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RECOMMENDATIONS FOR THE NEW ADMINISTRATION

Time to Update America's Energy Security Programs

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This brief is part of a series of policy recommendations for President-elect Joe Biden's incoming administration. Focusing on a range of important issues facing the country, the briefs are intended to provide decision-makers with relevant and effective ideas for addressing domestic and foreign policy priorities. View the entire series at www.bakerinstitute.org/recommendations-2021.

SUMMARY

Even though the United States has achieved the long-sought goal of energy self-sufficiency, energy security remains a strategic and economic challenge. Despite "self-sufficiency," the U.S. still imports significant quantities of oil and natural gas, as well as solar panels and wind turbine components, and prices for all of these products reflect global market dynamics. Traditional concerns about global supply disruptions remain, and new risks have also emerged. Domestic energy availability can be impacted by storms, terrorism, and cyber threats. Moreover, the rapid growth of renewable energy (and batteries) may help mitigate conventional concerns about fossil fuels but may also reveal new risks. The U.S. and its allies have a cooperative system for dealing with oil supply disruptions, including a large domestic strategic crude oil stockpile, but there is no similar domestic or international framework for dealing with other, emerging risks. The U.S. can aid the transition to a lower-carbon energy system by providing assurance that risks associated with that transition can be understood and managed, both at home and by working cooperatively with allies (as has long been the case for oil security).

ENERGY REMAINS VITAL TO U.S. STRATEGIC AND ECONOMIC INTERESTS, EVEN WITH SELF-SUFFICIENCY

According to the Department of Energy, the U.S. achieved a long-standing energy objective in 2019: domestic energy production exceeded domestic energy consumption for the first time since 1952.[1] Moreover, the energy mix has become much more diversified, with oil's share falling from 48% in 1977 to 39% in 2019—the latest full year for which data is available. In addition, the U.S. economy has become much more efficient in its use of energy (including oil): the amount of energy needed to produce a (real) dollar of GDP has fallen by more than 50% since 1980.

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That said, the U.S. remains connected to global markets, with significant trade—both imports and exports—of oil and natural gas (and to a lesser degree, coal and electricity).

- Even as the U.S. became a net oil exporter in late 2019 (remaining a small net importer for the year as a whole), gross imports of crude oil and refined products still averaged over 9 million barrels per day (Mb/d).
- Similarly, the U.S. has become a substantial net exporter of natural gas, yet still imported over 7 billion cubic feet per day (Bcf/d).
- Moreover, access to energy and global markets remains critically important to U.S. strategic interests. For example, the Commerce Department reports that in 2019, energy comprised 4% of total U.S. consumer spending. Last year, the U.S. government was a driving force behind an agreement that resulted in the world's largest coordinated oil production cuts as OPEC, Russia, and other countries struggled to adjust to collapsing global demand following the outbreak of the COVID-19 pandemic.

RISKS TO ENERGY SUPPLIES — OLD AND NEW

Oil remains the leading fuel for the U.S. and global economy, and risks to supply remain an important factor in considering energy security. The 2019 attack on the Saudi oil complexes at Abqaiq and Khurais caused the largest oil supply disruption ever recorded, with more than 6 Mb/d of production briefly shut-in. More broadly, the attacks highlight the risk to nearly 21 Mb/d of oil supply (and a significant share of global liquefied natural gas trade) that transits the Strait of Hormuz.[2] Significant supply disruptions (due to factors as diverse as civil unrest and sanctions) have also impacted oil supplies from Venezuela, Iran, Libya, Syria, and Yemen. Moreover, here in the U.S., hurricanes have disrupted oil and natural gas production, refineries, and pipelines—not to mention the electricity grid.

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- Roughly one-fourth of global natural gas is now traded internationally (compared with roughly two-thirds of global oil).
- Coal shipments from Australia were disrupted by bad weather in 2017.
- China dominates global production of rare earth metals (an important component for batteries), solar power panels, and batteries for electric vehicles—and has in the past attempted to leverage its rare earth metals dominance in international affairs.
- Additionally, two-thirds of the world's cobalt production (another battery component) is concentrated in the Democratic Republic of Congo. In contrast, the U.S. as the world's largest oil and natural gas supplier accounts for just 18% and 23%, respectively, of global production.
- Finally, cyber and terrorist threats also pose risks to critical domestic (and global) energy infrastructure.

U.S. AND ALLIES HAVE CAPACITY TO MANAGE OIL SUPPLY DISRUPTIONS ...

The U.S. and its allies have built a significant capacity for addressing oil supply disruptions over the past 50 years. Inventories (both commercial and government-held) are a key component: members of the International Energy Agency (IEA)—including the U.S.—are obliged to hold oil inventories sufficient to cover 90 days of net imports. The IEA reports that member states hold roughly 1.5 billion barrels of "public" strategic stocks, in addition to 3 billion barrels of commercial stockpiles (held by companies in the normal course of their operations). China and India are not IEA members, but as significant oil importers have also begun to build strategic oil stockpiles.

