



Energy Security & the International LNG Market

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Introduction: Energy Security & Energy Markets



□ The security of supply to meet demand in a net-zero context.

- ✓ a comprehensive approach to energy planning and investments
- ✓ supplying energy affordably and reliably to markets and end-users

Security of supply & Energy Security

Energy security



- the uninterrupted availability of energy sources at an affordable price.
- long-term energy security - timely investments to supply energy in line with economic developments and environmental needs.
- short-term energy security - the ability of the energy system to react promptly to sudden changes in the supply-demand balance.

Security of energy supply



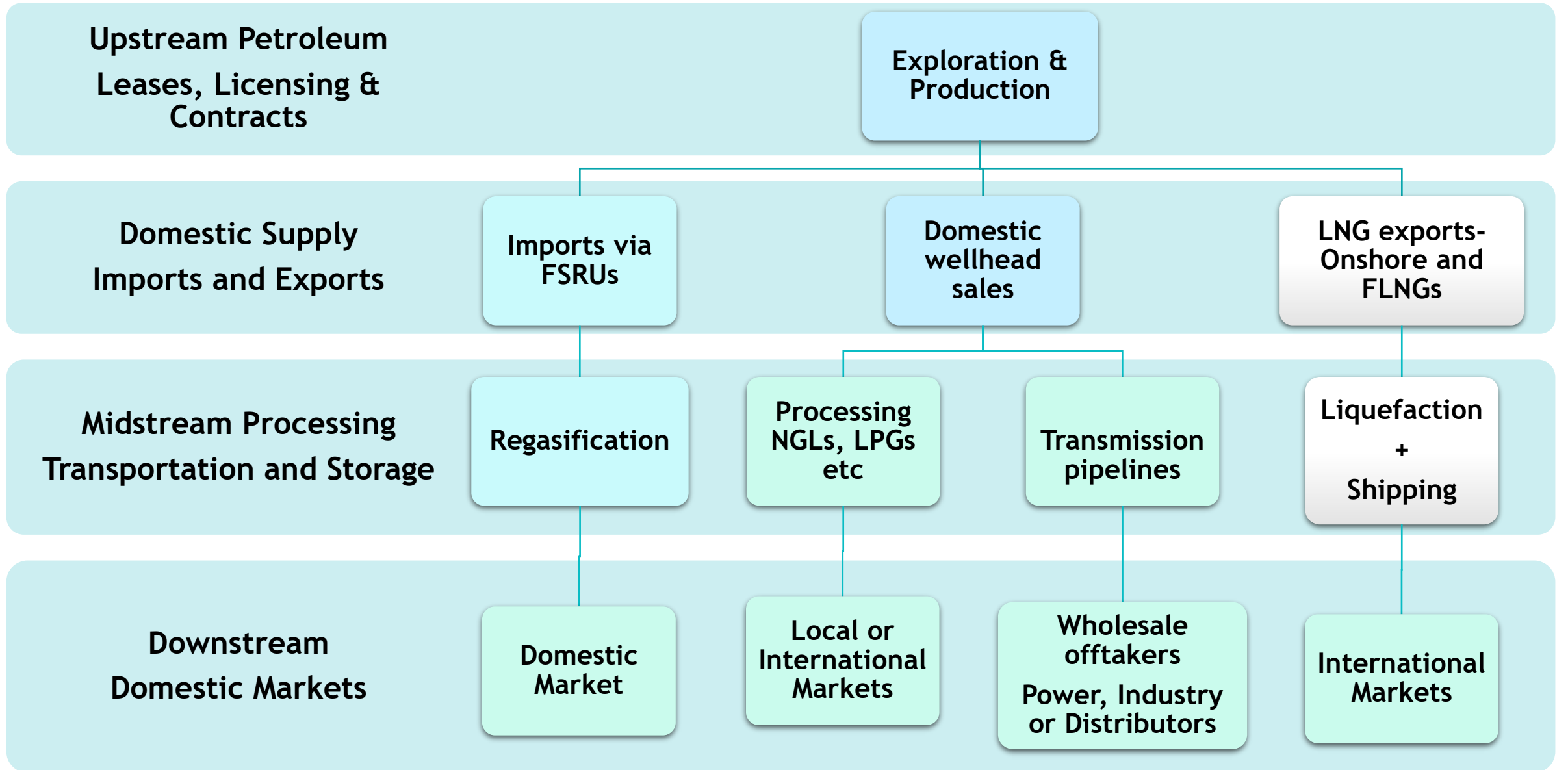
- The conditions under which all or most operating firms, citizens, and businesses have reliable access to a sufficient energy supply at reasonable prices for the foreseeable future
- The risk of major disruptions is eliminated or effectively mitigated.



