

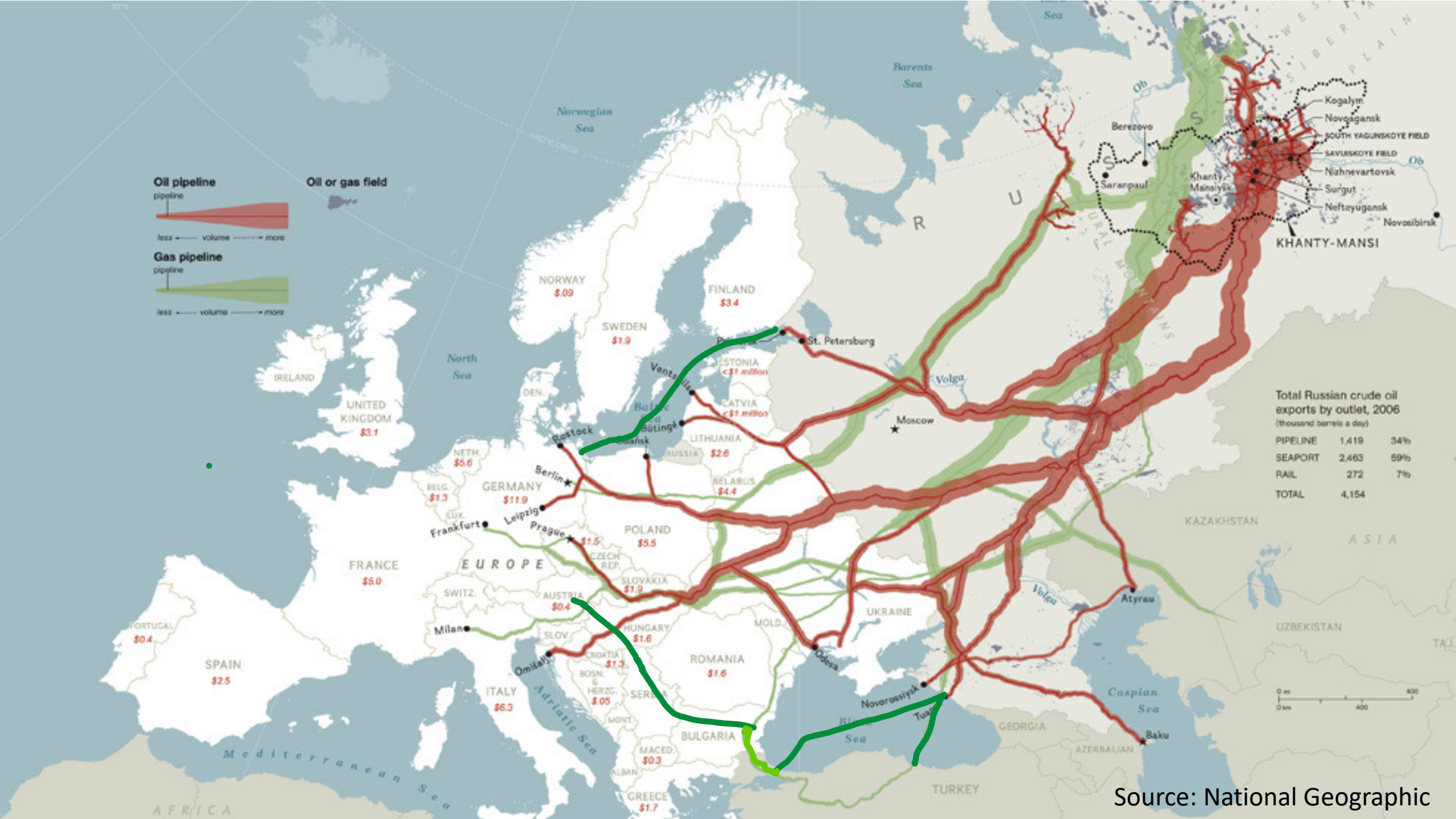
Naval Postgraduate School

Margarita Assenova

November 14, 2023

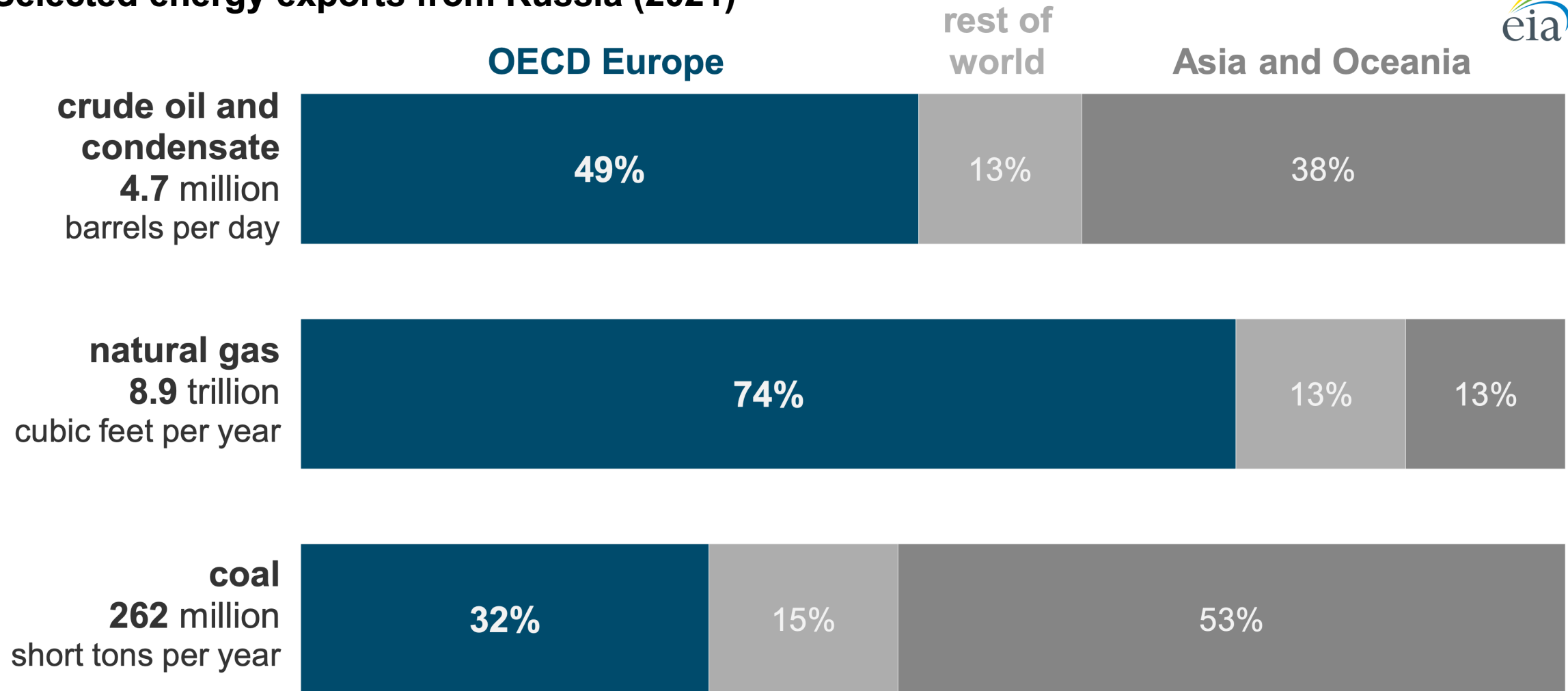
*Impact of  
Russia's War  
against Ukraine  
on Europe's  
Energy  
Landscape*





Source: National Geographic

## Selected energy exports from Russia (2021)



# Russian Oil and Gas Supplies to Europe

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Russia was the EU's top supplier of crude, accounting for 31% of total imports until the end of January 2022. **Now imports of Russian oil are down by 90 percent.**

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**The United States is now the biggest importer of crude oil to the European Union, supplying about one-fifth of its oil imports.**

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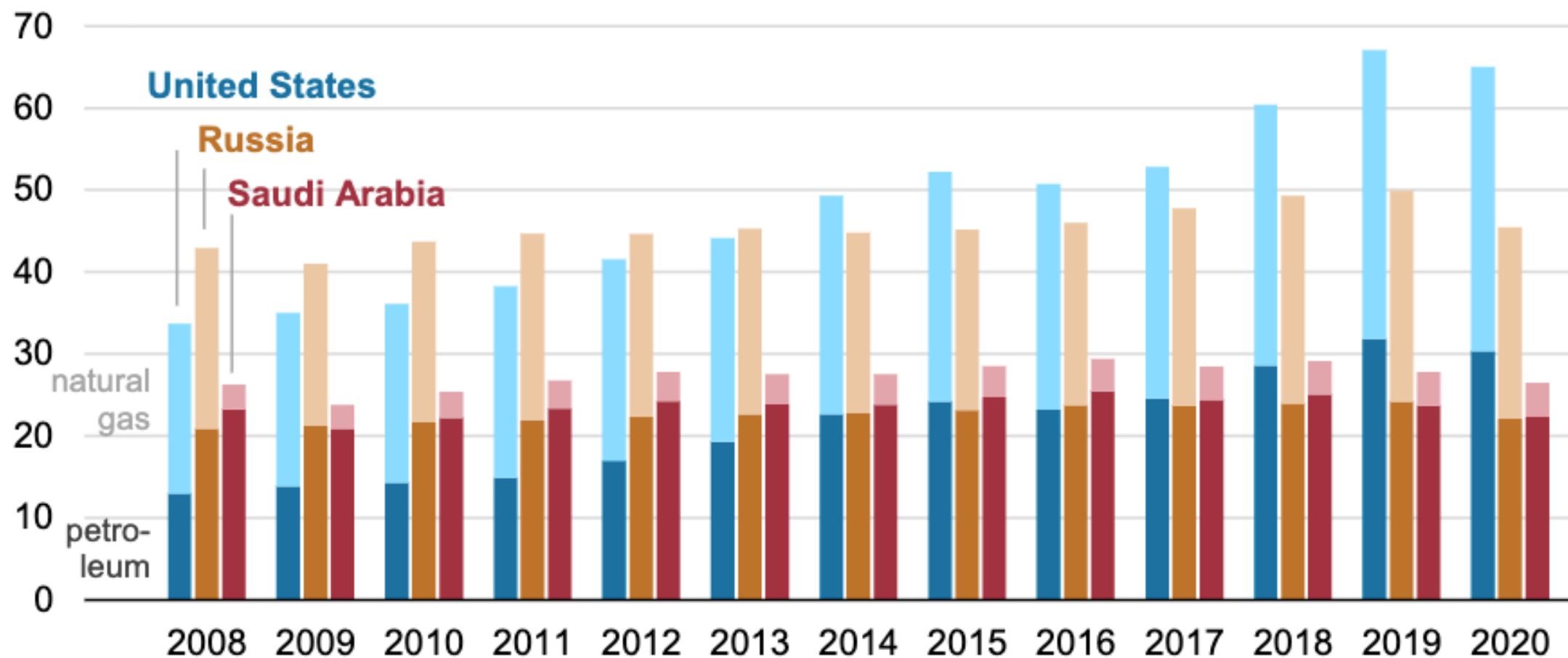
Russia supplied about **45 percent of total EU natural gas consumption** in 2019.

Now, Russian gas supply comprises about **10 percent of total EU consumption.**

The United States LNG deliveries **replace 40 percent of Russian gas deliveries since 2022.** The US remains EU's main LNG supplier in 2023.

## Estimated petroleum and natural gas production in selected countries (2008–2020)

quadrillion British thermal units



Source: U.S. Energy Information Administration, [International Energy Statistics](#)

Note: Petroleum includes crude oil, condensate, and natural gas plant liquids.



