

# Geopolitics of Energy

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November 2024

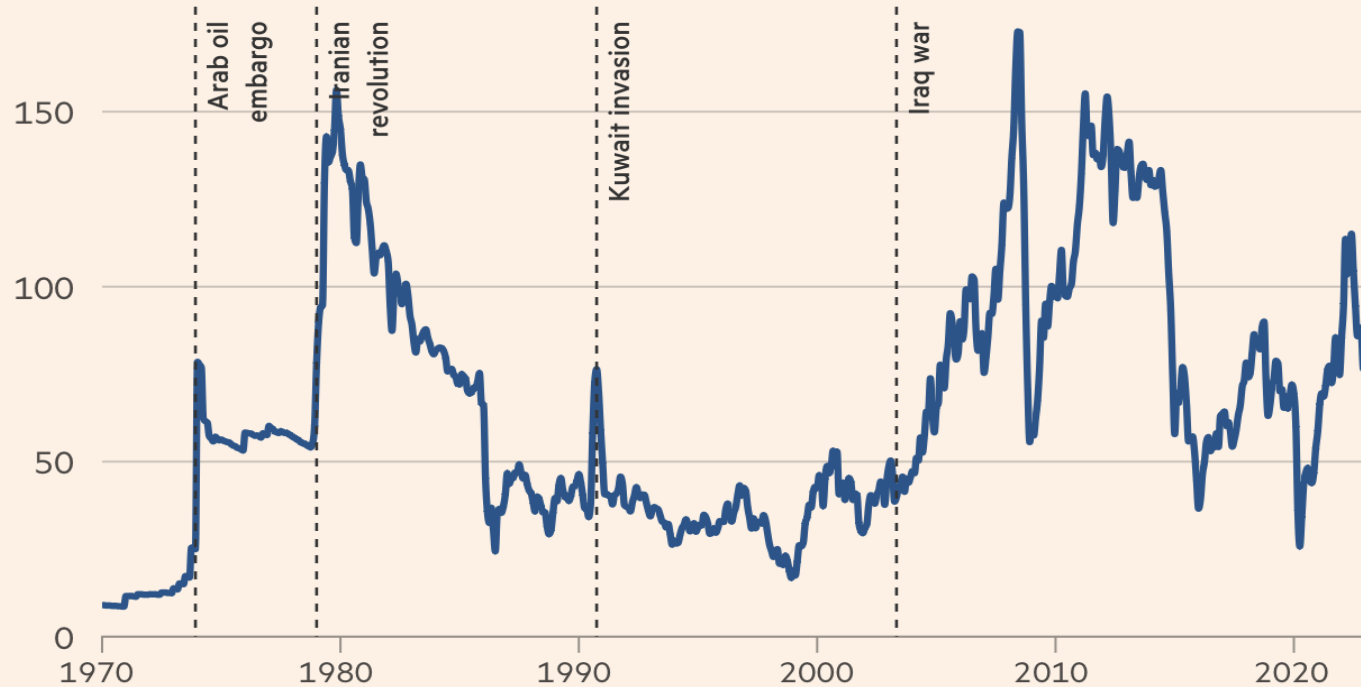


ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΙΡΑΙΩΣ

UNIVERSITY OF PIRAEUS



## Real oil prices (\$ per barrel)

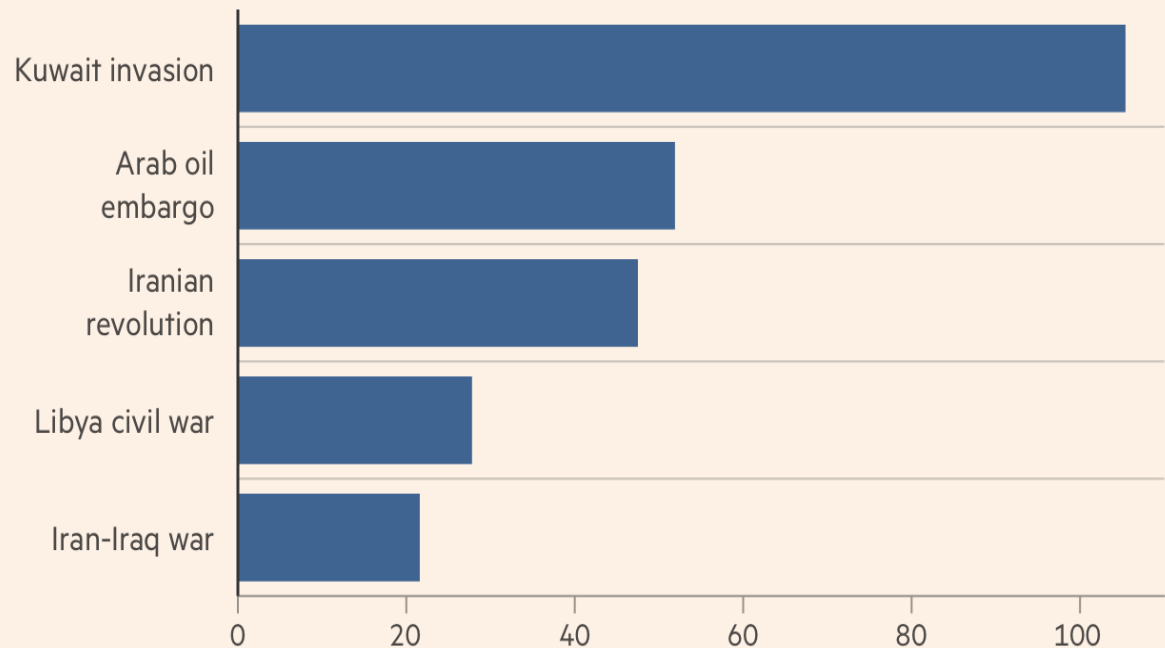


FINANCIAL TIMES

Source: World Bank, Bloomberg • Brent crude price deflated by US CPI

## Past oil shocks have caused big price jumps

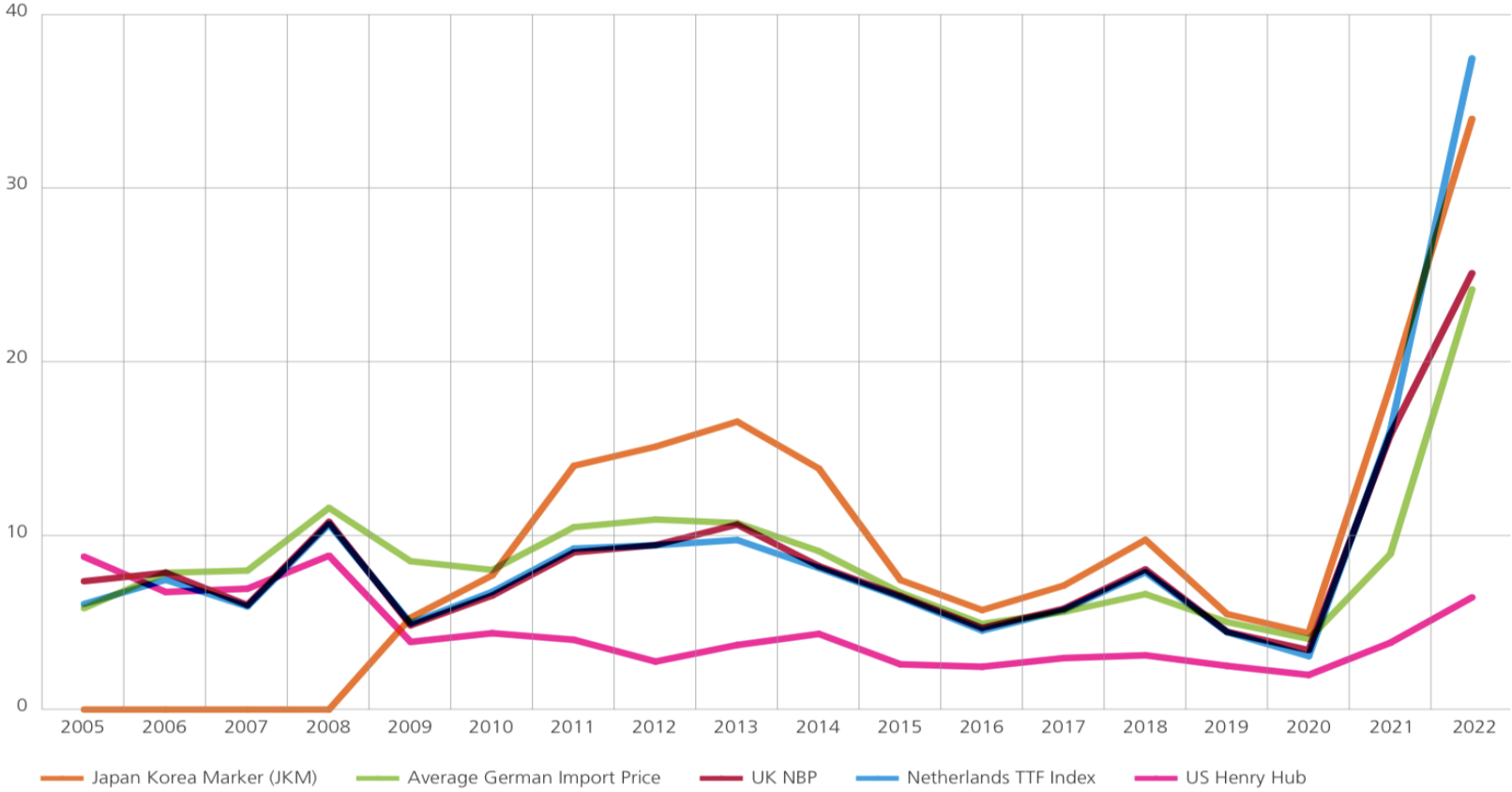
% change in average monthly oil prices three months after the onset



FINANCIAL TIMES

Source: World Bank

\$/mmBTU





## ***Oil a New Soviet Weapon In Economic and Political Offensive Against West***

**U.S. Moving Toward Policy Revision to Meet  
Threat of Reds' Increased Production and Exports  
—Officials Uncertain of Main Danger of Barter  
Deals That Open Way to Infiltration.**

**By RAYMOND P. BRANDT**

Chief Washington Correspondent of the Post-Dispatch.

WASHINGTON, June 3.

SHARPLY INCREASED PRODUCTION and steadily rising exports of Russian oil have confirmed fears in American official and private circles that the Kremlin has begun an economic and political offensive against the West with petroleum as a powerful weapon.

In the words of one official, "Oil is Russia's largest, easiest and most flexible export." Both in production and marketing, the Communists have decided advantages over the competitive, capitalistic producers, who have billions of dollars invested in the overseas trade.

Fidel Castro's seizure of American-owned refineries in Cuba to process Russian crude oil dramatized the need for a new Ameri-

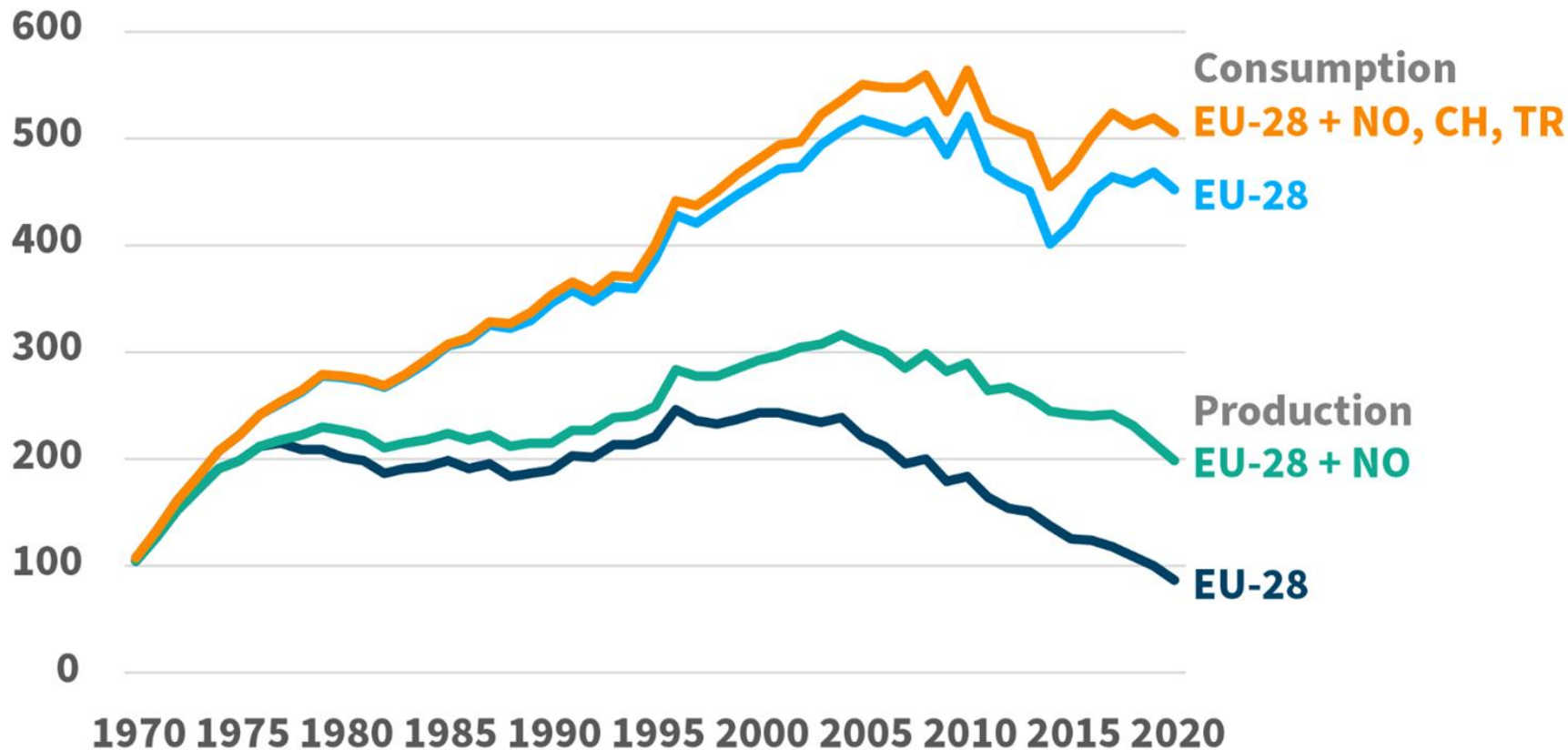
tions to maintain their refusal to lend money to foreign governments for the extraction of oil. The World Bank, in which the United States has the largest minority interest, is maintaining this position on its loans, and the Development Loan Fund, an affiliate of the International Co-operation Administration, has made no such outlays.

The Export-Import Bank, a govern-

For many decades, debate has raged about how much political power Moscow would gain from Europe's importing oil and natural gas from the Soviet Union and now Russia, as in this article from 1961.

