HASC Report 117-118, page 200, requests the Under Secretary of Defense for Acquisition and Sustainment to provide a briefing addressing the national security implications of reduced refinery capacity in the United States, including:

- the national security implications of diminished regional diversity of refining capacity attributable to closures over the last several years,
- any financial impacts of those closures, and
- the potential impacts of the closures on the fuel supply chain and
- the risks associated with reliance on foreign sources of fossil fuels, including finished petroleum products.

The briefing shall also address the status of the Department’s work to:

- integrate hydrogen-based fuels and sustainable fuel refining capabilities and
- describe how the Department is integrating those emerging capabilities into overall plans for delivering fuel.
National Security Implications of Diminished Regional Diversity of Refining Capacity

- DLA Energy oversees and executes procurement of bulk petroleum (jet fuel and marine diesel) to meet all Department steady state and wartime requirements of operational forces (ships, aircraft, tactical vehicles, contingency locations).

- Within the U.S., these fuels are acquired through two major purchase programs: Inland/East/Gulf Coast and Rocky Mountain/West Coast.
  - These two solicitations are open to vendors from across the U.S.

- As a nation-wide buyer, the Department is not facing national security effects from diminished regional diversity of refining.
  - Matching trends in larger market for refined petroleum products, the Department is facing higher costs, but these are not significant drivers of risks to fuel availability or quality.

The Department is not facing national security consequences from diminished regional diversity of refining capacity
Financial Impacts of Refinery Closures

- In addition to changes in refining capacity, the U.S. Energy Information Administration (EIA) identifies the drivers of fuel costs as including the cost of crude oil, costs of refining, distribution, marketing, and taxes.
  - In turn, crude oil and petroleum product costs influenced by worldwide supply and demand.

- The Department implemented the Standard Fuel Price (SFP) to insulate the military services from the normal ups and downs of the fuel marketplace.
  - The SFP provides the Department with budget stability despite commodity market swings, with gains or losses being absorbed by the Defense Working Capital Fund.

- The SFP is established well in advance of the current fiscal year and includes a projection of fuel price 18 months in the future and the budgeted cost of transporting, storing and managing the government fuel system, including war reserve stocks.

- As overall costs of crude oil and refining change, so do Department costs.
  - Increased fuel prices evident in increases in the SFP issued in Sep 2021, Dec 2021, Apr 2022.
  - Reflecting declining prices, the SFP decreased in Jul 2022.

Department fuel costs track those of the larger commercial market, and are influenced by crude oil costs, refining capacity, distribution and marketing costs, and taxes.
• While refinery capacity decreased in 2020-2021, the U.S. remains the largest producer of petroleum (crude oil and refined products) in the world and a net petroleum exporter.

• The Department has not experienced and does not anticipate any effects on the petroleum supply chain.
Risks Associated With Reliance on Foreign Sources

- In support of a globally deployed force, the Department often sources fuel closest to the point of use. In FY2021, 50 percent of operational energy was purchased overseas.

- The Department is monitoring the effects of political-economic influence on the availability of fuel needed for peacetime and contingency operations.

- The Department is balancing the political economic risks of relying on foreign sources closer to the point of use against the risks of longer supply chains needed to transport U.S. sourced petroleum to forces in Asia, Europe, and the Middle East.

- To mitigate these risks, the Department will continue to rely on appropriate Petroleum War Reserve Stocks to support operation plans, the procurement of commercial Jet fuel to ensure a more flexible worldwide supplier base, and the Defense Working Capital Fund to manage price volatility.
Hydrogen Fuels

- Hydrogen may either be burned directly as a replacement for liquid fuels in an internal combustion engine (ICE) or used as a fuel in a fuel cell to power electrified systems.
- Hydrogen production technology is well understood and can include direct electrolysis of water, electro-oxidation of ammonia, steam reforming of natural gas, and/or partial oxidation of fossil fuels.
- The production of hydrogen is energy intensive and inefficient but the opportunity to organically produce near the point of use has considerable logistical and operational advantages.
  - Depending on the feedstock and the need for energy to create hydrogen, production at forward bases could face similar supply chain challenges or the need to develop novel power generation sources to power the conversion process.
- In addition, the U.S. and the world lack hydrogen storage and transportation infrastructure that matches that of petroleum, and the unique temperature, pressure, and corrosive properties of hydrogen complicate the buildout of such infrastructure.