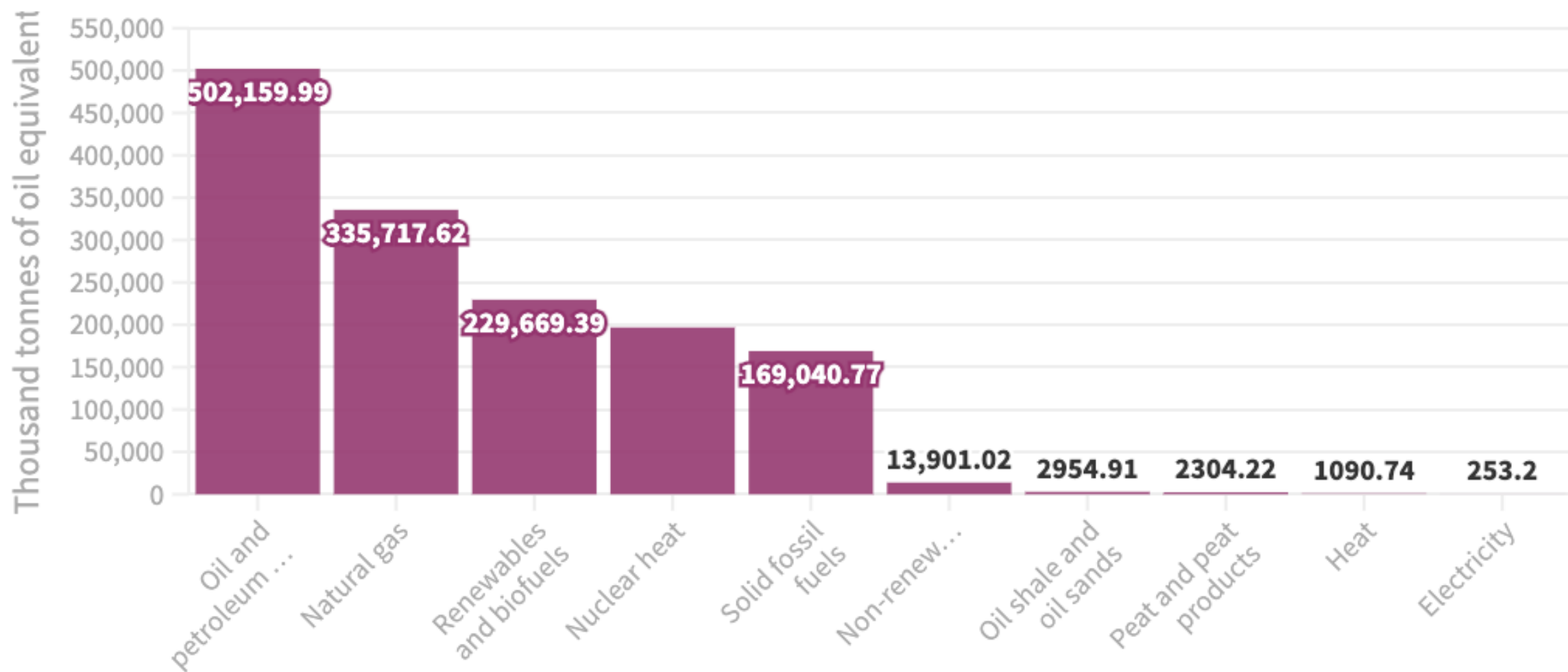
# European Energy Transition

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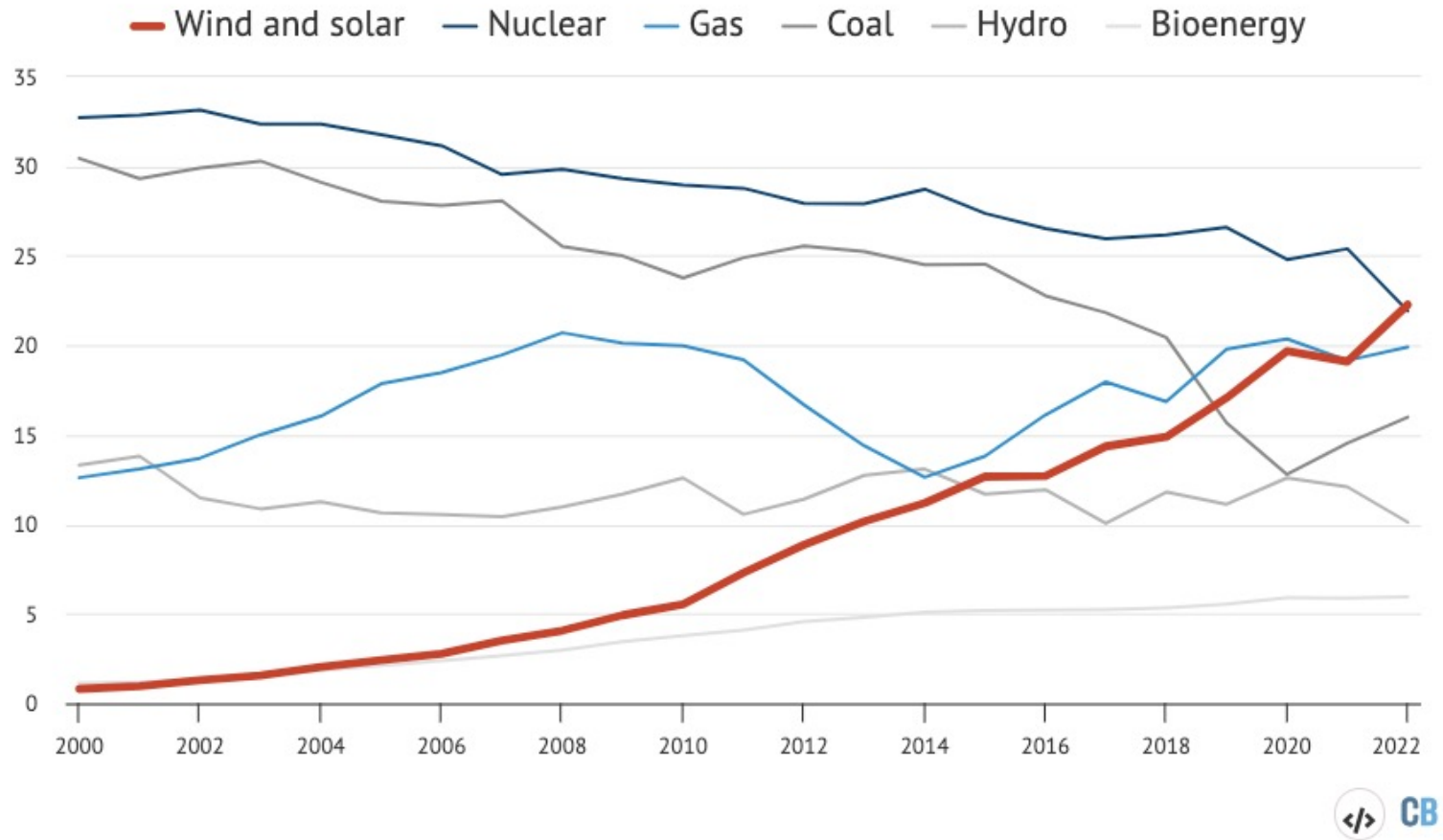
# How much energy do EU countries use?

Total energy demand for 27 member states in 2019



# Wind and solar were EU's top power source in 2022 for the first time ever

Share of electricity generation (%)



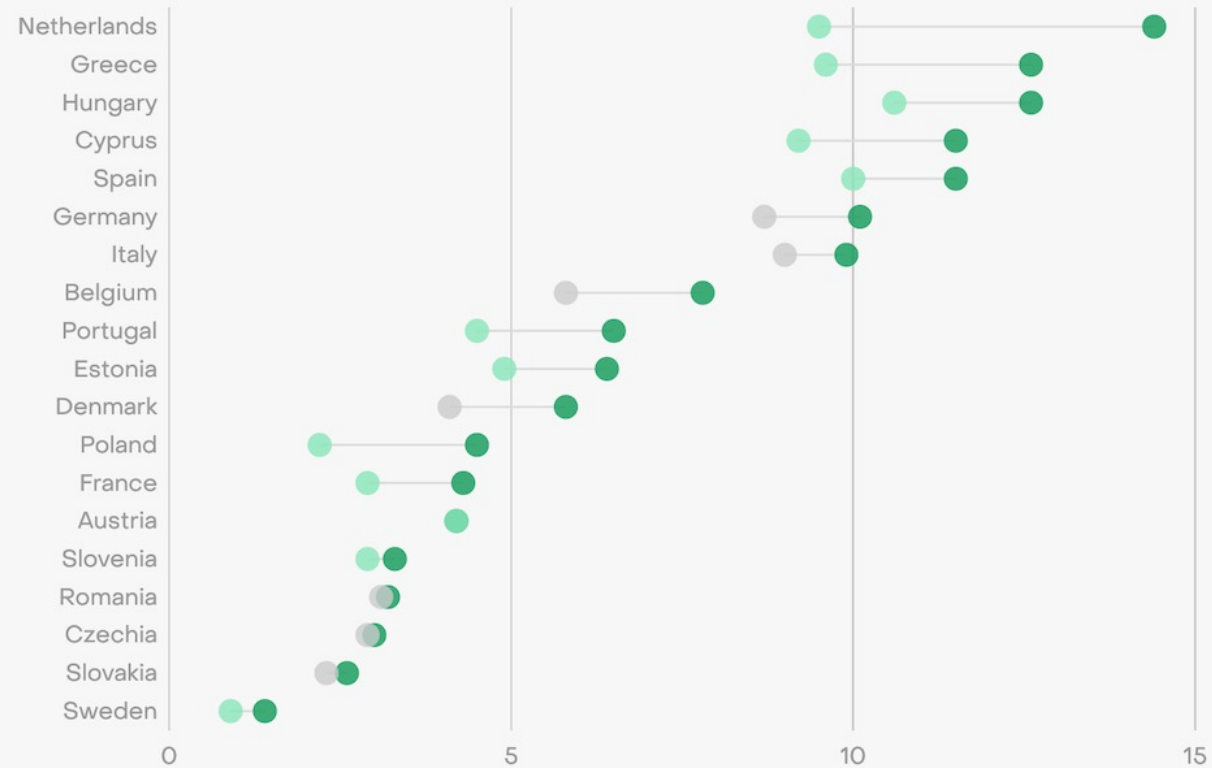
Shares of EU electricity generation by source, 2000-22, %. Source: [Ember](#). Chart by Carbon Brief using [Highcharts](#).



## 20 EU countries set solar records in 2022

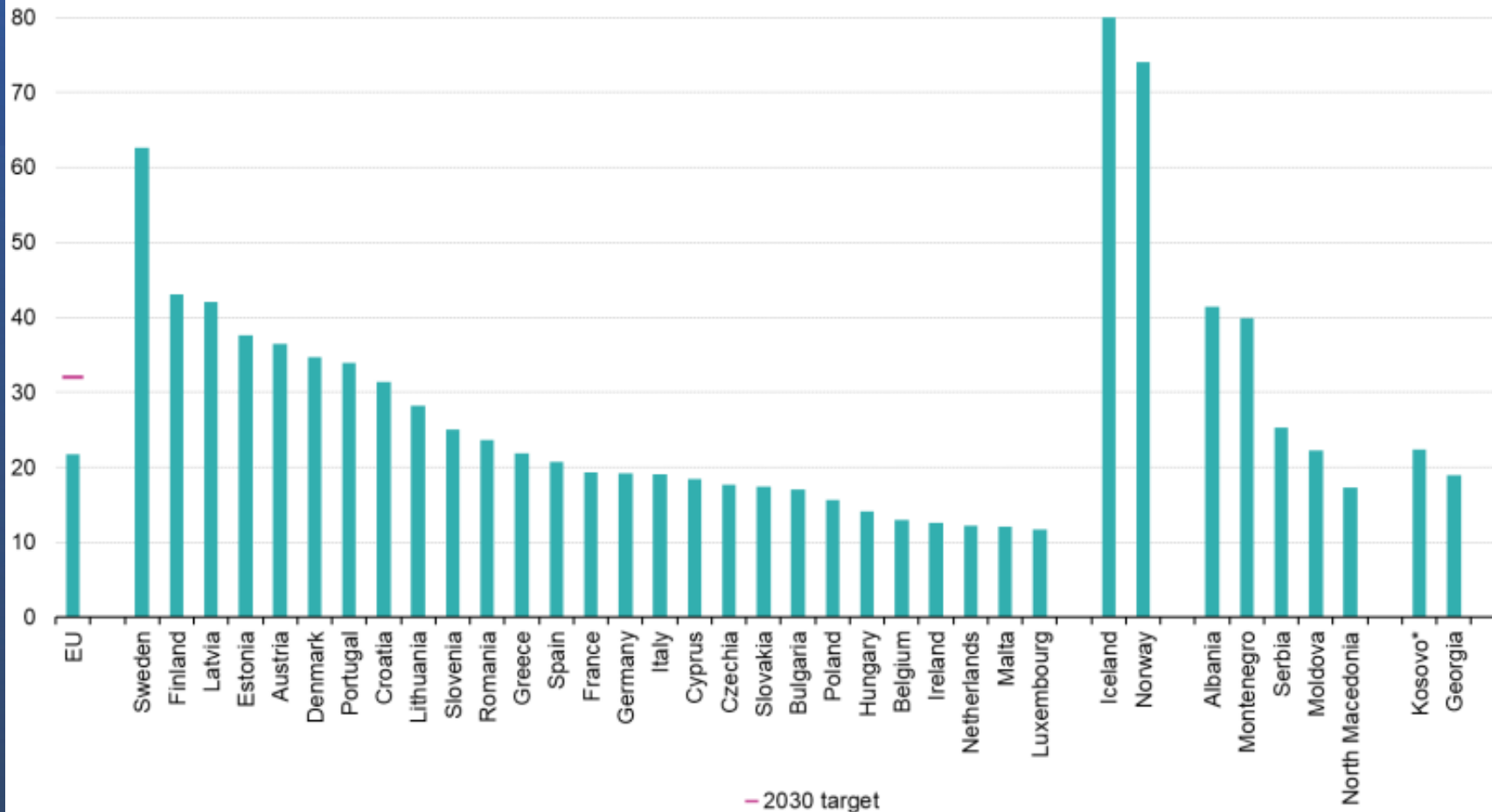
Share of electricity generation (%)

● 2022 ● Previous record (2021) ● Previous record (2020)



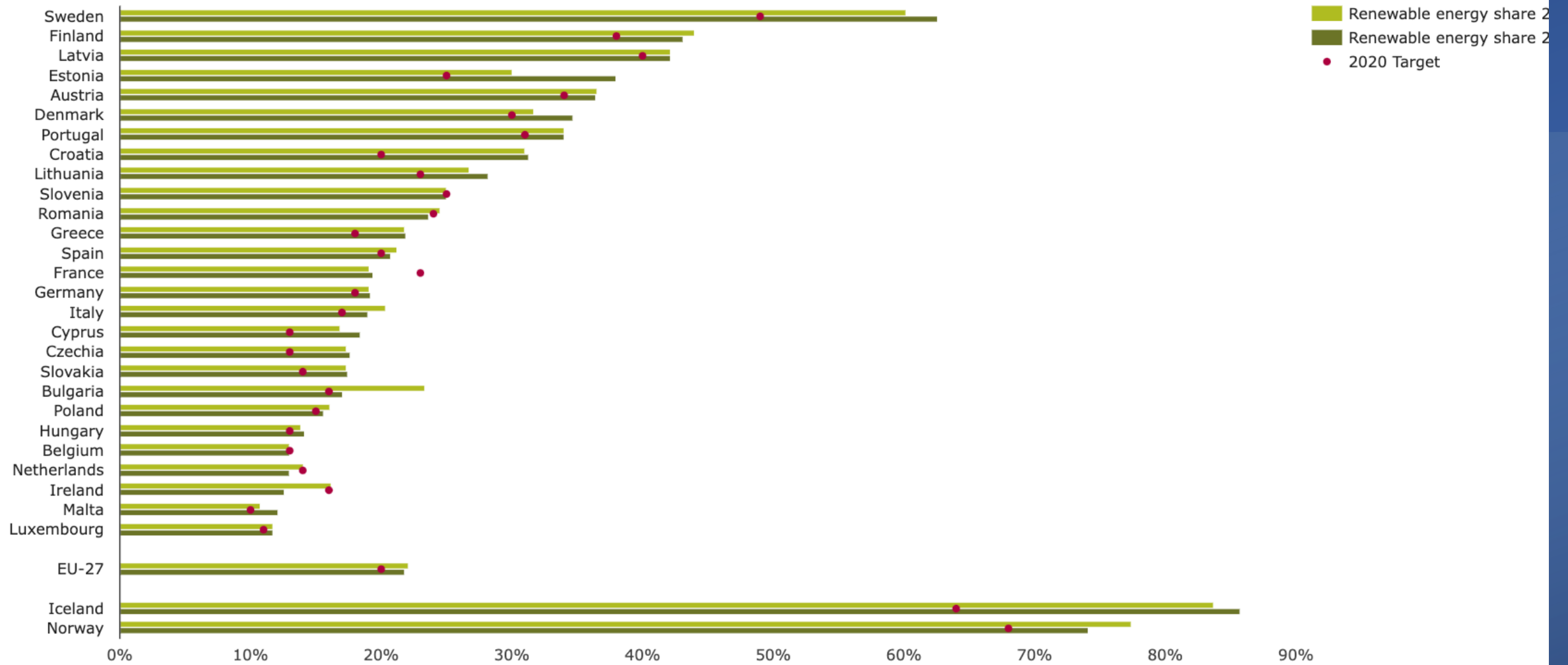
Source: Annual electricity data, Ember · Latvia, Lithuania and Luxembourg were excluded from the solar share in generation analysis due to electricity imports exceeding 30% of the demand

## Share of energy from renewable sources, 2021 (% of gross final energy consumption)



\* This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

Source: Eurostat (online data code: nrg\_ind\_ren)