LNG & Evolving International Gas Markets

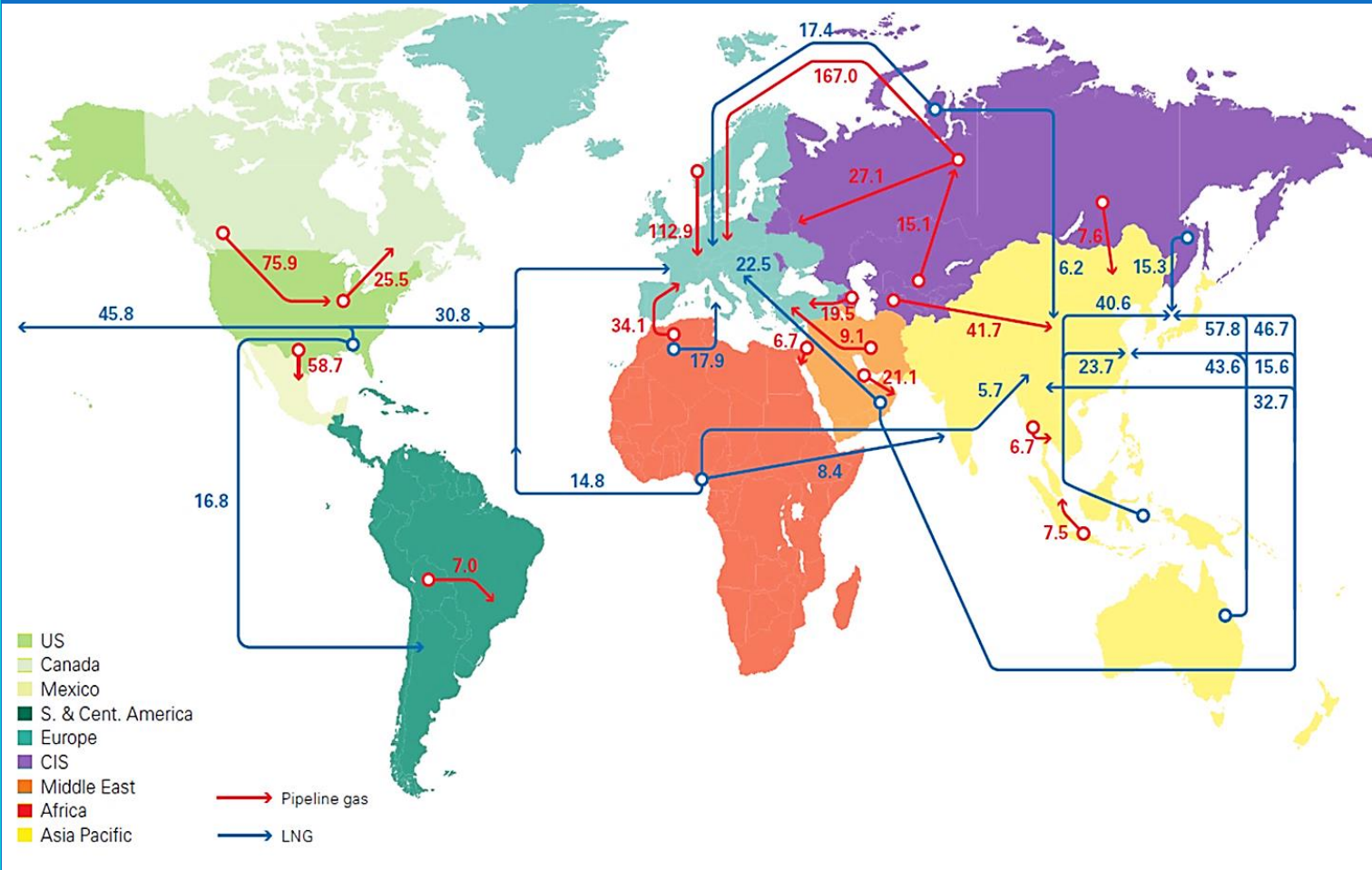


An international and interconnected gas and energy supply chain



Global Gas Trade Movements 2021 - (billion cubic meters)

