

U.S. LNG Exports – Catch a Wave!

NARO Convention
Oct. 4, 2019

LNG  Allies™
THE US LNG ASSOCIATION



LNG Allies

The US LNG Association

LNG Allies – Advocacy Coalition

- Founded in March 2014
- Principal funding from U.S. industry
- Close cooperation with EU governments
- Highlight geostrategic advantages of U.S. LNG exports

LNG Allies – Association

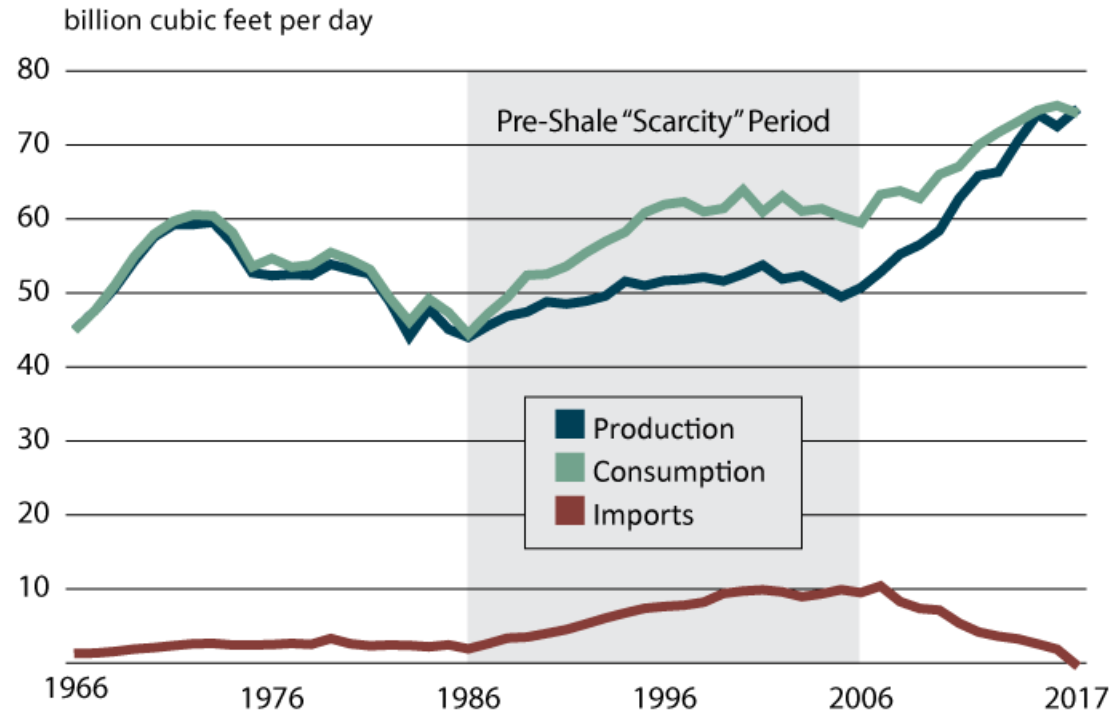
- Now trade association of the U.S. LNG export industry and select upstream/midstream companies
- Global reach (but remaining closely aligned with U.S. allies in Europe)
- Highlight all benefits of U.S. LNG exports

LNG Allies – Mission

To expedite and maximize LNG exports to create U.S. jobs and economic growth, enhance the energy security of America's allies, and improve economic and environmental conditions worldwide.

Shale Changes Everything

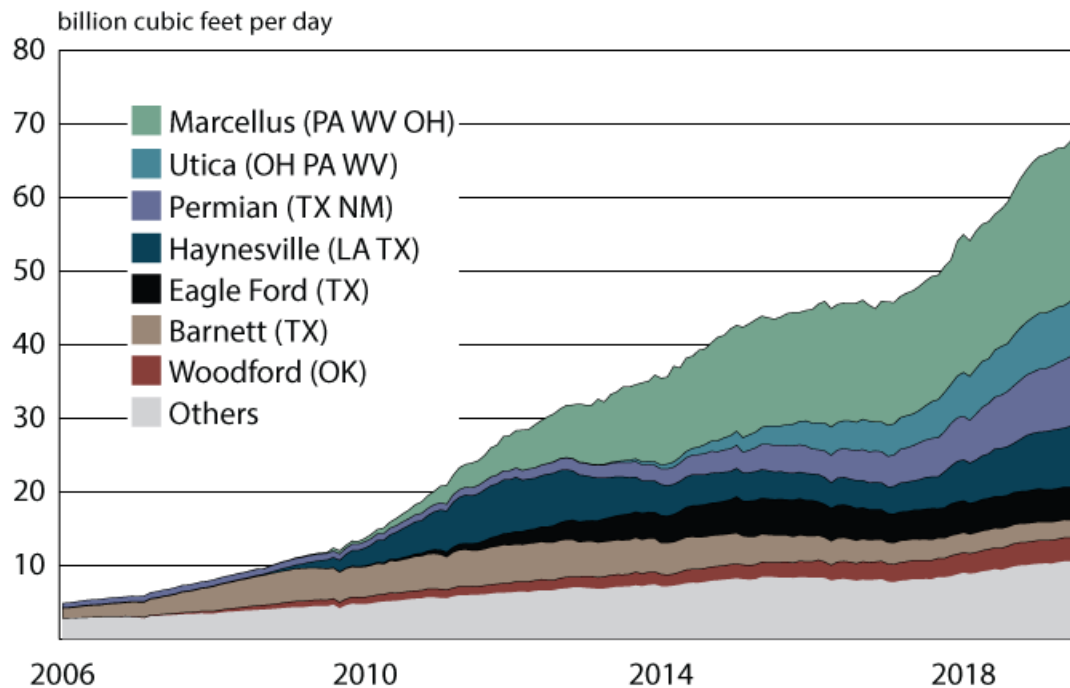
U.S. Natural Gas Production, Consumption, Imports



Source: EIA Monthly Energy Review (Jan. 2019)

