

U.S. LNG Exports – Catch a Wave!

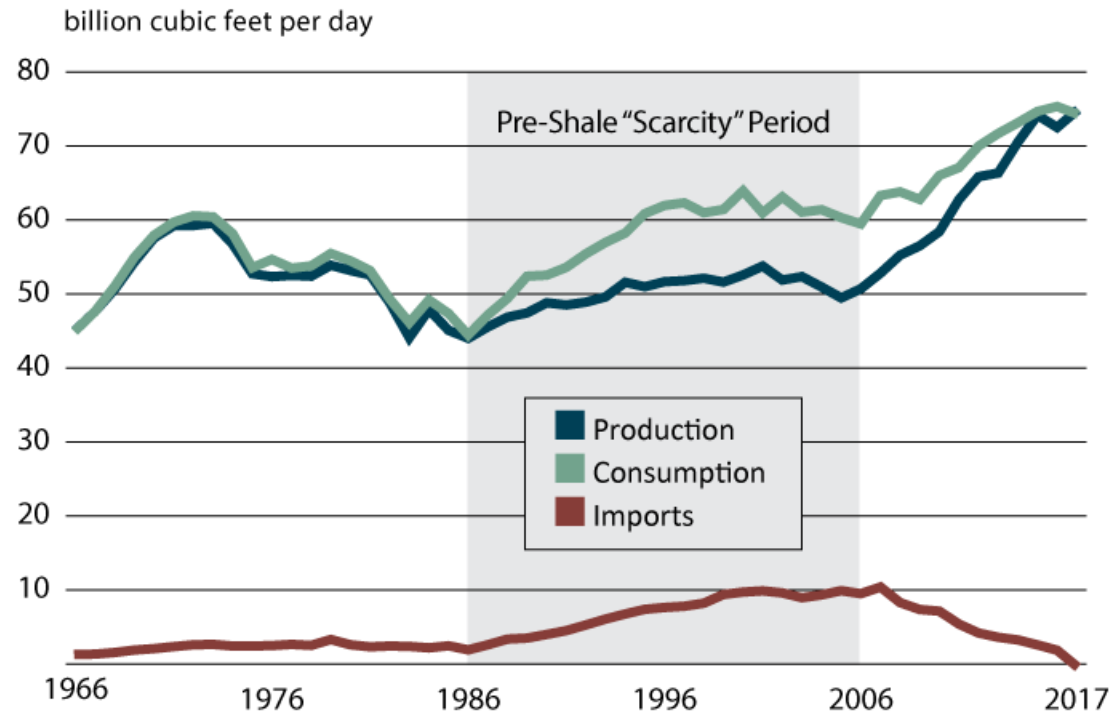
USEA 12th Annual
Energy Supply Forum
Oct. 2, 2019

LNG  Allies™
THE US LNG ASSOCIATION



Shale Changes Everything

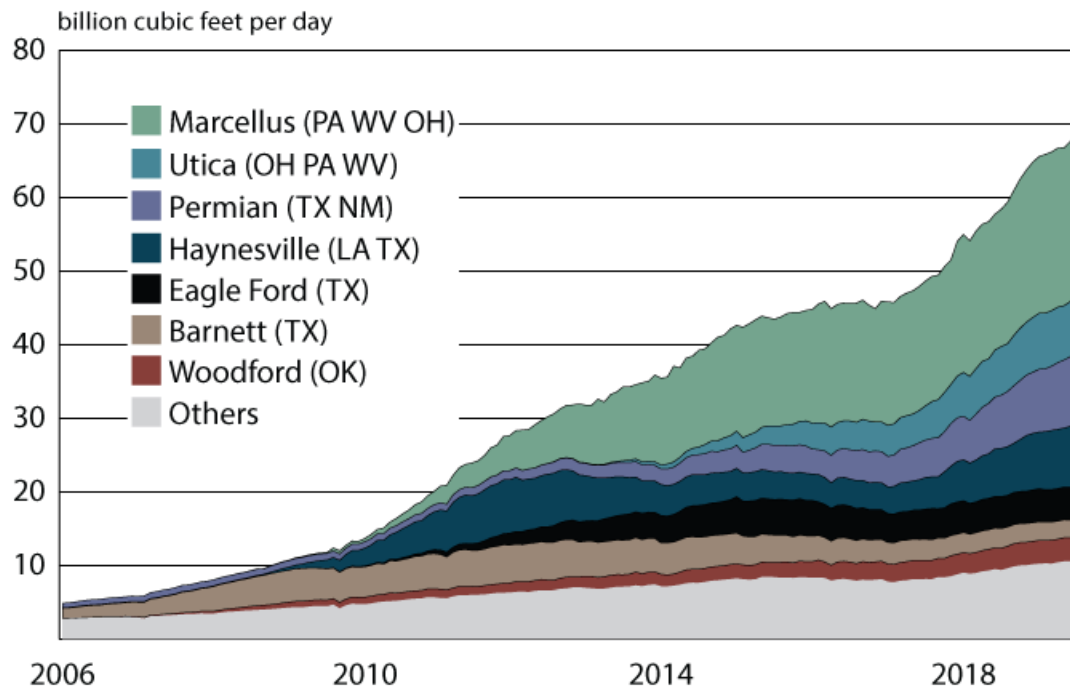
U.S. Natural Gas Production, Consumption, Imports