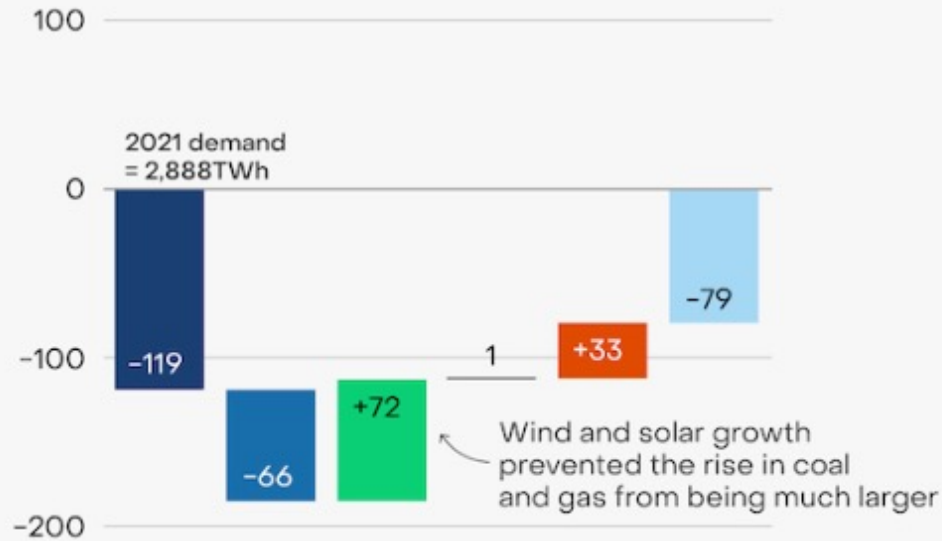
Share of energy from renewable sources

# A big fall in fossil generation is expected in 2023

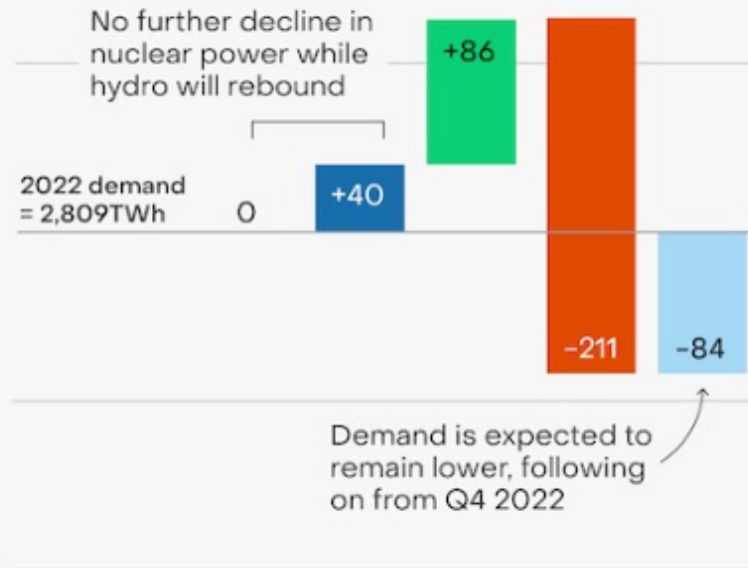
Year-on-year change in electricity generation, TWh

■ Nuclear ■ Hydro ■ Wind and solar ■ Other ■ Coal & gas ■ Demand

**2022**



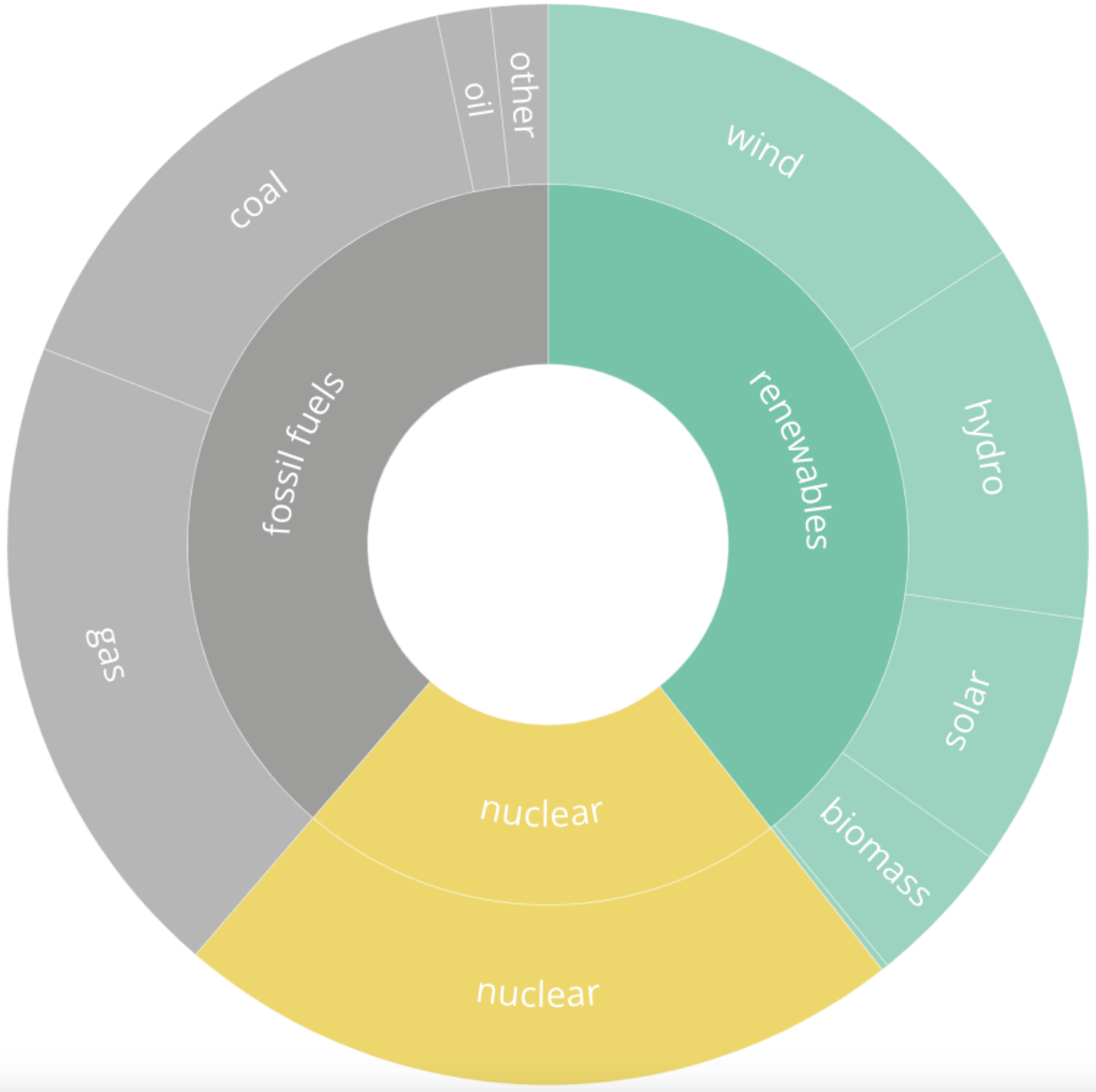
**2023 projection (Ember)**



Source: Annual electricity data, Ember; Ember calculations  
'Other' includes bioenergy, other renewables, other fossil fuels and net imports

**EMBER**

Change in EU electricity generation 2021-2022 and a projection for 2022-2023. Credit: [Ember](#)





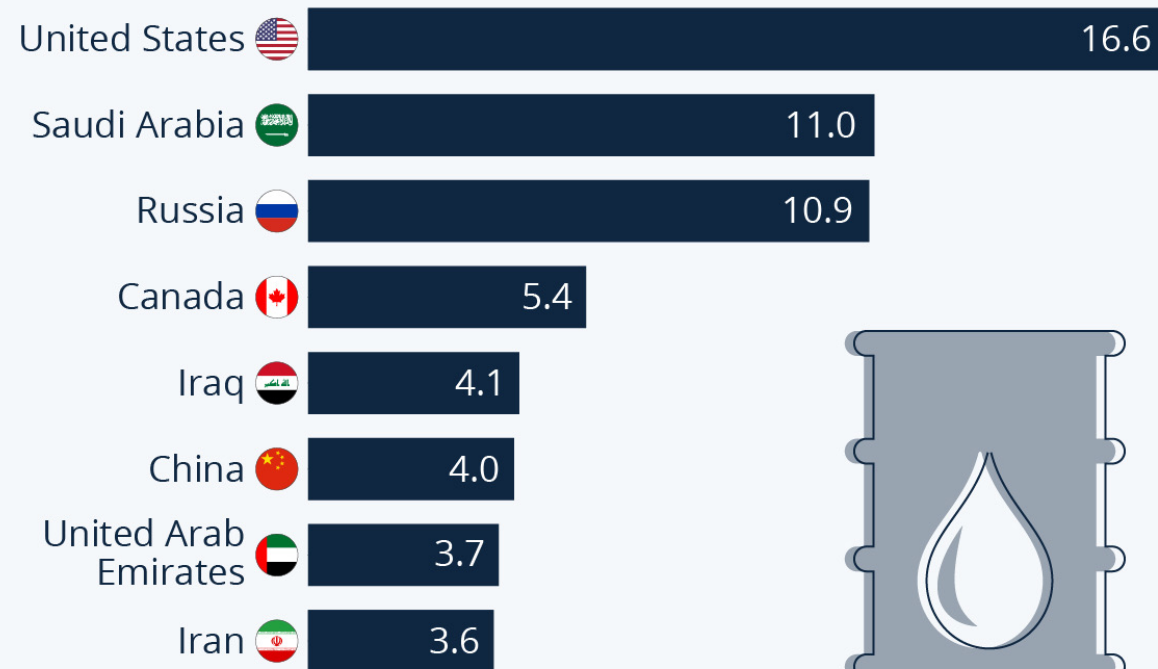
# Oil and Oil Products

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# The World's Biggest Oil Producers

Oil production by country in 2021 (in million barrels per day)

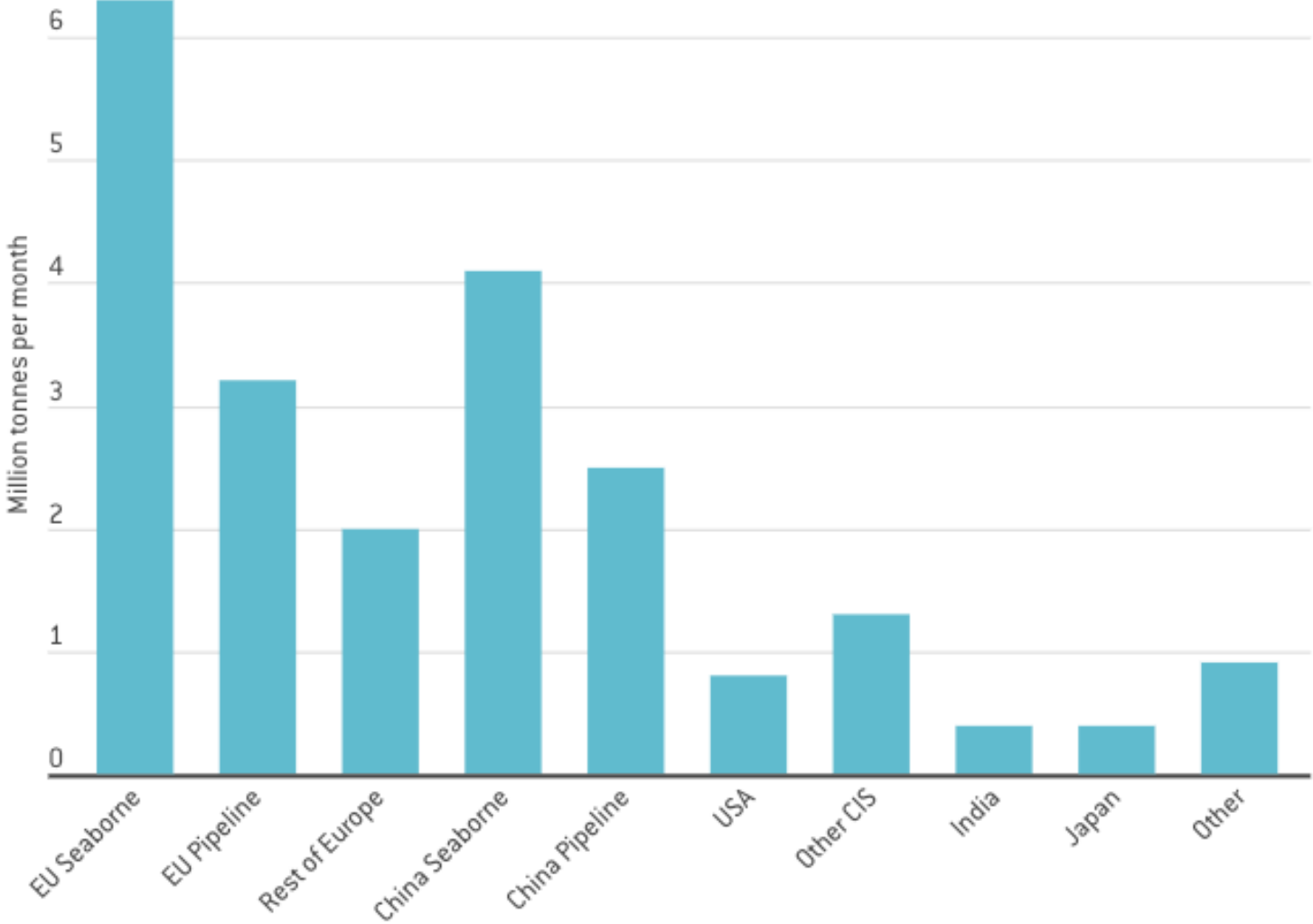


Includes crude oil, shale oil, oil sands, condensates and natural gas liquids.