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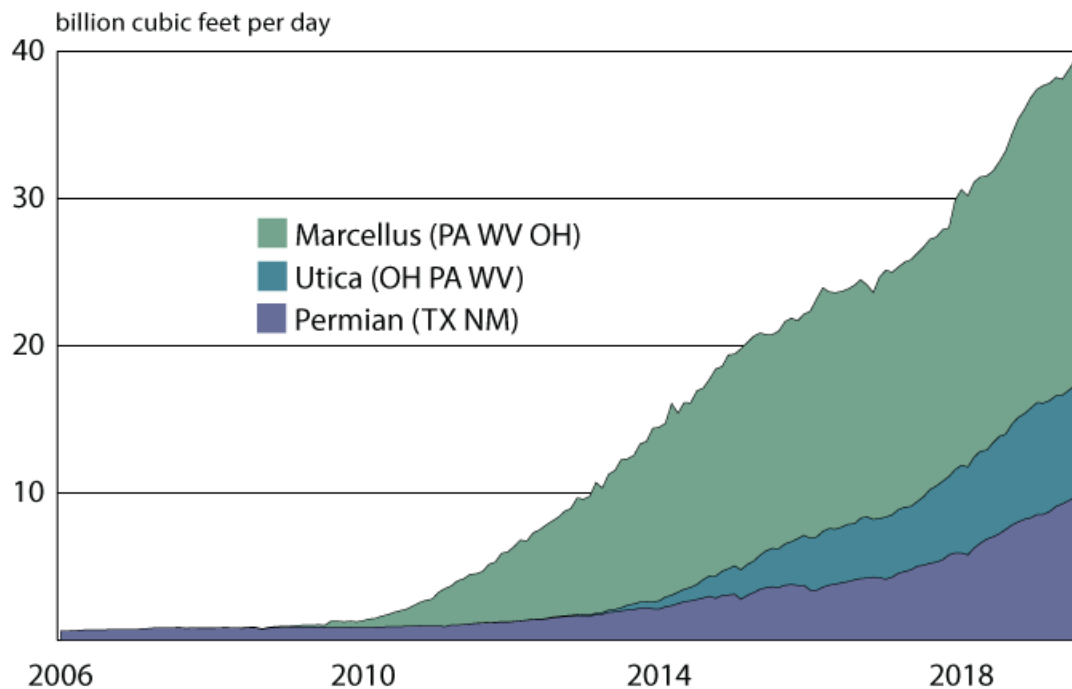
U.S. Dry Shale Gas Production by Basin



Source: EIA Natural Gas Weekly Update (07 Aug. 2019)

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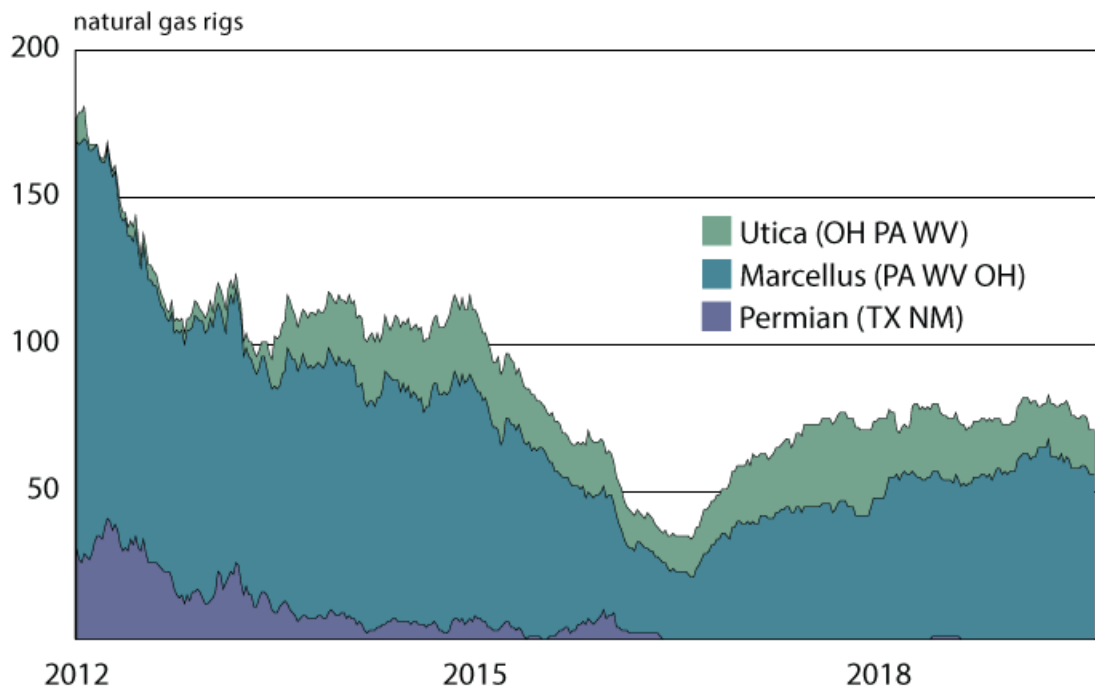
Permian, Utica, Marcellus Shale Gas Production



Source: EIA Natural Gas Weekly Update (07 Aug. 2019)

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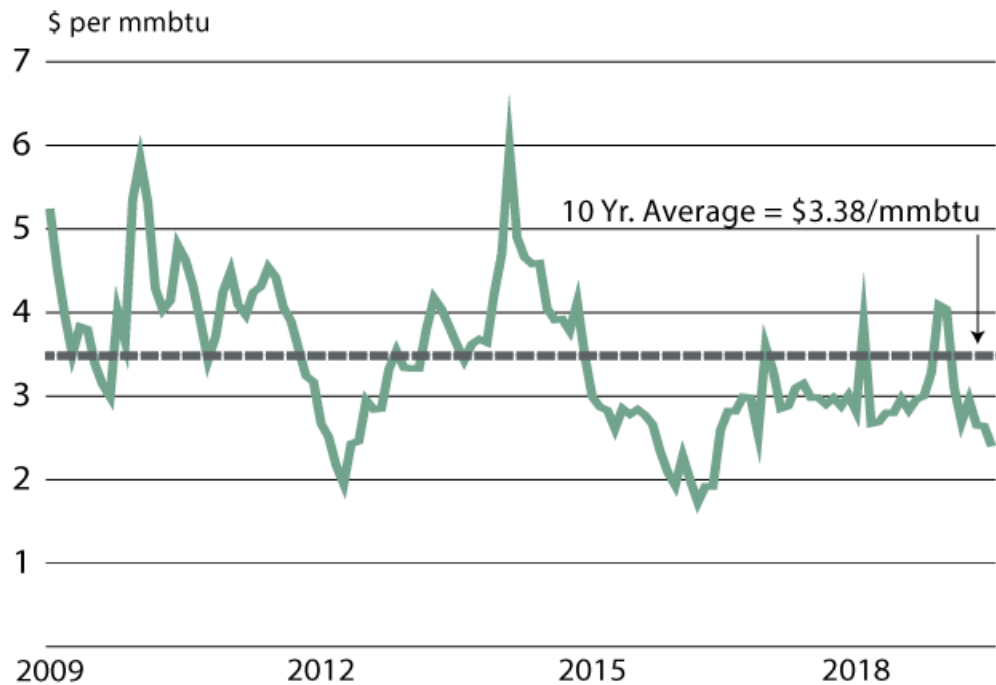
Permian, Utica, Marcellus Weekly Gas Rig Count



Source: Baker Hughes GE (09 Aug. 2019)

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Monthly Henry Hub Spot Prices - Past 10 Years