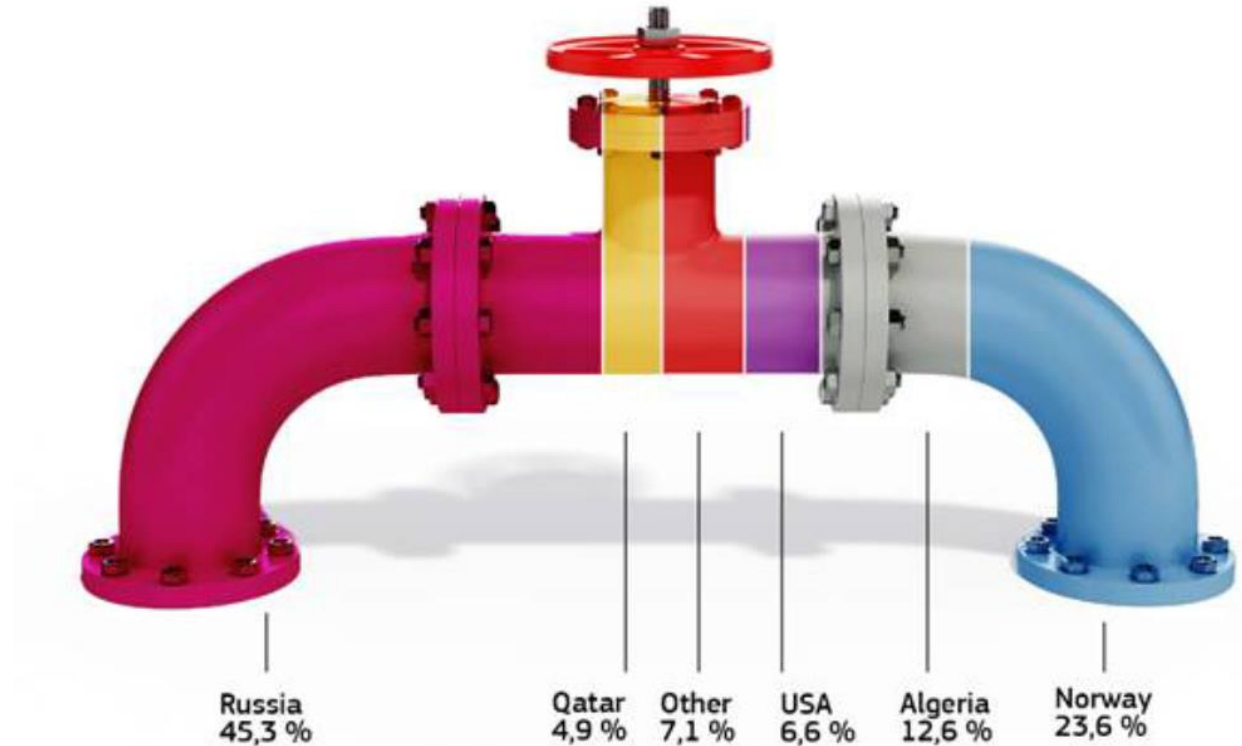
# Europe's Gas Supply and Demand Balance

billion cubic meters (bcm)

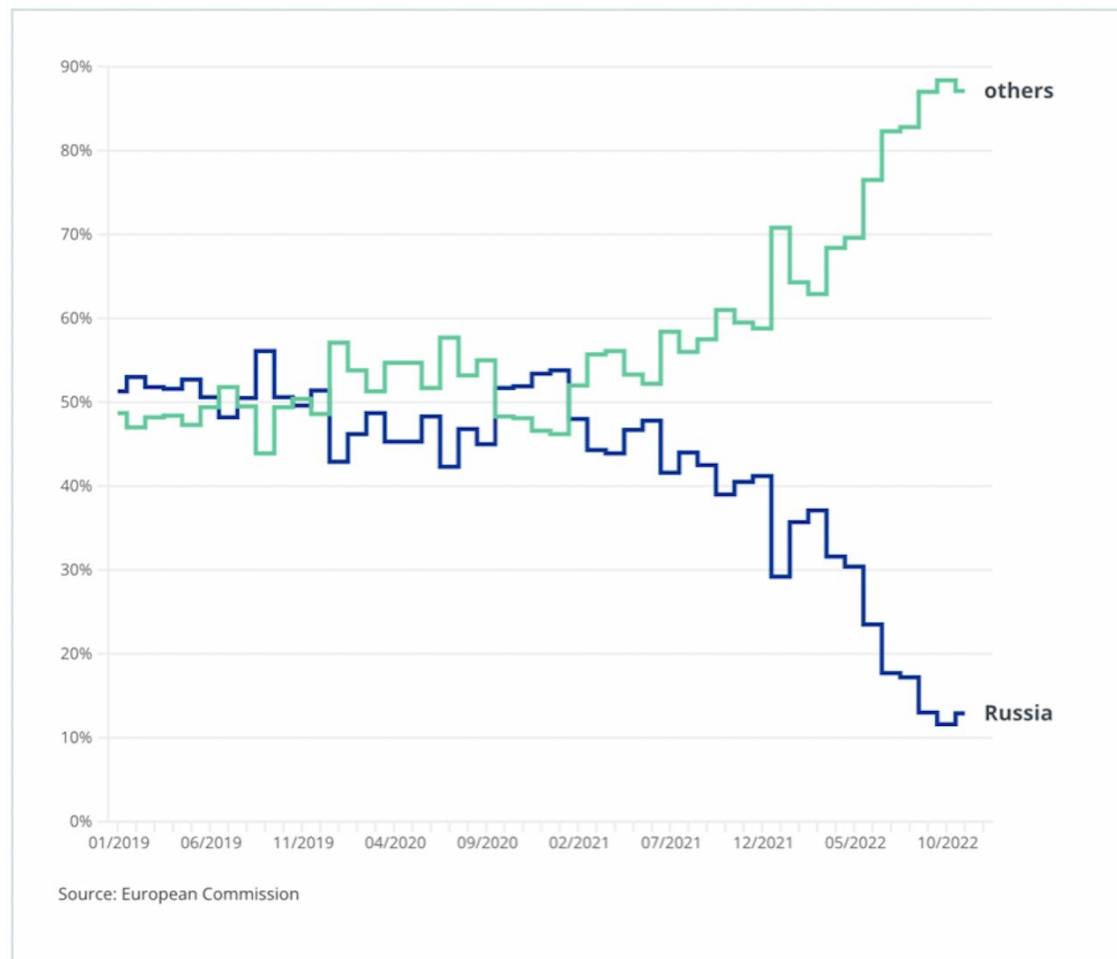


Source: BP Statistical Review of World Energy, July 2021.

## Share in EU natural gas imports, 2021



Source: European Commission



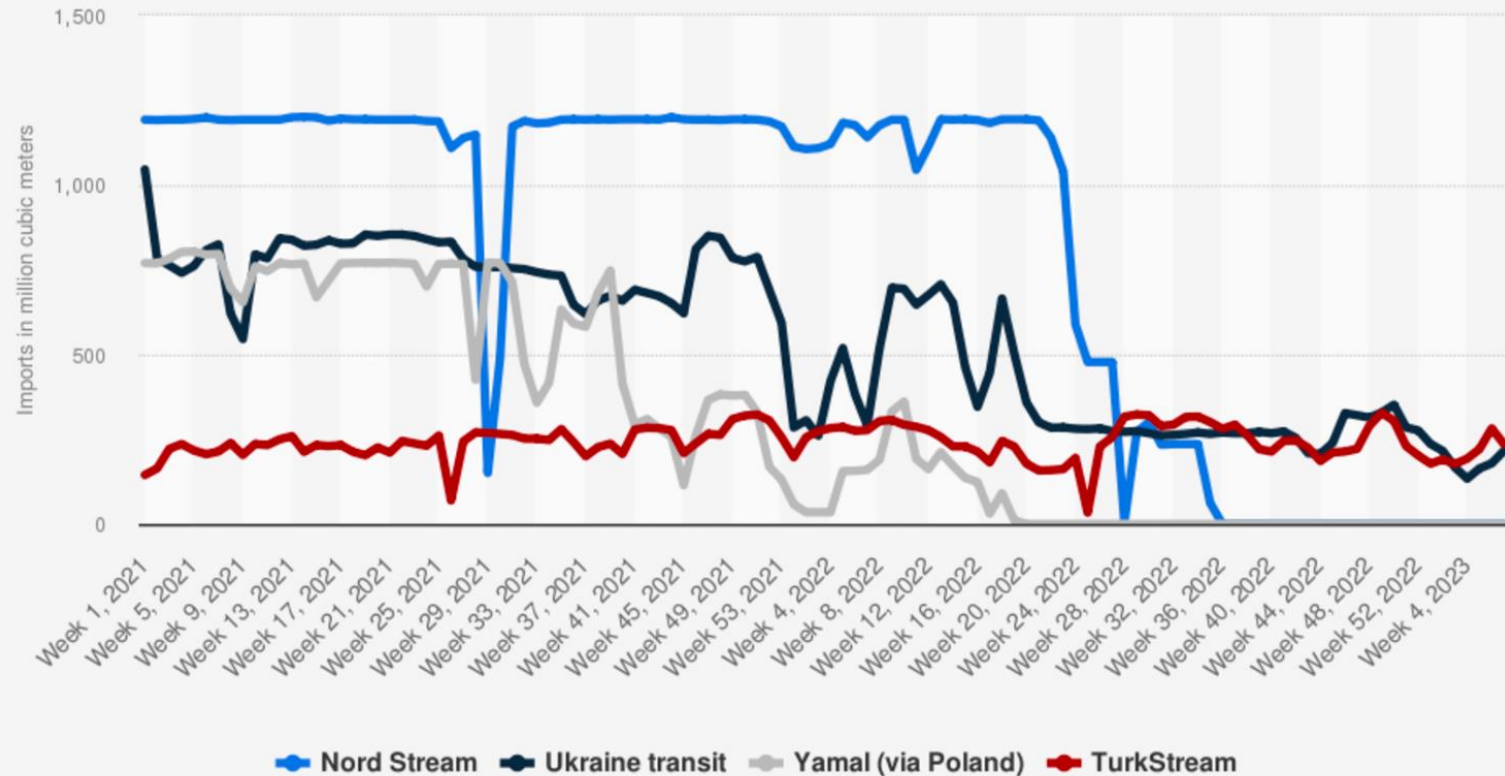
The EU's diversification away from Russian gas

# Europe's gas-pipeline network

Theoretical capacity of selected pipelines



**Natural gas import volume from Russia in the European Union (EU) and the United Kingdom (UK) from week 1, 2021 to week 7, 2023, by exporting route (in million cubic meters)**



Source: Bruegel; ENTSO-E





North stream 2: Putin's signature project is now destroyed



A specialized barge lays pipe under the Baltic Sea in 2019 for the controversial Nord Stream 2 pipeline, which is meant to carry additional Russian gas to Germany





Receiving station for the Nord Stream 2 gas pipeline, near Lubmin, Germany

# Mystery leaks reported from Nord Stream gas pipelines



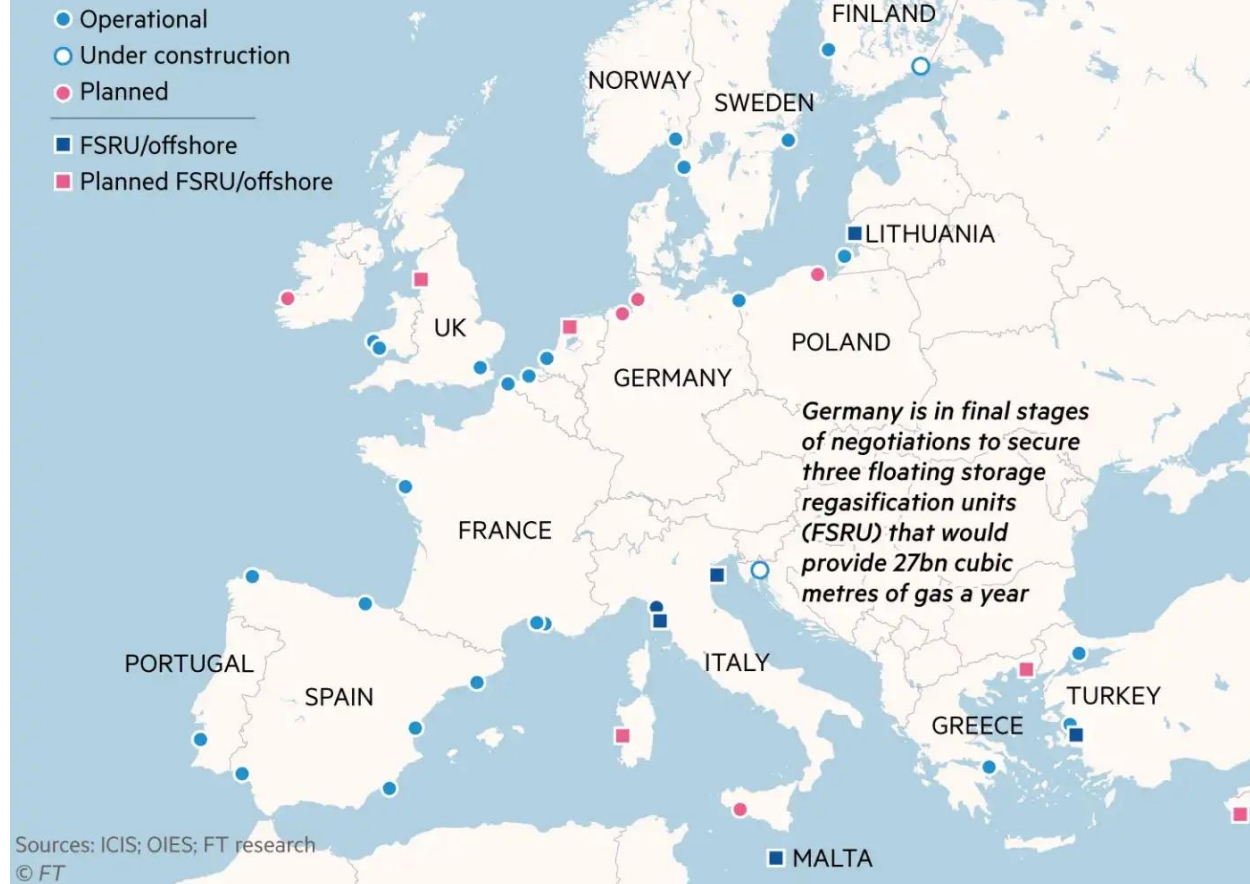
Sources: European Network of Transmission System Operators for Gas (ENTSOG); Danish and Swedish maritime authorities

Prasanta Kumar Dutta | Reuters, Sept. 27, 2022



Gas leaking from the Baltic pipeline after the September 2022 explosion

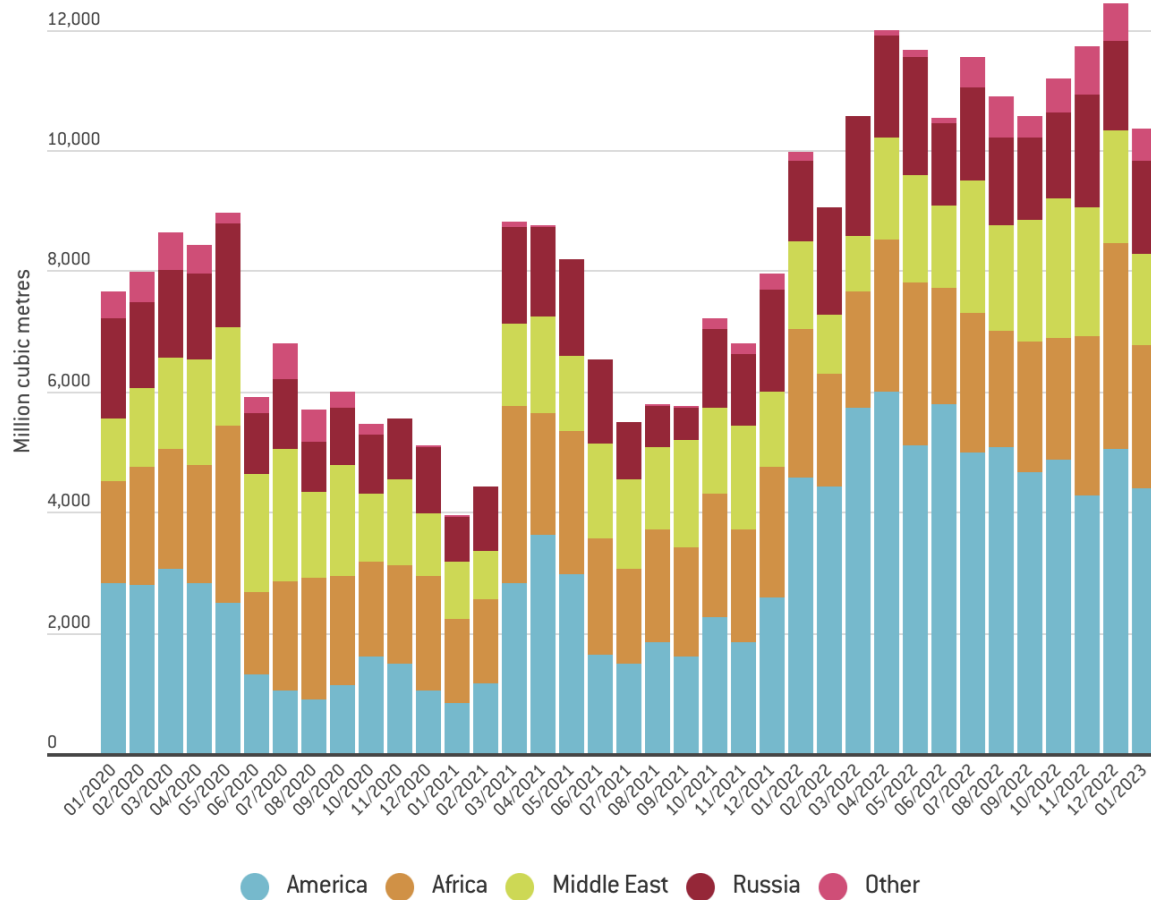
## European LNG import terminals







The Gate Terminal in the Netherlands is a critical entry point for liquefied natural gas, a vital fuel for Europe. Gate Terminal