Source: EIA Monthly Energy Review (Jan. 2019)

©LNG Allies, 2019

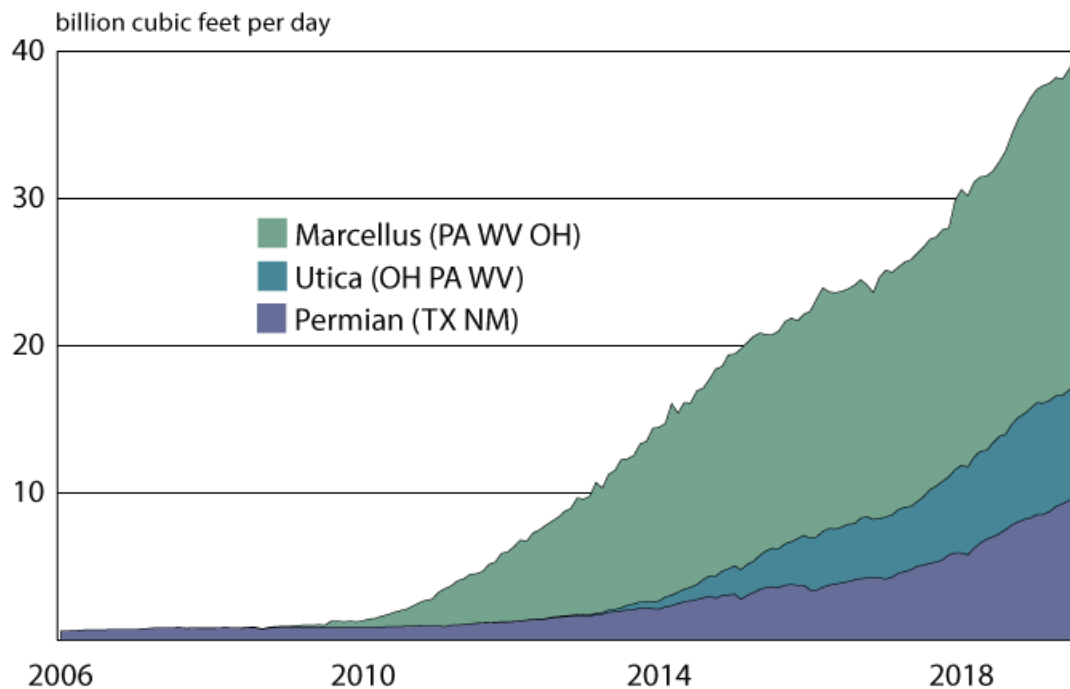
U.S. Dry Shale Gas Production by Basin



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

©LNG Allies, 2019

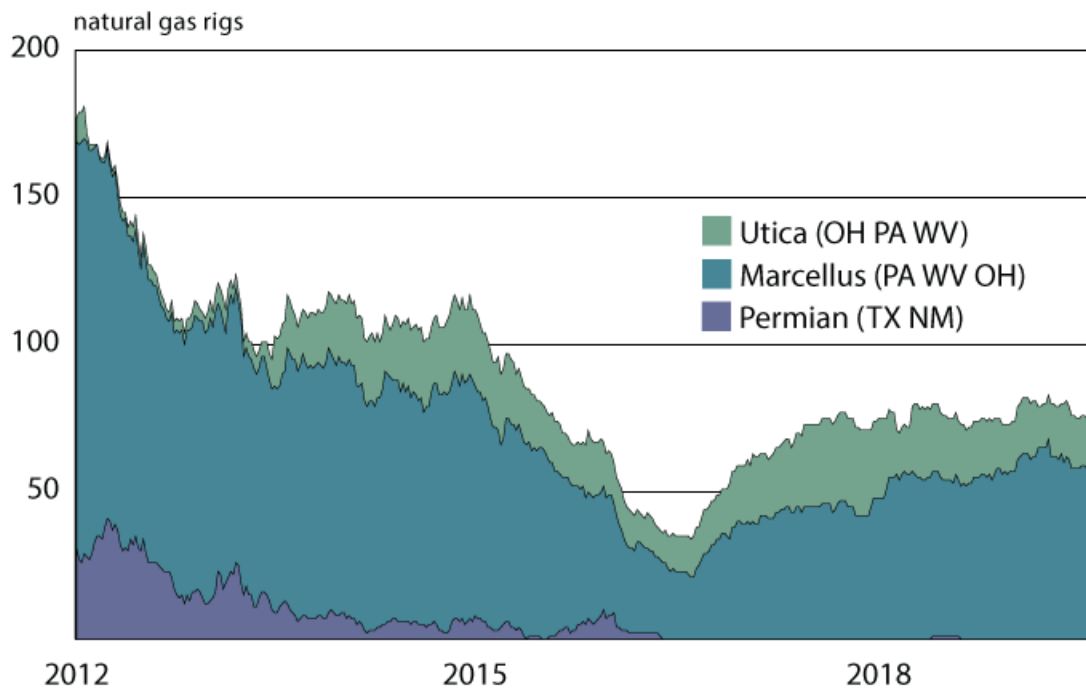