Source: BP Statistical Review of World Energy 2022

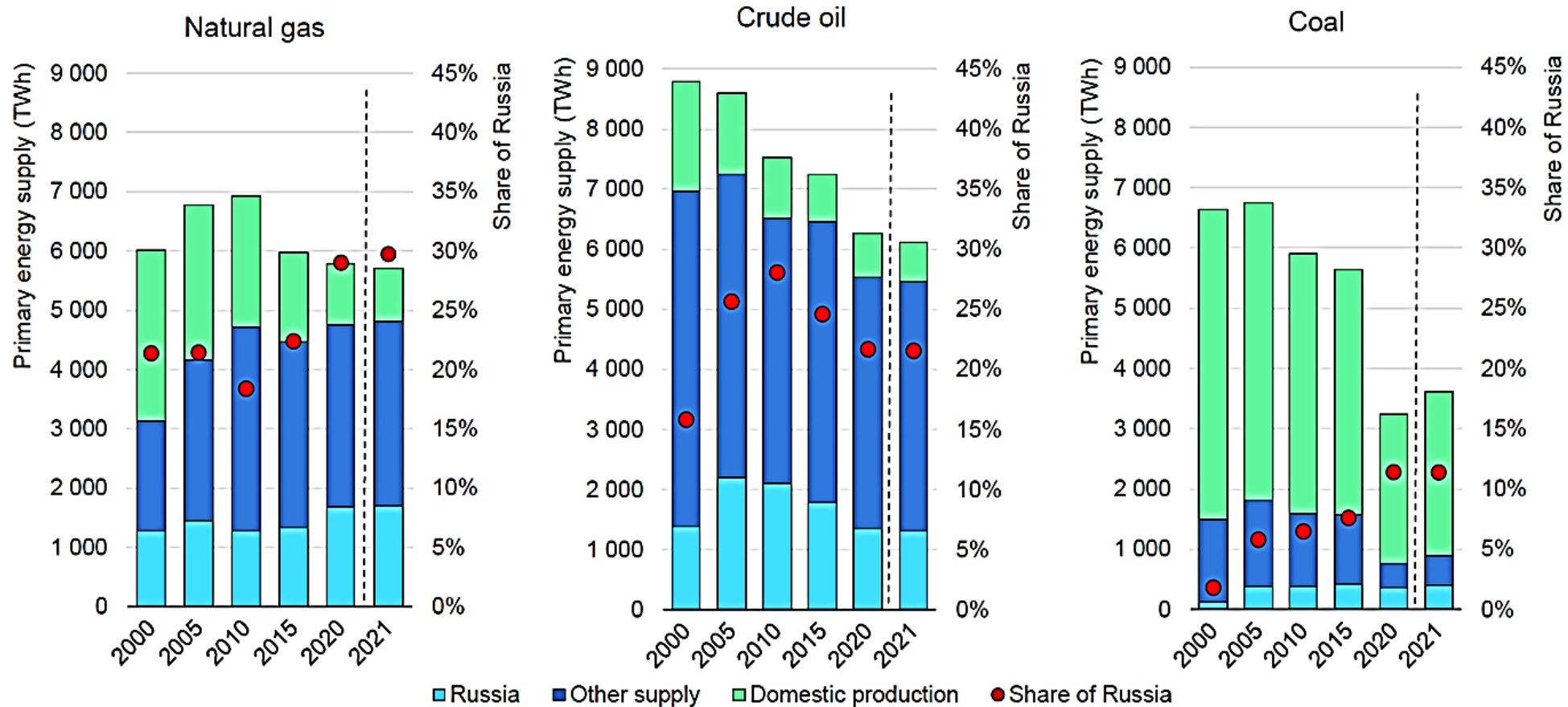


LNG Projects & Supply Drivers

- Long-term take-or-pay agreements vs. spot market trading
- Destination flexibility
- Pricing
- Competing energy alternatives
- Force Majeure & change of law
- Shipping terms- FOB vs Ex Ship etc.
- Shipments of carbon-neutral LNG???
- Decarbonization policies
- Demand aggregation, joint gas purchasing, gas storage capacity
- Good luck with winter weather

Europe's current dependency on energy imports

Estimated shares of Russian gas, crude oil and coal imports in the EU and UK energy supply, 2000-2021



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Note: The "Share of Russia" indicators refer to how much Russian imports account for in the total supply (domestic production + imports from Russia + other supply) of the European Union and the United Kingdom combined.