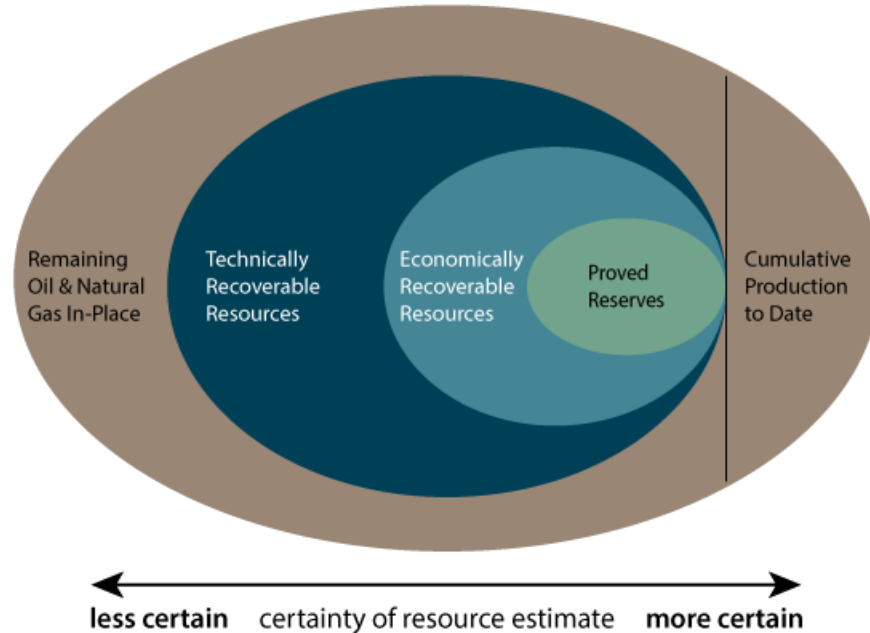
Source: EIA & Thomson Reuters (Data to June 2019)

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Will It (The Shale Revolution) Last?

Oil and Natural Gas Supply Categories

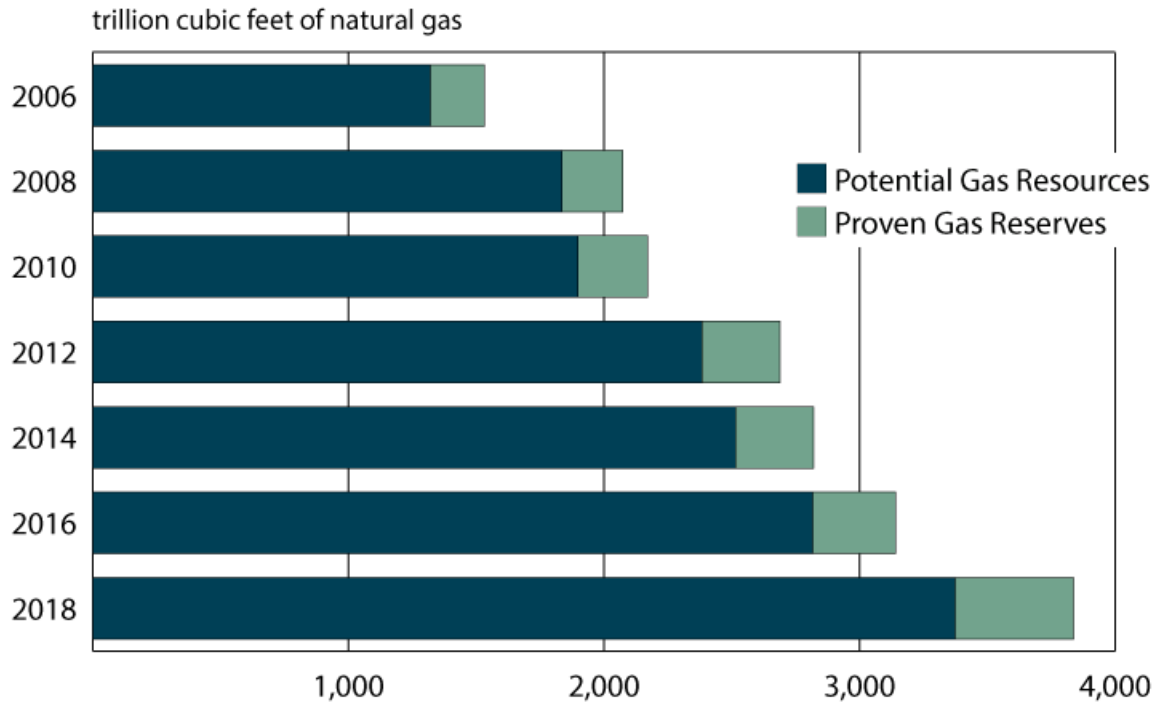
Stylized representation of oil and natural gas categorizations (not to scale)



Source: U.S. Energy Information Administration

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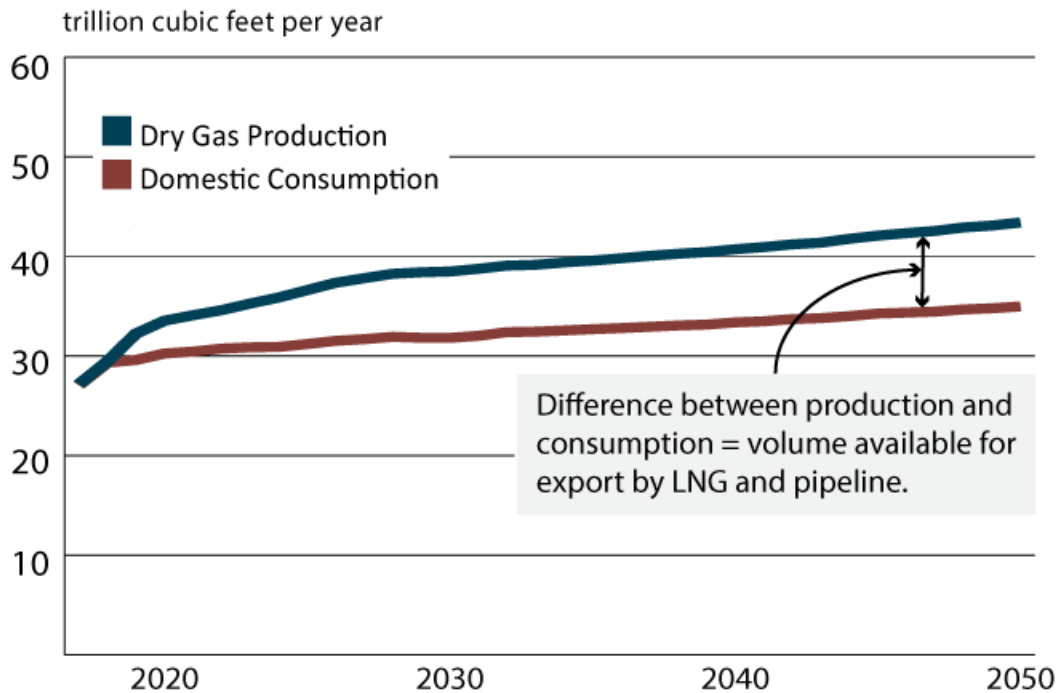
U.S. Future Gas Supply (Resources + Reserves)*



Sources: Potential Gas Committee (Resources); EIA (Reserves)