Permian, Utica, Marcellus Shale Gas Production



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

©LNG Allies, 2019

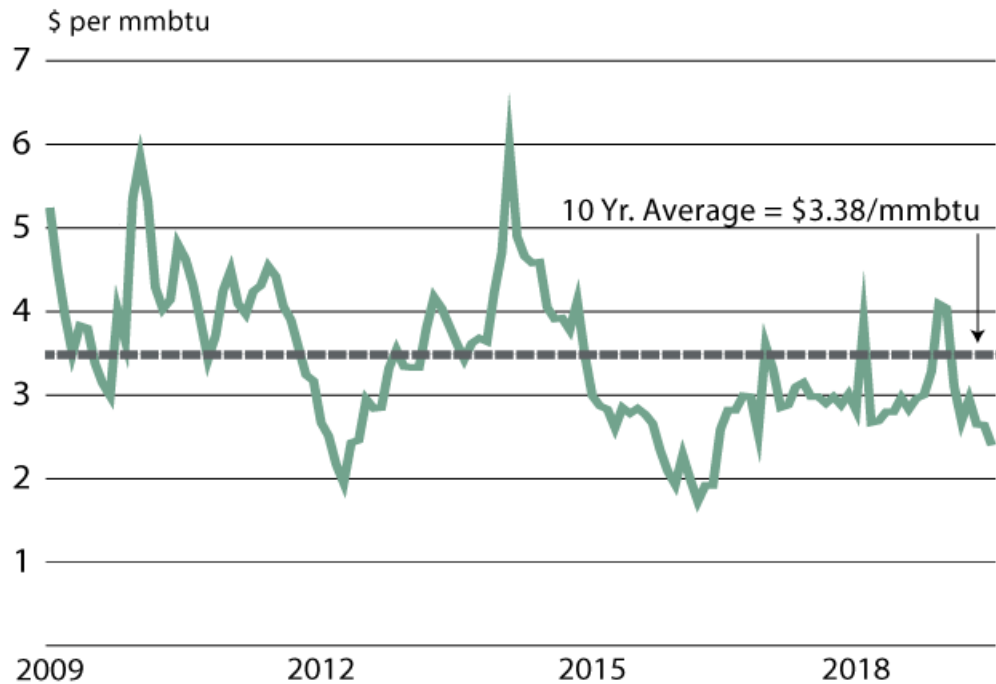
Permian, Utica, Marcellus Weekly Gas Rig Count



Source: Baker Hughes GE (09 Aug. 2019)