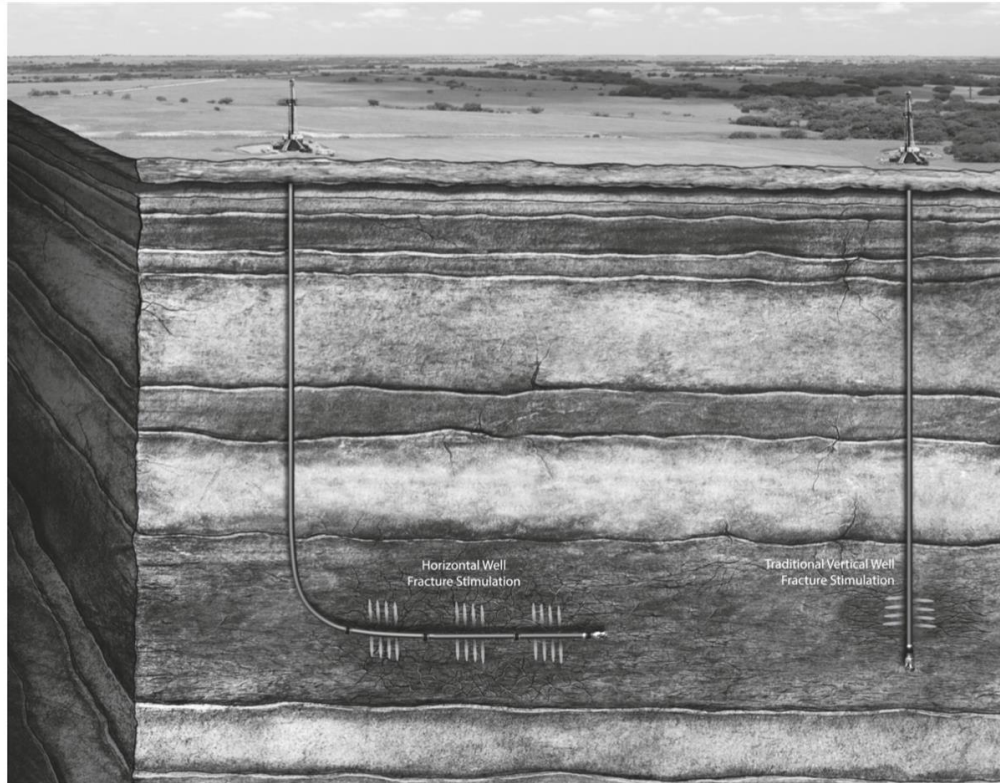


EU27 LNG monthly imports by region of origin



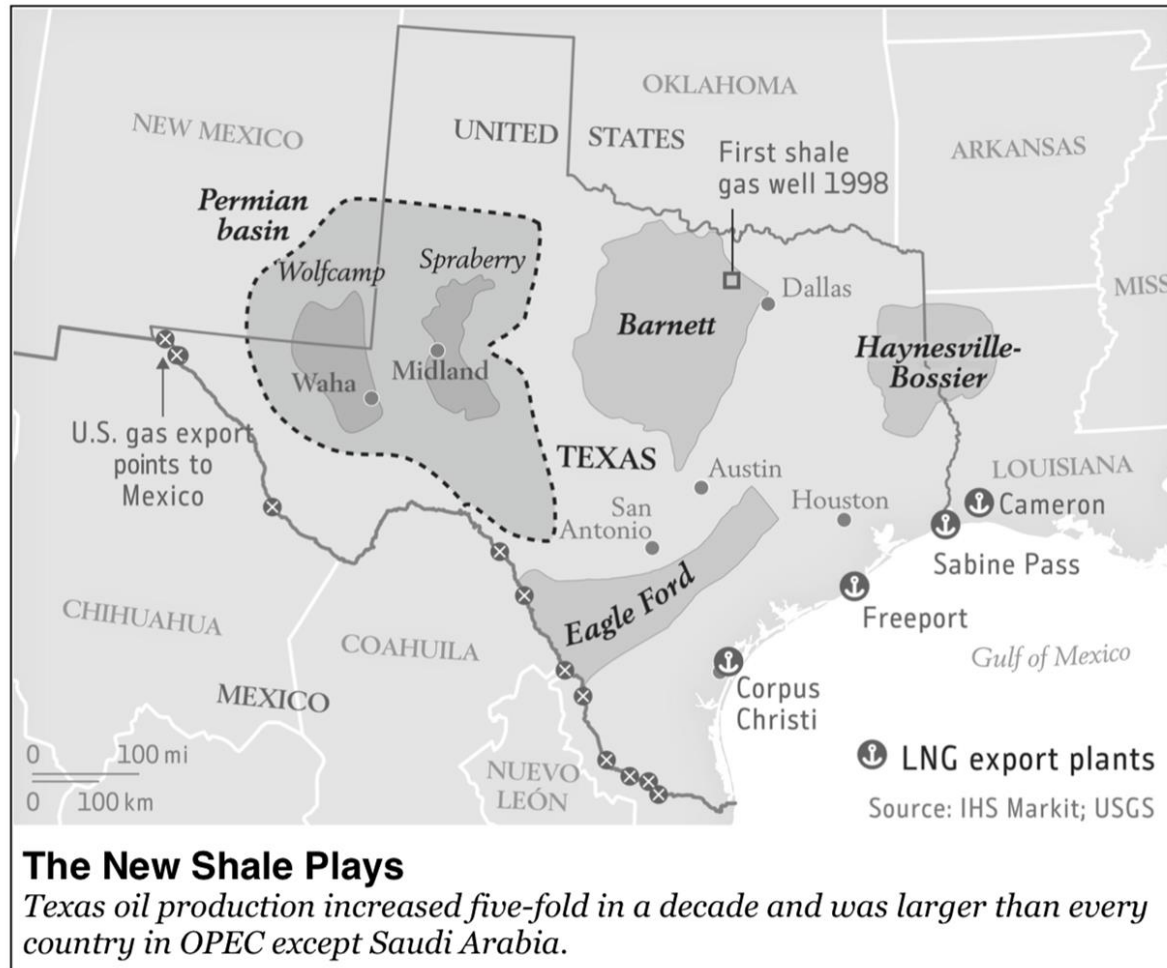
A floating storage and regasification unit. The ships offer the fastest way for Europe to boost LNG imports © Claudine Klodien/Alamy





The Permian Basin in West Texas and New Mexico is now the world's second-largest producing area, propelling the United States to become the world's largest oil producer in 2018, ahead of Saudi Arabia and Russia. Horizontal drilling taps multiple zones containing shale oil.







Ships at Cheniere Energy's Sabine Pass terminal being loaded with liquefied natural gas. Cheniere

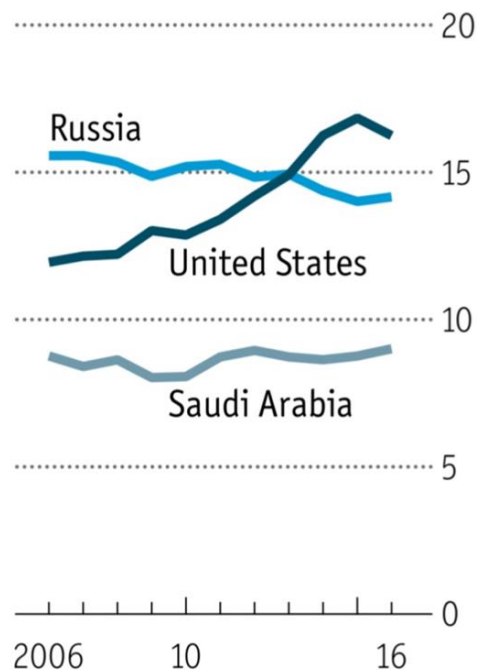


In 2016, a tanker passed through the expanded Panama Canal carrying the first cargo of U.S. liquefied natural gas (LNG) to China. Oil and gas exports now loom large in U.S.-China trade battles.

## Pumped

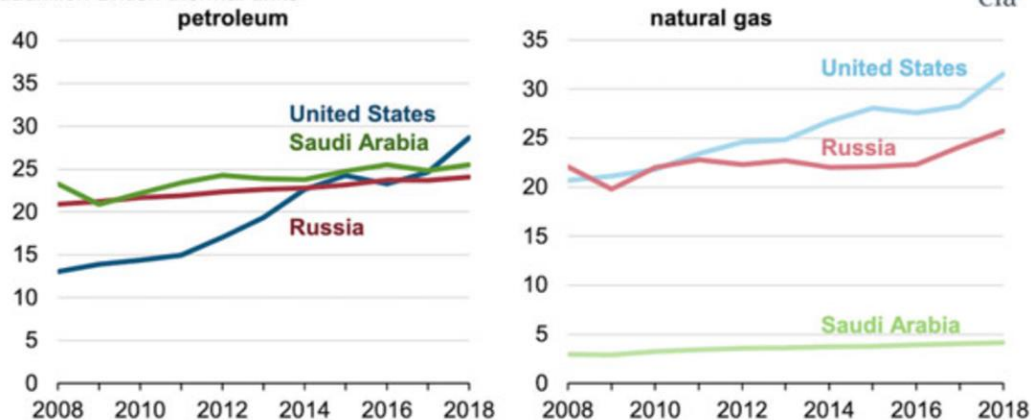
Oil and gas production

As % of world total



Source: BP

Estimated petroleum and natural gas production in selected countries  
quadrillion British thermal units



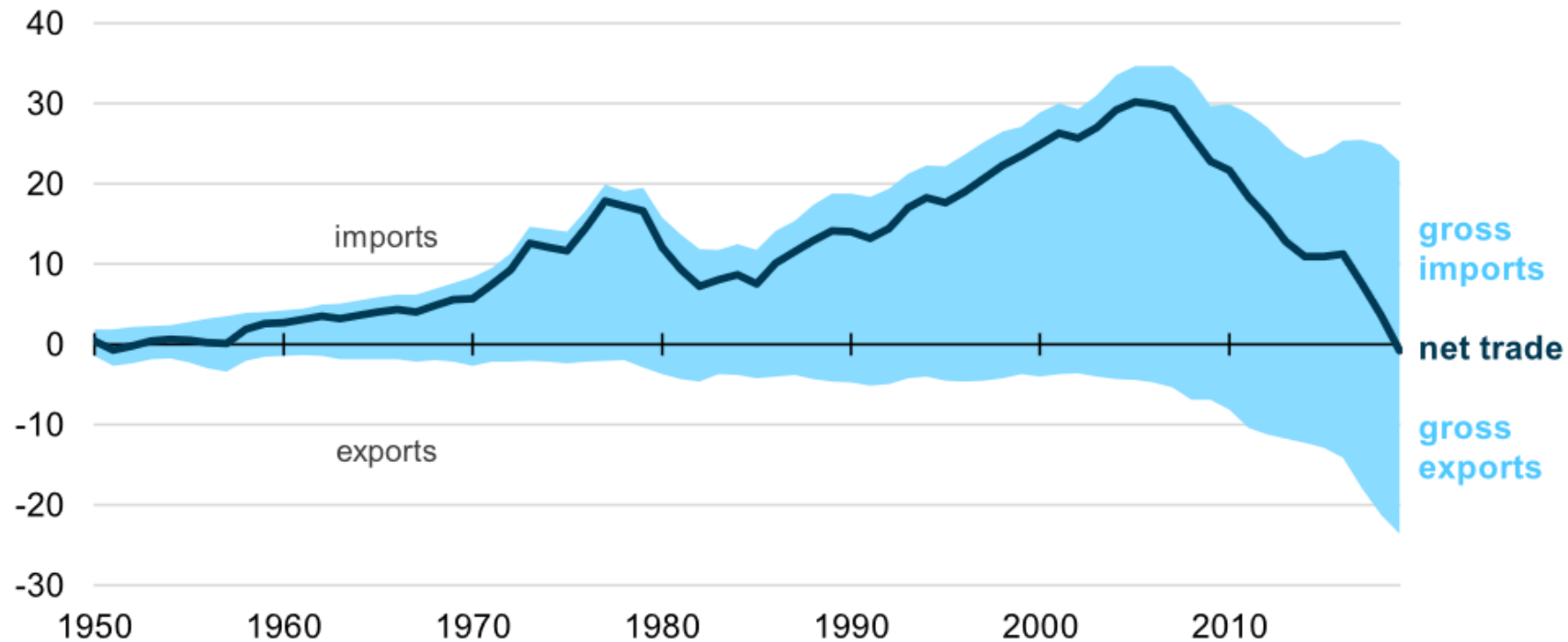
**Fig. 11.1** Estimated petroleum and natural gas production in selected countries (Source U.S. Energy Information Administration, based on International Energy Statistics. Note Petroleum includes crude oil, condensate, and natural gas plant liquids)



# U.S. total energy exports exceed imports in 2019 for the first time in 67 years

## U.S. total energy trade (1950-2019)

quadrillion British thermal units



Source: U.S. Energy Information Administration, [Monthly Energy Review](#), Tables 1.4a, 1.4b, and 1.4c



Russia: Pivoting to the East



*The Power of Siberia is the first gas pipeline built to supply Russian gas to China. Image courtesy of Gazprom.*



*Gas supply to China through the Power of Siberia pipeline was started in December 2019. Image courtesy of Gazprom.*



