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Special topic

VLGC Carrier Market

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LPG vs. Ethane: Feedstock Competition and Freight Market Repercussions in China's Petrochemical Shift"

The petrochemical landscape in China is evolving rapidly, driven by shifts in feedstock preference, trade policy turbulence, and the relentless expansion of steam cracker and PDH capacities. At the heart of this transformation lie two critical U.S. exports—LPG (mainly Propane) and ethane—both of which serve as foundational feedstocks for China's growing olefins production. An analysis of monthly U.S. exports reveals divergent trends, shaped by structural shifts in Chinese demand, price dynamics, and geopolitical factors.

Export Trends: U.S. LPG and Ethane to China

U.S. exports of both LPG and ethane to China remained robust through 2024 and early 2025, but with notable fluctuations. The sharp rise in ethane exports in late 2024, particularly in September and December, corresponds with the commissioning of new ethane-fed steam cracker projects in China.

Meanwhile, LPG imports, while more volatile, remained high, sustained by a strong base of PDH units and dual-feed crackers.

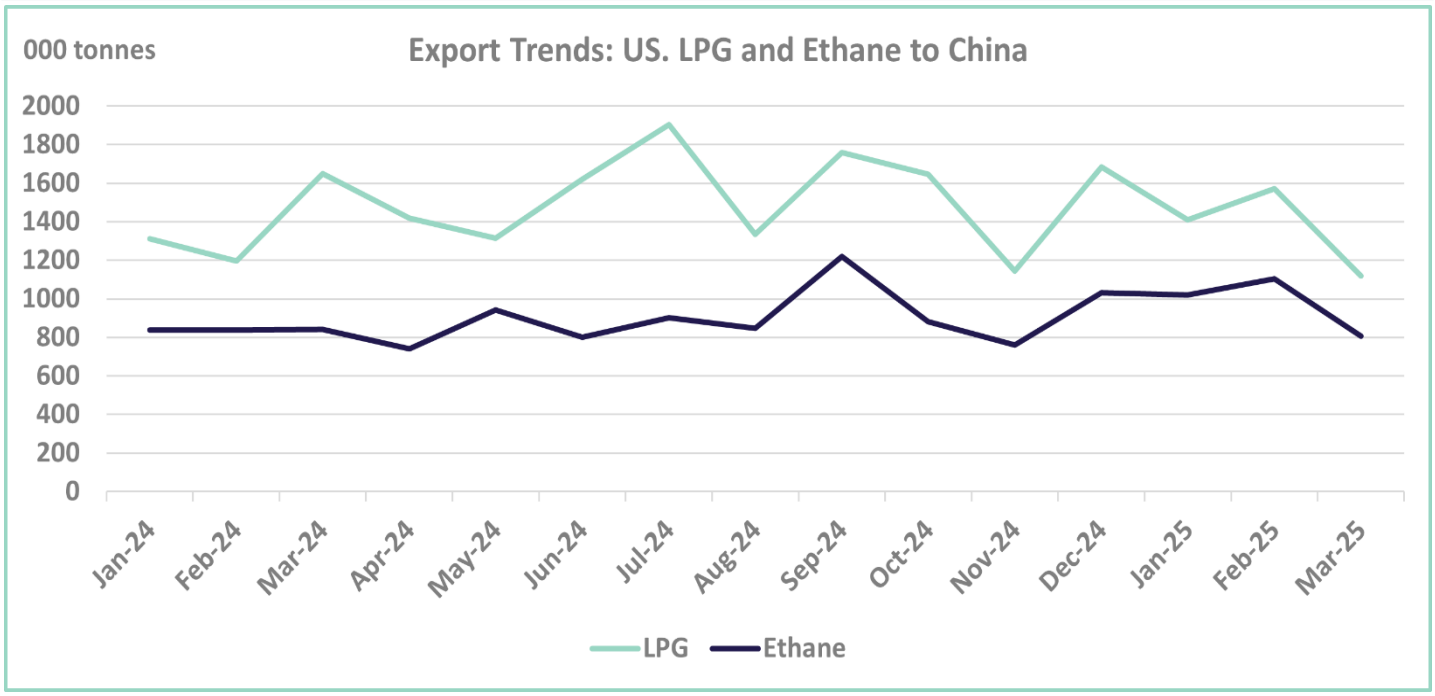
PDH Plant Dynamics and Feedstock Competition

China's PDH capacity has grown significantly in recent years, creating a sustained appetite for imported propane. These units convert propane into propylene, a key building block for plastics.

