

Long-Term Perspectives for Energy Market Analysis

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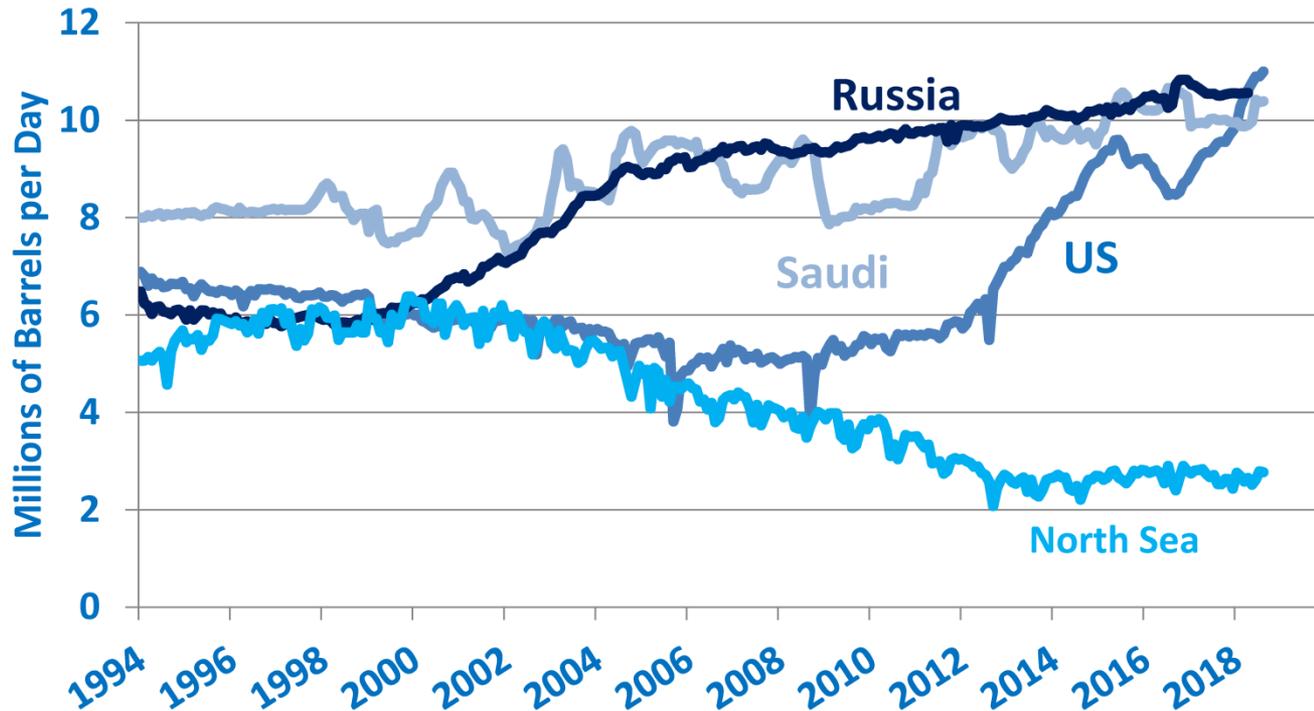
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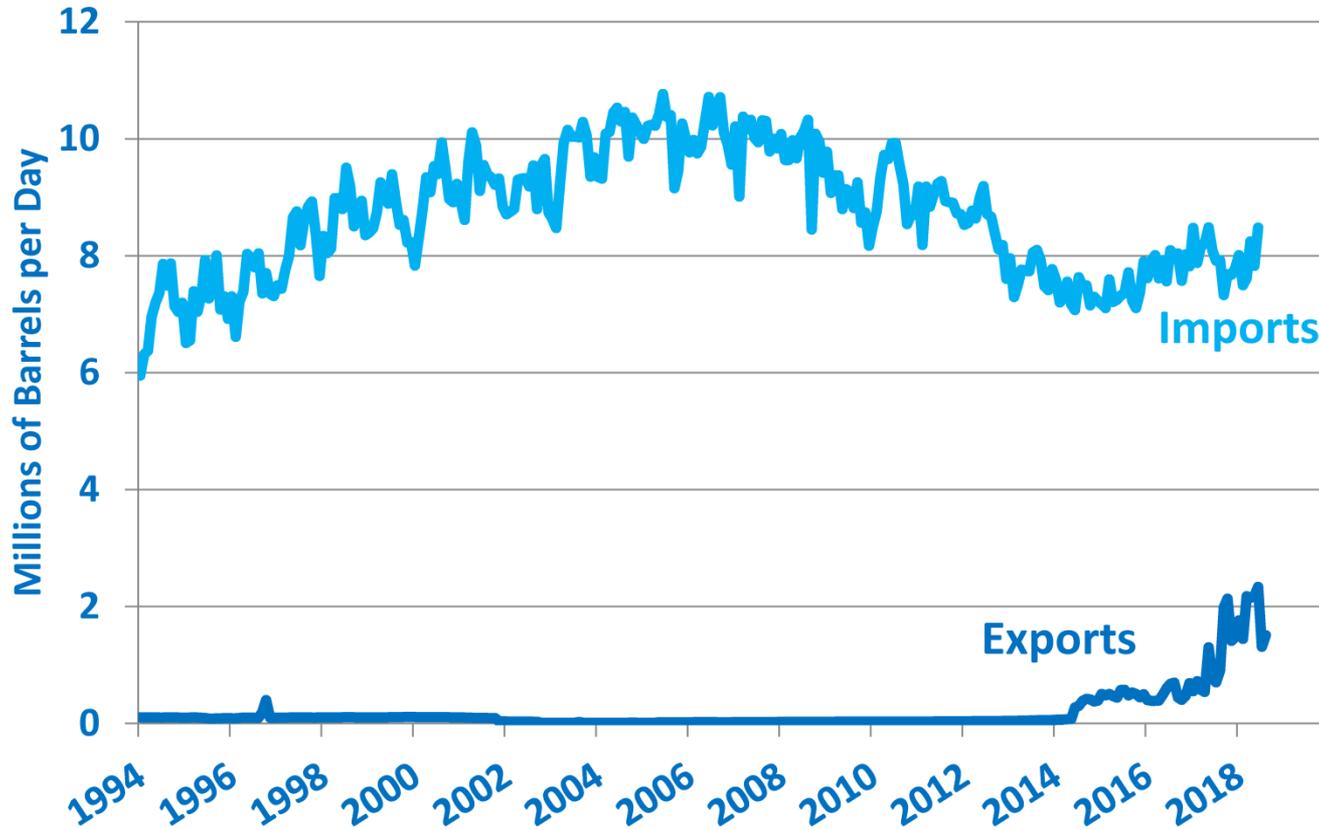
- 1) US shale oil production to be much more price elastic than Saudi or Russia
- 2) US exports are key to globalization and understanding benchmark spreads
- 3) Infrastructure for US exports and futures products (Natural Gas – Sabine Pass, HCL – Oil Futures Physical Delivery from Houston)
- 4) Shipping costs matter, critical to basis risk relative to oil or natural gas faced by importer of US energy
- 5) Electric cars to hit gasoline demand in 2020s.
- 6) Natural gas to continue to supplant coal all around the world in electrical power generation

