1859, but it was not until a century later, in the 1960s, that oil replaced coal as the world’s top energy resource.



An oil derrick in Dacono, Colo.

PHOTO: HELEN H. RICHARDSON/THE DENVER POST/GETTY IMAGES

Of course, there was nothing in those previous centuries to compare to the weight of government policy, money, activism and technical wizardry that is pushing the energy transition today. But these forces for change must deal with the scale and complexity of an energy system that supports what was, before the pandemic, an \$87-trillion global economy. The world currently depends on fossil fuels for 84% of its energy. And in the years ahead, government budgets promoting the transition will be constrained by the heavy debt burden accumulated in coping with Covid-19.

Still, whatever the time frame, climate change and political pressures will move the world toward low-carbon energy sources, and it is not too early to see how this shift is likely to affect the global balance of power.

China stands to gain the most from the energy transition ahead. Though China has a robust oil industry and is in fact the world's fifth largest oil producer, its output falls far short of what it needs to fuel the world's second largest economy. China imports about 75% of its oil and has become by far the world's largest oil importer.

Ever since the Korean War, Beijing has seen dependence on petroleum imports as a major strategic weakness. In recent years, that danger has been dubbed the "Malacca Dilemma," referring to the narrow strait leading past Singapore and into the South China Sea. The risk in Beijing's eyes is that, in the event of a confrontation with the U.S. over Taiwan or the South China Sea, the U.S. Navy would shut the strait to tankers carrying China's oil imports from the Mideast and Africa, immobilizing large parts of China's economy and military. Reducing the country's dependence on imported oil will be a big strategic win for China.



Workers at a solar-panel factory in China's Zhejiang province.

PHOTO: ZHEJIANG DAILY/REUTERS

But China will gain still more from an energy transition, having carved out a leading global position in what it calls “new energies.” More new cars are sold every year in China than in the U.S., and if they run on gasoline, that means both oil imports and pollution will rise. As Wan Gang, the country’s former minister of technology, said, China needs to seize “the strategic window for developing electric vehicles,” and that it has done, in part through his own efforts. Thanks to aggressive government promotion, China now possesses half the world’s electric cars.

It’s not just a matter of reducing oil imports and urban pollution, however. Beijing recognizes that it is too late to catch up with the global auto companies selling cars powered by internal combustion engines. By using electric cars to leapfrog ahead, it can overtake the established auto makers and gain leadership in global markets.

China already dominates in lithium, the necessary ingredient for batteries for electric cars. Though lithium is mined in a number of countries, China stands atop the entire supply chain, with over 80% of the world’s battery manufacturing capacity. And a world that turns increasingly to solar power will run largely on goods made in China. China’s solar manufacturing juggernaut has driven down solar costs dramatically over the past decade, with China now the source of almost 70% of the world’s solar panels.

If China is likely to be the big winner from the energy transition, its neighbor to the north stands to be a big loser. “I have never referred to Russia as an energy superpower,” Vladimir Putin once said, “but we do have greater possibilities than almost any other country in the world. This is an obvious fact.” That fact is indeed obvious today in the sheer scale and abundance of Russia’s energy resources. It is one of the world’s three

largest producers of oil, is second in natural gas and remains the world's largest gas exporter.

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Nuclear weapons and its superpower inheritance from the Soviet Union help to explain how Putin has established Russia—with a GDP less than Italy's—as a great power. But its energy might, built on oil and gas, is key to its global presence and a major element in its growing bonds with China. These resources make Russia a major player in the world economy.

Russia's dependence on earnings from exporting oil and natural gas is also, however, a strategic vulnerability. The revenues provide the financial foundation for the Russian state and Russian power—in normal times, 40% to 50% of the government's budget, 55% to 60% of export earnings and an estimated 30% of GDP.

For two decades, the country's need for reform, to diversify and reduce its dependence on oil and gas, has been a recurrent theme. But the reforms never seem to come, leaving Russia at risk from a shift in the global energy balance.

Likewise, the specter of Middle East oil power that so animated earlier decades has faded with the development of resources elsewhere, most notably in recent years with the rise of the U.S. as the world's largest oil producer. But oil remains fundamental to the economic might of the region's regimes, and an energy transition will undermine that power.



An oil processing facility of Saudi Aramco, the Saudi Arabian state-owned oil and gas company.

PHOTO: STANISLAV KRASILNIKOV/TASS/GETTY IMAGES

Oil exports are responsible for 70% of Saudi Arabia’s government revenue and 40% of the country’s GDP, according to the International Monetary Fund. Moreover, says the IMF, “non-oil activity is highly dependent on government outlays financed by oil revenues.”

That explains the urgency of the Vision 2030 reform program launched by Saudi crown prince Mohammed bin Salman. “Since the early 1970s, we’ve had Five Year development plans,” said one Saudi official. “They all had the same objectives—diversify the economy, grow the private sector and have less reliance on oil.... But look at the three basic objectives—we did not manage to realize them.” Vision 2030 aims to fix that and, in the process, build a sovereign-wealth fund that becomes, in the words of the crown prince, “larger than the largest fund on earth,” with a diversified portfolio of investments outside the country.

