

# **Indo-Pacific Energy Markets**

## **Opportunities and Risks for the United States**

### Scope Note

This paper is the result of a six-month research project conducted under the auspices of the Office of the Director of National Intelligence's 2018 Public-Private Analytic Exchange Program. The project examined the economic and national security implications for the United States of two trends in the global energy market: increasing U.S. production and rising demand throughout the Indo-Pacific region. Given the compressed time-frame and resource constraints, the project limited its analysis to those two regions and did not examine other major sources of energy supplies or demand. The project also limited its analysis to energy commodities, specifically hydrocarbons, and did not examine other aspects of the energy trade, such as technology and services. Examinations of other energy-related regions and products are recommended for future investigations.

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## Executive Summary

*“As a growing supplier of energy resources, technologies, and services around the world, the United States will help our allies and partners become more resilient against those that use energy to coerce.”*

*National Security Strategy of the United States of America, December 2017*

The U.S. National Security Strategy recognizes that the global energy landscape is changing, with important implications for U.S. security and economic interests. The United States is projected to become a net energy exporter in the coming years—driven by the growth of non-traditional production methods such as hydraulic fracturing—while strong demand in the Indo-Pacific region is likely to make it a key market for U.S. energy products.<sup>1</sup>

Through research and discussions with experts, this project examined how the intersection of increased U.S. supply and growing Indo-Pacific demand is likely to affect U.S. economic and security interests in this strategically vital region. Six key findings emerged as a result of this investigation:

**Key Finding 1:** The U.S. is less dependent on energy imports and more insulated from market fluctuations.

**Key Finding 2:** Increasing demand will exacerbate the Indo-Pacific region’s import dependency.

**Key Finding 3:** Increasing U.S. production of oil and gas will improve the functioning of an efficient global energy market.

**Key Finding 4:** U.S. exports will strengthen regional energy security and diminish the use of energy as a geopolitical weapon.

**Key Finding 5:** U.S. exports will help improve relationships with Indo-Pacific partners.

**Key Finding 6:** Maritime chokepoints will continue to influence regional energy security.

Building on these findings, the project concludes with recommendations for both industry and government:

**Recommendation 1:** *The United States Government and respective state agencies should expeditiously review and approve oil and natural gas modernization projects that will improve domestic energy infrastructure and better position the United States as a key energy exporter.*

**Recommendation 2:** *Private industry should build redundancies into production and transportation networks to avoid expensive shortages should failures occur.*

**Recommendation 3:** *The United States Government should facilitate energy infrastructure development in the Indo-Pacific region by providing technical assistance on regulatory, technological, and financial matters.*

**Recommendation 4:** *The United States Navy should continue partnering with regional allies to ensure maritime security of key chokepoints and shipping lanes.*

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<sup>1</sup> We define the Indo-Pacific region as encompassing the sub-regions of South Asia, Southeast Asia, Northeast Asia, and Oceania.

## **U.S. Production and Exports Grow...**

U.S. oil and gas production has increased significantly in the past decade, making the United States an increasingly consequential global energy player. The primary driver of this increased production is the extraction of so called “tight oil and gas” through technologies such as hydraulic fracturing and horizontal directional drilling. Between 2006 and 2017, average U.S. oil production increased from approximately 5 million barrels per day (mb/d) to 9.3 mb/d.<sup>1</sup> U.S. natural gas withdrawals have also significantly increased over the last decade, increasing from 696 billion cubic meters (bcm) in 2006 to 937 bcm in 2017.<sup>2</sup>

The U.S. Energy Information Administration (EIA) anticipates U.S. crude oil production to continue to increase to 11.4 mb/d in 2019, and the International Energy Agency (IEA) expects that U.S. crude production will reach 12.1 mb/d by 2023.<sup>3,4</sup> For natural gas, the EIA predicts an increase from 2 bcm per day in 2017 to 2.3 bcm per day in 2019, with production continuing to grow through 2050.<sup>5,6</sup>