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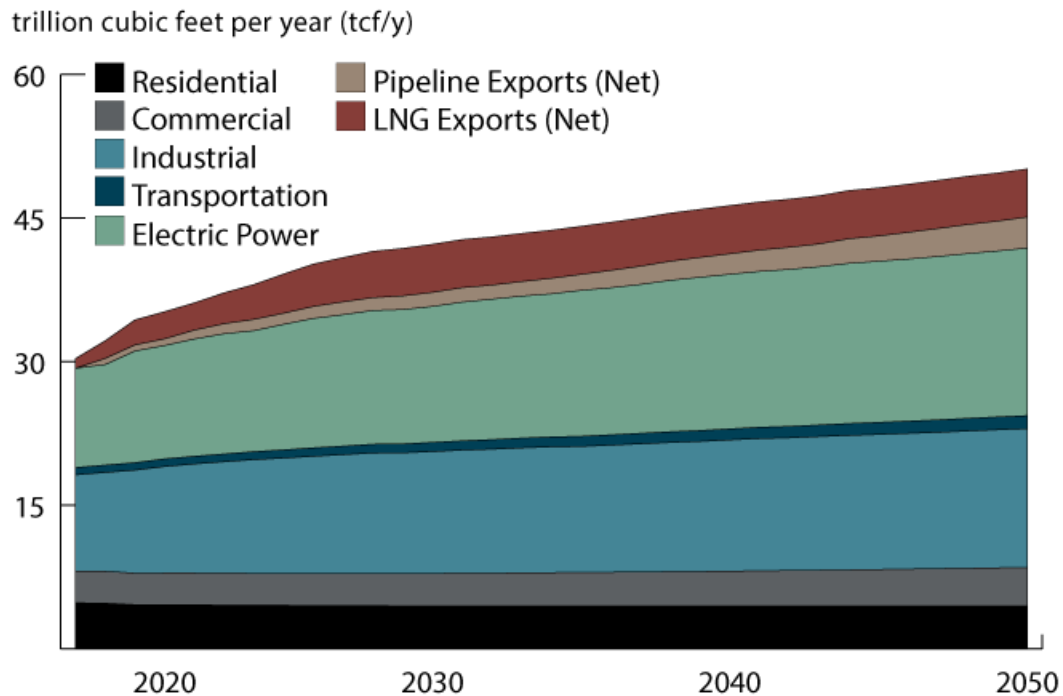
U.S. Natural Gas Production and Consumption



Source: EIA Annual Energy Outlook - 2019 (Reference Case)

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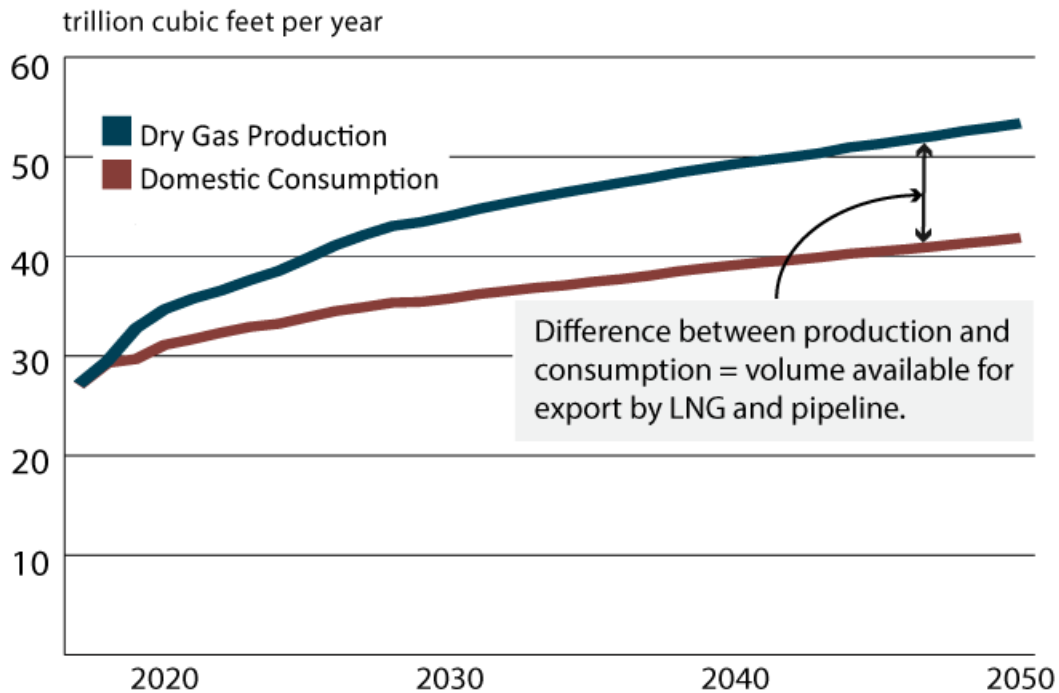
U.S. Natural Gas Consumption by Sector



Source: EIA Annual Energy Outlook 2019 (Reference Case)

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U.S. Natural Gas Production and Consumption

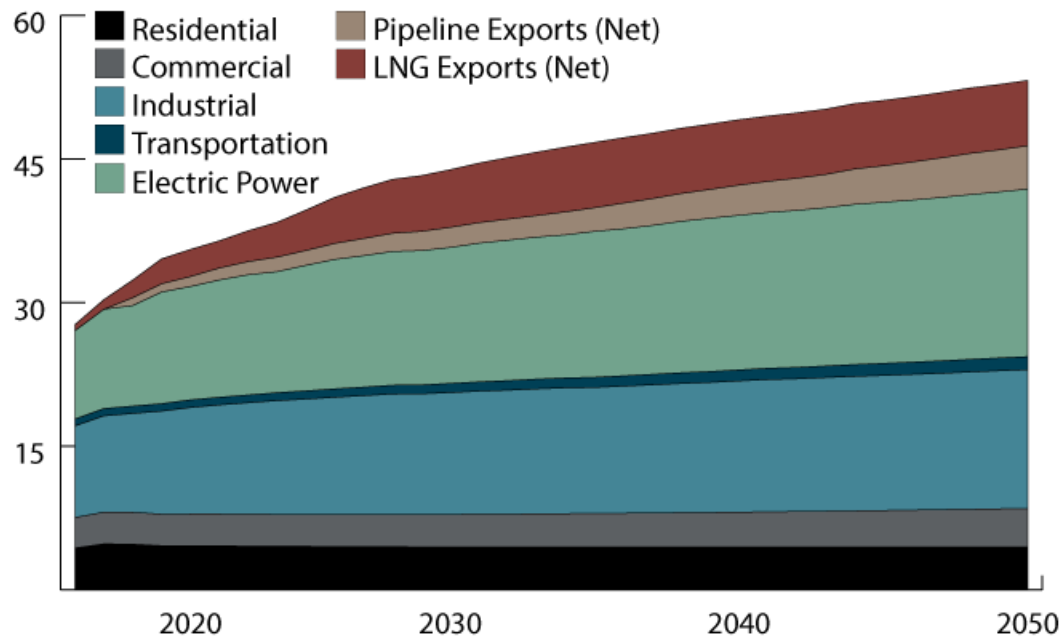


Source: EIA Annual Energy Outlook - 2019 (High Oil & Gas Case)

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U.S. Natural Gas Consumption by Sector