# Piloting to the East

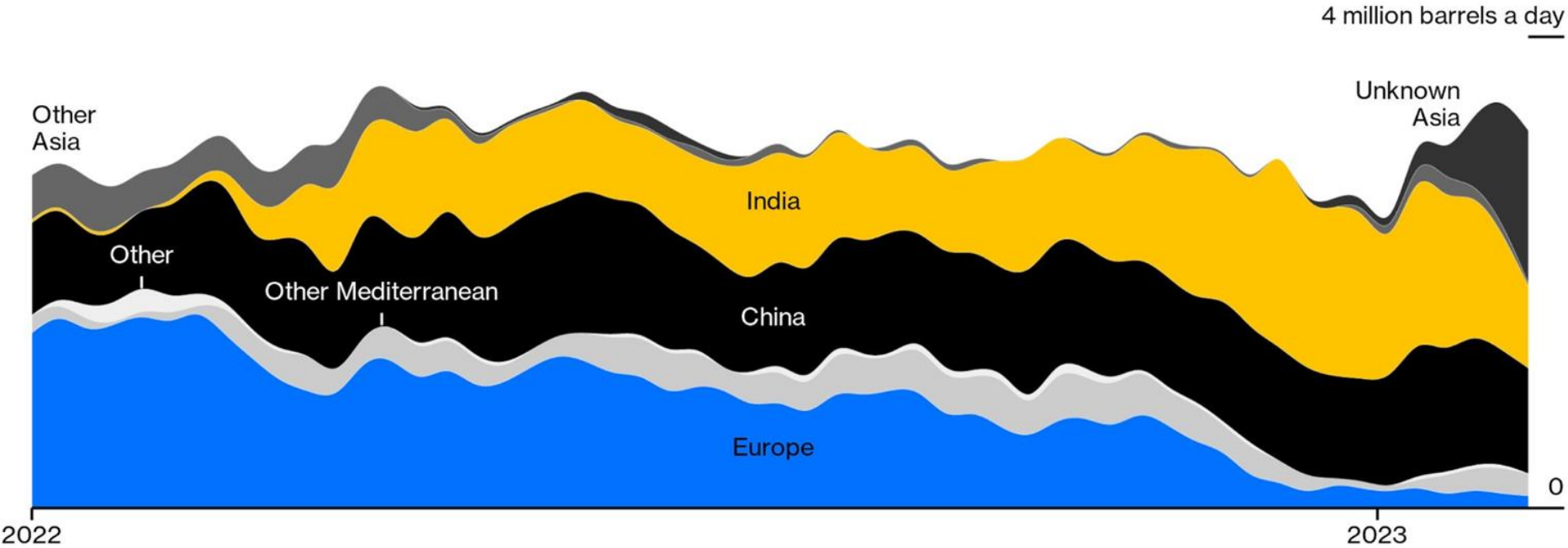


*Trans-Mongolian Route for Power of Siberia 2*



**Buyers of Russia's Crude Oil**

India has provided the most important lifeline for Moscow's crude sales

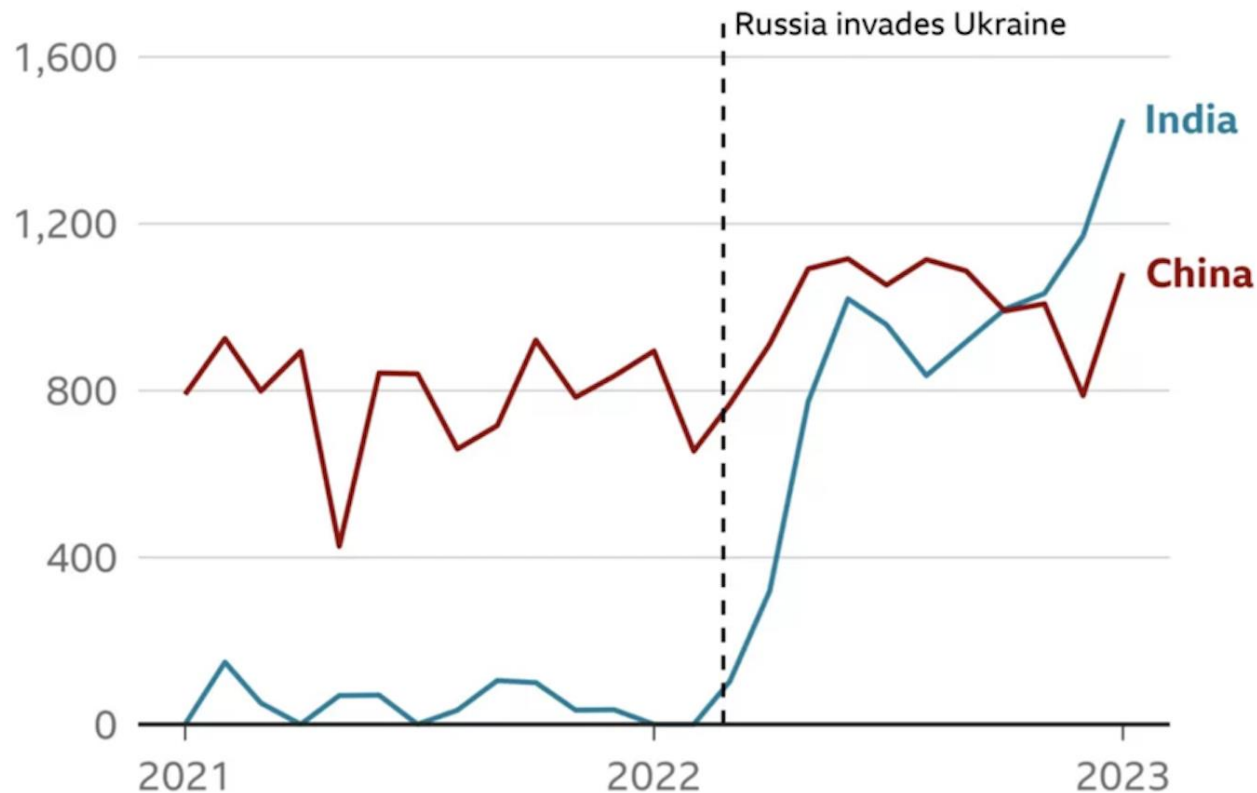


Source: Vessel tracking data monitored by Bloomberg

Note: Four-week average flows of Russian crude. Recent history suggests that most of the barrels heading to "Unknown Asia" destinations will end up in India, with some heading to China. "Other Med." is mostly shipments to Turkey.

# Russia oil exports to India and China

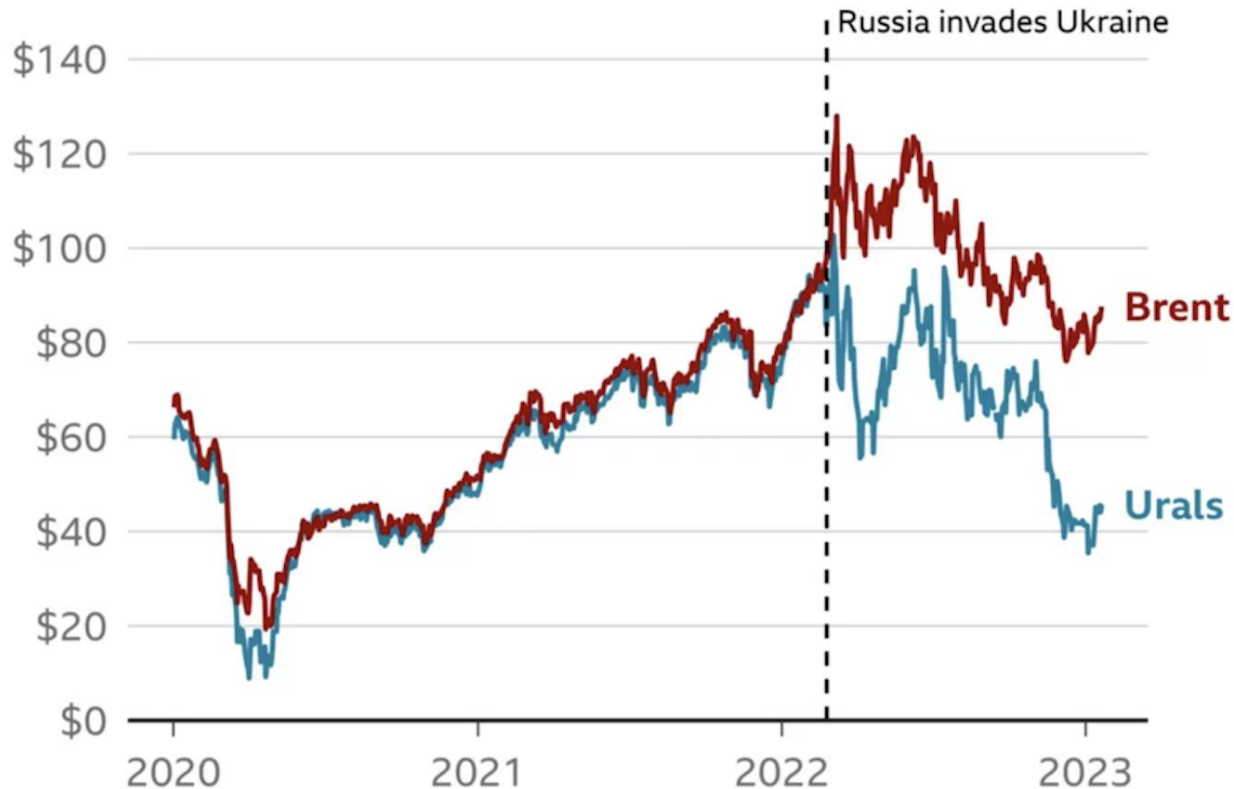
Thousands of barrels per day



Source: Kpler

# Price of Russian oil dropping faster than Brent

US dollars per barrel



# Where Turkey gets its gas







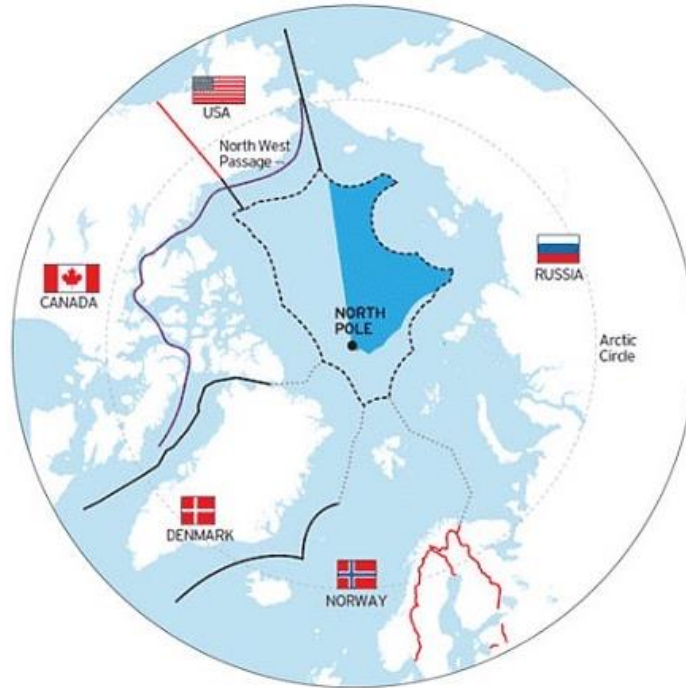
At the “*end of the land*” on a remote Arctic peninsula. Russia will become one of the world’s major exporters of LNG, capable of cutting through the ice eastward to Asia or westward to Europe <sup>35</sup>

# Estimated Undiscovered Oil and Gas in the Arctic and Potential Trade Routes





## Russian Continental Shelf Claims in the Arctic



Resource  
competition  
in the Arctic

**Source:** Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, "Outer limits of the continental shelf beyond 200 nautical miles from the baselines: Submissions to the Commission: Submission by the Russian Federation," at [www.un.org/depts/los/clcs\\_new/submissions\\_files/rus01/RUS\\_CLCS\\_01\\_2001\\_LOS\\_2.jpg](http://www.un.org/depts/los/clcs_new/submissions_files/rus01/RUS_CLCS_01_2001_LOS_2.jpg).



11. The consequences of melting Arctic ice for shipping.



“Icebreaker gap” benefits Russia



### South China Sea

China is claiming most of the South China Sea with its Nine-Dash Line map, leading to tension with Southeast Asian countries and the United States.

## Chokepoints and U.S. Encroachment





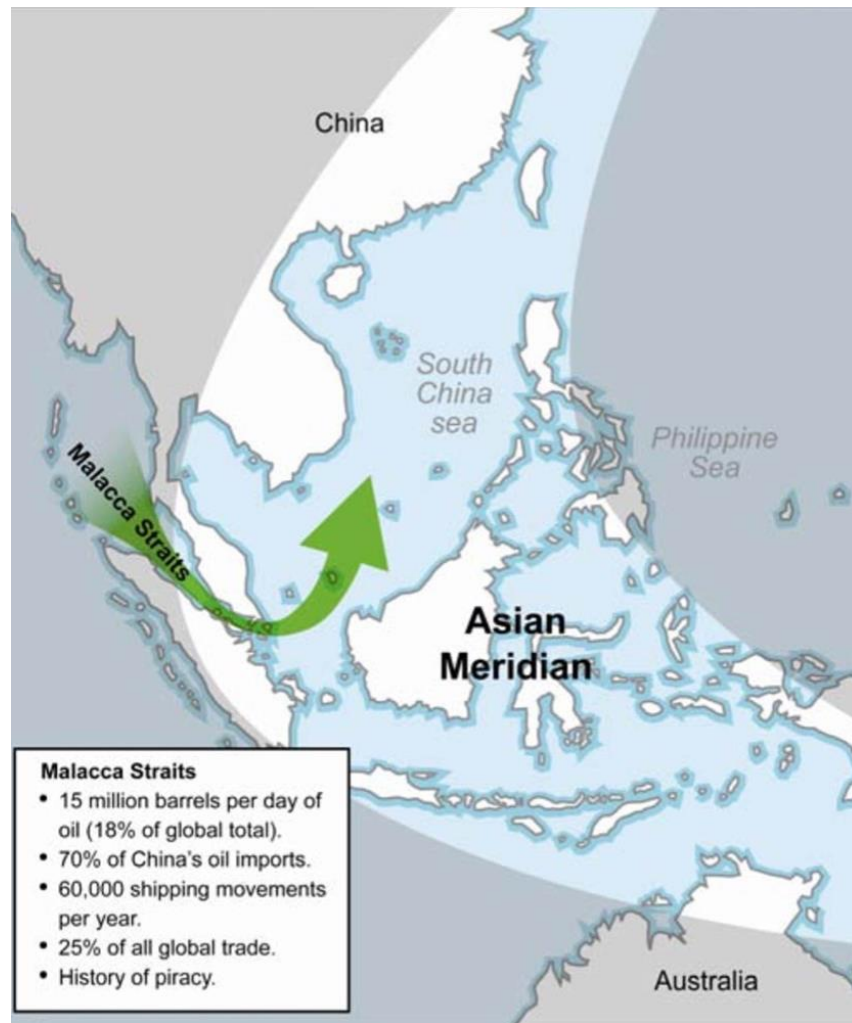
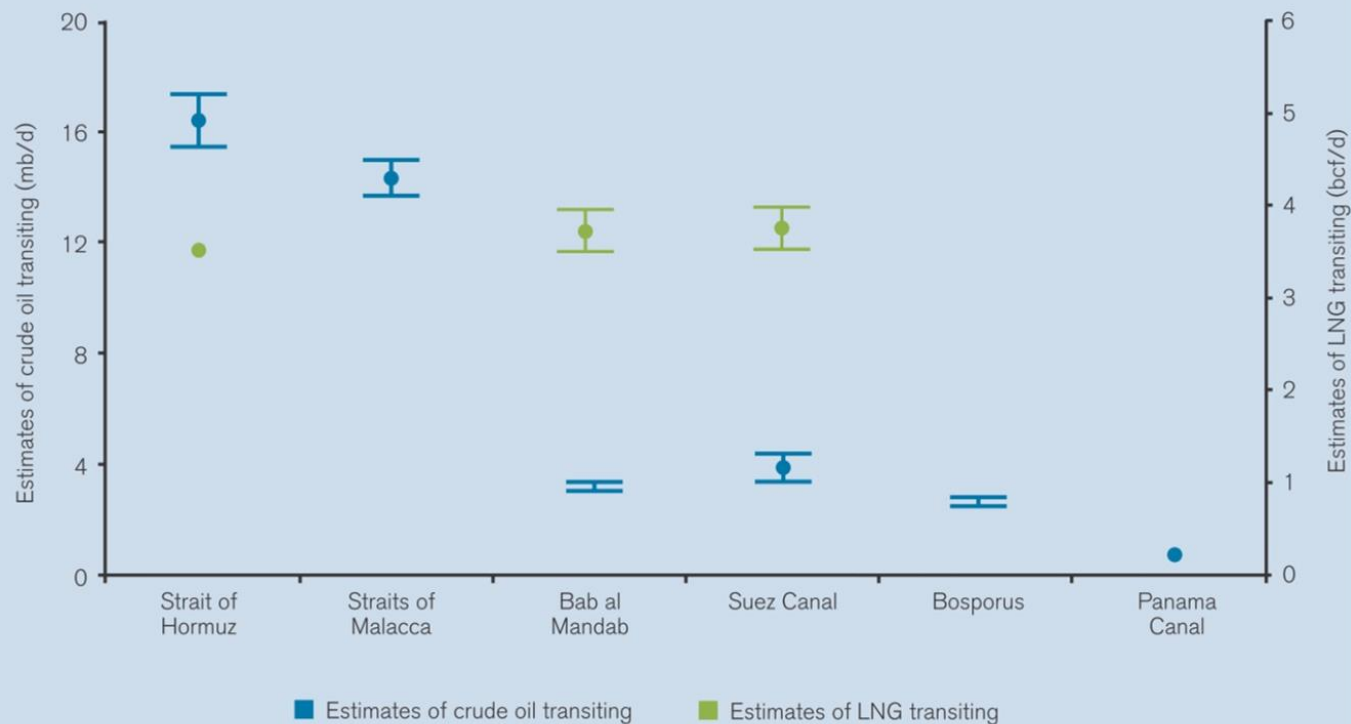