Against this backdrop of increasing domestic production, the United States is poised to become a major energy exporter. Several factors are responsible: the increase in unconventional production; slow domestic growth in the demand for fossil fuels; existing refining capacity, and increased international demand.<sup>7</sup> Since the U.S. lifted restrictions on exporting crude oil at the end of 2015, U.S. exports of crude oil have increased to approximately 1.5 to 1.7 mb/d. Future forecasts of U.S. crude oil exports vary from less than 1 mb/d to up to 5 mb/d.<sup>8,9,10</sup>

The EIA predicts that the U.S. will have a natural gas export capacity of approximately 0.27 bcm per day (96.3 bcm per year) by the end of 2019, giving the U.S. the third-largest export capacity in the world.<sup>11,12</sup> The IEA predicts the U.S. will become the largest exporter of Liquefied Natural Gas (LNG) by the mid 2020's.<sup>13</sup> There are currently two operating LNG export terminals in the U.S. – Sabine Pass, TX and Cove Point, MD – with five more currently under construction.<sup>14</sup>

## **... Just as Indo-Pacific Demand Surges**

Simultaneously, the Indo-Pacific region will dominate future increases in global energy demand, making it an increasingly common destination for U.S. exports. According to the IEA, India, China, and Southeast Asia will account for approximately two-thirds of the total global increase in energy demand through 2040.<sup>15</sup> This includes demand for both crude oil and natural gas. Approximately 80% of the global increase in petroleum and liquid fuels will occur in Indo-Pacific nations, due in large part to rapid industrial growth and increased demand for transportation.<sup>16</sup> According to the IEA, China will see the largest net increase in natural gas demand, with additional significant increases in demand from India and other parts of Asia.<sup>17</sup> Worldwide LNG trade is expected to nearly triple by 2040, from 340 bcm in 2015 to 879 bcm, with most of the increase in LNG imports occurring in Asia.<sup>18</sup>

## **Economic Implications**

### Key Findings

- The U.S. is less dependent on energy imports and more insulated from market fluctuations.
- Increasing demand will exacerbate the Indo-Pacific region's import dependency.
- Increasing U.S. production of oil and gas will improve the functioning of an efficient global energy market.

#### ***The U.S. is Less Dependent on Energy Imports and More Insulated from Market Fluctuations***

As a result of increased domestic production, the U.S. possesses greater energy self-sufficiency and requires fewer imports.<sup>19</sup> In 2017, total U.S. energy imports dropped 35% from 2016 levels.<sup>20</sup> In 2017, net petroleum imports averaged about 19% of total U.S. petroleum usage, and successful exploitation of natural gas deposits has made the U.S. a net exporter of gas.<sup>21</sup>

Expanded domestic oil and gas production helps ensure that the U.S. economy is more insulated from global supply and price fluctuations than in the past. Increased production helps the U.S. economy receive sufficient energy resources at competitive prices and protects against swings in external prices. It also partially insulates the United States from significant supply shocks, such as unexpected geopolitical instability.<sup>22</sup> As two energy sector observers note, "U.S. energy security is improving as it relies to a growing extent on domestic and reliable regional supplies, and its exposure to risk is diminishing as a result... A revolution in U.S. energy supply has created a buffer, but not a firewall, against global risk...."<sup>23</sup>

Despite expanded domestic production, the United States remains part of an integrated global energy market and cannot completely insulate itself from global volatility.<sup>24</sup> The United States still imports about 8 mb/d of crude oil,<sup>25</sup> and shale production is vulnerable to low oil prices that can make wells less competitive.<sup>26</sup>

#### ***Increasing Demand Will Exacerbate the Indo-Pacific Region's Import Dependency***

Projections from the Asian Development Bank (ADB) indicate that the Indo-Pacific region "will consume more than half the world's energy supply by 2035, with electricity consumption more than doubling as economic growth and rising affluence drive demand." The region will continue to rely on fossil fuels to meet more than 80% of energy needs. The ADB expects that net oil imports will rise to more than 25 mb/d in 2035, approximately the current crude output for the entire Middle East. Natural gas demand will grow at an even faster rate (of nearly 4% per year) because of its increased use for power generation.<sup>27</sup>