Source: BP



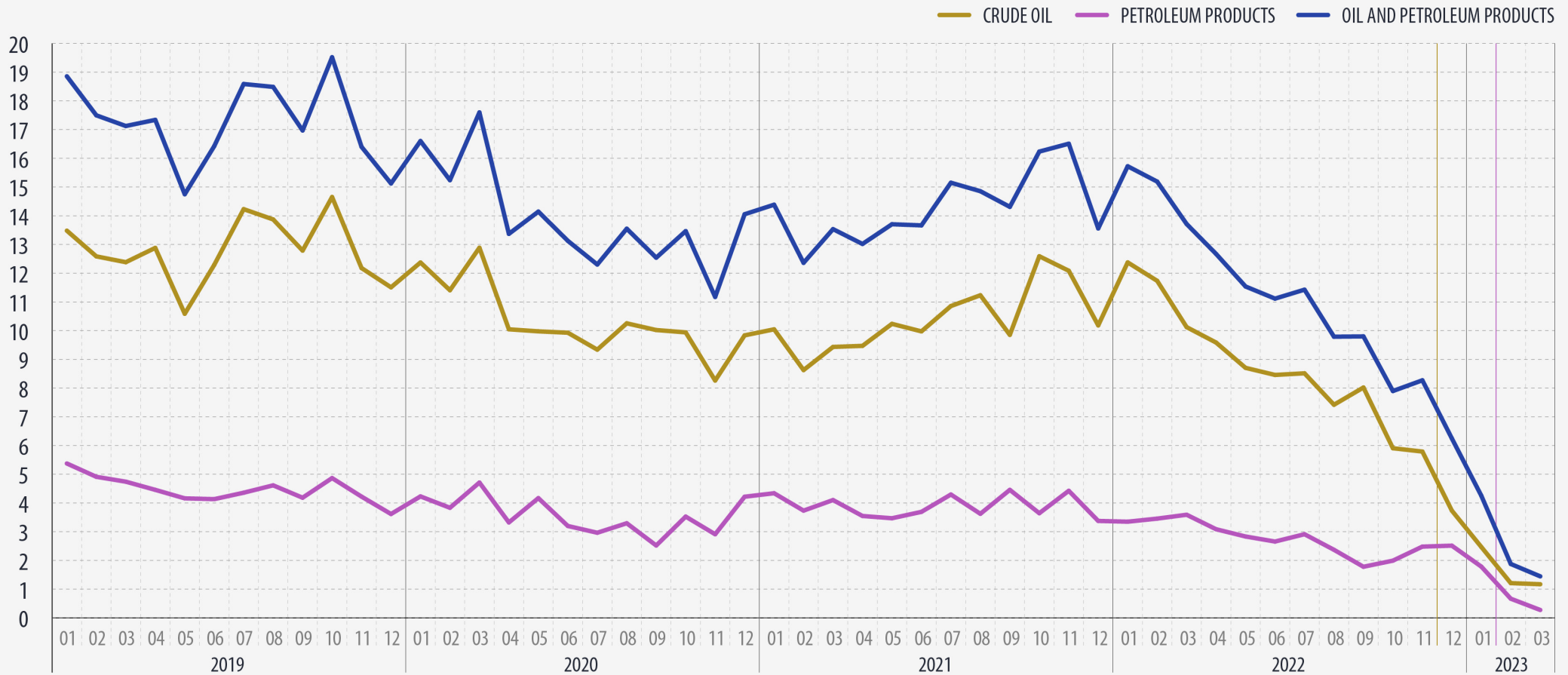
Figure 1: Average Monthly Russian Crude Oil Exports 2021





# EU imports of crude oil, petroleum products, and oil and petroleum products from Russia

(in million tonnes)

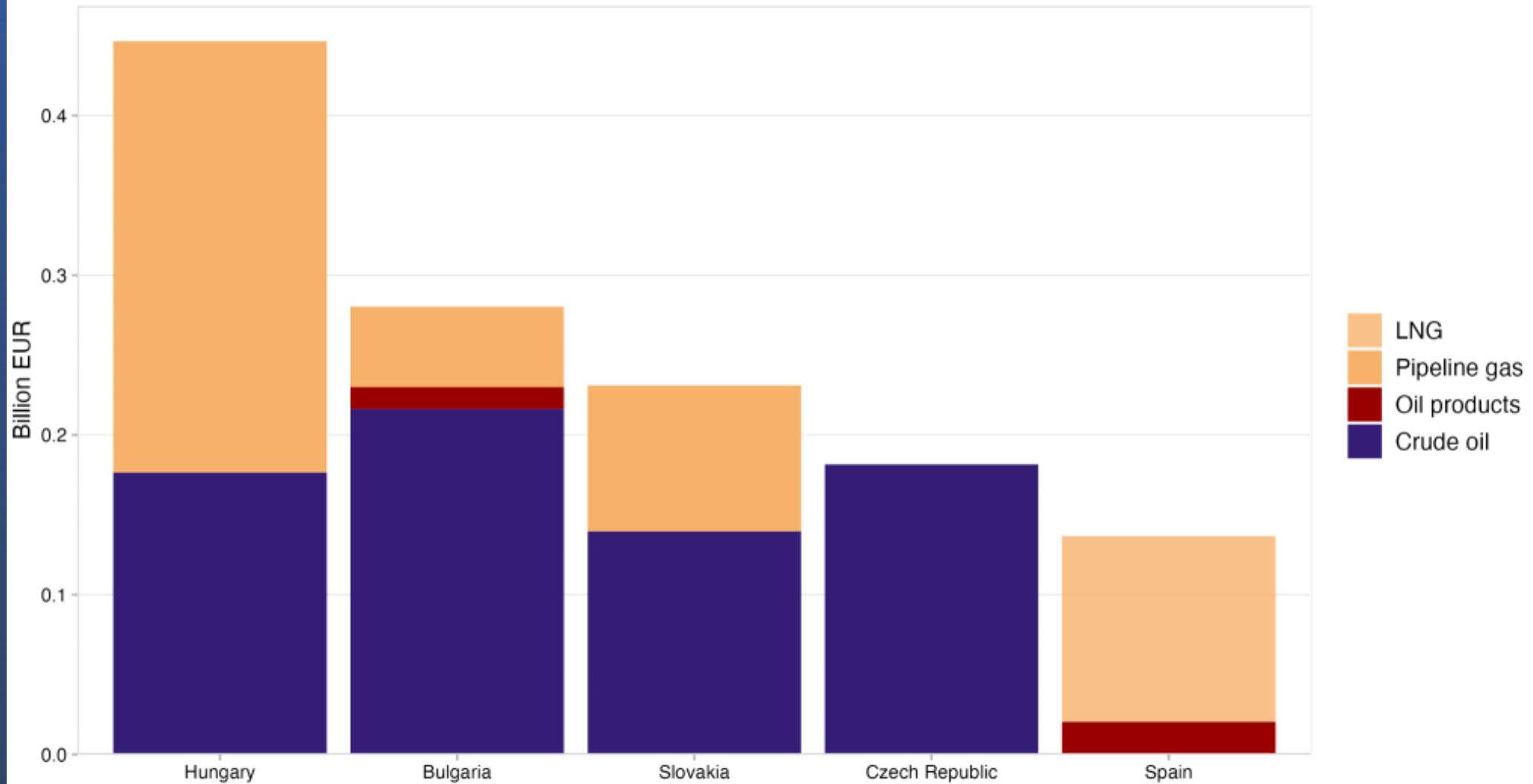


Crude oil: includes natural gas liquids (NGL), refinery feedstocks, additives and oxygenates, and other hydrocarbons. This definition applies only to the data presented, not necessarily to the embargo on crude oil.

December: EU embargo on crude oil  
February: EU embargo on petroleum products

# Who's buying Russia's fossil fuels in July 2023

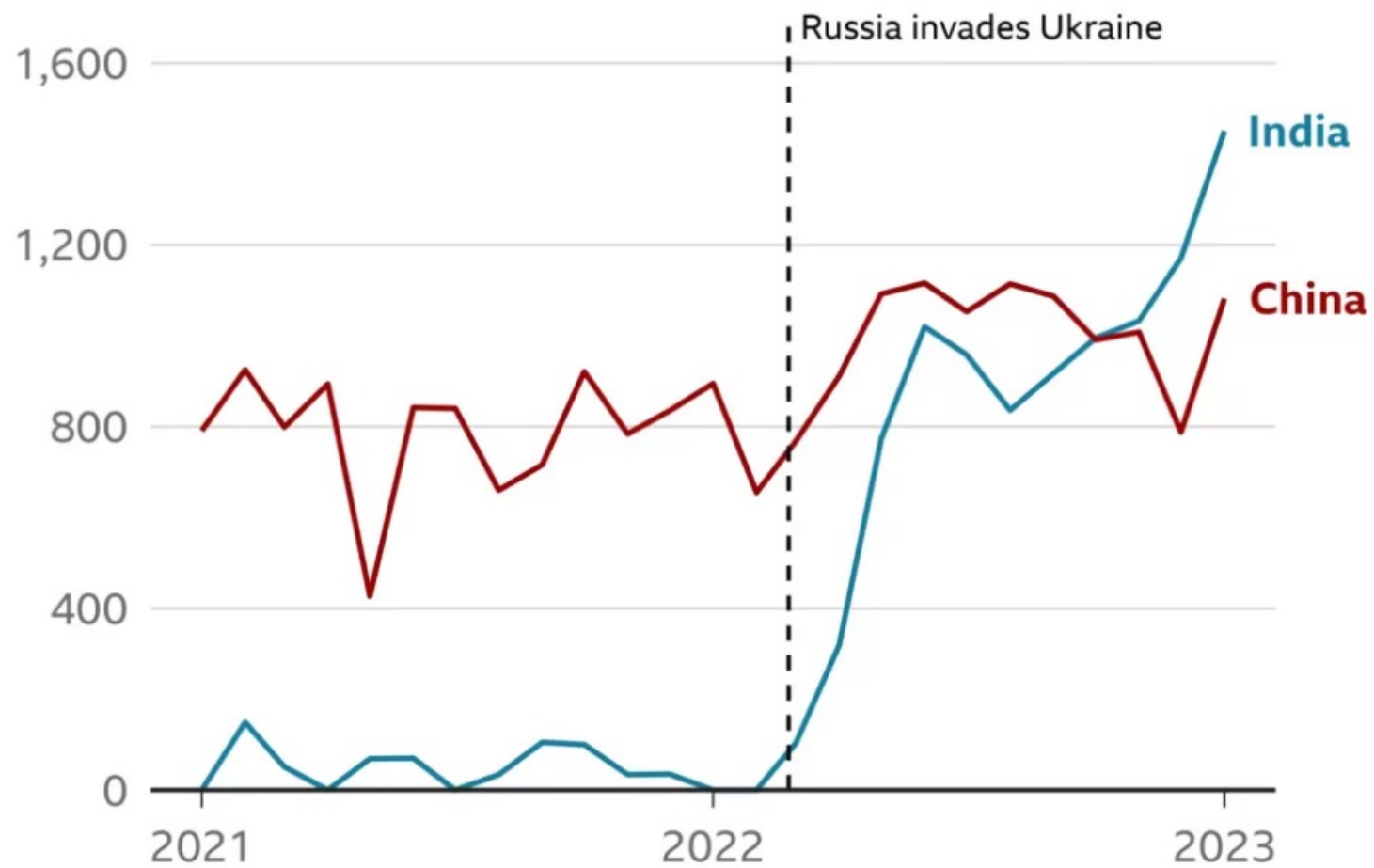
Top-5 regions in the EU



Source: CREA analysis based on Kpler, Marine Traffic, ENTSOG and customs data.

# Russia oil exports to India and China

Thousands of barrels per day



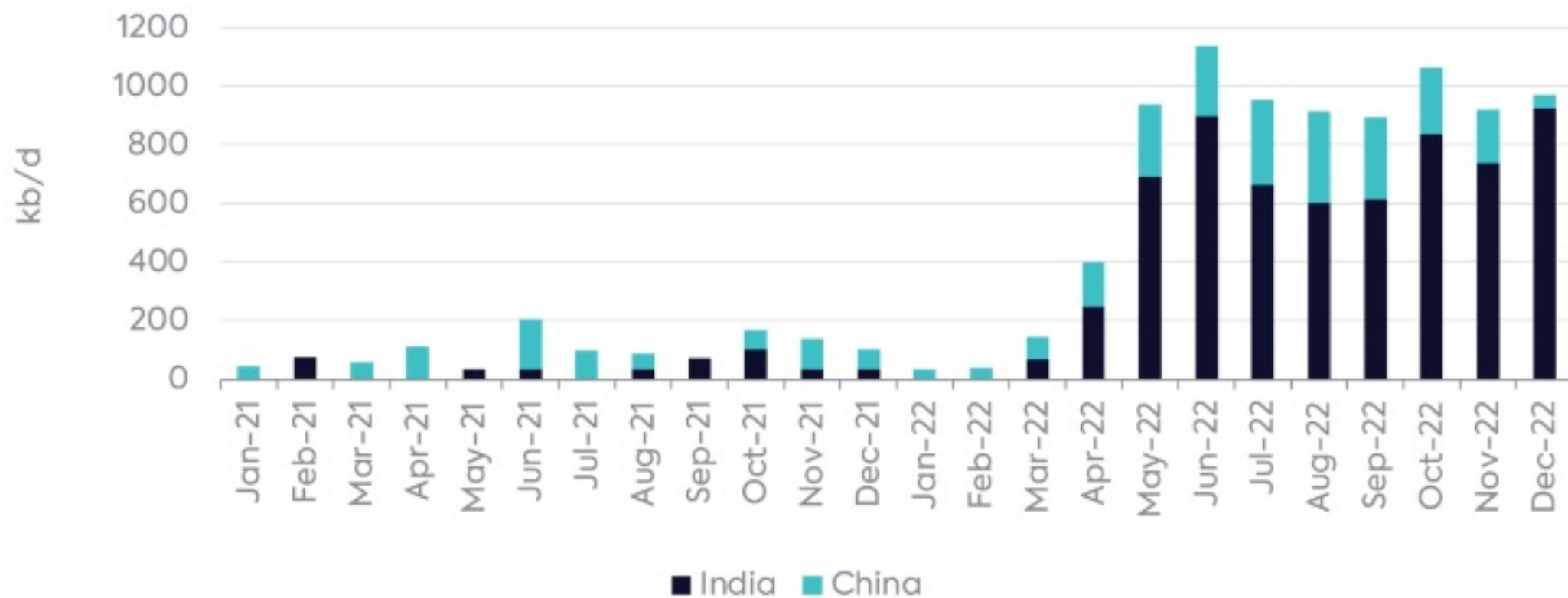
Source: Kpler

BBC

# China oil imports from Russia all-time high

- In May 2023, China's crude oil imports from Russia soared to an all-time high of 2.29 million barrels per day (bpd) as refiners in the world's top crude oil importer continue to buy discounted Russian oil. Total imports in May were 9.71 million tons.
- This is more than double the amount from February 2022.
- **Russia has overtaken Saudi Arabia as the main supplier of oil to China.**
- Russian energy deliveries to China in 2023 are set to grow by 40 percent.

**Figure 5:** Urals crude exports to Asia



Source: Kpler Terminal, accessed January 8, 2023.