Figure 4.13: Estimated volumes of oil and gas through key choke points, 2010

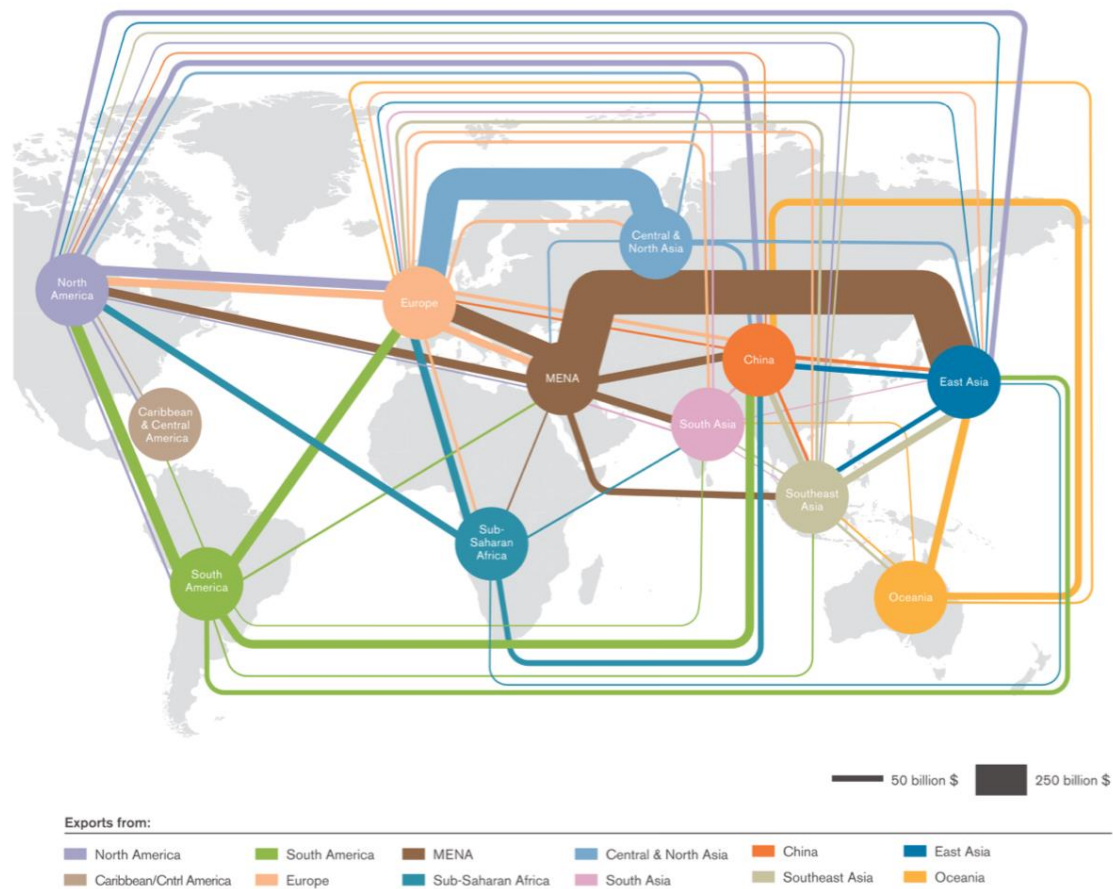


Source: Stevens and Emmerson (2011).

# Tanker damaged in attack off the straits of Hormuz

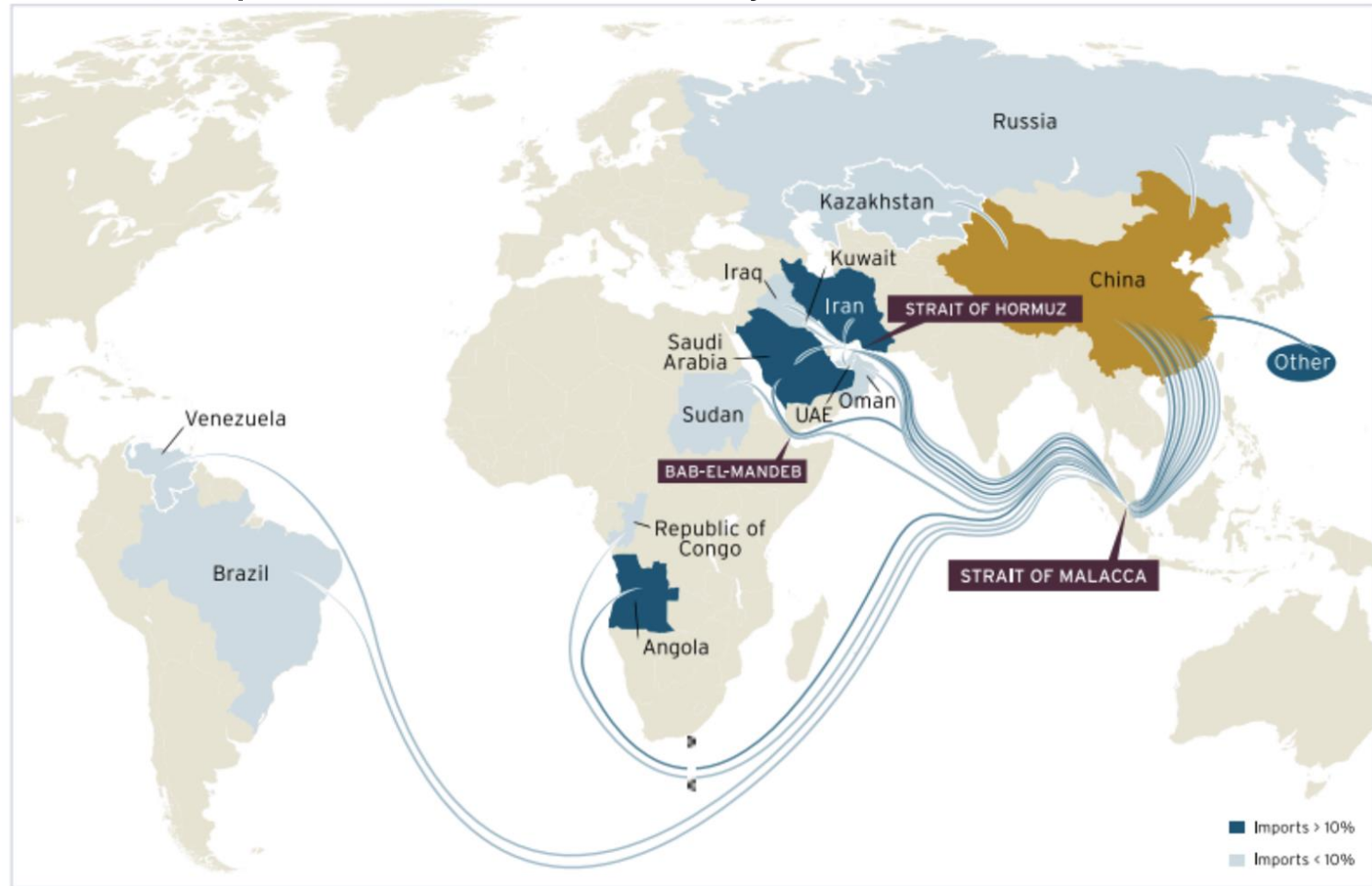


Figure 1.2: Resource trade between regions, by value, 2010



Sources: Chatham House Resource Trade Database, BACI, COMTRADE. Resource trade flows between regions worth more than 10 bn \$ in 2010.

# China imports: Trade vulnerability and the Malacca dilemma





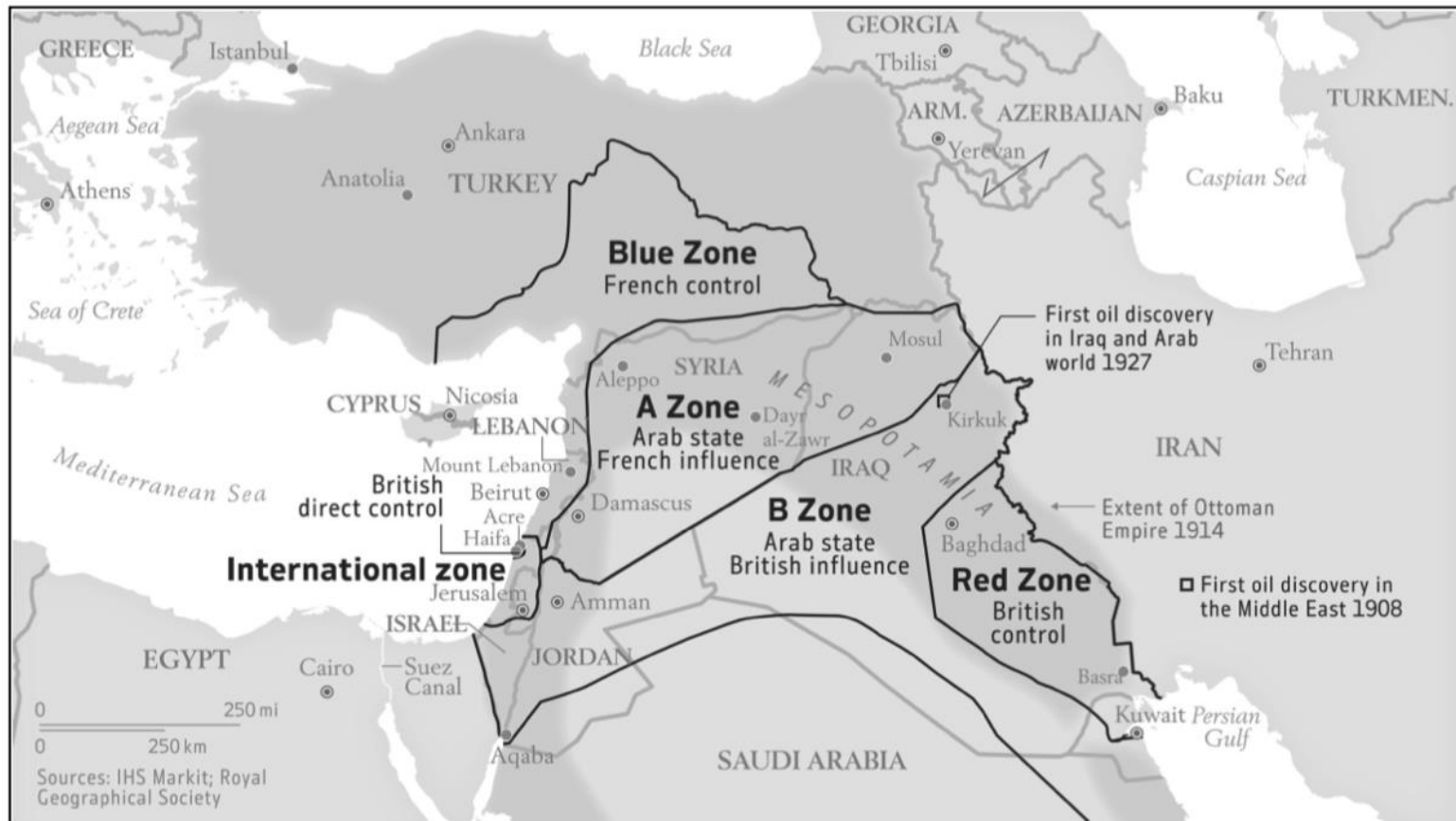


## China's Belt and Road Initiative

*Launched in 2013, the "BRI" aims to promote "connectivity" and reorder the global economy.*



Piraeus port as part of the maritime Silk Road



## Sykes-Picot Agreement 1916

*The British and French drafted this interim map during World War I for the Middle East after the end of the Ottoman Turkish Empire.*





An ISIS jihadist in a 2014 propaganda video declares, “We’ve broken Sykes-Picot,” as a bulldozer erases the border between Iraq and Syria. The U.S. defense secretary said ISIS’s lightning offensive across Iraq was “beyond anything we’ve seen.”



## Persian Gulf

*The oil heartland of the Middle East produces about 60 percent of the oil that is sold in international markets.*





# BLOOD and OIL

THE MIDDLE EAST  
IN WORLD WAR I

*A Film by Marty Callaghan*





Coalition forces enter Kuwait in March 1991. Asharq Al-Awsat



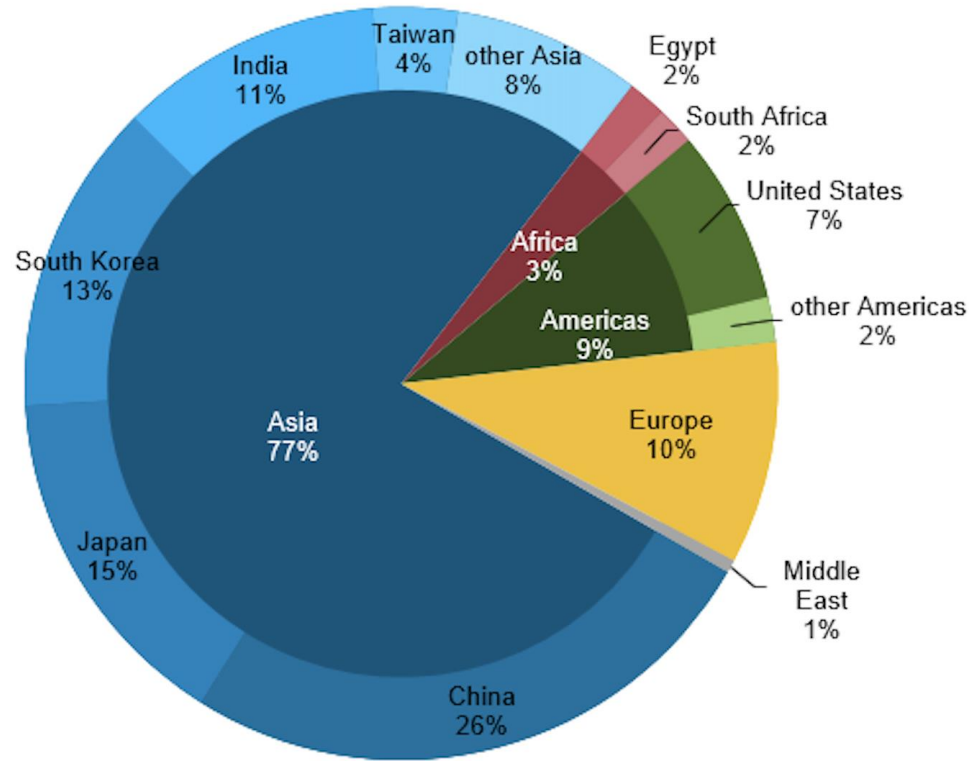


Houthi militants in Yemen cheer the launch of a ballistic missile aimed at Saudi Arabia. The Yemen civil war led to a huge humanitarian crisis.