Source: IEA's *Electricity Market Report - July 2022 Update*



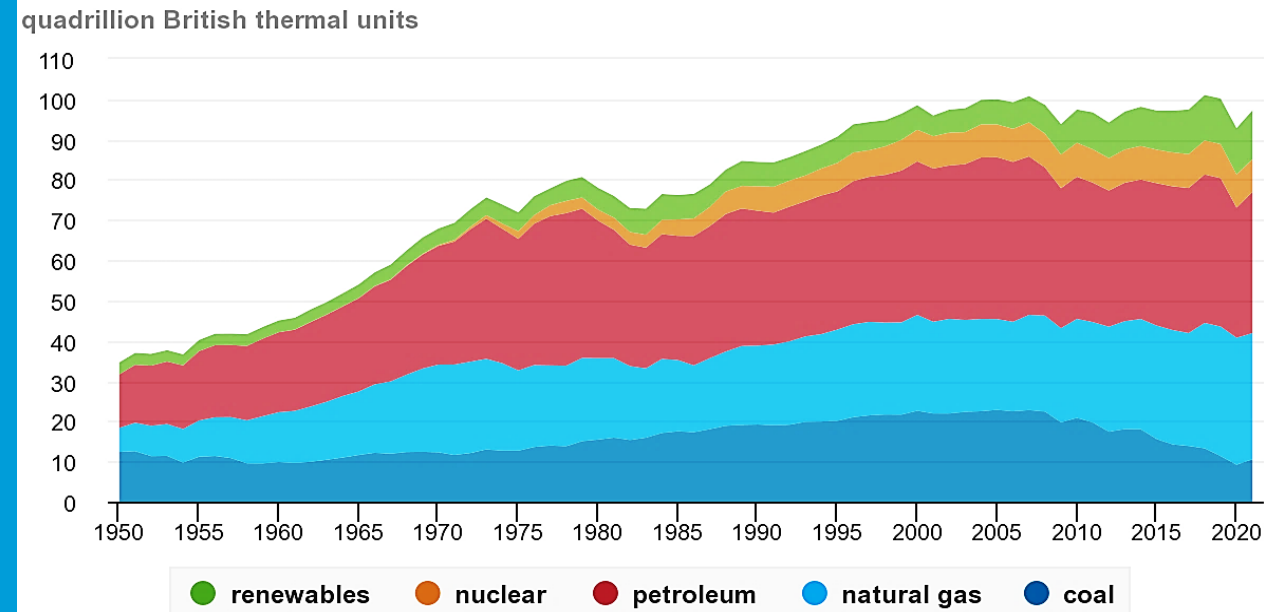
US and LNG Export Projects



US energy production and supply trends...

- Domestic energy production has outpaced consumption since 2019.
- Natural gas accounted for about 32% of total U.S. energy consumption in 2021.
- Gas production increases help to reduce domestic gas prices
 - ✓ Fuel switching from coal to gas
 - ✓ Increasing share of renewables and new technologies
 - ✓ natural gas adds less CO₂, reliability and security of supply

U.S. primary energy consumption by major sources, 1950-2021



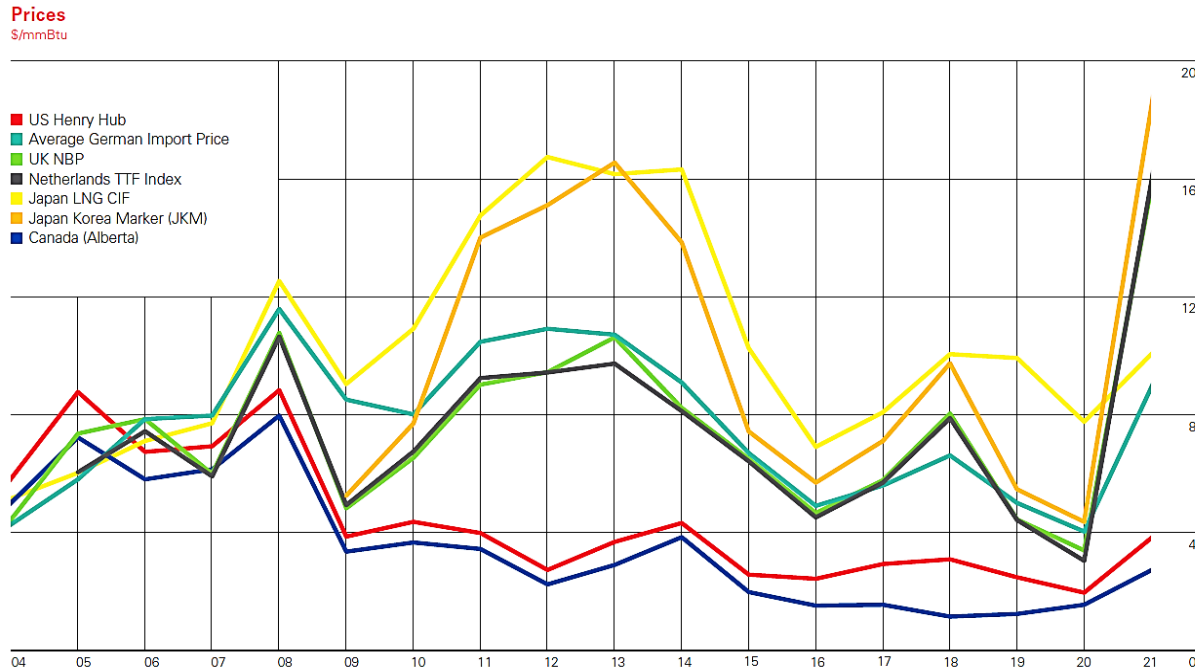
Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3, April 2022, preliminary data for 2021