Reshaping an economy so entrenched in oil revenues would be difficult under any circumstances. It is even more difficult during Covid-19 and the current global economic downturn. As it turns out, oil revenues are essential to fund the investments required to diversify away from oil.

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[The New Geopolitics of Energy](#), September 11, 2020

[Land of Free \(and Fettered\) Speech](#) September 4, 2020

Abu Dhabi, the oil-rich emirate that borders Saudi Arabia, has demonstrated what an oil-exporting country can do to try to insulate itself from the energy transition. In 2007, well before the shift away from oil was widely accepted, it laid out its own Economic Vision 2030 to prepare for a time when it could not depend on petroleum. “In 50 years, when we might have the last barrel of oil,” Abu Dhabi’s crown prince Mohammed Bin Zayed said at the time, “when it is shipped abroad, will we be sad? If we are investing today in the right sectors, I can tell you we will celebrate.” A country whose GDP was almost all oil two decades ago is now 60% non-oil.

If Mr. Biden wins in November, his new administration would waste no time in putting the U.S. back into the Paris agreement and at the forefront on global climate policy. The U.S. is already in a strong position in one realm that will be essential for the energy transition—scientific research and the development of new energy technologies.

Meeting the goal of net carbon zero by 2050 will require breakthroughs and innovations in chemistry, physics and materials science, as well as advances in carbon capture, hydrogen fuel, digitization, manufacturing, artificial intelligence, robotics, software, data analytics and other technologies.

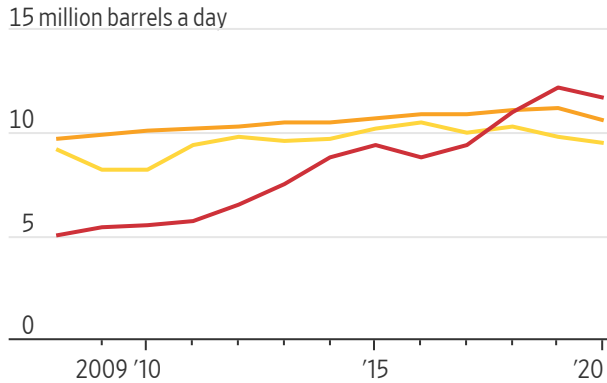
The U.S. has big advantages in these fields thanks to its unique and dynamic energy-innovation ecosystem—consisting of the Energy Department’s 17 national laboratories, the country’s universities and research institutes, and countless established companies and startups. Add to this a culture that encourages people to take risks and a financial system that can mobilize capital. There are today, for instance, over 60 private-sector advanced nuclear energy projects in the country. The U.S. Energy Department spends over \$6.5 billion a year on research in the basic sciences that will be the foundations of tomorrow’s technology—far more than any other country.

Fracking to First

The U.S. has displaced the world's former top oil producers.

Crude oil production

■ U.S. ■ Russia ■ Saudi Arabia



Note: 2020 through first half of the year. U.S. and Russian production includes condensates.

Source: IHS Markit

America is also currently advantaged in terms of its existing resource base, thanks to the “shale revolution” of the past decade, otherwise known as fracking. This revolution could not have been imagined in 2008, when the U.S. was the world’s largest importer of oil and its domestic oil and gas business seemed destined to fade away.

Shale has turned the U.S. into the world’s largest oil producer, ahead of Saudi Arabia and Russia. The U.S. has also become one of the largest exporters of oil and the largest producer of natural gas, and will be one of the major exporters of LNG, liquefied natural gas. The shale revolution has stimulated over \$200 billion of investment in new factories, reduced the trade deficit by several hundred billion dollars, generated millions of jobs and contributed significantly to federal and state revenues.

Less well understood is that this rapid rise in oil and gas production has given the U.S. a new dimension of influence and flexibility in the world. American oil and gas exports, for instance, are one of the foundations of the expanding relationship between the U.S. and India. The shale revolution also provides a solid foundation for energy security as the energy transition unfolds over the next several decades.

Navigating the world’s new energy map will require significant choices. If the campaign to “ban fracking” were to gain traction—or short of that, even if major new restrictions were imposed on oil and gas development—the result would be a rapid decline in U.S. production, because most oil and gas wells today have some element of fracking.

And there would be strategic consequences. Global oil and gas consumption will begin to grow again in the post-pandemic economic recovery, and the loss of U.S. supply would create a gap in output that other exporting countries would eagerly fill. The biggest beneficiaries would be Saudi Arabia and Russia, making them unexpected beneficiaries of the energy transition, at least for a decade or two.

This article is adapted from Mr. Yergin's new book, "The New Map: Energy, Climate and the Clash of Nations," which will be published by Penguin Press on Sept. 15. He is the author of "The Quest" and "The Prize," for which he received the Pulitzer Prize, and is the vice chairman of IHS Markit.

SHARE YOUR THOUGHTS

To what extent do you think the transition to renewables will affect the geopolitical order? Join the conversation below.

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