# Aramco oil refineries damaged

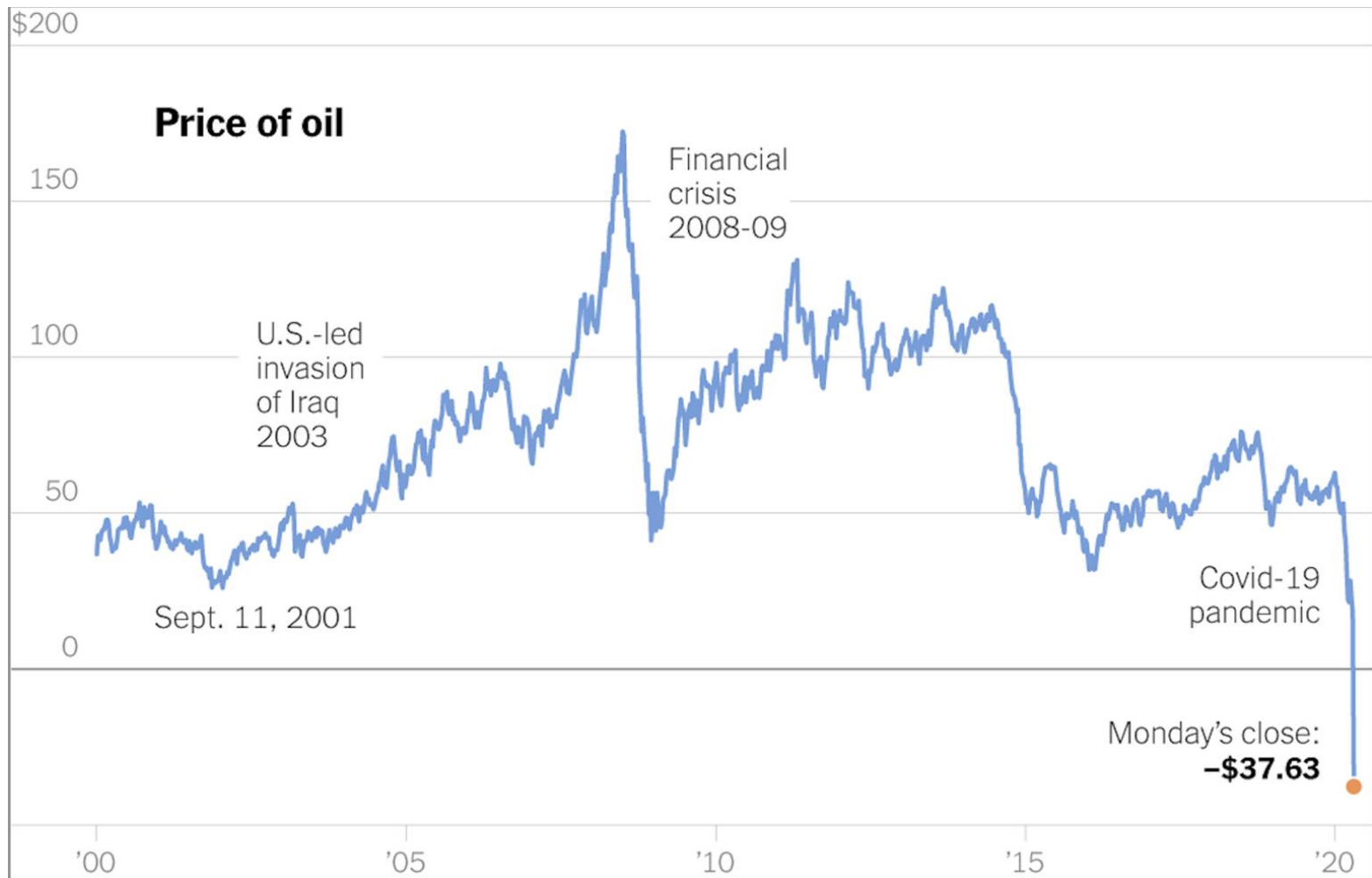




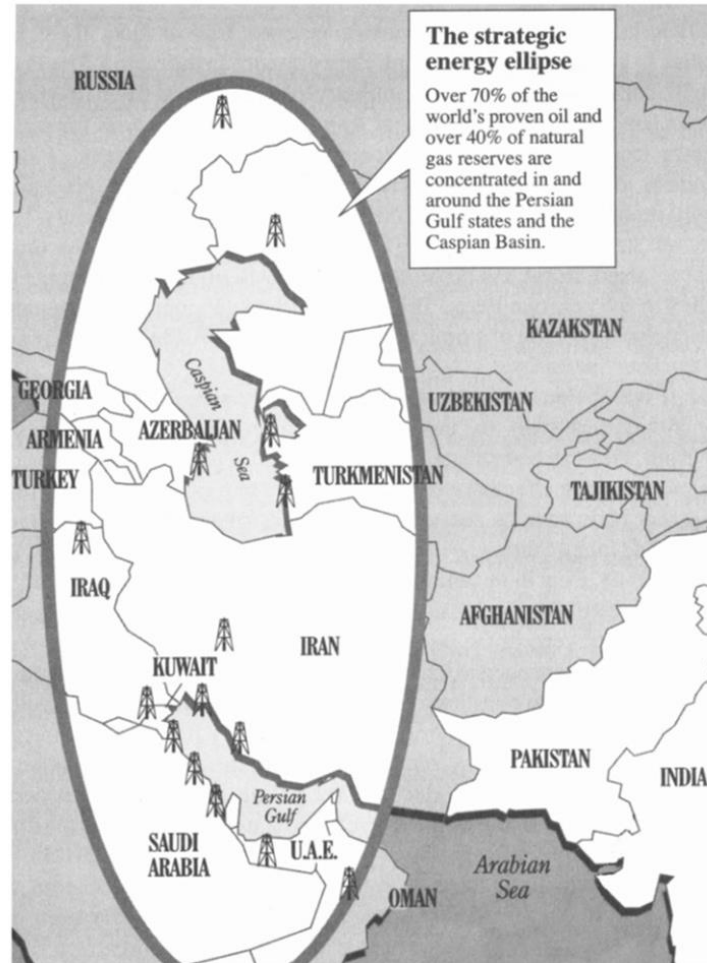


Source: Graph by the U.S. Energy Information Administration, based on data from Global Trade Tracker  
eia Note: Totals may not add up because of independent rounding.

## Saudi Arabia's crude oil exports by destination, 2020

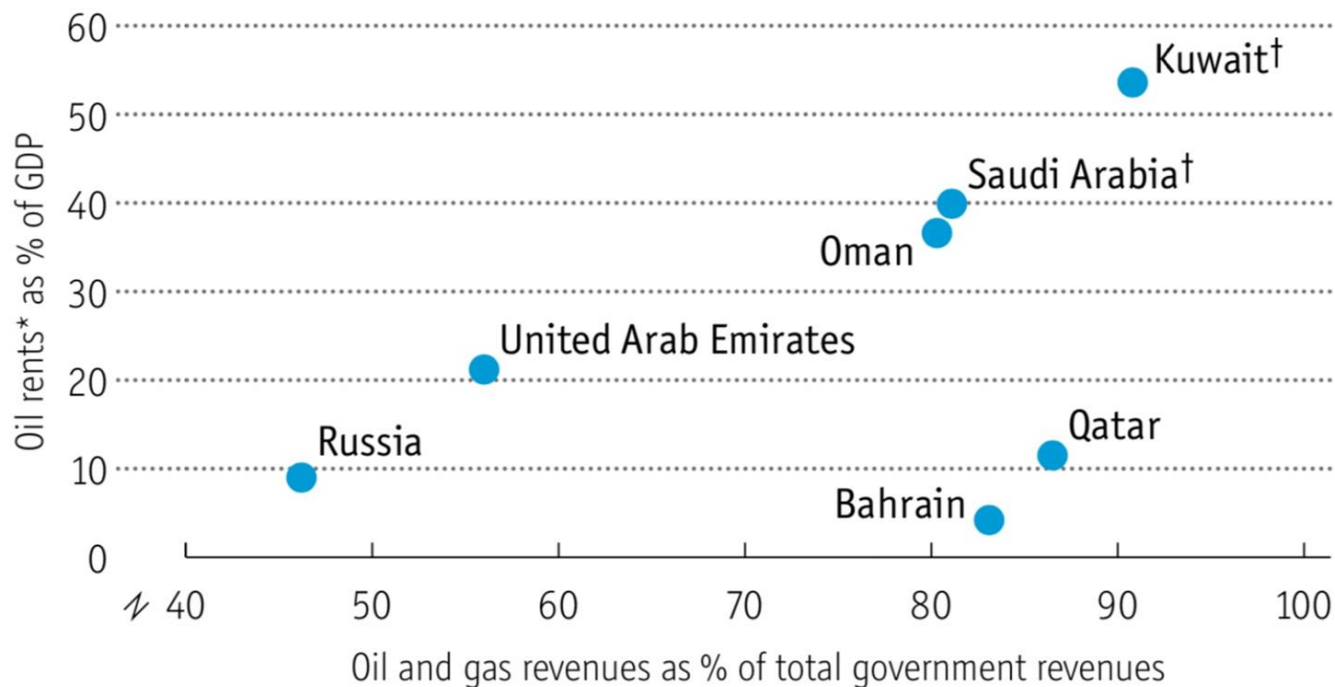


**Figure 1: The Strategic Energy Ellipse**



## Hooked on the black stuff

2012-16 averages



Sources: Haver Analytics; World Bank

\*Sale price minus production cost

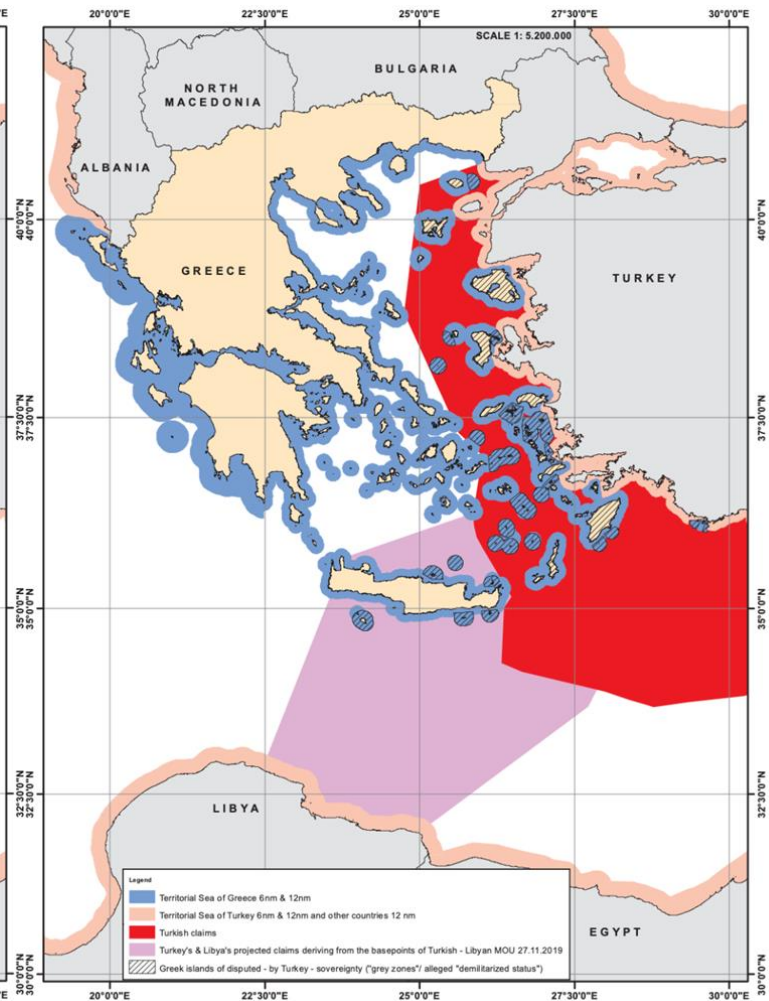
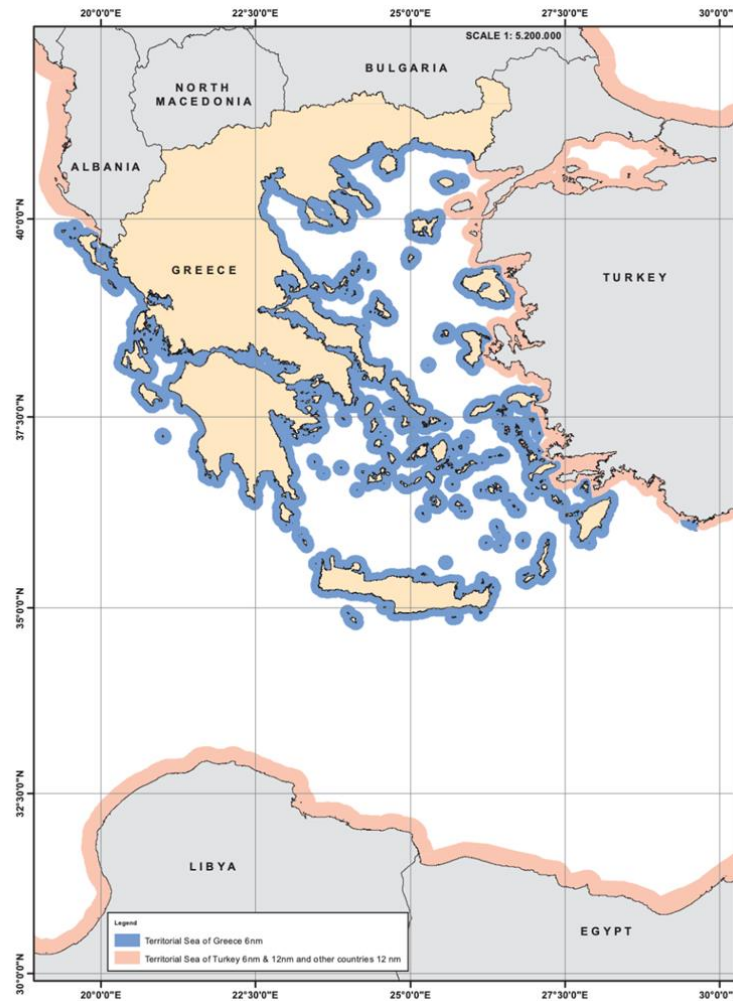
†Oil revenues only



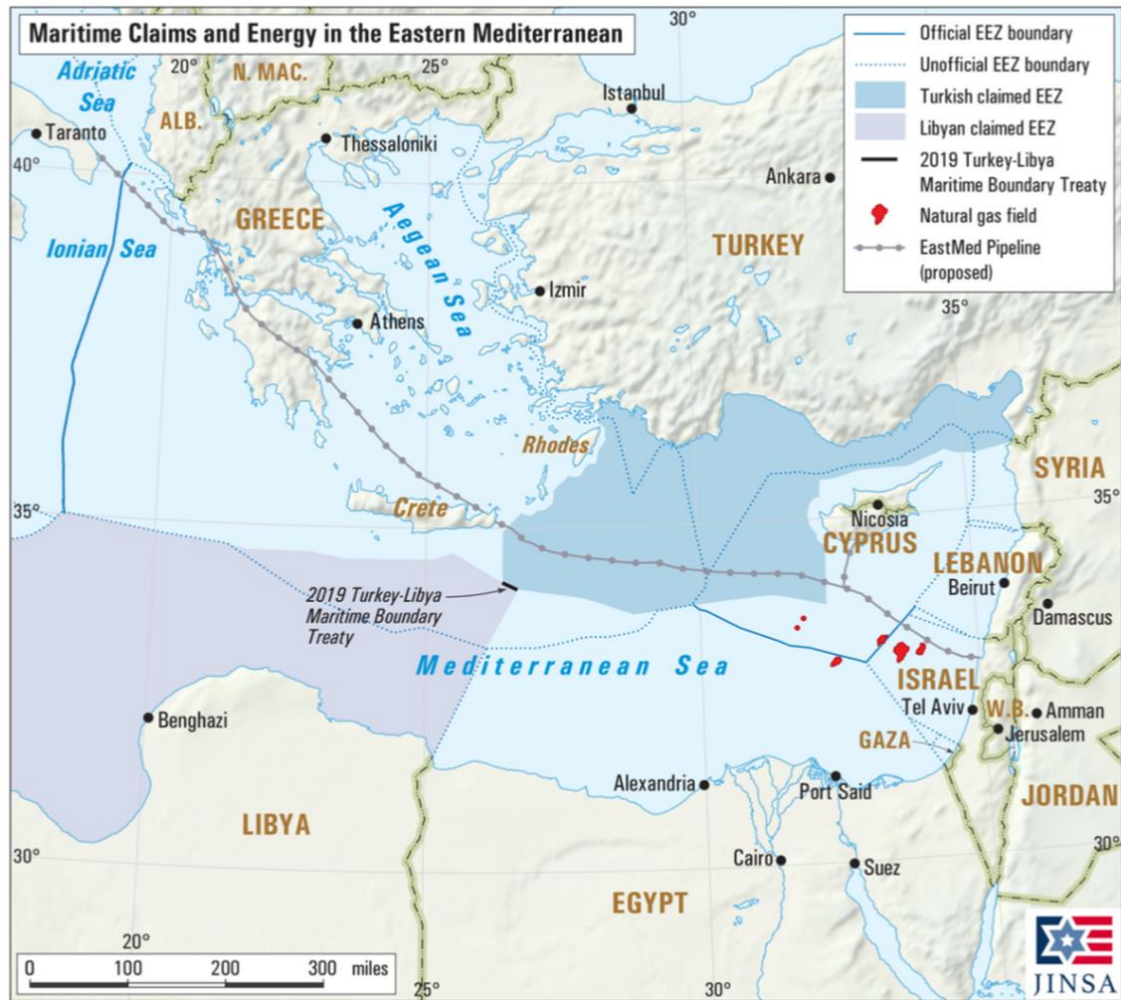
Israel's giant Leviathan natural gas field, started up at the end of 2019, marked the rise of the “*Eastern Med*” as a new energy province and possible exporter to Europe