At the same time, regional production will diminish. Supply deficits for oil and natural gas will continue, and the region will become a net importer of coal.<sup>28</sup> Import dependency throughout the region will increase, led by the top four importers: China, India, Japan, and South Korea.<sup>29</sup>

EIA projects that by 2040 China's oil consumption will reach 20 mb/d, while domestic production will remain under 6 mb/d, increasing Chinese demand for oil imports.<sup>30</sup> During the same period, China also will become the largest source of global gas demand growth, projected to reach 600 bcm. China's domestic gas supplies will meet less than half of total demand. IEA forecasts that gas import demand by 2040 will be 150 bcm via pipelines and 130 bcm via LNG shipments.<sup>31</sup>

Indian energy demand also will grow significantly by 2040, propelled by economic and population growth. Already the third-largest energy consumer in the world (after China and the U.S.), India is increasingly dependent on imports, and 75% of demand is met by fossil fuels. Crude oil imports are approximately 4 mb/d, and India is the world's fourth-largest LNG importer.<sup>32</sup>

Japan and South Korea are both large energy consumers with limited domestic resources who currently import the vast majority of their oil and gas from the Middle East.<sup>33</sup> Total demand is essentially equivalent to import demand. Due to decreasing demand for oil, Japan and South Korea are not projected to be major oil importers, but both countries will be significant importers of natural gas.<sup>34</sup> By 2040, Japan's projected gas import demands will likely approach 200 bcm.<sup>35</sup> South Korea currently ranks as the second-largest global importer of LNG (after Japan), and gas demand is anticipated to grow in coming decades.<sup>36</sup> Together, import demand for natural gas in Japan and South Korea could exceed 250 bcm by 2040.

### ***Increasing U.S. Energy Production Will Improve the Functioning of an Efficient Global Energy Market***

When prominent energy suppliers face little or no competition, opportunities exist to subvert market preferences in favor of geopolitical considerations. By increasing competition among producers, diversity of supply inhibits potential subversion and improves the global energy market. Supplies that are flexible and responsive can more easily flow to demand, enhancing competition among energy producers who must choose to fight for either greater market share or higher price, but not both.<sup>37</sup>

U.S. energy exports will both increase the supply and diversify the source of products in the global energy market. In 2017, the U.S. increased its exports of crude oil by 89%, natural gas by 36%, petroleum products by 11%, and coal by 61%. U.S.-produced oil, natural gas, coal, and other fuels have contributed to about 25% of the global energy market mix.<sup>38</sup>

U.S. exports will improve the energy market further by making the supply of oil and natural gas more responsive to changes in demand. Both shale production and waterborne distribution are more flexible and responsive than alternatives. U.S. producers who tap shale and tight oil resources can quickly increase production with lower up-front costs than traditional oil and gas,<sup>39</sup> making near-term markets more competitive and fungible. Waterborne distribution permits easier redirection of supply flows, compared to pipelines. While most global gas supplies are tied to oil prices, U.S. gas exports are tied to Henry Hub benchmark prices and can be sold without destination clauses or long-term contracts, which is slowly improving market conditions.<sup>40</sup>

The Western Hemisphere does not have sufficient demand to absorb all of the U.S. energy supplies that will be entering the market. As a result, U.S. exports will compete in global energy markets, with an increasing amount likely destined for the Indo-Pacific region. According to one energy commodities expert, current market forces indicate that the U.S. will become the marginal supplier to the Indo-Pacific region,<sup>ii</sup> and U.S. exports will set the upper (cap) and lower (floor) price limits.<sup>41</sup>

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<sup>ii</sup> Marginal suppliers are those suppliers able to increase (or decrease) their supply when demand for their product or commodity increases (or decreases).

## National Security Implications

### Key Findings

- U.S. exports will strengthen regional energy security and diminish the use of energy as a geopolitical weapon.
- U.S. exports will help improve relationships with Indo-Pacific partners.
- Maritime chokepoints will continue to influence regional energy security.