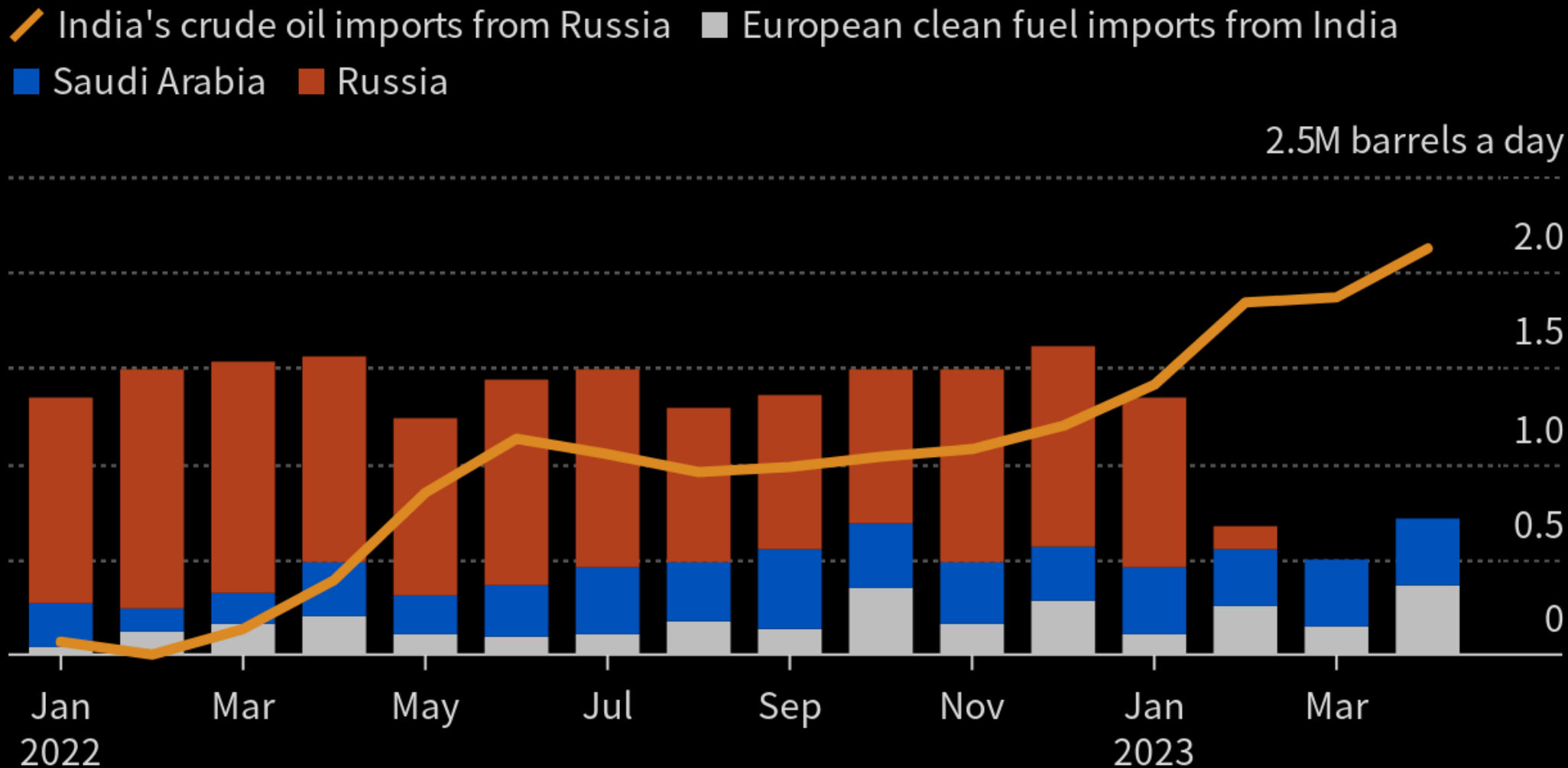
# Russian crude pipeline and storage system



Source: Data taken from IHS Markit midstream content (EDIN): 2005733

# India Becomes Europe's Top Fuel Supplier

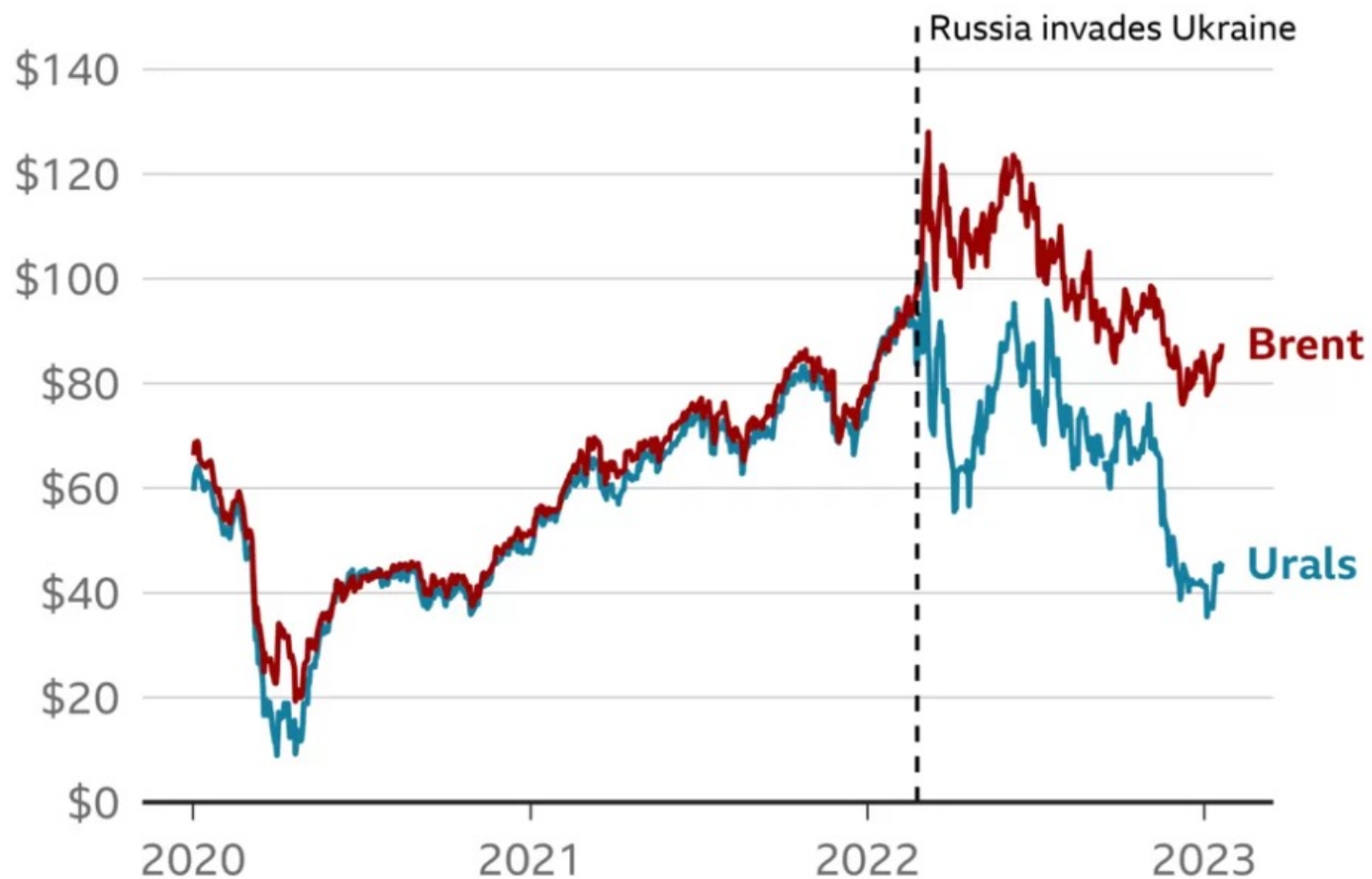
Europe's reliance on Indian oil products have grown since Russian ban



Source: Kpler data, compiled by Bloomberg  
April volumes include vessels in transit

# Price of Russian oil dropping faster than Brent

US dollars per barrel



Bloomberg, ICE, Argus Media

BBC



# Brent vs Urals

The price difference increased after a price cap on Russian oil was announced on December 2, 2022, and took effect on December 5:

- January 11, 2023: Urals crude oil sold below **\$50** a barrel, while Brent Crude sold for **\$80** a barrel
- March 20, 2023: Urals crude traded at **\$38** a barrel, while Brent traded at **\$71**
- July 13, 2023: Urals crude traded at nearly **\$64** a barrel, while Brent traded at **\$81**
- September 20, 2023: Urals crude was recorded at **\$16.77** per barrel below Brent
- August 1, 2023: Russian President Vladimir Putin signed into law amendments to the tax code to narrow the discount of Urals crude to Brent to \$20 per barrel.
- Chinese imports of Russian oil remained above the price cap (\$60 per barrel) but below the price of Brent.

# Impact on Russian Economy

- <https://www.youtube.com/watch?v=V9WPzrCL2eo>

## July 31, 2023

- Russia's current account surplus has **fallen by \$140 bln** or 85% -- **\$25.2 bln** in July 2023, compared to **\$165.4 bln** in July 2022.
- The central bank forecasts the 2023 current account surplus at **\$26 billion**, sharply down from last year's **\$227 billion**.
- Oil and gas revenues, the lifeblood of Russia's economy, have slumped **41.4 percent** year-on-year in the first seven months, which the Finance Ministry has put down to lower prices for Urals crude and lower natural gas export volumes.

# Gazprom Losses

## Gazprom Troubles

- Gazprom's net profit plunged by **8.5 times** to stand at just \$3.1 billion (296 billion Russian rubles) for the first half of 2023, down from \$26 billion (2.5 trillion rubles) for the same period of 2022.
- Separately, Gazprom Neft, the oil arm of Gazprom, reported in July 43% annual slump in its second-quarter net profit amid lower sales.

# Natural Gas





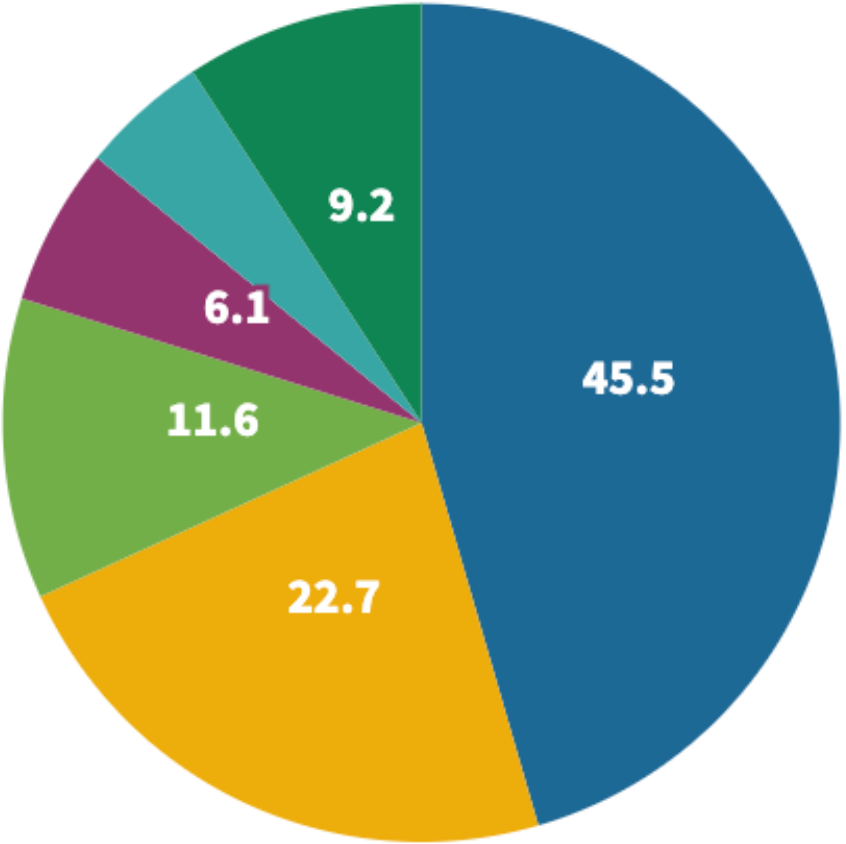
Source: Bruegel

# Which countries export natural gas to the European Union?

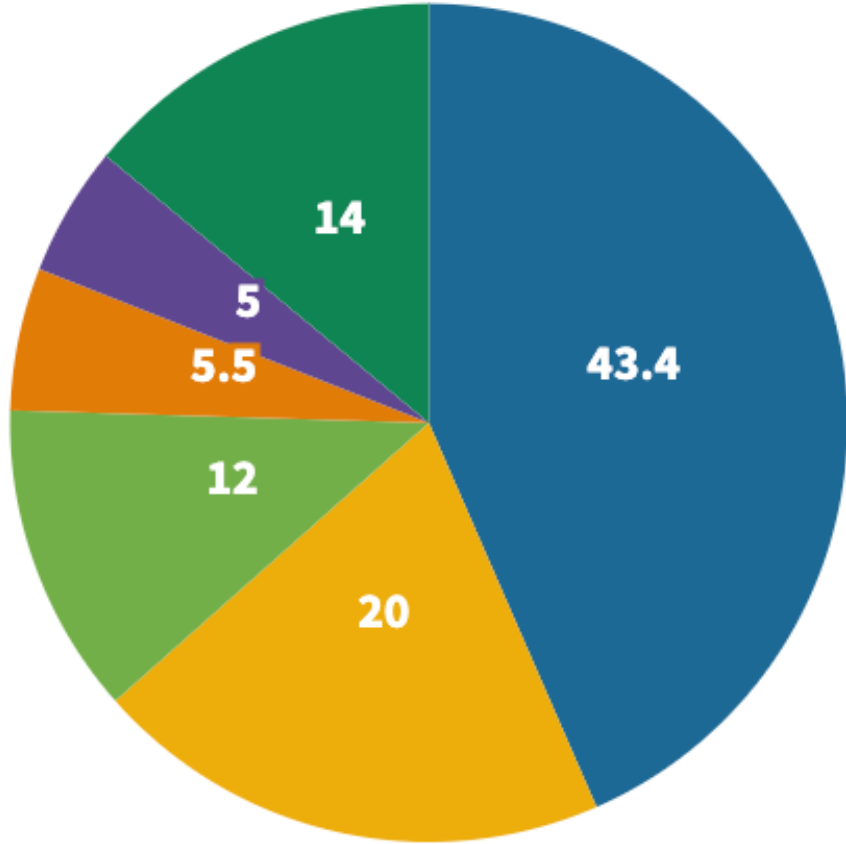
Percentage of non-EU country imports of natural gas into bloc

Russia Norway Algeria Qatar Nigeria United Kingdom United States Others

2019



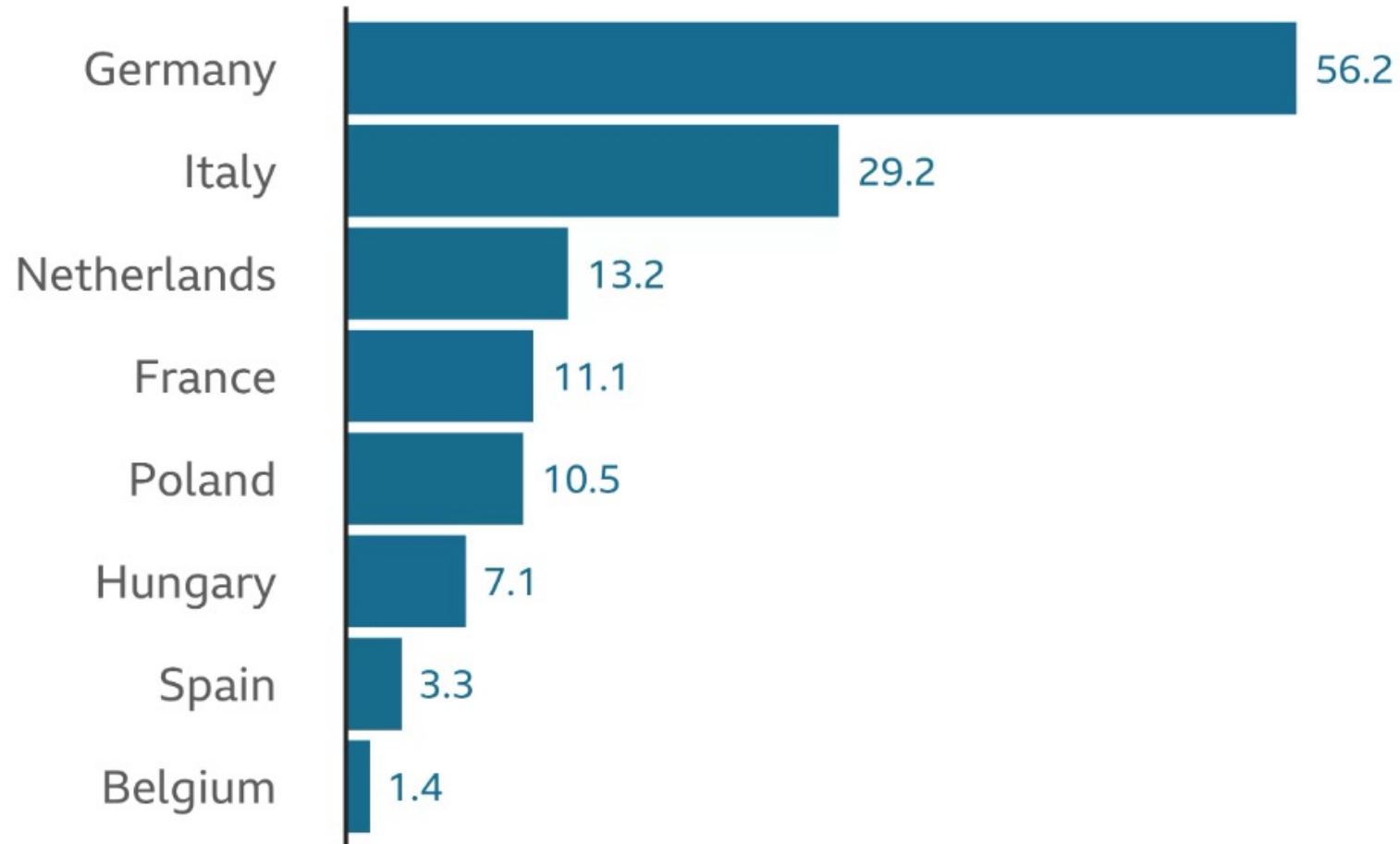
2020



Source: Eurostat

# Russia's gas exports

Countries by billion of cubic metres imported from Russia



Source: IEA. Estimates for 2021

**BBC**

# Landlocked countries in central Europe are more reliant on Gazprom

Gas imports 2017 (%)