Comparative mapping of Turkish claims/visions 1972-2022



# Offshore is the new frontier for wind power







Solar costs have fallen an extraordinary 85% over a decade,  
and deployment has grown enormously



## China supplied 70% of the world's solar cells



Workers are seen at a solar-panel maker in Hangzhou, Zhejiang province, on Aug. 26. Photo: IC



Thomas Edison's electric car failed to gain traction

# INSANE MODE

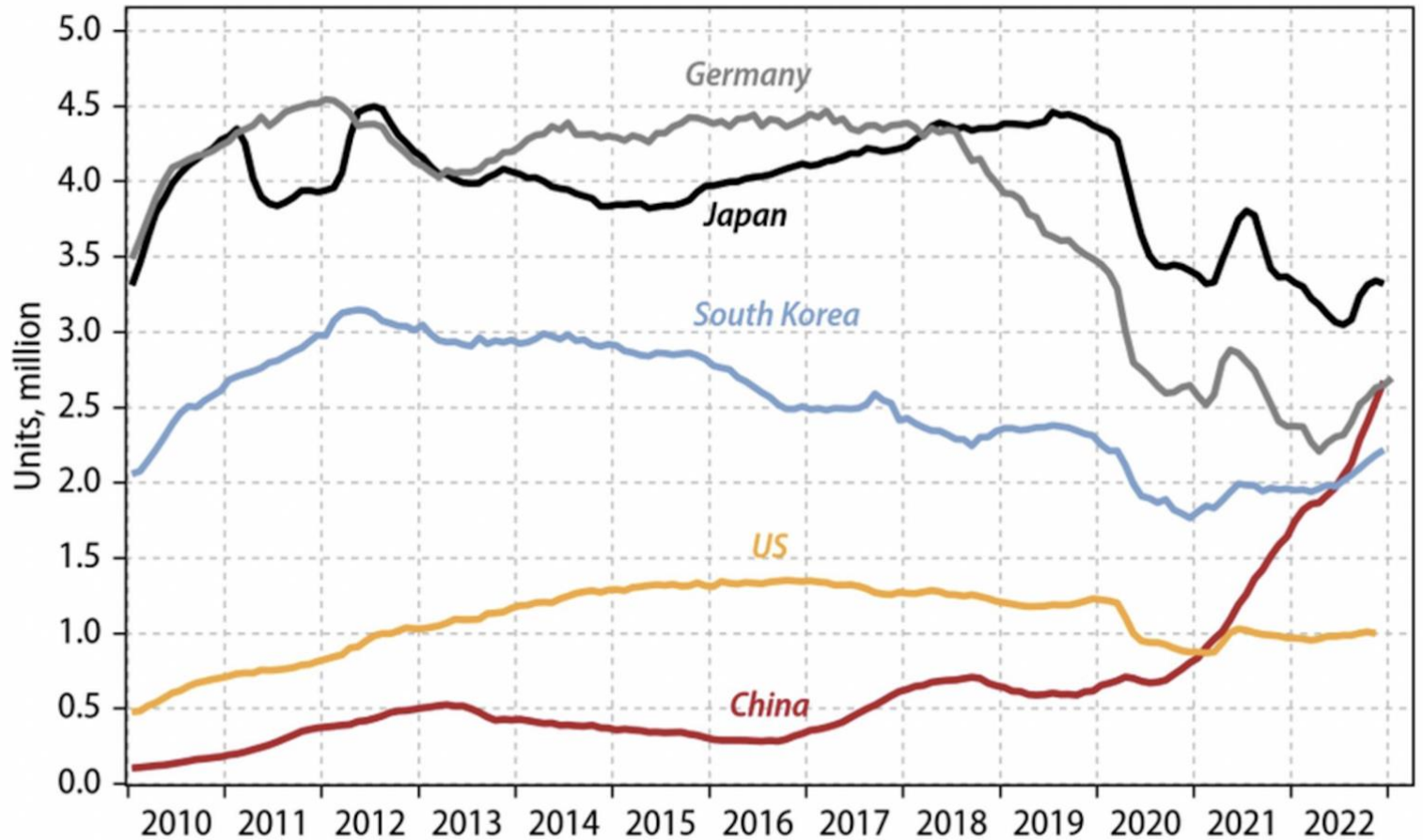
How Elon Musk's Tesla  
Sparked an Electric Revolution  
to End the Age of Oil



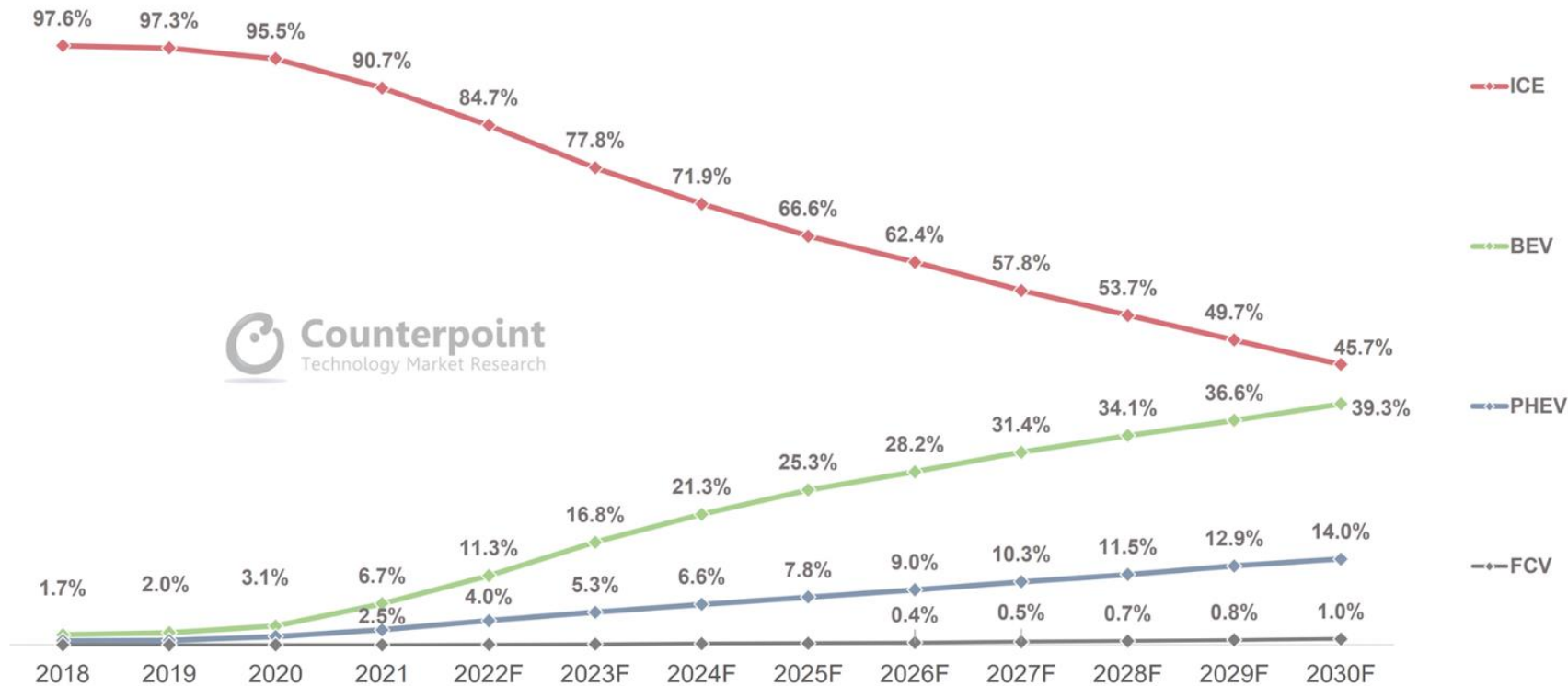
HAMISH MCKENZIE

The electric car  
revolution has  
geopolitical implications

## Exports of passenger cars; rolling 12m sum



# Global PV Sales Share Forecast by Powertrain



Source: Counterpoint Research Passenger Vehicle Forecast, April 2022





# Electric Shock

*Interpreting China's Electric Vehicle Export Boom*

CSIS BRIEFS



# CHINA'S TAKOVER



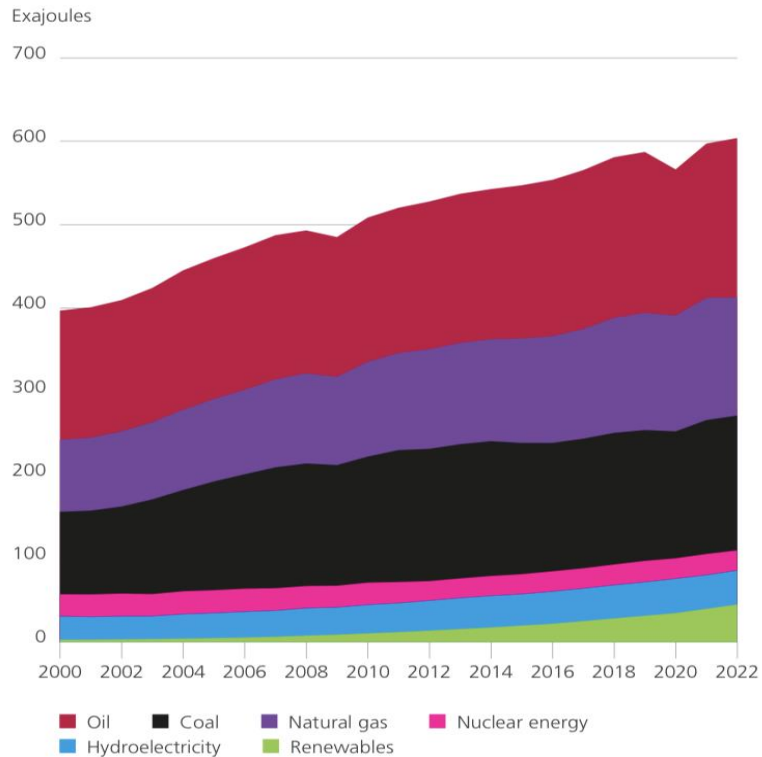




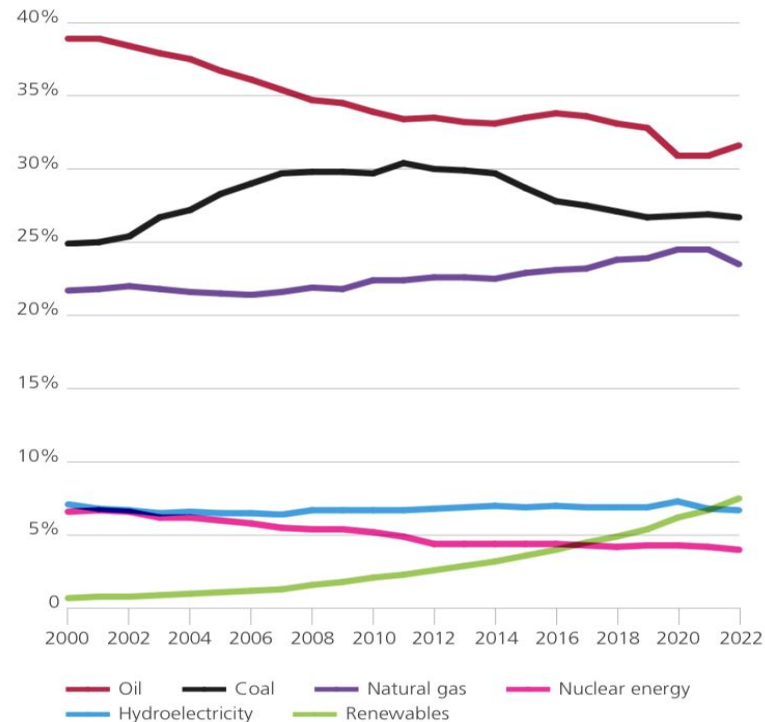
The birthplace of the Industrial Revolution: wood replaced with coal