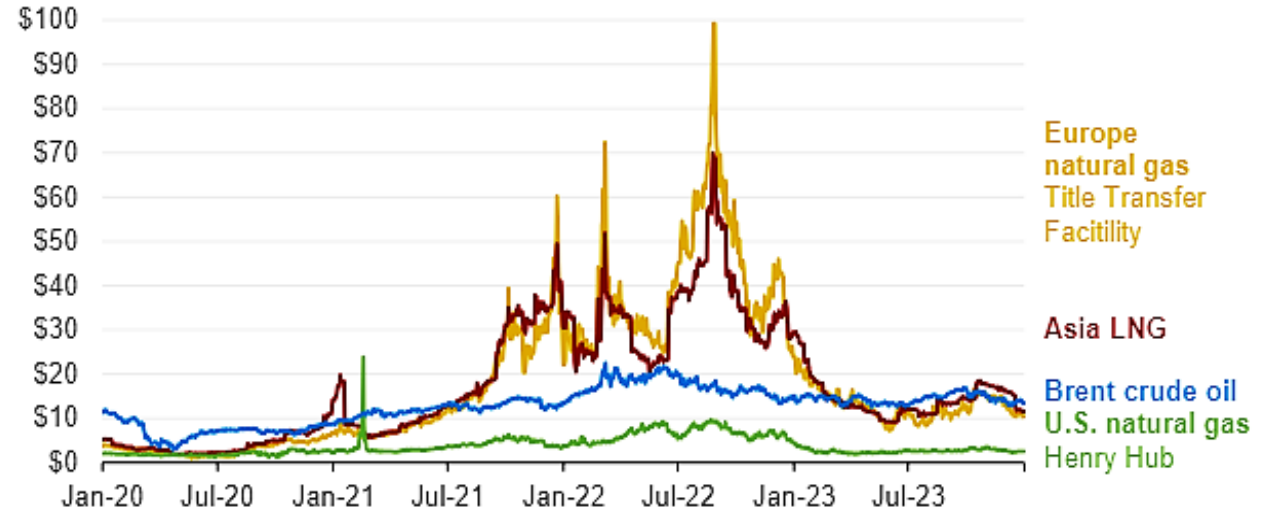
Note: Petroleum is petroleum products excluding biofuels, which are included in renewables.