- In addition, IEA member countries have developed emergency response protocols for sharing supplies in the event of an oil disruption, as well as for restraining

demand and encouraging fuel switching.
- IEA member countries also engage in coordinated discussions to improve the resilience of the overall energy system in the face of threats ranging from climate change to cyber threats.

Saudi Arabia and other OPEC members have also played an important role in offsetting supply disruptions by utilizing their spare production capacity. Saudi Arabia is unique in having invested to maintain a significant buffer of spare production capacity as its contribution to improved energy security. Even before the recent OPEC/non-OPEC production cuts boosted spare capacity in countries reducing output, the U.S. Department of Energy (DOE) estimated that total OPEC spare production capacity stood at about 2 Mb/d—largely in Saudi Arabia. Based on DOE estimates, recent production cuts have increased global spare production capacity (as of the date of writing) to roughly 10 Mb/d.

... BUT LESS CAPACITY FOR DEALING WITH NON-OIL RISKS

Historically, international focus on energy security has been on oil supply, and the resulting U.S. and multinational framework is therefore heavily oriented toward managing oil supply risks. As other energy forms grow in their importance to the U.S. and global energy system, understanding and managing any attendant risks also becomes more important. The system built by the U.S. and its allies over the past 50 years to manage oil security can serve as a template for building new systems to manage energy security in an energy system in transition.

In assessing vulnerability, there is an important distinction between fuel that is consumed (such as oil, natural gas, or electricity) and equipment that produces (such as wind turbines and solar panels) or stores (such as batteries and pumped hydro) energy. A disruption in the trade of the equipment that produces or stores energy would not immediately disrupt current energy availability, but it would have delayed impacts on investment and therefore future energy availability. In this sense, the potential disruption of fuels poses a much more substantial short-term vulnerability to the U.S. and global energy systems.

More broadly, the assessment of risks for non-oil energy sources is hindered by a lack of data. For example, while the DOE's Energy Information Administration (EIA) tracks global oil supply disruptions monthly, there is no corresponding effort (in the U.S. or elsewhere) for other energy forms, nor for technology and minerals that are crucial to the production of wind turbines, solar panels, and batteries for EVs and electricity storage.

RECOMMENDATIONS

1. Recognizing that the first step of any policy process is data gathering, the U.S. should launch an effort—in coordination with the G20, International Energy Agency, and other related countries and organizations—to gather relevant data to better understand future supply/demand/trade dimensions of an energy transition, including both direct energy forms and key mineral inputs.[3] While acknowledging the limits of the historical experience of oil security analysis/policy for new energy forms and key minerals, it is still advised that the EIA's data and processes—as well as U.S. oil security protocols both internal and multilateral—can serve as useful historical guides for both new energy forms and key mineral inputs.
2. Undertake assessments—again, within the U.S. government and in coordination with other countries/organizations— to understand potential risks in these new energies and mineral inputs, as well as risk-management options. Within the U.S. government, this work should be done on an interagency basis to leverage insights from perspectives ranging beyond energy to include economic, technical, cyber, and foreign policy/military.
3. Encourage sound governance and resilience of emerging global markets/supply chains for new energy forms and minerals. The State Department's Energy Resource Governance Initiative is an early exemplar.

CONCLUSION

The domestic and international discussion of energy security must evolve along with the energy system. Growing international trade of natural gas and a growing reliance on renewable energy help mitigate risks of future oil supply disruptions. But with mining of base metals and manufacturing concentrated abroad, these same dynamics also raise new risks that must be understood and managed/mitigated. Indeed, the U.S. and its allies can help speed the energy transition by assuring that the attendant risks are being assessed and managed.

ENDNOTES

1. See U.S. Energy Information Administration, Monthly Energy Review, December 2020, https://www.eia.gov/totalenergy/data/monthly/pdf/sec1_3.pdf.
2. See U.S. Energy Information Administration, "The Strait of Hormuz is the world's most important oil transit chokepoint," June 20, 2019. https://www.eia.gov/todayinenergy/detail.php?id=39932.
3. For more discussion, see Mark Finley, Morgan Bazilian, Steve Griffiths, and Kenneth B. Medlock III, "Refreshing Global Energy Security Policy and Infrastructure for the Energy Transition," T20 Saudi Arabia, October 2020, https://t20saudiarabia.github.io/PolicyBriefs/T20_TF10_PB3.pdf; and Mark Finley, "Energy Security and the Energy Transition: A Classic Framework for a New Challenge," Baker Institute Report, November 25, 2019, https://www.bakerinstitute.org/files/15237/.

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