- 80+
- 60 to 79
- 40 to 59
- 20 to 39
- 0 to 19

Traditional route via Ukraine

Nord Stream

Nord Stream 2

Traditional route via Poland

OPAL

EUGAL

Turkish Stream



Sources: BP Statistical Review of Energy 2018, Gazprom



# "Optimization" Program of Gazprom



<https://www.gazprom.com/press/news/miller-journal/2016/277026/>

[www.eegas.com](http://www.eegas.com)

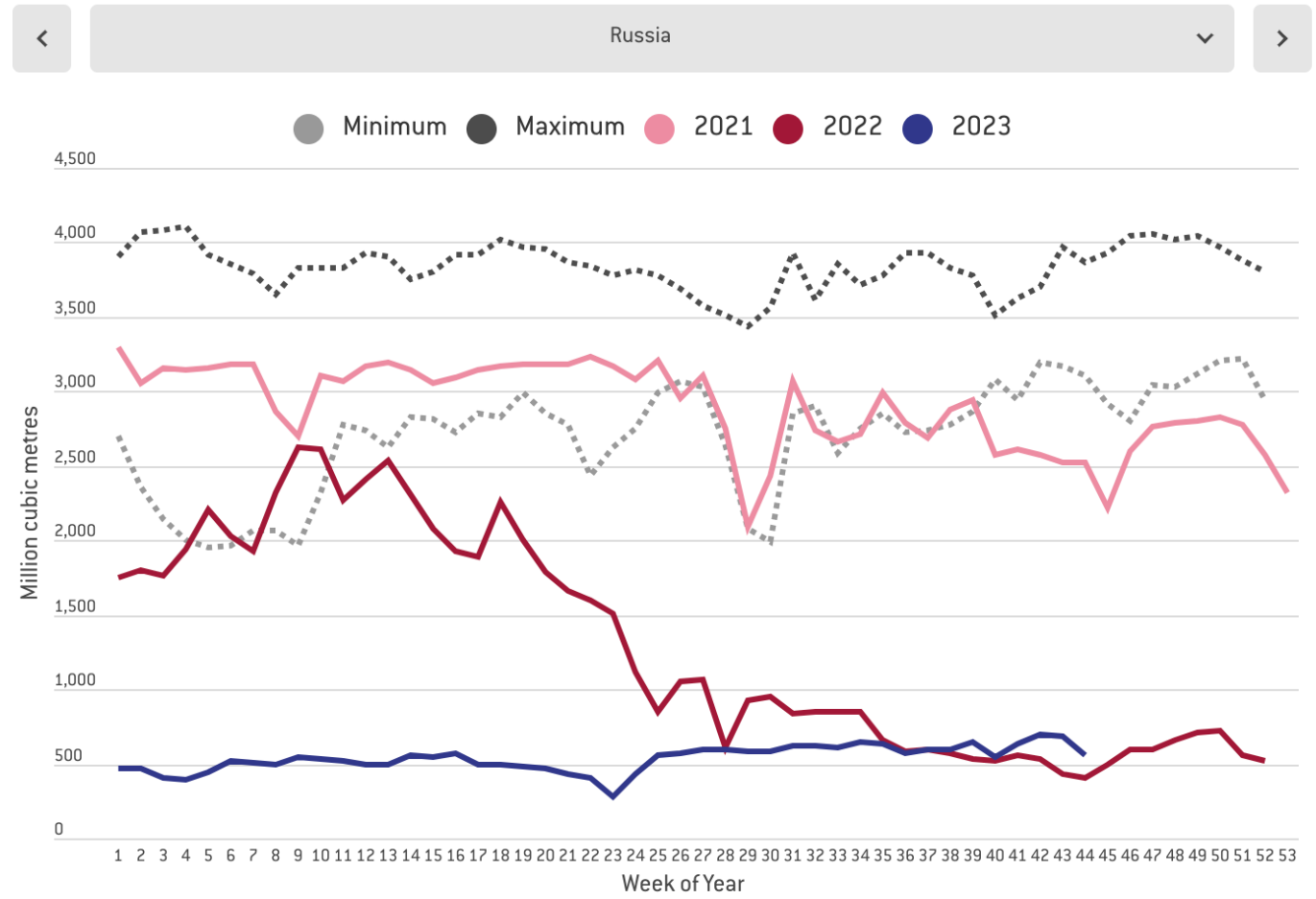


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Figure 1: EU27 Natural Gas Imports (by source)

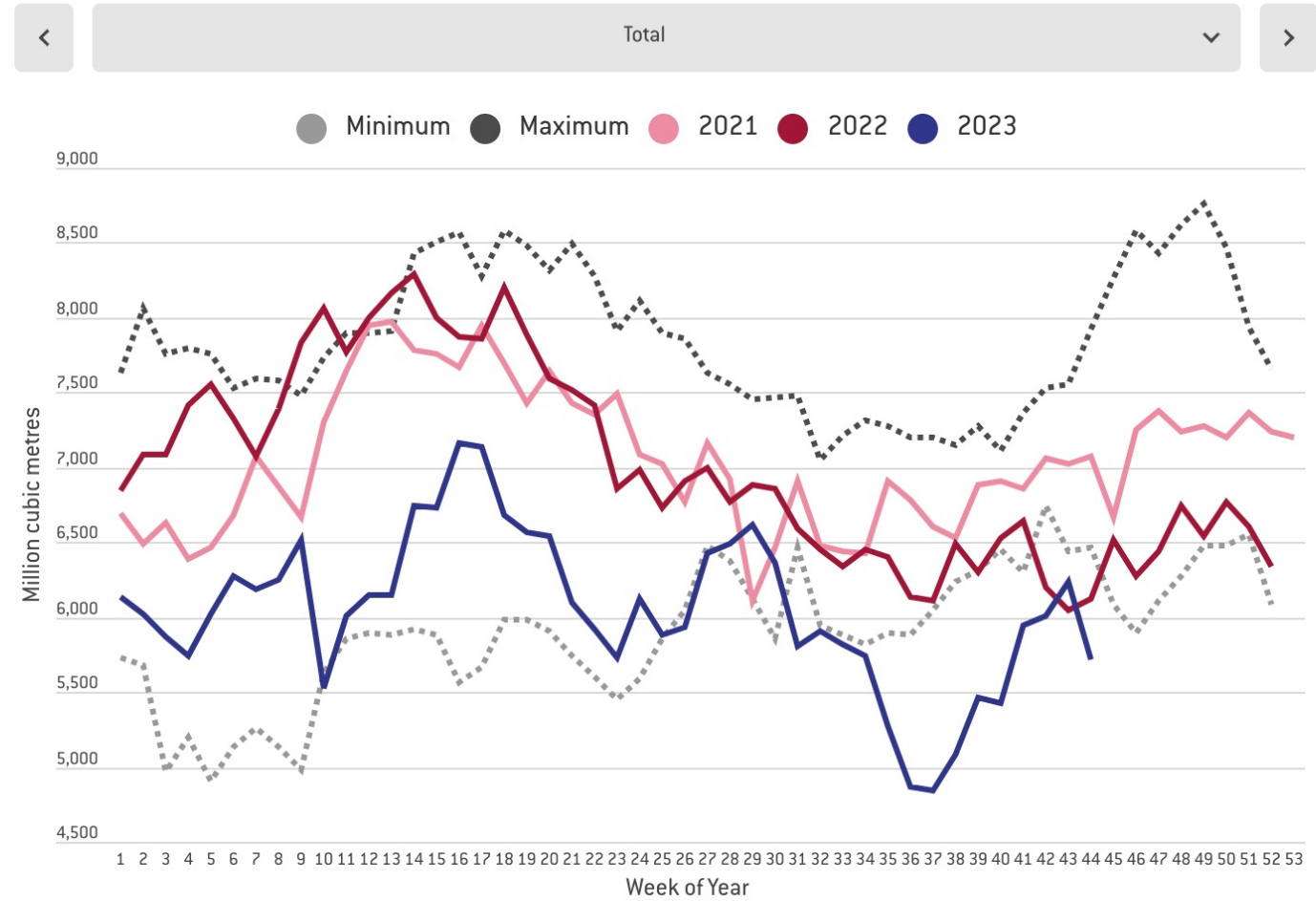
Last updated: 07/11/2023 (updated every Tuesday/Wednesday)



Source: ENTSO-G, <https://transparency.entsog.eu/#/map>

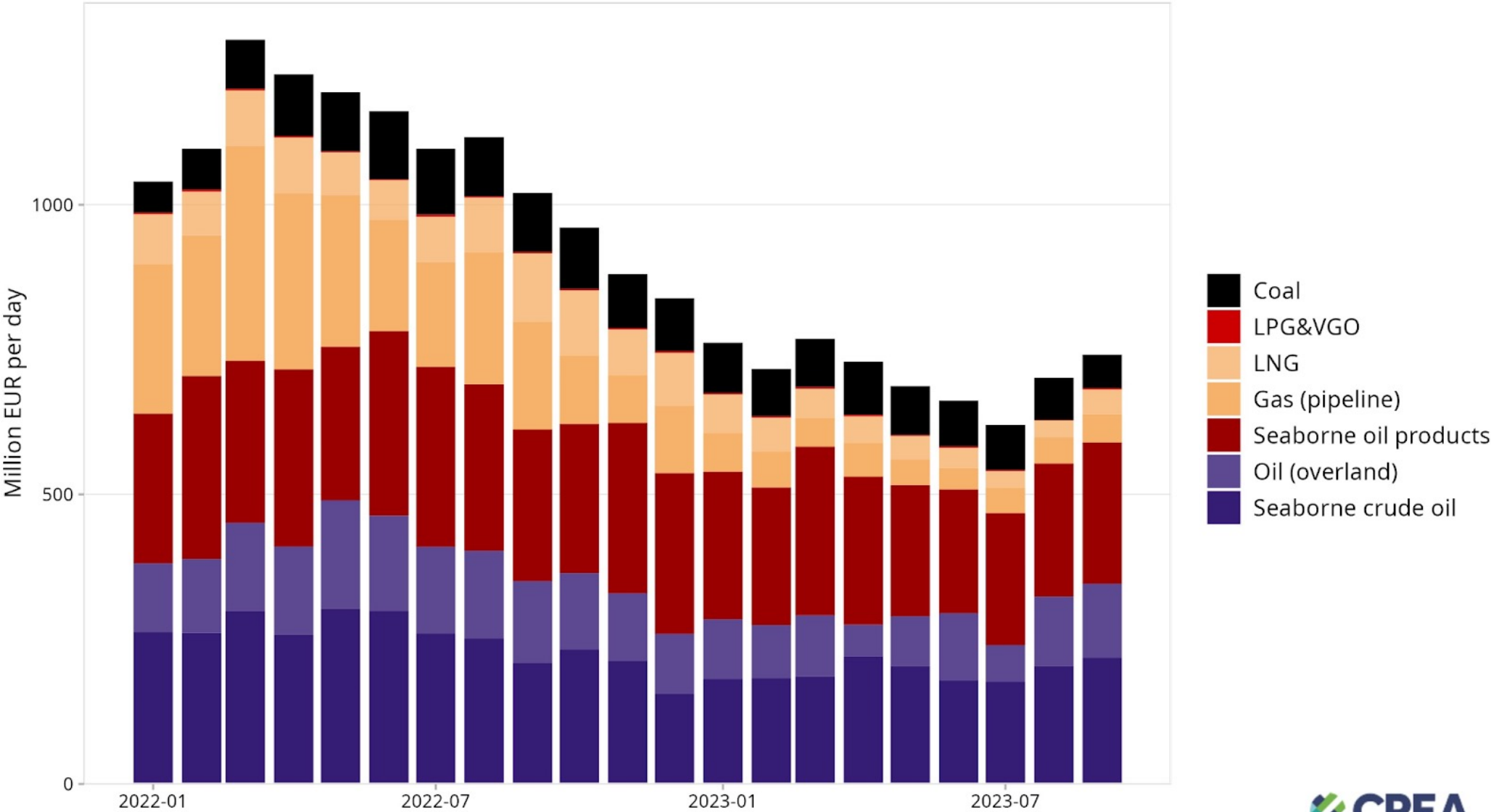
Figure 1: EU27 Natural Gas Imports (by source)

Last updated: 07/11/2023 (updated every Tuesday/Wednesday)