# P Primary energy World consumption\*

World consumption



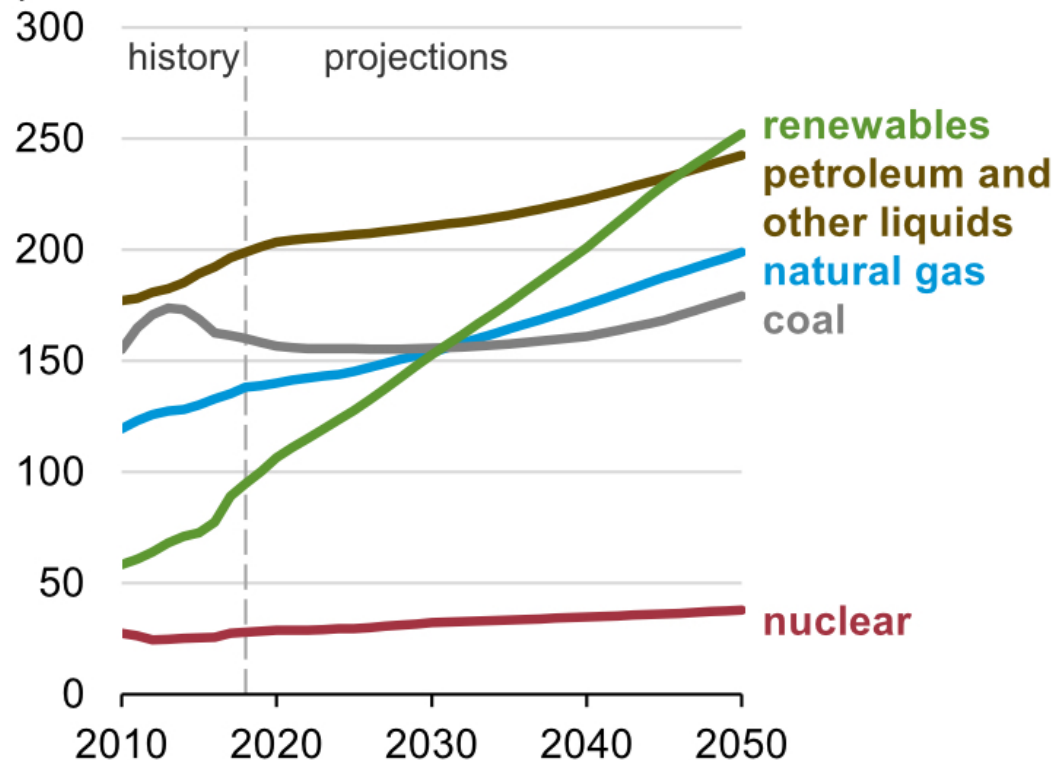
Share of global primary energy



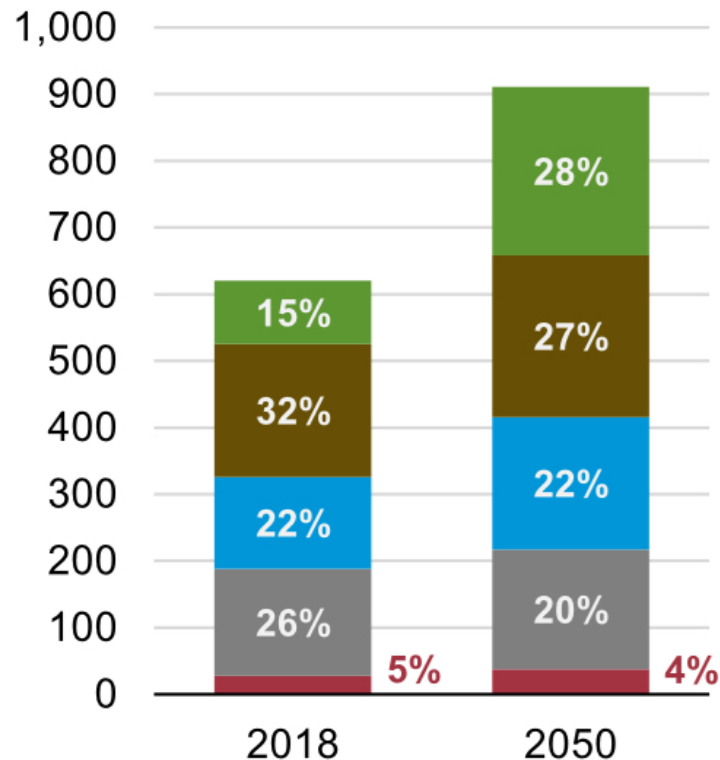


# Global primary energy consumption by energy source (2010-2050)

quadrillion British thermal units

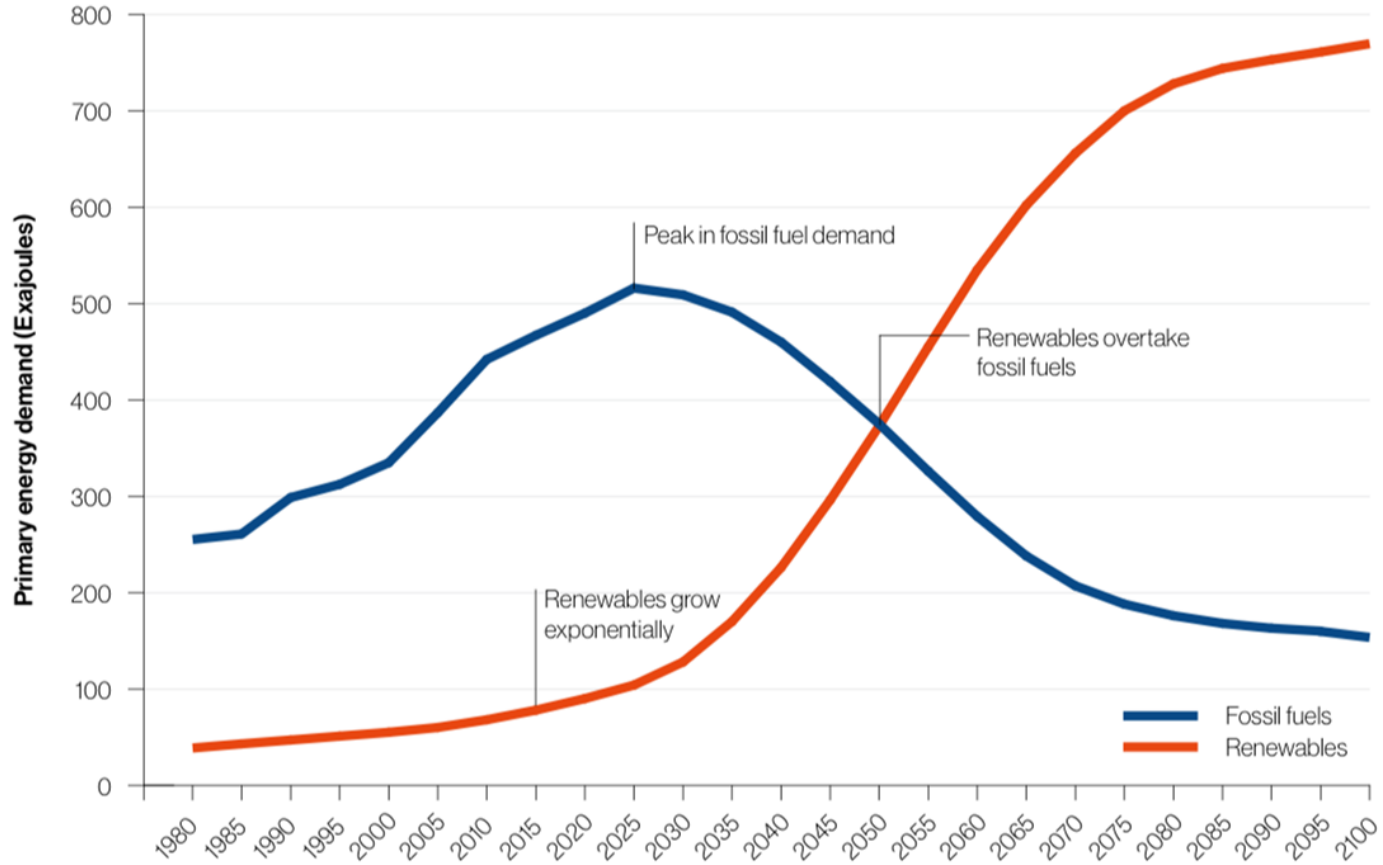


quadrillion British thermal units

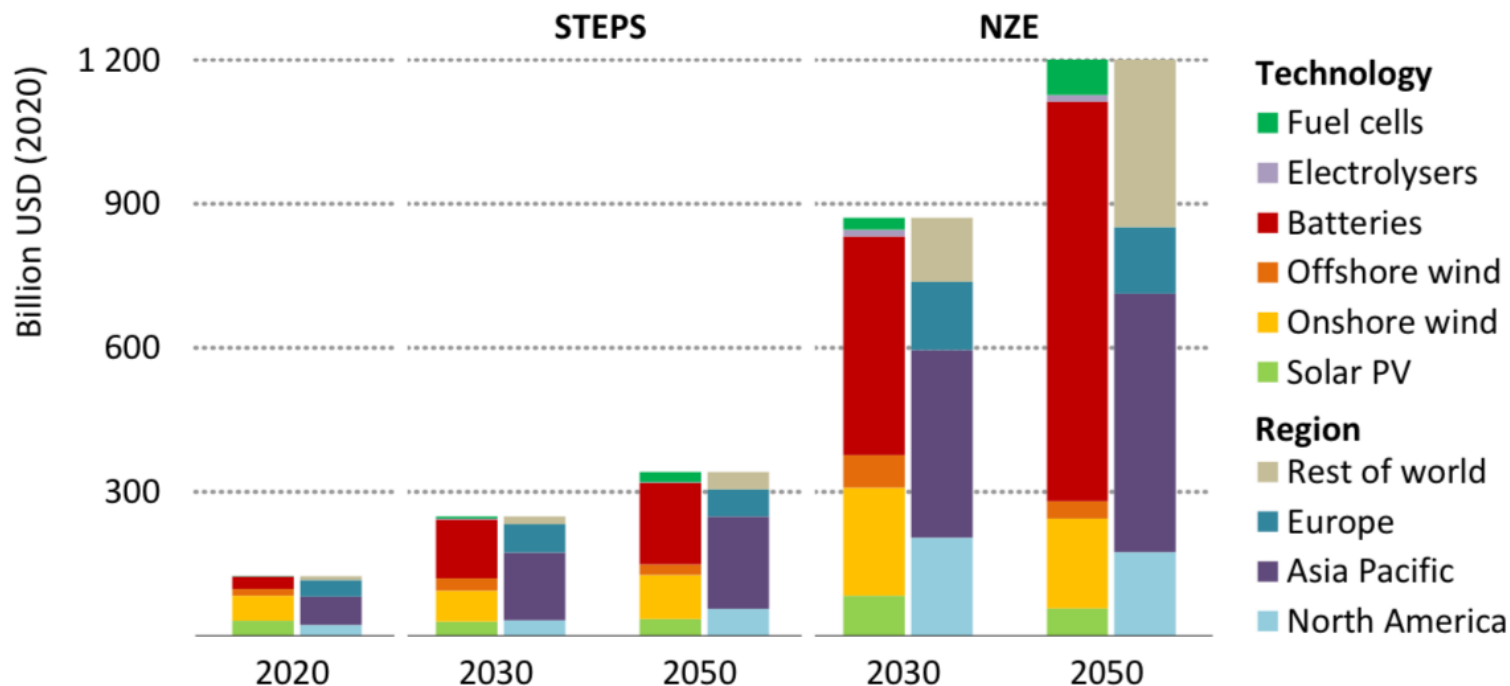


Source: U.S. Energy Information Administration, *International Energy Outlook 2019* Reference case

Figure 1. The energy transition framework



**Figure 1.3** ▶ Estimated market size for selected clean energy technologies by technology and region, 2020-2050



IEA. All rights reserved.

*There is explosive growth in clean energy technologies over the next decade in the NZE, leading to a clean energy market worth a cumulative USD 27 trillion by 2050*

# BATTERY MANUFACTURING CAPACITY BY COUNTRY

Global lithium-ion battery production capacity is [projected to increase eightfold by 2027](#).

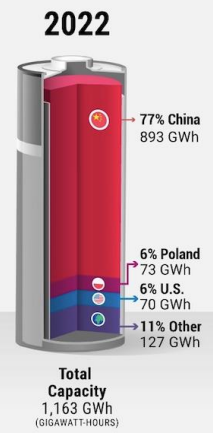
Here's a look at the top countries for battery manufacturing in 2022 and 2027, based on BloombergNEF's lithium-ion supply chain rankings.

Six of the top 10 battery manufacturing companies are headquartered in China.

U.S. battery production capacity is projected to grow over 10x by 2027.

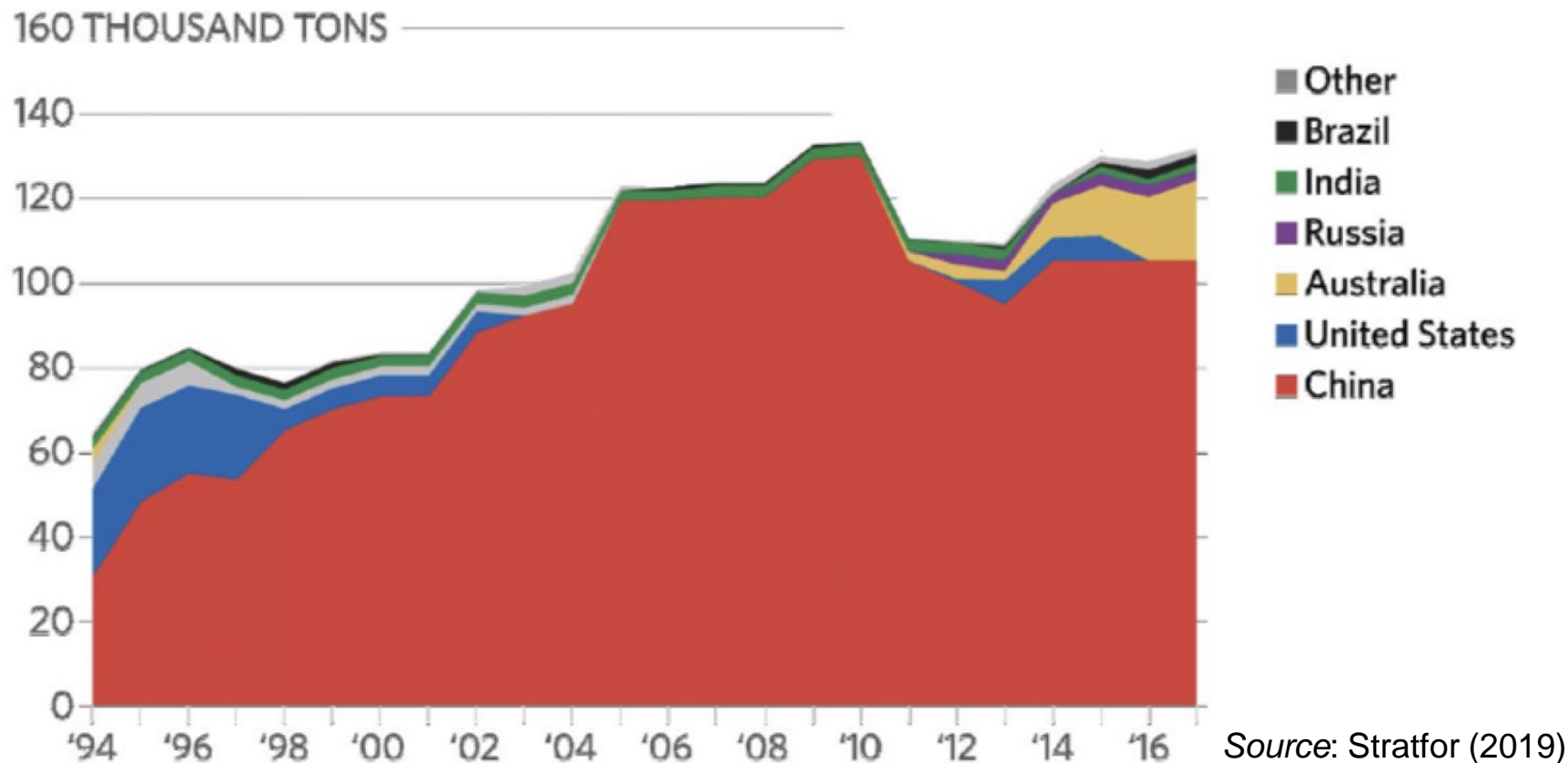
2027P

China's dominance is supported by its control over cathode, anode, and refined battery materials production.



Source: BloombergNEF





World production of rare earths by country



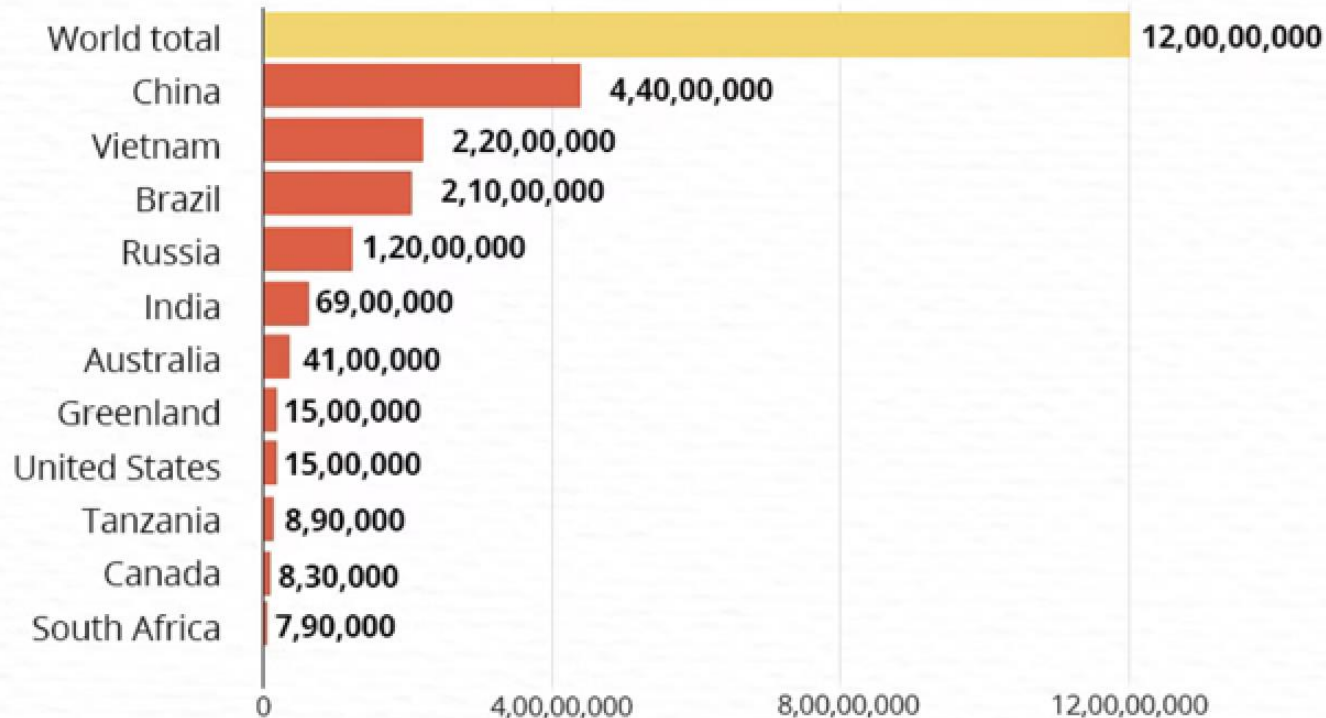
A mining truck drives down a winding canyon road in Xinjiang, China. As demand for rare earth elements increases rapidly, China aims to become the dominant producer and refiner of rare earth elements. (Photo: Getty images)





# WHERE ARE THE WORLD'S LARGEST RARE EARTH RESERVES

Reserves in metric tonnes of REO (rare earth oxides) as of 2020



Source: U.S Geological Survey





**Thank you for your attention!**