However, PDH margins have come under pressure in 2024–25 due to weak propylene prices and high feedstock costs, making ethane-fed steam crackers a more economically viable option in some cases.

Ethane, primarily extracted from natural gas liquids (NGLs), offers a higher ethylene yield and lower carbon intensity when compared to propane, providing economic and environmental advantages. This has led to rising interest in ethane imports, particularly as new Chinese crackers come online with dedicated ethane-handling infrastructure.

Figure 15.1 Export Trends: U.S. LPG and Ethane to China



Trade Policy and Supply Chain Risks

Despite recent growth, trade between the U.S. and China remains vulnerable to geopolitical frictions. U.S. LPG exports to China in June 2025 plummeted to 317,000 tonnes from over 1.3 million tonnes in May—a 76% decline—reflecting renewed trade tensions and tariff policy uncertainty. Ethane trade has proven more resilient, likely due to long-term supply contracts and the strategic role of ethane in new cracker operations.

Infrastructure Expansion and Market Implications
To support future demand, U.S. midstream operators like Enterprise Products and Energy Transfer are expanding export terminal capacity. The Nederland terminal alone could add up to 7–8 additional propane cargoes per quarter, reinforcing the US role as a key LPG and ethane supplier to Asia.

Outlook and Strategic Implications

The future of U.S. LPG and ethane exports to China will hinge on several interrelated factors:

- **Cracker Feedstock Preferences:** As China builds more ethane-capable crackers, ethane demand will continue to rise—potentially reaching 11.4 million tonnes/year by 2027. This could reduce LPG demand if economics and margins favour ethane over propane.
- **PDH Viability:** PDH economics remain under strain. Should margins recover, propane demand could rebound sharply, especially as LPG remains a more flexible and diversified feedstock for other industrial uses.
- **Freight and Logistics:** Tighter VLGC availability and rising freight costs could weigh on LPG trade economics, especially if ethane remains more competitive on a delivered-cost basis.
- **Policy and Geopolitics:** US. - China trade relations will be pivotal. Tariffs or disruptions in U.S. supply could force Chinese crackers to pivot back to naphtha or domestically sourced LPG.

Freight Market Outlook: Tonnage Tightness and Fleet Evolution

The shipping side of the LPG and ethane equation is set to undergo recalibration in 2025, with direct implications for freight rates and vessel supply dynamics. Seven VLGCs and Eight additional hybrid VLGC/VLEC units are scheduled for delivery this year. However, over 50 vessels are expected to undergo mandatory drydockings, significantly tightening effective tonnage availability compared to 2024. This constraint is likely to support firmer freight rates, particularly during periods of peak export activity from the US Gulf.

Newbuilding prices have continued their upward trajectory, with the average cost of a VLGC rising to $121.5 million as of early 2025. The market's bullish outlook is further reflected in the ordering momentum— In 2024 and 2025, a total of 141 LPG carriers were contracted, a notable increase from 122 in 2023.

A closer look at the orderbook reveals a growing trend toward specialized gas carriers. VLECs increased to 25 in orders —accounting for 16.2% of the total gas carrier orderbook—highlighting primarily intended for ethane transport, many of them may temporarily enter the broader LPG market to optimize utilization while awaiting dedicated downstream capacity. This cross-deployment could exert downward pressure on VLGC freight rates in the near term, increasing competition on key routes such as the U.S.–Asia corridor. Conversely, as more ethane infrastructure becomes operational in Asia, VLEC availability could tighten, reinforcing rate strength in that segment.

Conclusion

While both LPG and ethane remain essential to China's petrochemical feedstock mix, their roles are increasingly shaped by policy risk, margin economics, and infrastructure compatibility. Ethane is gaining strategic ground due to its cleaner profile and better yields, but LPG retains its relevance through broader utility and diversified demand pathways. Meanwhile, the evolving fleet landscape—characterized by drydock constraints, specialized tonnage, and rising

vessel costs—will continue to influence freight market dynamics. For market participants, a nuanced understanding of these interlinked variables is essential, as trade flows, shipping rates, and investment strategies are recalibrated in response to China's shifting petrochemical priorities.

Table 15.2 Gas Carrier Orderbook from 2024 till date