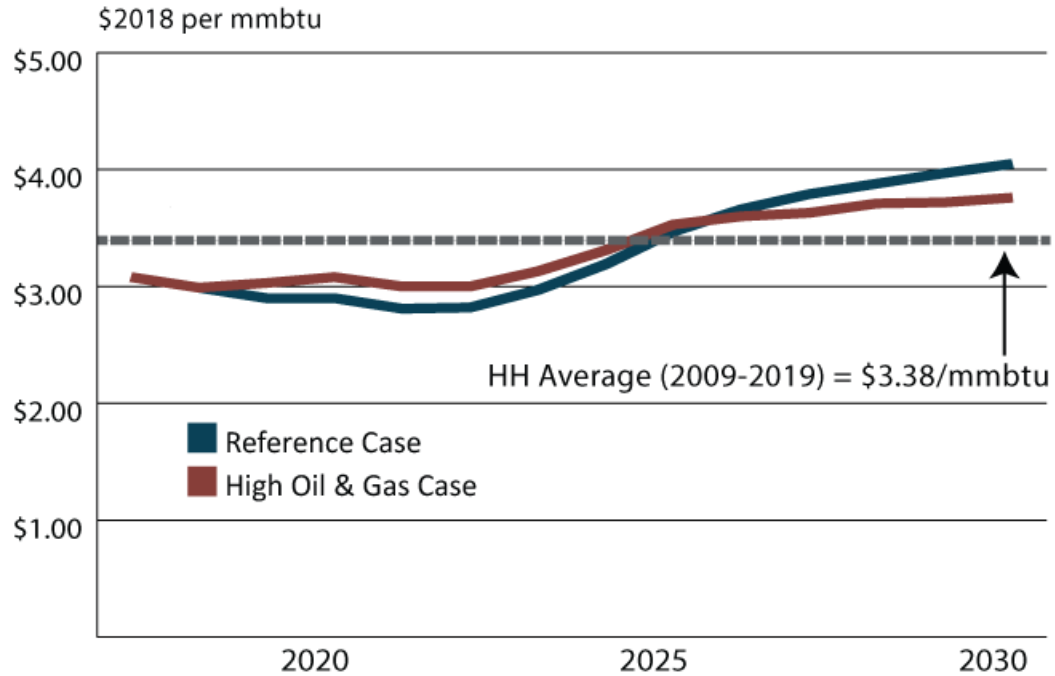
trillion cubic feet per year (tcf/y)



Source: EIA Annual Energy Outlook 2019 (High Oil & Gas Case)

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U.S. Natural Gas Price Forecasts (Henry Hub)



Source: EIA Annual Energy Outlook - 2019

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U.S. LNG Export Industry

U.S. LNG Export Industry

- Eight major brownfield (import) terminals adding/planning liquefaction capabilities
- Another 20+ greenfield projects proposed
- Midstream players and special purpose entities; IOCs mostly offtakers not project sponsors (XOM, Total, minority owners)

Permitting Status of Major U.S. LNG Export Projects

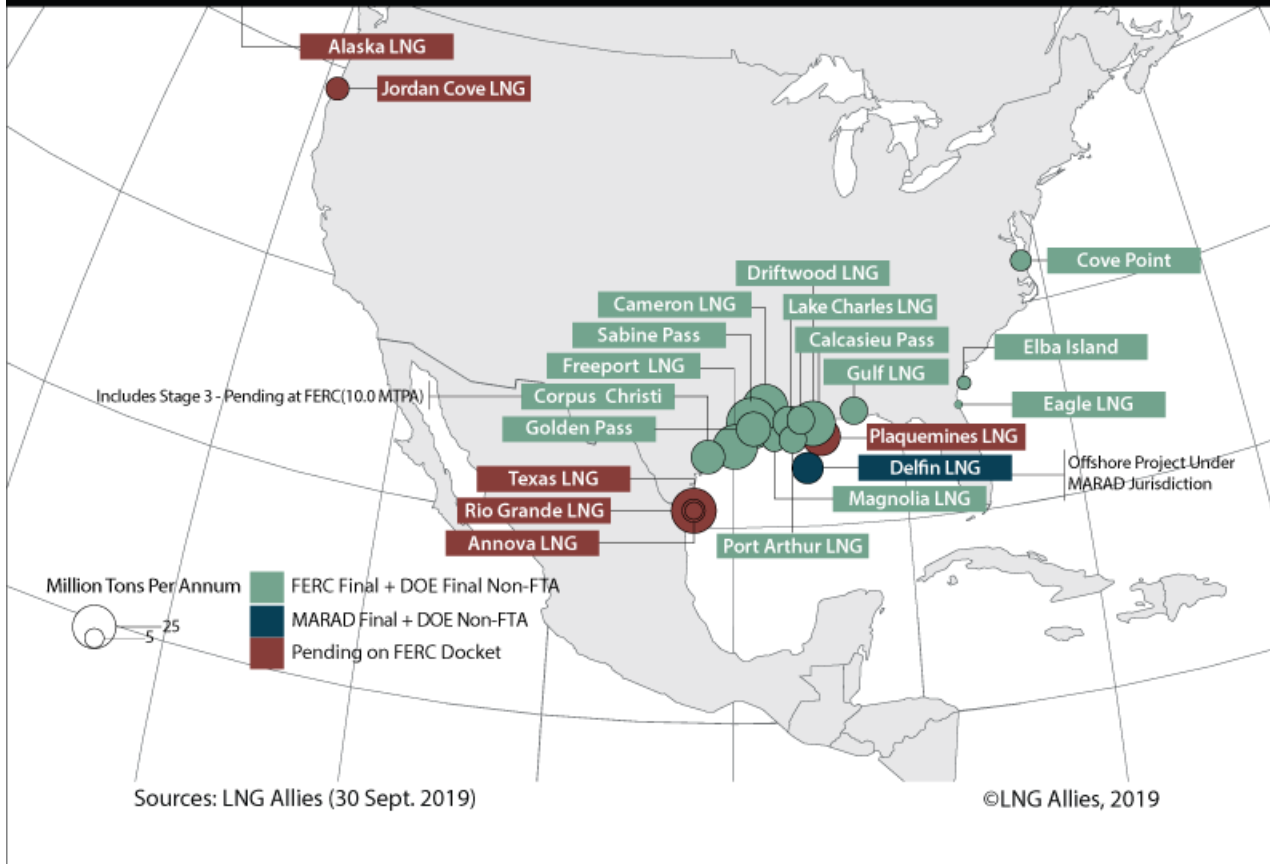
Project Stage	Projects	mtpa	bcm/yr	bcf/day
Permitted & Under Construction	8	107.9	148.8	14.2
Permitted Pre-FID	6	101.5	140.0	13.4
Formal FERC Review	8	105.0	144.8	13.8
FERC Pre-Filing	4	61.0	83.6	8.0
Total	26	375.4	517.3	49.4

Notes: (1) Projects = individual projects. (2) Additional trains for existing projects not included in the project count, but in mtpa, bcm/year, and bcf/day totals (Sabine Pass #6, Cameron #4 #5, Freeport #4, Port Arthur #3 #4). (3) This table only includes projects with a liquefaction capacity of 1.0 mtpa or greater.