Source: ENTSO-G, <https://transparency.entsog.eu/#/map>

# Russia's fossil fuel export revenue

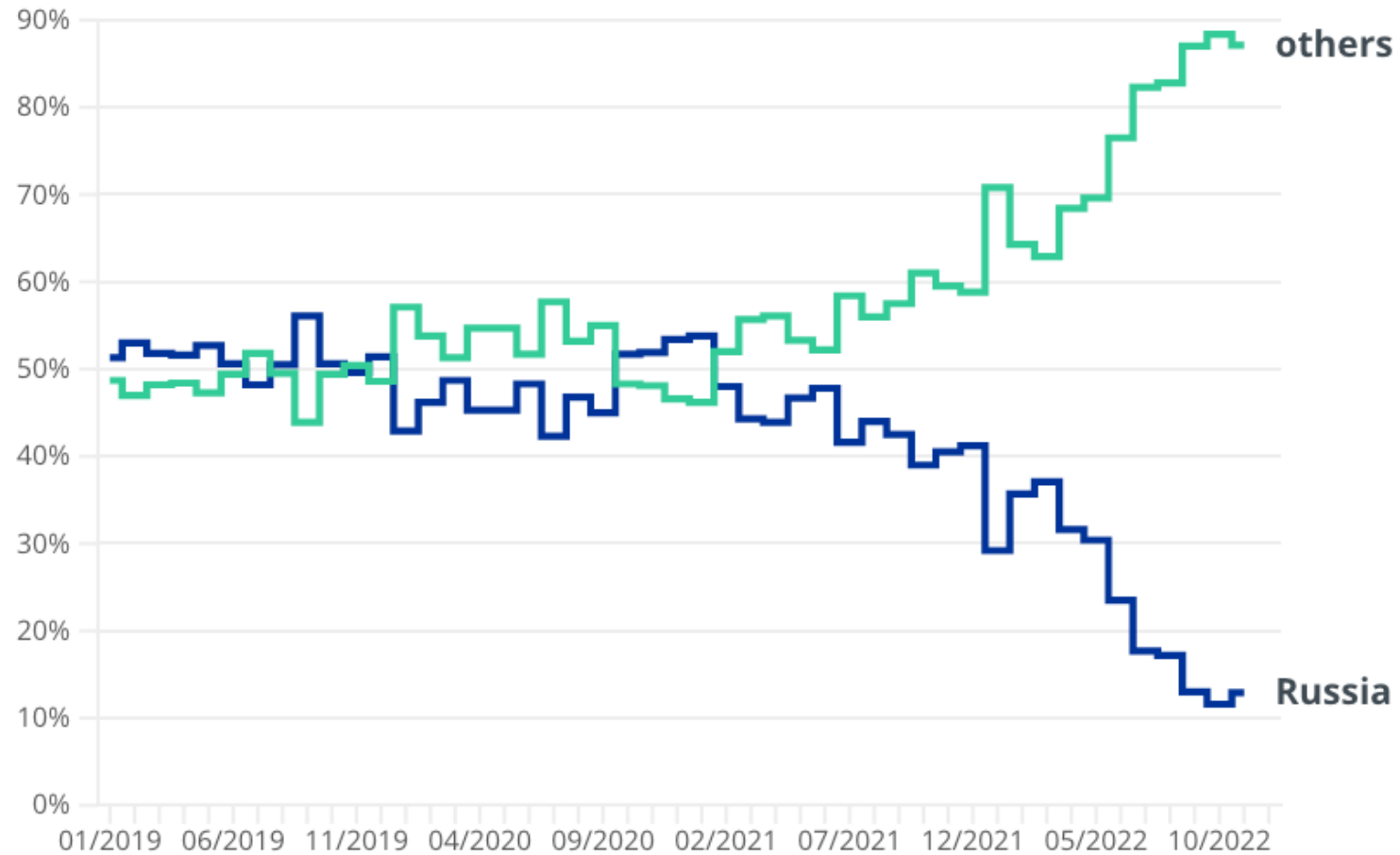


Source: CREA analysis based on Kpler, Marine Traffic, ENTSOG and customs data.

## Russian natural gas supplies

- Gazprom used to deliver between **160 and 178 billion cubic meters (bcm)** of natural gas to Europe (excluding Turkey) in 2017-2019. **Now it delivers about 40 bcm, four times less.**
- **Gazprom's profits** for 2022 were 1.226 trillion rubles (\$15.4 billion), **41% lower than in 2021.**
- But in 2023, the gas revenues have dropped to **less than \$100 million a month from \$350 million in January 2022.**
- **Annualized, this is a drop from \$130 billion to \$36 million – a \$94 billion loss.**

## The EU's diversification away from Russian gas

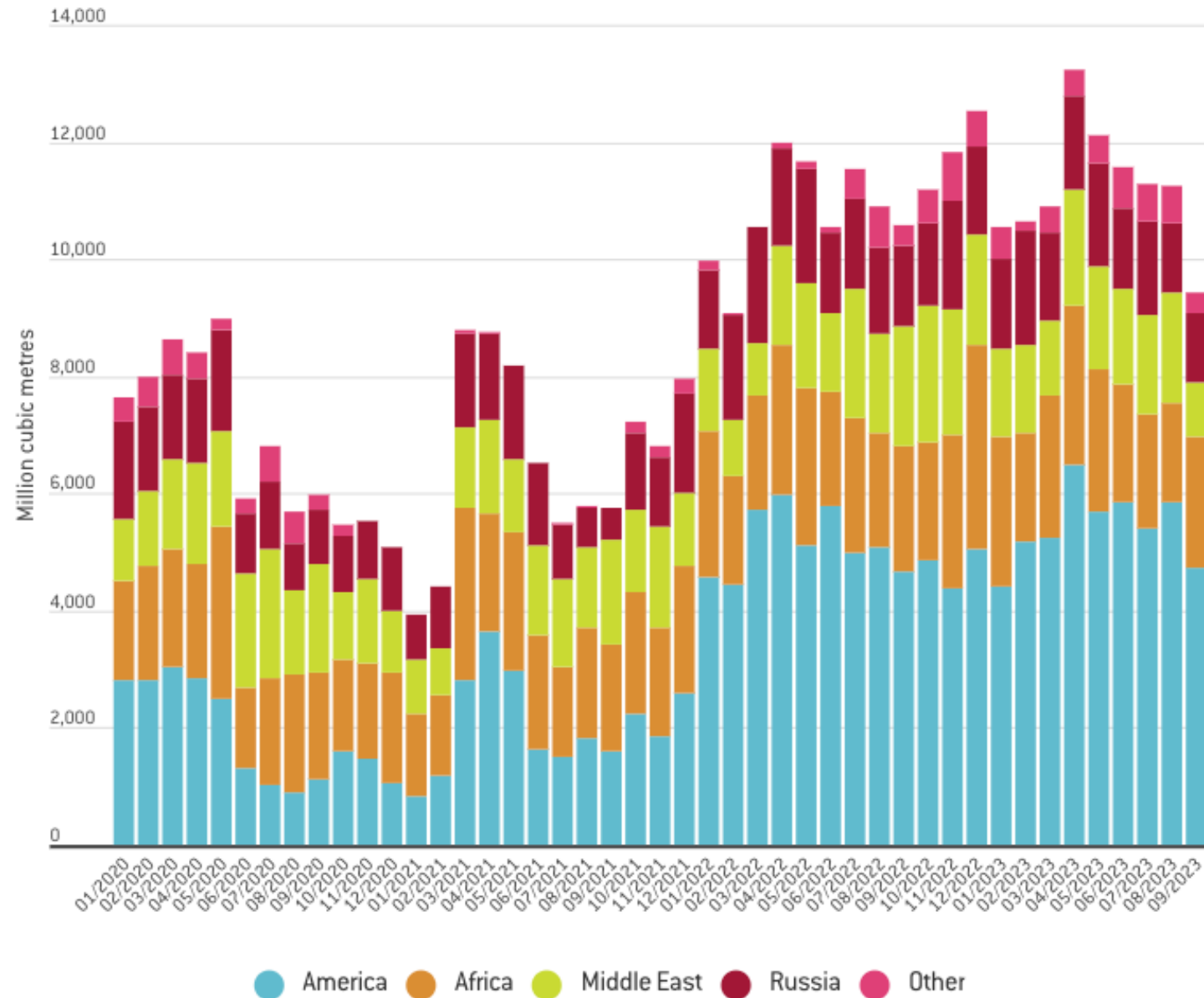


Source: European Commission



## Figure 4: EU27 LNG monthly imports by region of origin

Last updated: 11/10/2023 (updated every month)

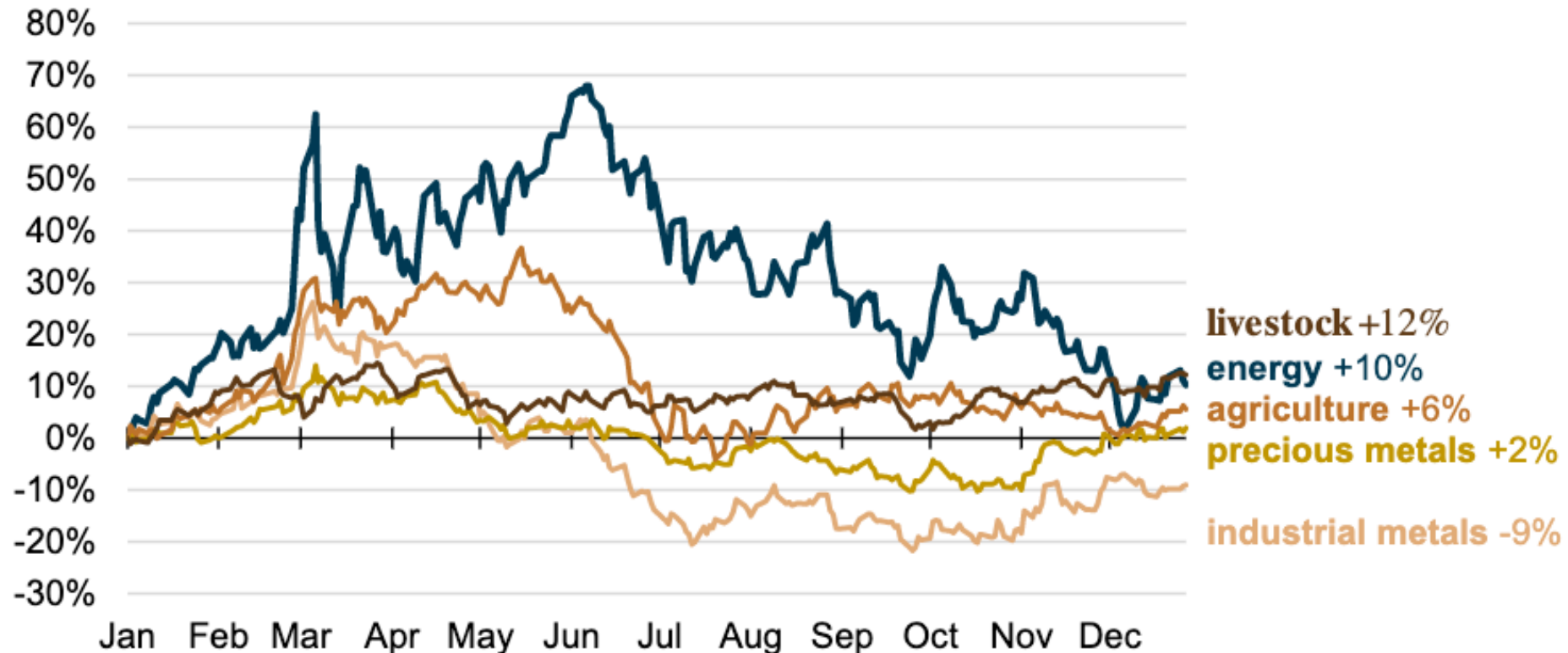


Source: Bruegel based on Bloomberg



# Price changes in 2022

**Components of the S&P Goldman Sachs Commodity Index (2022)**  
percentage change since first trading day of the year



Data source: S&P Dow Jones and Bloomberg, L.P.