### ***U.S. Exports Will Strengthen Regional Energy Security and Diminish the Use of Energy as a Geopolitical Weapon***

Energy security is the result of a number of factors, including a country's ability to withstand supply shortfalls, maintain energy reserves, and sustain the necessary infrastructure to import required resources. U.S. energy exports will allow Indo-Pacific nations to diversify their energy imports and rely less upon current suppliers. This will improve the energy security of Indo-Pacific countries, particularly among U.S. regional allies whose security is an extension of U.S. national security interests. So long as U.S. allies remain among the world's leading energy importers, decreasing risks to their energy security will continue to play a significant role in their diplomatic investments and the role the U.S. plays as a strategic ally.

An increase in the production and supply diversity of oil and natural gas will also diminish the ability of any single exporter to leverage their energy supplies as a geopolitical weapon. As a marginal supplier, U.S. energy exports can help insulate energy markets against price shocks and supply disruptions. This is reinforced by the fact that U.S. energy producers are typically more agile, flexible, and responsive than state-backed suppliers, allowing U.S. suppliers to increase or decrease production and distribution rapidly. Additionally, import-dependent countries often are willing to pay a premium for assurances that supplies will be stable, providing a comparative advantage for U.S. supplies over those from exporters that leverage energy supplies for geopolitical purposes.<sup>42</sup>

While increased U.S. oil and gas production will diminish the ability of other suppliers to use energy as a geopolitical tool, the U.S. government will not increase or decrease energy production in order to influence prices or further geopolitical goals.<sup>43</sup> In contrast to countries in which the state can exert direct control over energy supplies, the U.S. government does not direct the business decisions of energy companies. Rather, market considerations will continue to determine where energy companies buy, sell, and distribute energy supplies.

### ***U.S. Exports Will Help Improve Relationships with Indo-Pacific Partners***

Energy exports could become an economic anchor of the U.S. Indo-Pacific strategy.<sup>44</sup> The U.S. role as marginal supplier to Indo-Pacific countries will likely produce a perception of increased national strength, regional presence, and economic leadership, providing an opportunity for increased U.S. diplomatic leverage. Currently, the region views U.S. energy production with cautious optimism.<sup>45</sup>

Indirect geopolitical leverage will likely result from mutually aligned interests between the United States and import-dependent Indo-Pacific countries. Major consumers, such as China and India, share an interest in diversifying energy suppliers and mitigating supply disruptions and price volatility that can result from political instability among energy exporters. Ultimately, there is less geopolitical risk for major importers to purchase oil and gas from U.S. companies, as compared to state-sponsored national oil companies.

U.S. relations with Indo-Pacific countries will likely see improvement due to a desire to increase imports of U.S. oil and natural gas. Because the U.S. has growing supplies of hydrocarbons available for export, it is able to leverage the energy sector during strategic negotiations with major importers. In one recent example, the Chinese government offered to purchase \$40-50 billion of U.S. energy exports as part of a proposed deal to resolve current trade disagreements with the United States.<sup>46</sup>

For India, importing U.S. oil is part of the country's strategy to reduce dependence on and achieve better terms from Middle East suppliers. India has taken advantage of increased U.S. energy supplies to reduce imports from the Middle East by approximately 20%.<sup>47</sup> India's increased imports of U.S. energy products will likely further enhance U.S.-India relations and cooperation.

U.S. energy exports also could deepen the relationships with Japan and South Korea, both of whom are perpetually concerned about their energy security. Both countries already share a robust diplomatic and military relationship with the U.S., and remain key regional allies and trading partners for the U.S.<sup>48,49</sup> In addition to being net importers of natural gas, Japan and South Korea also export refined petroleum products to downstream markets. As these allies continue to play leading roles as both importers and exporters, their ability to secure the necessary import/export infrastructure and to partner with the U.S. and other regional allies to maintain secure transportation routes will be a primary driver of energy security throughout the region.

### ***Maritime Chokepoints Will Continue to Influence Regional Energy Security***

Narrow channels on international sea routes, known as "chokepoints," are critical to global energy security.<sup>50,51</sup> Closures or other disruptions can lead to higher shipping and consumer costs as well as critical delays in the movement of cargoes, including energy supplies.