The Department is currently conducting research into the suitability of hydrogen as a fuel for tactical systems and monitoring the development of hydrogen production technology.
Sustainable Aviation Fuels (SAF)

• While SAF provides no efficiency improvement and thus no effect on the demand for energy, SAF does offer considerably lower carbon emissions than petroleum.

• In coordination with equipment manufacturers, fuel producers, and governments (including DoD), ASTM International identifies low carbon fuels that, when comprising no more than 50 percent of the total fuel blend, are fully compatible with aircraft and storage and distribution infrastructure.
  – The Military Departments have qualified four alternative fuels approved for commercial use, and is qualifying additional pathways in FY 2022 to ensure the ability to use all approved SAF pathways.

• While the seven SAF approved pathways suggests the feasibility of SAF production, the primary challenge remains the availability of SAF.
  – While increasing, U.S. production of SAF in 2021 totaled 5M gallons, or <1 percent of total U.S. jet fuel use.
  – Additional production facilities are under construction in the U.S. (including two facilities funded by the Defense Production Act), but future production from these facilities has already been purchased by airlines and other users. The Department will compete for these limited volumes of SAF.

• The relatively high price of SAF limits the Department’s ability to acquire SAF. Per title 10 U.S.C. 2922h, the Department can only procure alternative fuels when cost competitive with petroleum.

The Department does not plan to eliminate the use of fossil fuels across all operational assets and platforms, and, as a result, does not have any Department-wide timelines or cost estimates for these emerging capabilities.

The Department is investing in analyses, research, and development to identify the feasibility, capability improvements, and the supply chain resiliency of these emerging energy sources compared to petroleum.

The Department recognizes that climate change is increasing the demand for military operations, impacting readiness, and imposing unsustainable costs. When aligned with mission objectives, the Department is investing in innovations that increase efficiency.

Faced with contested operating environments, the Department also is implementing the Deputy Secretary’s April 2022 guidance to reduce energy demand and increase energy supportability across all force development activities.
The Department’s approach to energy is informed by the need to sustain operations in contested environments and the imperatives of climate adaptation and mitigation.

As a national buyer of refined petroleum, the Department has not identified significant national security consequences or financial impacts of diminished regional refinery diversity.

All hazard challenges – kinetic, cyber, political-economic – will complicate the sourcing of fuel from overseas sources and pose equal, if not greater, challenges to fuel sourced from the U.S.

The Department is postured for the use of SAF and is evaluating other energy sources on the basis of technical feasibility, potential capability improvement, and changes in supply chain risks relative to petroleum.
Appendix
Petroleum Prices Are Influenced by a Range of Factors

Global Competition
- Crude Oil Production
  - Supply/Demand
  - OPEC Policy
  - Geopolitical Events
  - World Economy
  - Financial Markets
- Refining
  - Product Supply/Demand
  - Refinery Capacity
  - Economy Standards
  - Financial Markets

Global/Local Competition
- Distribution
  - Ships
  - Pipelines
  - Trains
  - Trucks

Local Competition
- Marketing
  - Local competition
  - Other products
  - Operating Costs
  - Taxes
Amid Growing U.S. Production, U.S. Imports and Exports Large Amounts of Crude Oil

The U.S. is heavily involved in the international crude market (all values are for the Year 2021 in thousand barrels per day)

U.S. Crude Production = 11,188

Imports
- Canada - 62%
- OPEC - 13%
- Mexico - 10%
- 15 countries - 15%

6,110

Exports
- India - 14%
- Korea - 12%
- Canada - 11%
- 34 countries - 47%

2,980

U.S. Crude Runs = 15,148

Sources: U.S. Energy Information Administration
U.S. is a Significant Exporter of Diesel

The U.S. is heavily involved in the international diesel market (all values are for the Year 2021 in thousand barrels per day)

U.S. Production = 4,663

Imports
- Canada - 44%
- Netherlands - 6%
- Columbia - 6%
- 20 countries - 44%

287

Exports
- Mexico - 26%
- Brazil - 13%
- Chile - 9%
- 47 countries - 52%

1091

U.S. Demand = 3943

Sources: U.S. Energy Information Administration
The U.S. is less involved in the international jet market (all values are for the Year 2021 in thousand barrels per day)

U.S. Production = 1,312

U.S. Imports
- S Korea: 50%
- India: 9%
- Canada: 8%
- 16 countries: 33%

Imports = 158

U.S. Demand = 1371

U.S. Exports
- Mexico: 41%
- Canada: 14%
- Chile: 9%
- 15 countries: 36%

Exports = 106

Sources: U.S. Energy Information Administration