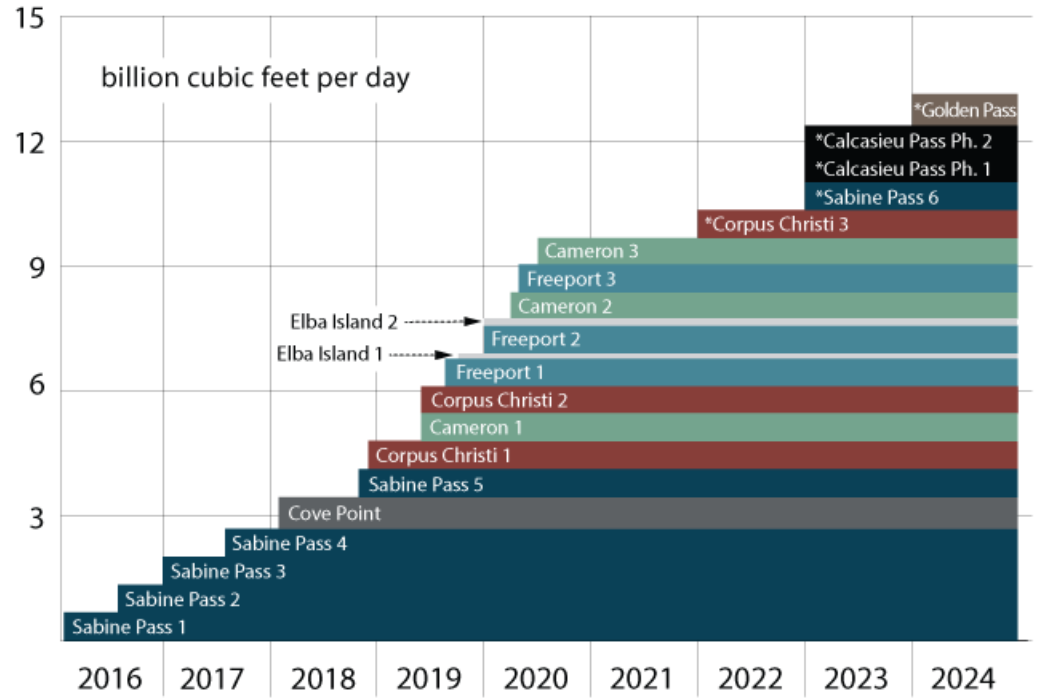
Source: Federal Energy Regulatory Commission & LNG Allies (21 Aug. 2019)

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Major U.S. LNG Export Projects - Existing & Proposed



U.S. LNG Liquefaction Capacity Growth

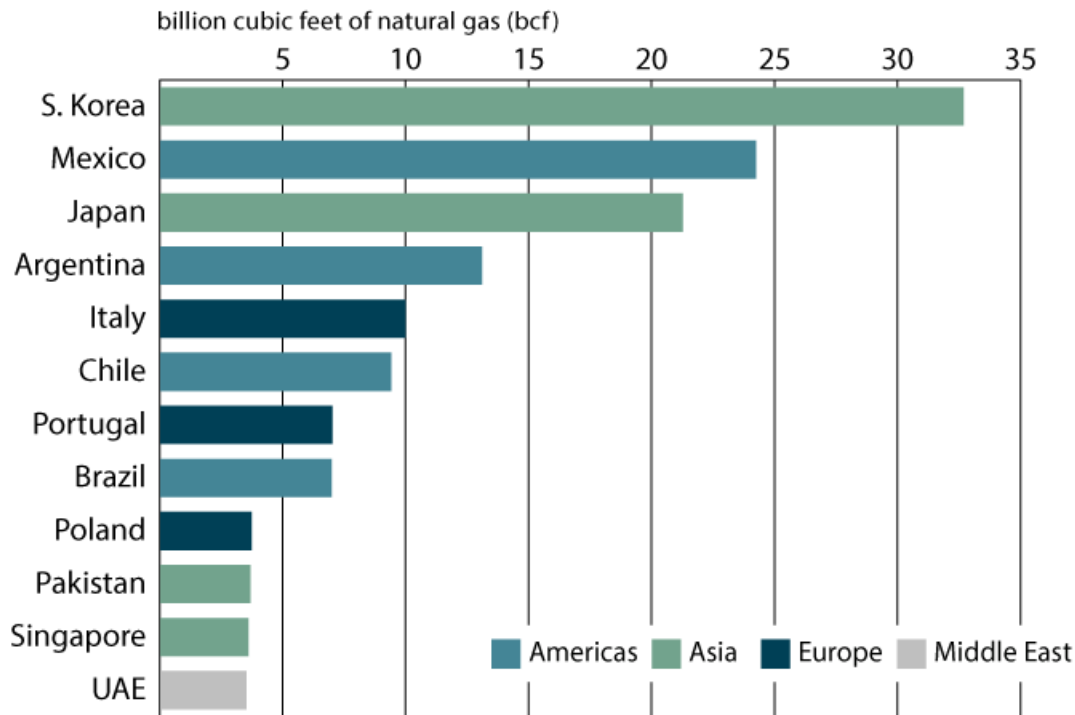


Source: EIA and LNG Allies (21 Aug 2019) *Rough Estimate Only

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U.S. LNG Exports

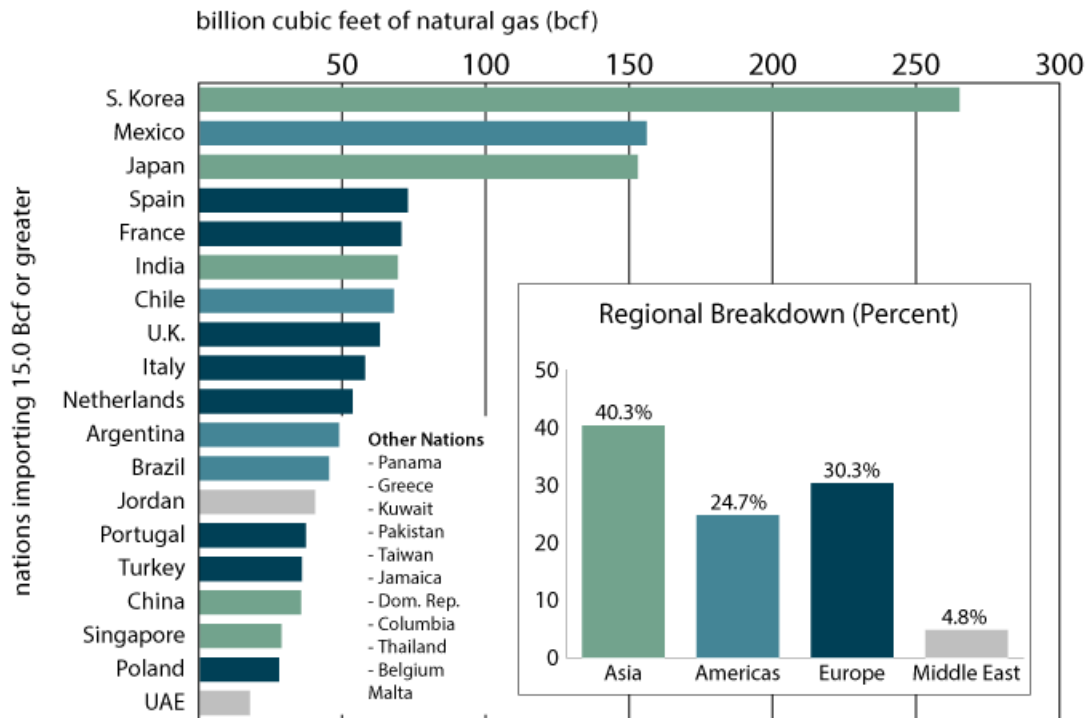
Top 12 U.S. LNG Export Destinations - July 2019