International Gas Pricing Trends

BP Statistical Review of World Energy, 2022



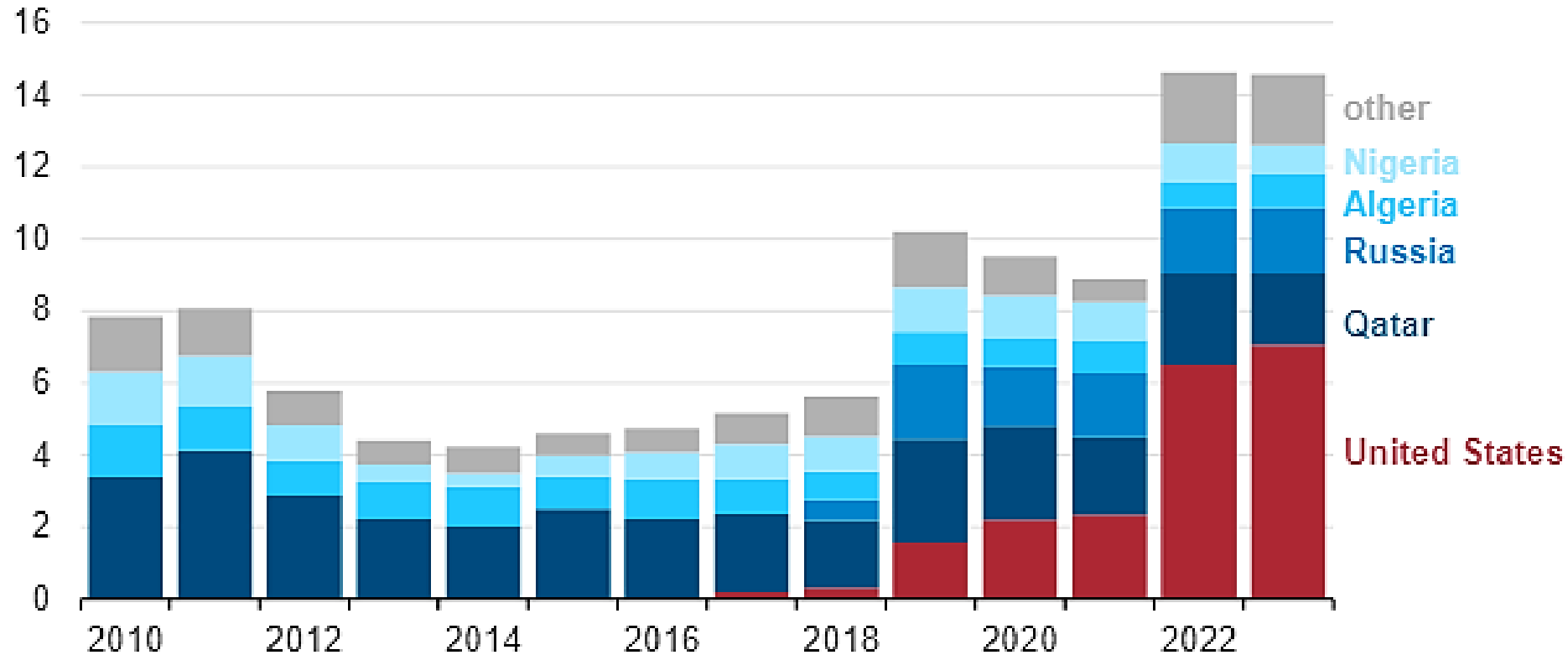
Daily crude oil, natural gas, and liquefied natural gas (LNG) front-month futures prices at select hubs (Jan 2020–Dec 2023)
dollars per million British thermal units



- ❖ The U.S. Henry Hub price averaged \$1.50 per MMBtu on February 20, 2024, the lowest price since at least 1997
 - ✓ High gas production
 - ✓ low natural gas consumption and higher natural gas inventories
- ❖ European TTF hub prices increased to almost \$100 in 2022, and \$11.89/MMBtu by 2023