The Gulf Coast is and will remain the primary location for U.S. exports of oil and natural gas, due to the infrastructure and expertise located in the region. The increased export of U.S. energy supplies will result in an increase in the movement of LNG west through the Panama Canal and east through the Suez Canal, Bab-el-Mandeb, and Strait of Malacca, further increasing the importance these chokepoints play in global shipping. The Strait of Malacca is a major transit point for oil and natural gas traveling to East Asian markets, and dependence on this waterway makes the Strait of Malacca the most significant chokepoint for many Indo-Pacific energy importers.<sup>52</sup>

The Panama Canal will play a significantly larger role in global energy shipping, particularly for the shipment of natural gas. LNG being shipped to East and Southeast Asia from the U.S. will typically transit the recently expanded Panama Canal, with the canal carrying up to five times as much LNG in 2020 as it did in 2017.<sup>53</sup> LNG traveling to South Asia may travel through the Panama Canal, or travel east from the Gulf Coast through the Suez Canal.

Shipments of crude oil from the U.S. to the Indo-Pacific are less likely to use the Panama Canal due to size limitations.<sup>54</sup> These shipments, however, are likely to transit other key maritime chokepoints, including the Suez Canal, Bab el Mandeb, and Strait of Malacca, further increasing their importance to U.S. interests.

## Recommendations

The key findings from this project suggest particular recommendations for both industry and government:

**Recommendation 1:** *The United States Government and respective state agencies should expeditiously review and approve oil and natural gas modernization projects that will improve domestic energy infrastructure and better position the United States as a key energy exporter.*

U.S. oil and natural gas production responds quickly to oscillations in price. Modernization projects will improve the capability to surge production when market conditions signal higher prices and increased demand. Until recently, U.S. oil and natural gas exports were highly restricted. Now that U.S. companies are increasingly exporting oil and natural gas, existing domestic infrastructure is falling short. For example, the existing pipeline system of the Permian Basin region in the southwestern United States is currently operating at full capacity, so much so that the local price of natural gas is effectively \$0 (i.e., producers have resorted to burning off excess gas).<sup>55</sup> As increased demand in the Indo-Pacific translates into revenue for domestic producers, these funds become available to support energy infrastructure projects.

**Recommendation 2:** *Private industry should build redundancies into production and transportation networks to avoid expensive shortages should failures occur.*

Like any distribution system, pipelines are subject to transportation failures. They require consistent observation and analysis to identify and mitigate potential problems. As energy production and export capabilities increase, energy companies should incorporate geopolitical enterprise risk analysis into considerations, especially concerning threats to production facilities and transportation lines.

**Recommendation 3:** *The United States Government should facilitate energy infrastructure development in the Indo-Pacific region by providing technical assistance on regulatory, technological, and financial matters.*

While there are plenty of economic drivers for energy imports throughout the Indo-Pacific, the necessary infrastructure – a pre-requisite for energy security – is lacking. U.S. exports would benefit from infrastructure development within potential importing countries, including LNG import facilities, pipeline integration, power generation, and power transmission. The increased capacity to receive and process oil and LNG would directly complement the region's growing demand and quickly translate into increased imports. Moreover, enhanced demand infrastructure would allow importers to more easily diversify energy suppliers, which would further enhance regional energy security and improve the functioning of an efficient global energy market.

**Recommendation 4:** *The United States Navy should continue partnering with regional allies to ensure maritime security of key chokepoints and shipping lanes.*

Maritime security will continue to be a primary concern of the global energy market, as an even greater number of products will transit international waterways in coming decades. Serious threats to maritime energy shipments persist, including terrorism and piracy. The U.S. Navy is currently the primary security guarantor for global maritime shipping, and U.S. energy exports will require protection for the foreseeable future.

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<sup>40</sup> Information obtained from interview with private sector subject matter expert.

<sup>41</sup> Information obtained from interview with private sector subject matter expert.

<sup>42</sup> Information obtained from interview with private sector subject matter expert.

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