Source: DOE LNG Monthly (Data through July 2019)

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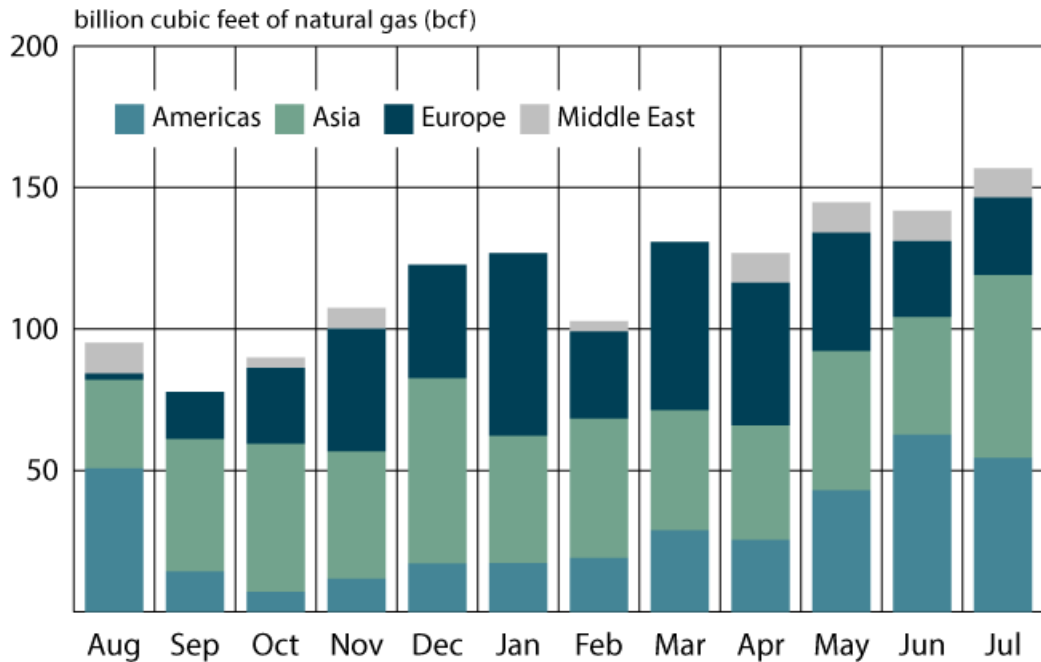
U.S. LNG Destinations - Past 12 Months



Source: DOE LNG Monthly (Data through July 2019)

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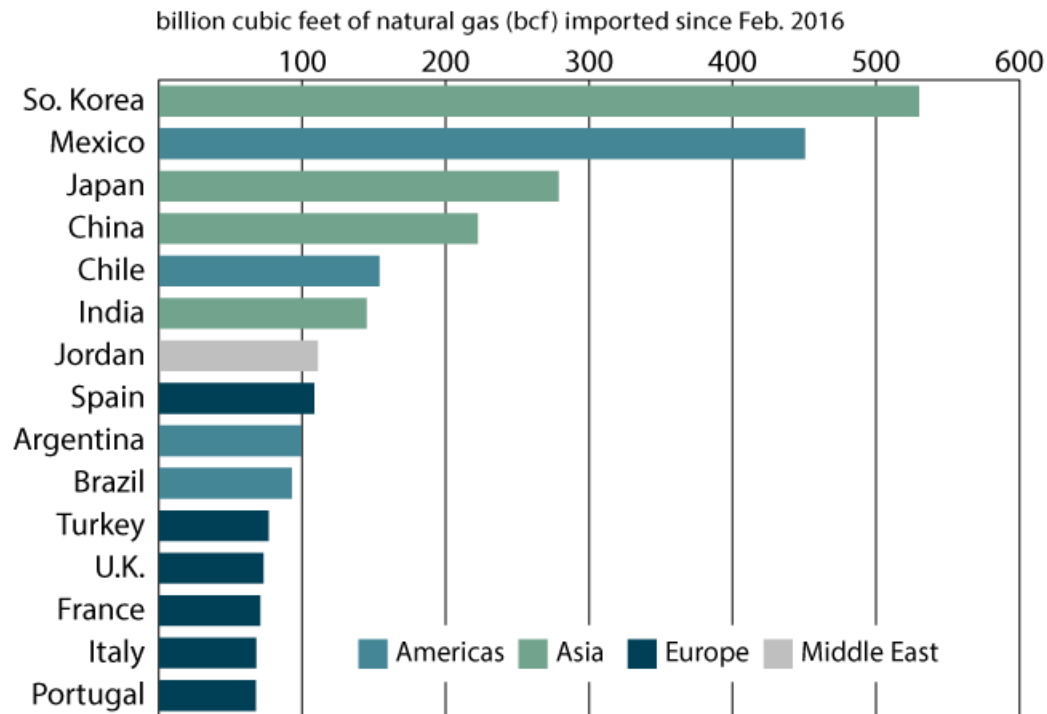
Regional Distribution of U.S. LNG - Past 12 Months



Source: DOE LNG Monthly (Data through July 2019)

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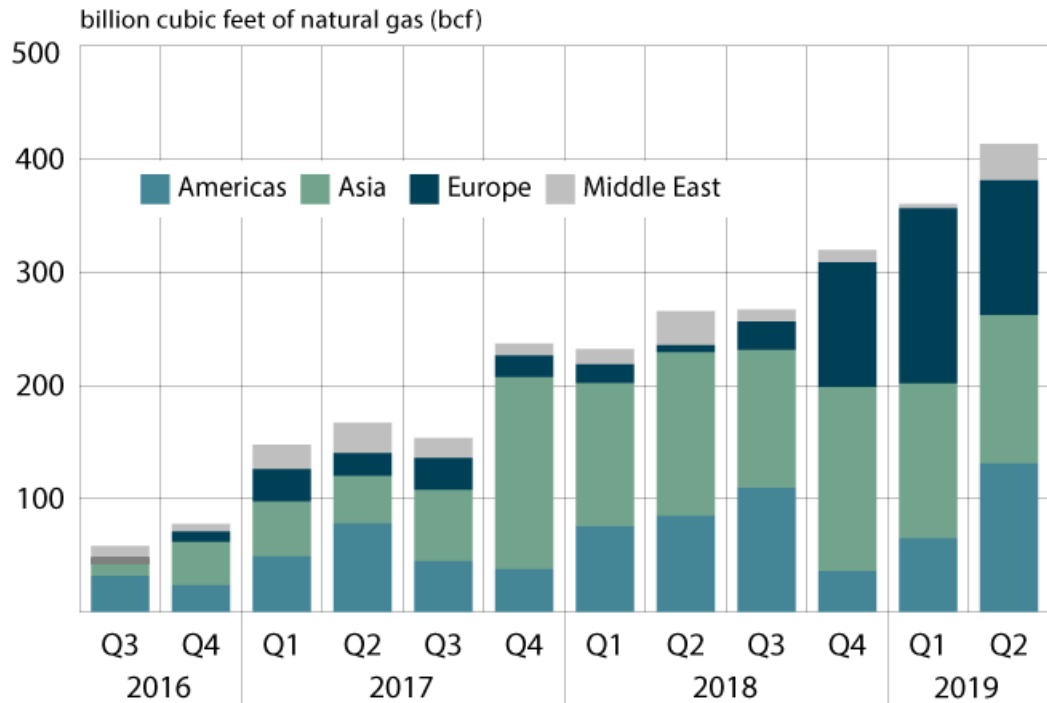
Top 15 Importers of U.S. LNG - Since Feb. 2016