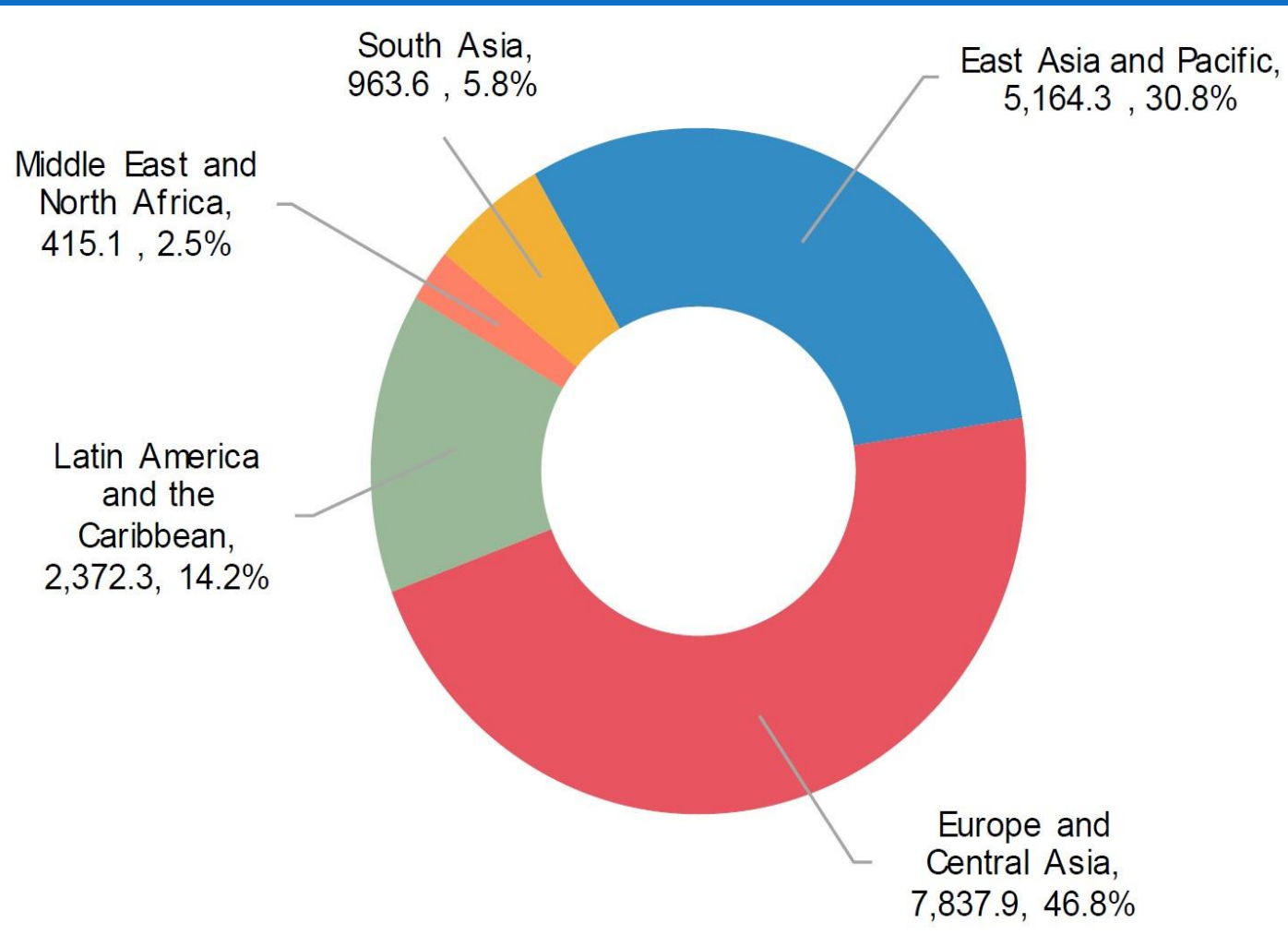
The US as the main LNG supplier to EU & UK since 2022

Europe (EU-27 and UK) annual LNG imports by exporting country (2010–2023)
billion cubic feet per day



- The US accounted for 27%, or 2.4 billion cubic feet per day (Bcf/d), of total European LNG imports in 2021; 44% (6.5 Bcf/d) in 2022; and 48% (7.1 Bcf/d) in 2023.
- Europe's LNG import/regasification capacity is expanding to 29.3 Bcf/d in 2024

Domestically-Produced US LNG Exported by Region (Cumulative from February 2016 through September 2023) (Bcf, %)



- ❑ EU adding Regasification Capacity - Energy Security and Russia effect
 - Germany is adding the most LNG regasification capacity
 - the Netherlands, Spain, Italy, Finland, and France increased regasification capacities in 2023
 - Belgium, Greece, Poland, Netherlands, and Cyprus to add a combined 1.8 Bcf/d of new capacity by 2024

US LNG Export & Supply

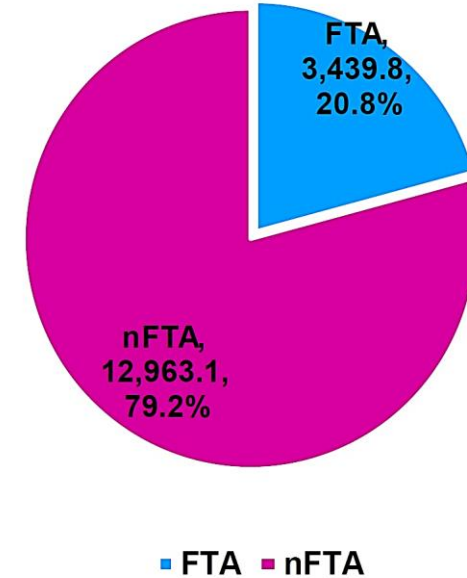
- In 2020, the U.S. exported almost 2,400 Bcf of LNG
 - ✓ delivered to 40 countries on five continents.
 - The U.S. still imports some LNG, mostly to New England, - constrained by limited pipeline and storage capacity.
- LNG exports to countries with a US/free trade agreement (FTA) or to import LNG from any source are deemed automatically in the public interest.
- DOE to evaluate applications to export LNG to non-FTA countries
 - *Critical step for securing financing and construction.*