# European Union Natural Gas Import Price (I:EUNGIP)

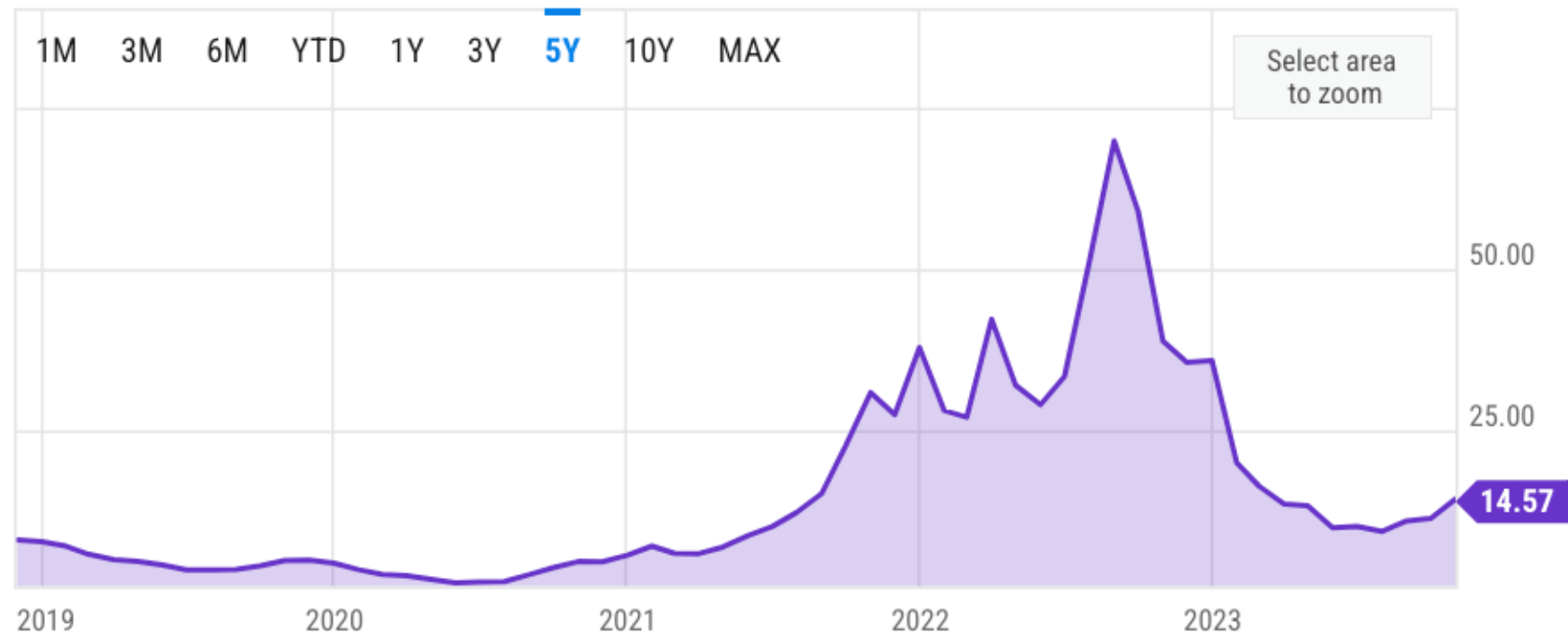
14.57 USD/MMBtu for Oct 2023

Overview

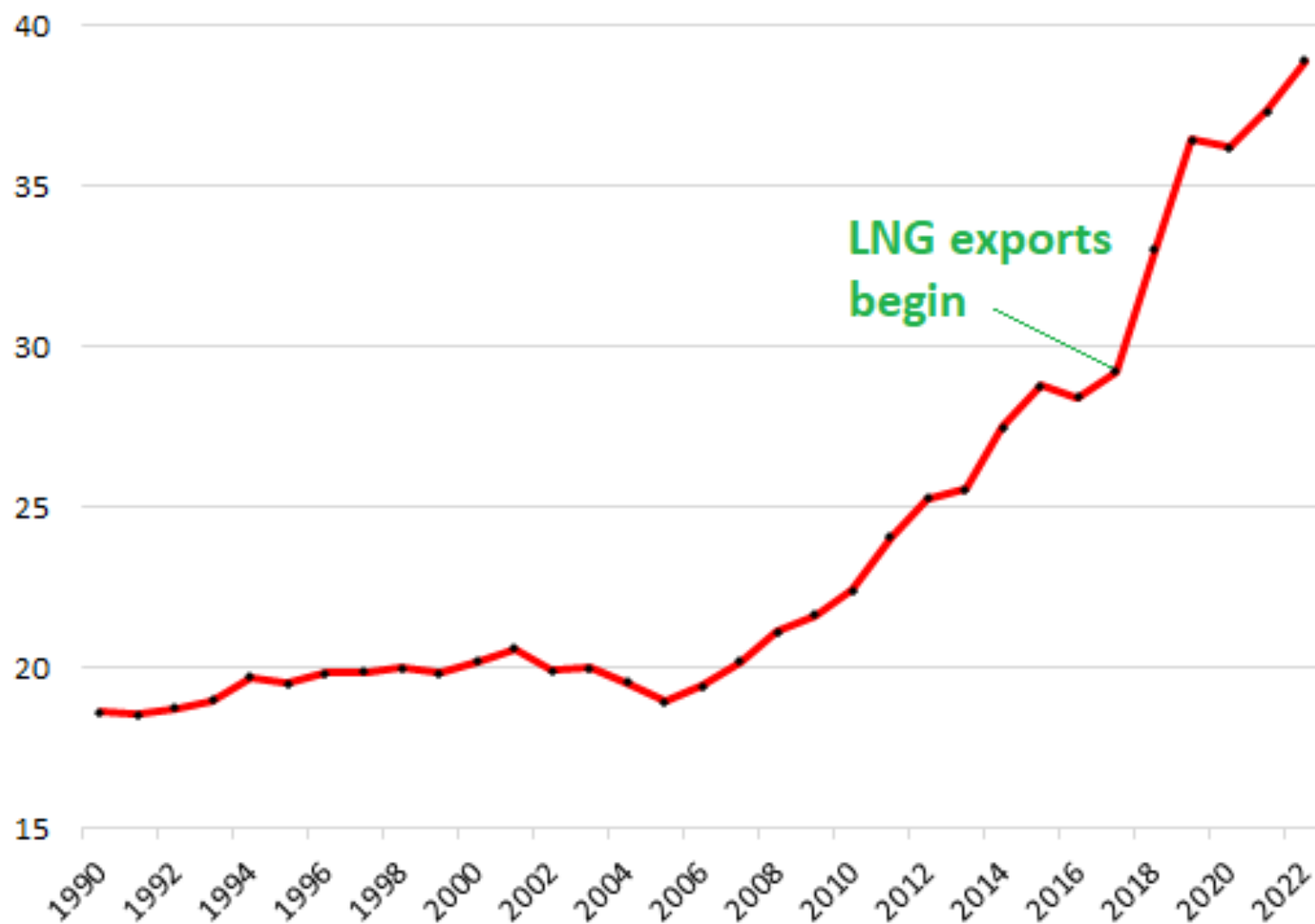
Interactive Chart

Level Chart

[VIEW FULL CHART](#)



## U.S. Natural Gas Production, Trillion Cubic Feet per Year

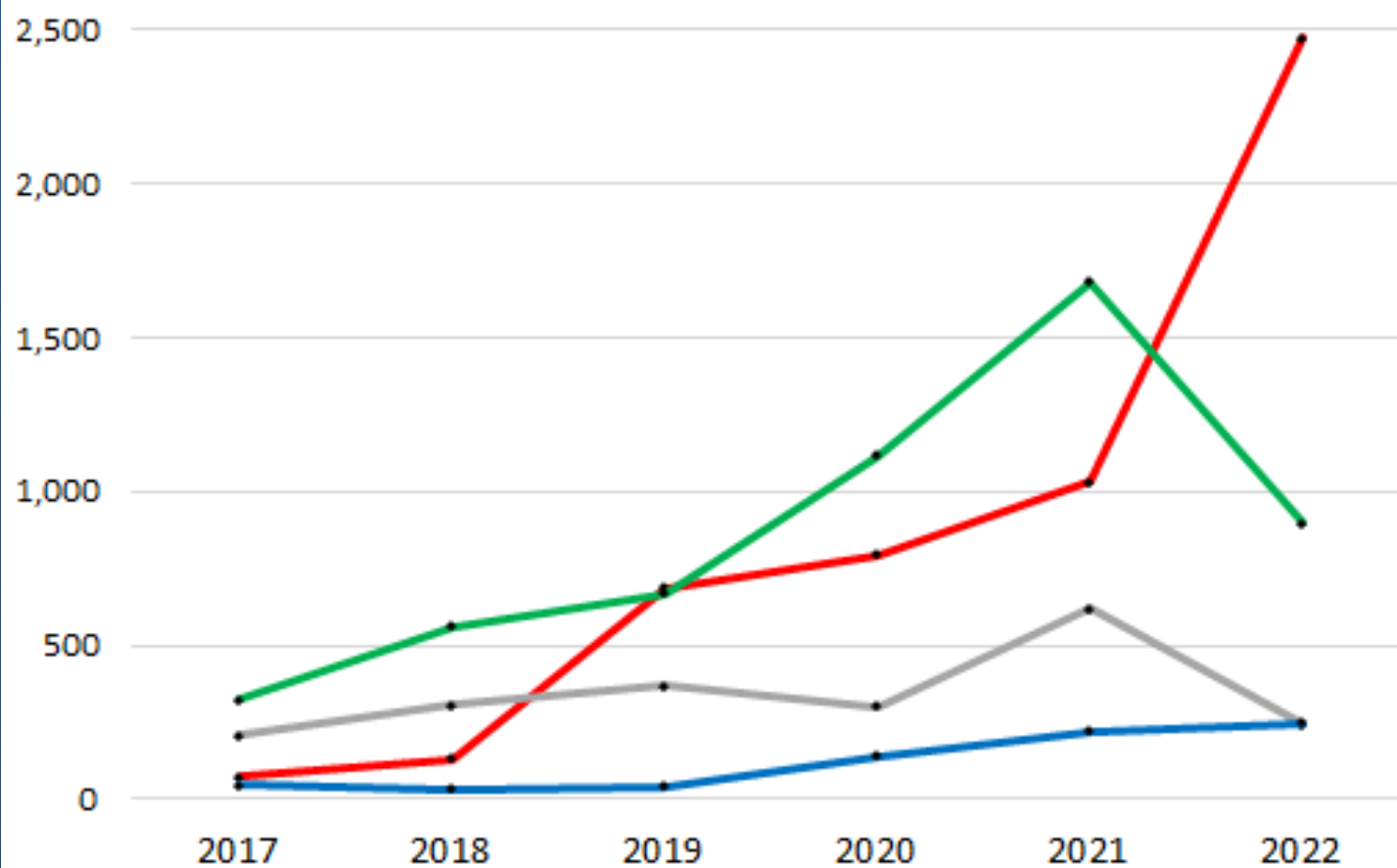


Source: EIA

WOLFSTERET.com

## U.S. LNG Exports by Region, Billion Cubic Feet

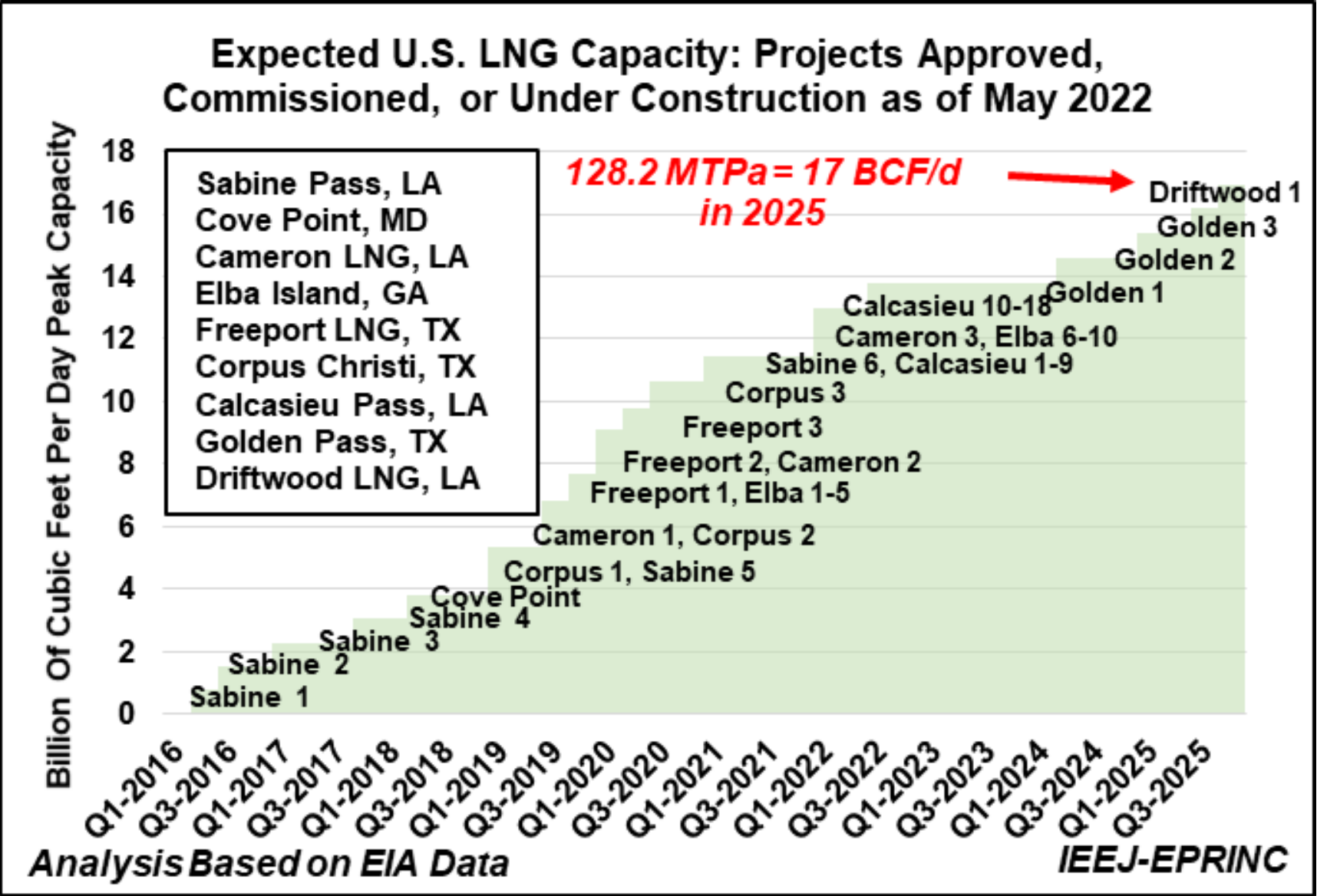
—●— Europe —●— Asia —●— Latin America —●— Middle East, Africa



Source: EIA

WOLFSTREET.com

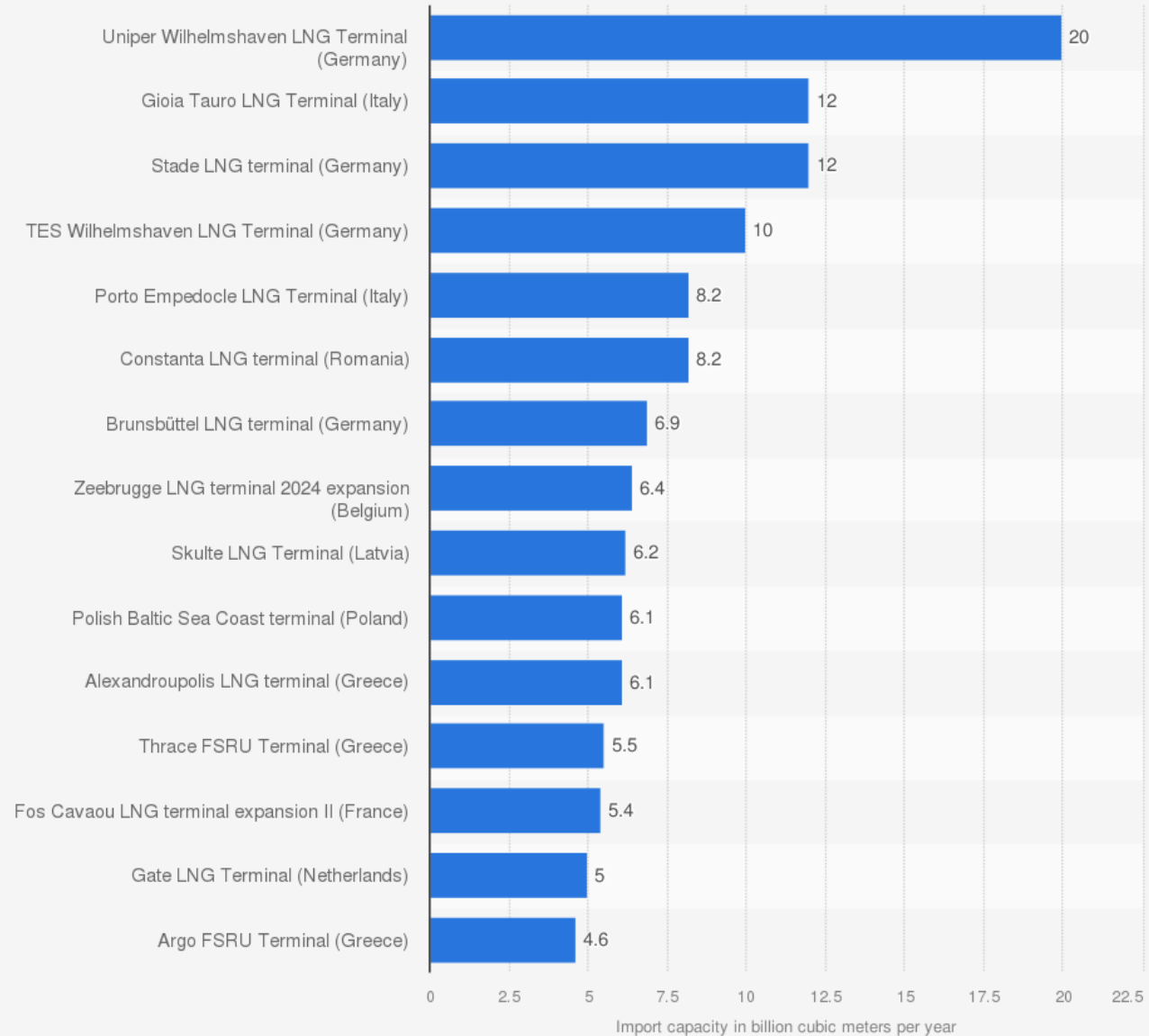
# Expected U.S. LNG Capacity



**Current U.S. U.S. LNG Liquefaction Capacity is about 10 BCF/d.**

**It is expected to reach 17 BCF/d by late 2025.**

## Largest liquefied natural gas import terminal projects proposed or under construction in the European Union (EU) as of 2022, by capacity (in billion cubic meters per year)



**Source**  
Global Energy Monitor  
© Statista 2022

**Additional Information:**  
EU; 2022