US, Russian, Saudi Arabian, and North Sea Oil Production



Source: Bloomberg Professional
(DOETCRUD, OPCRSAUD, DWOPRUSS, PIWANORT)

US Oil Imports and Exports



Source: Bloomberg Professional (DOCRTOTL, DOEBCEXP)

Infrastructure to Export

Terminals
Storage
Pipelines
Etc.

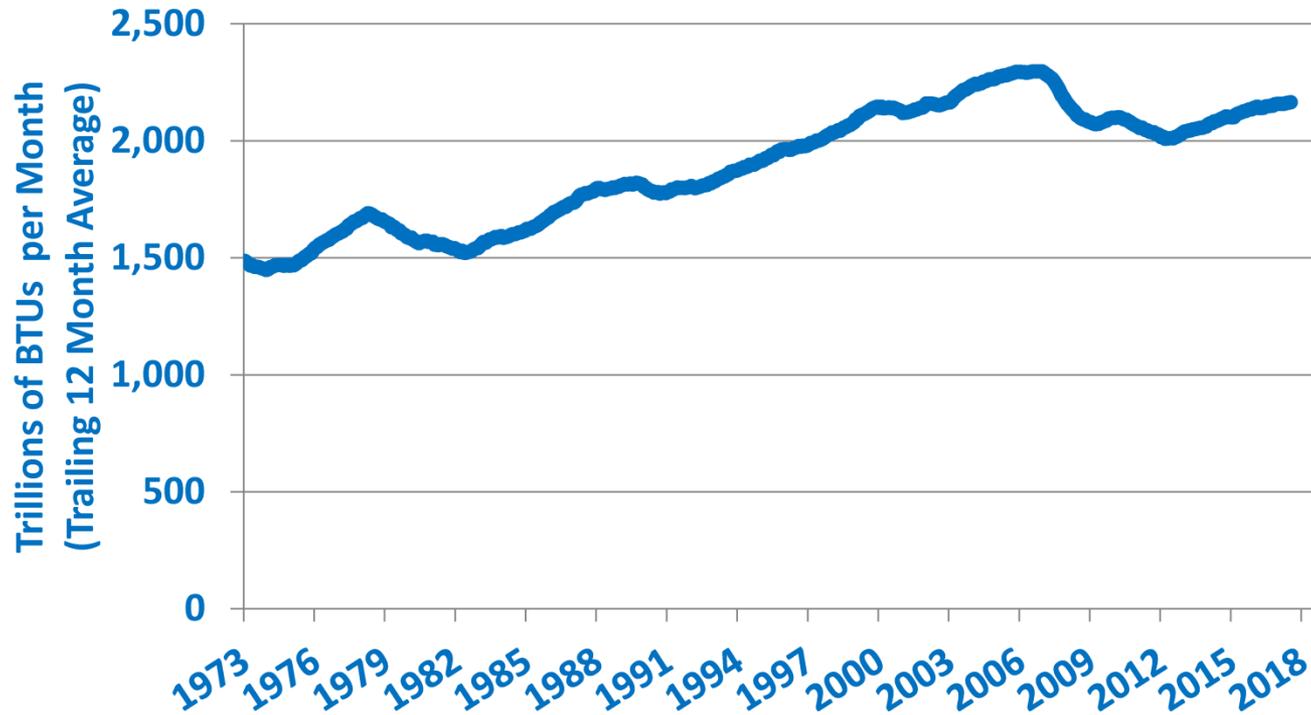


Distances from Sabine Pass

Discharge Port	Nautical Miles
Gateway (NL)	5002
Tokyo	15762
Tokyo (via Panama Canal)	9209
Tokyo (via Suez Canal)	14521
Shanghai	15098
Shanghai (via Panama Canal)	10081