Volumes and Percentages of US LNG Delivered to FTA and NON-FTA Countries

(Cumulative from February 2016 through September 2023)

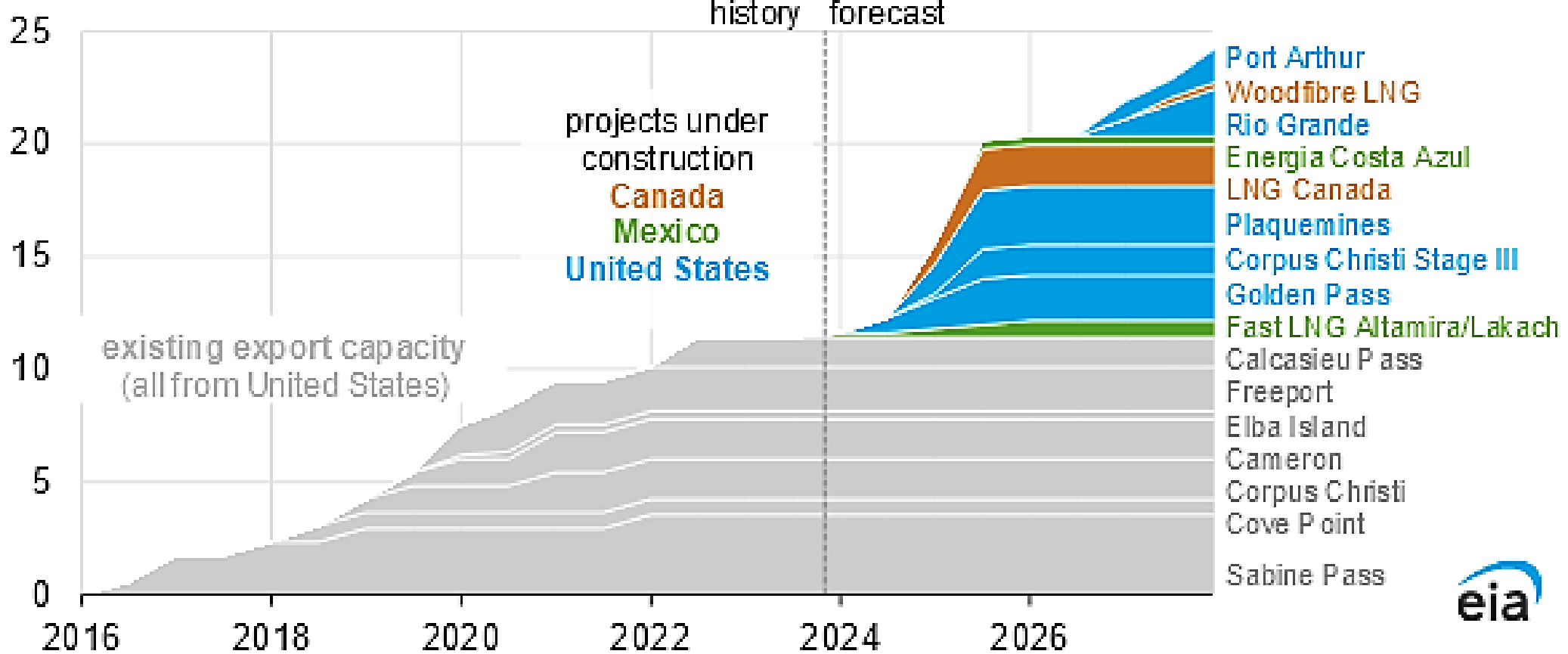
- The US has FTAs *requiring national treatment for trade in natural gas* with
 - ✓ Australia, Bahrain, Canada, Chile, Colombia, Dominican Republic, El Salvador, Guatemala, Honduras, Jordan, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Republic of Korea and Singapore.
 - ✓ Panama is the most recent country to sign an FTA with the US
- FTA with Costa Rica and Israel do not require national treatment for trade in natural gas
 - ✓ International trade law principle for giving others the same treatment as one's own nationals.

	Volume (Bcf)	Percentage of Total Volume	Number of Countries
FTA	3,487.9	20.8%	10
nFTA	13,265.3	79.2%	35
Total LNG Exports	16,753.1	100.0%	45



Annual North American liquefied natural gas export capacity by project (2016–2027)

billion cubic feet per day



✓ LNG export capacity from North America is likely to more than double through 2027

To what extent will or should existing US capacity increase after the recent DOE pause/review?



Conclusion

Energy Security and Sustainable Energy Policy



Thank you for listening...