Source: DOE LNG Monthly (Data through July 2019)

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Regional Distribution of U.S. LNG - Past 3 Years



Source: DOE LNG Monthly (Data through 30 June 2019)

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Environmental Benefits of U.S. Natural Gas

Powerplant Air Emissions Comparison

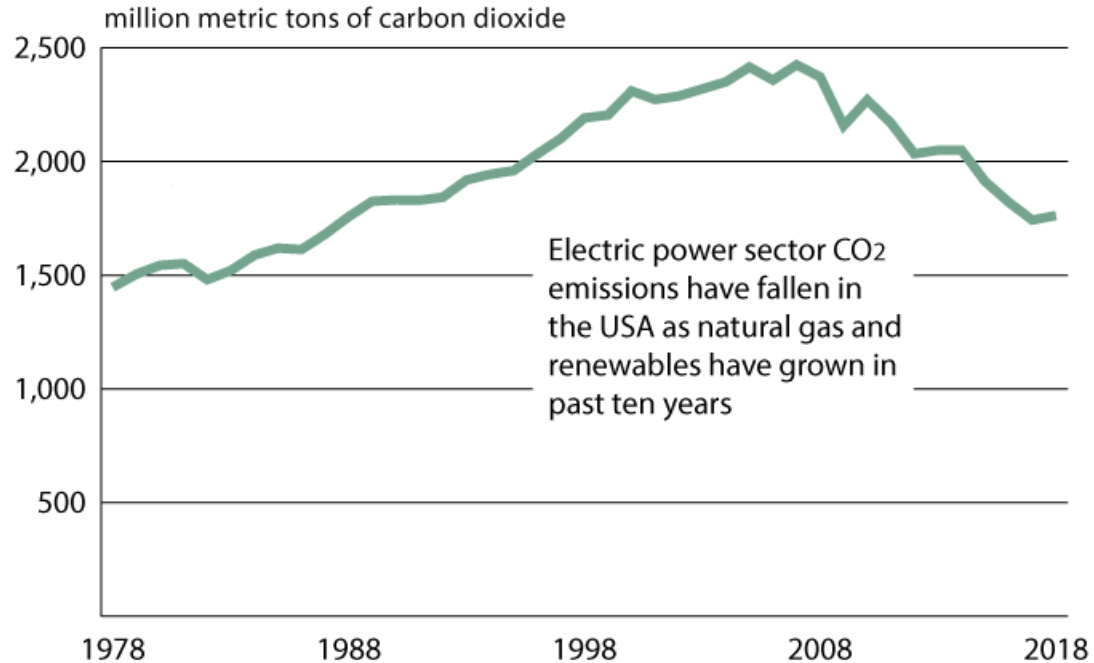
Tons per year per thousand households		Biomass (wood)	Coal	Natural Gas	Nuclear Renew.
Carbon Monoxide	CO	11	7.2	0.3	0.0
Carbon Dioxide	CO ₂	14,264	9,832	4,076	0.0
Nitrogen Oxides	NO _x	5.9	2.9	0.3	0.0
Particulate Matter	PM	0.73	0.48	0.17	0.0
Volatile Organic Comp.	VOC	0.15	0.14	0.17	0.0
Sulfur Dioxide	SO ₂	0.0	4.77	0.03	0.0
Mercury	Hg	0.0	0.0001	0.0	0.0

■ Most Emissions
 ■ Middle Emissions
 ■ Least Emissions

Source: RW Beck | Emissions from Powerplant Operations Only

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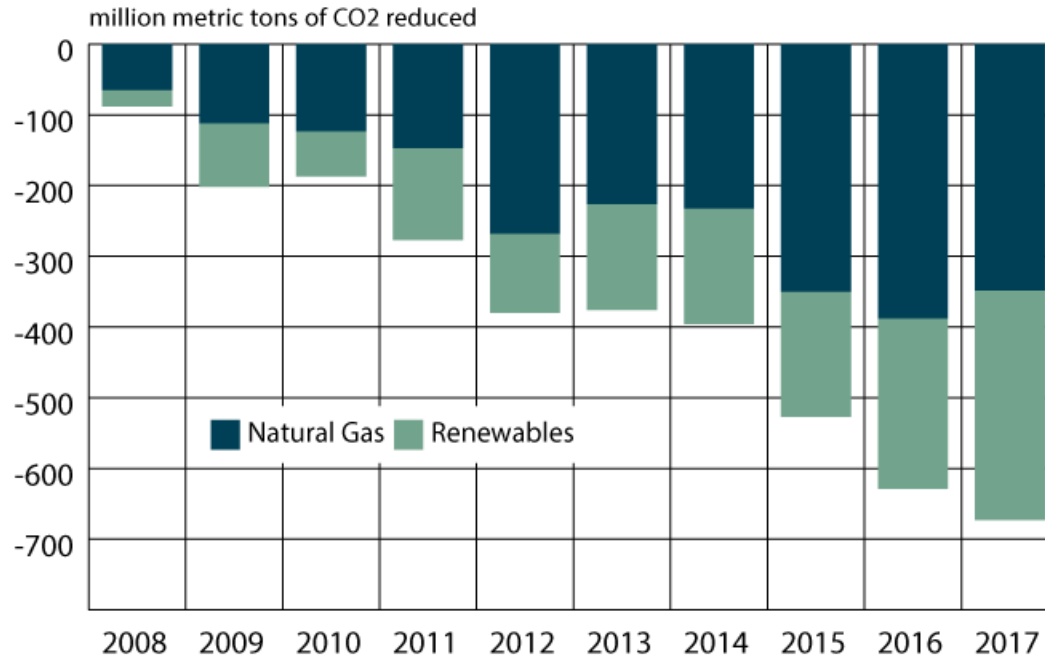
CO2 Emissions from U.S. Electric Power Sector



Source: EIA Monthly Energy Review, July 2019

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U.S. Electric Sector CO2 Reductions - Past 10 Years



Source: EIA Monthly Energy Review (Aug. 2018)

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