Shanghai (via Suez Canal)	13854

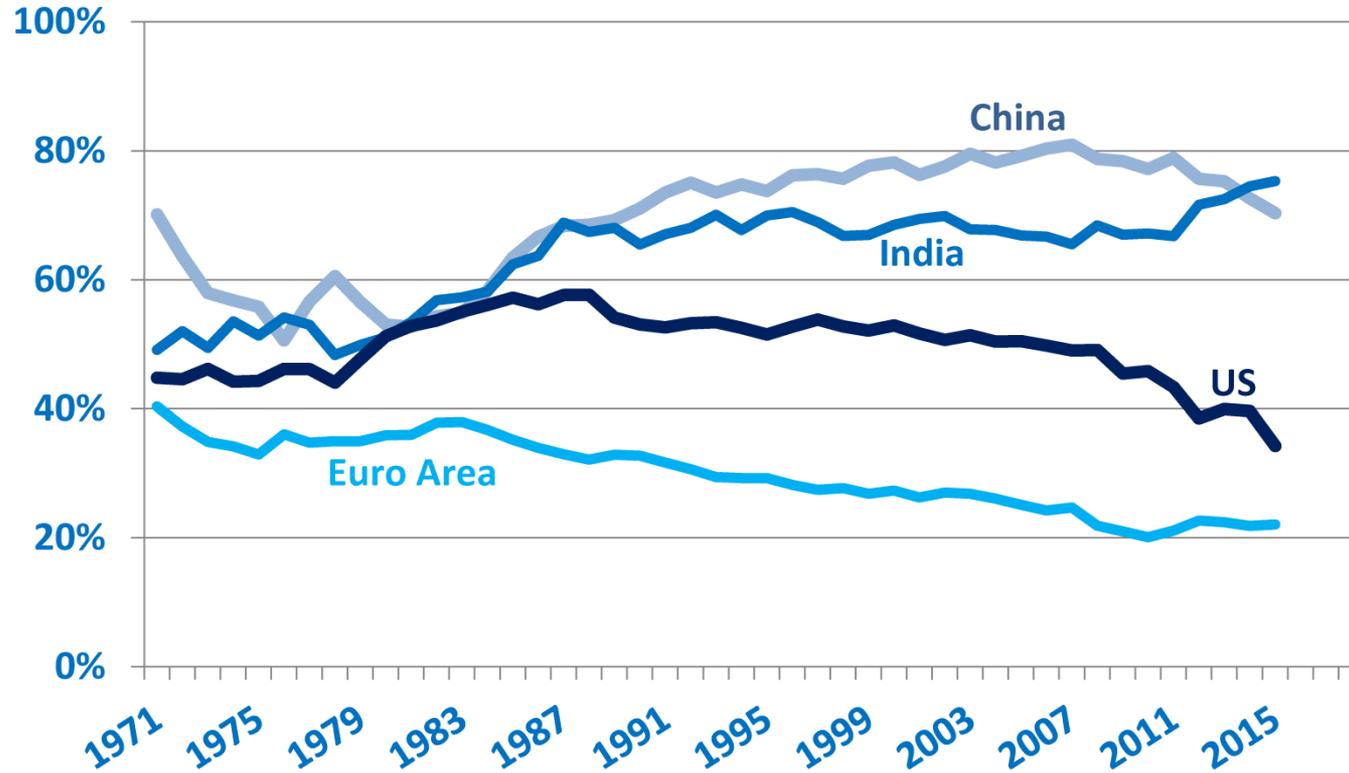
Source: SEA-DISTANCES.ORG, <https://sea-distances.org/>

Petroleum Production Consumed by the US Transportation Sector



Source: U.S. Energy Information Administration, Sept-2018 Monthly Energy Review, Table 2.5 Transportation Sector Energy Consumption.

Coal as a Percent of Electricity Generation



Source: IEA Statistics © OECD/IEA 2014
(<http://www.iea.org/stats/index.asp>)

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