©LNG Allies, 2019

Monthly Henry Hub Spot Prices - Past 10 Years



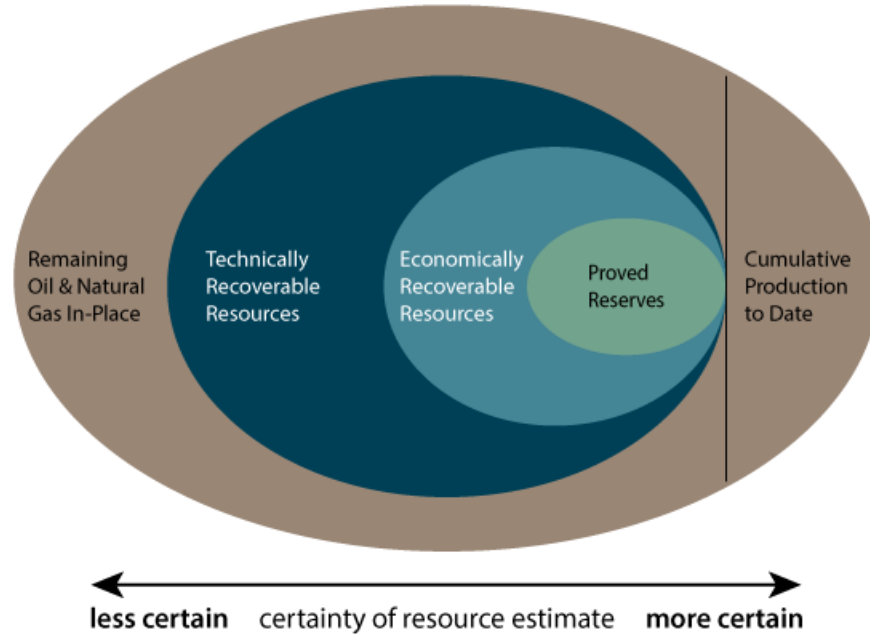
Source: EIA & Thomson Reuters (Data to June 2019)

©LNG Allies, 2019

Will It (The Shale Revolution) Last?

Oil and Natural Gas Supply Categories

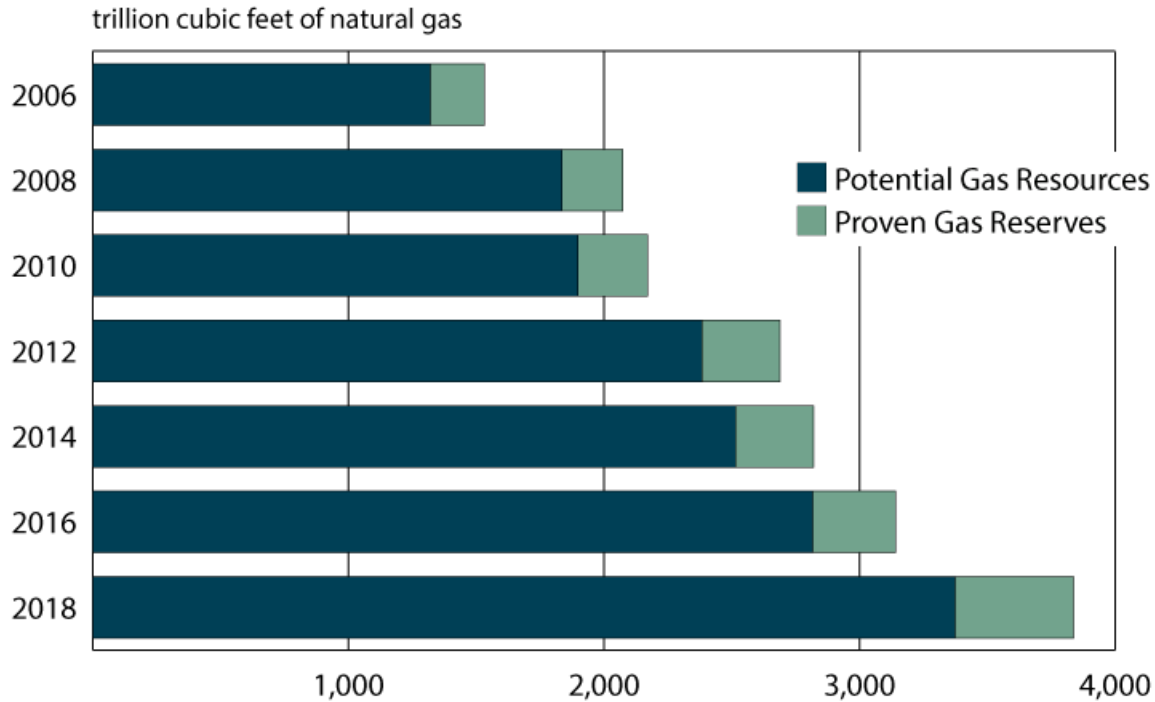
Stylized representation of oil and natural gas categorizations (not to scale)



Source: U.S. Energy Information Administration

©LNG Allies, 2019

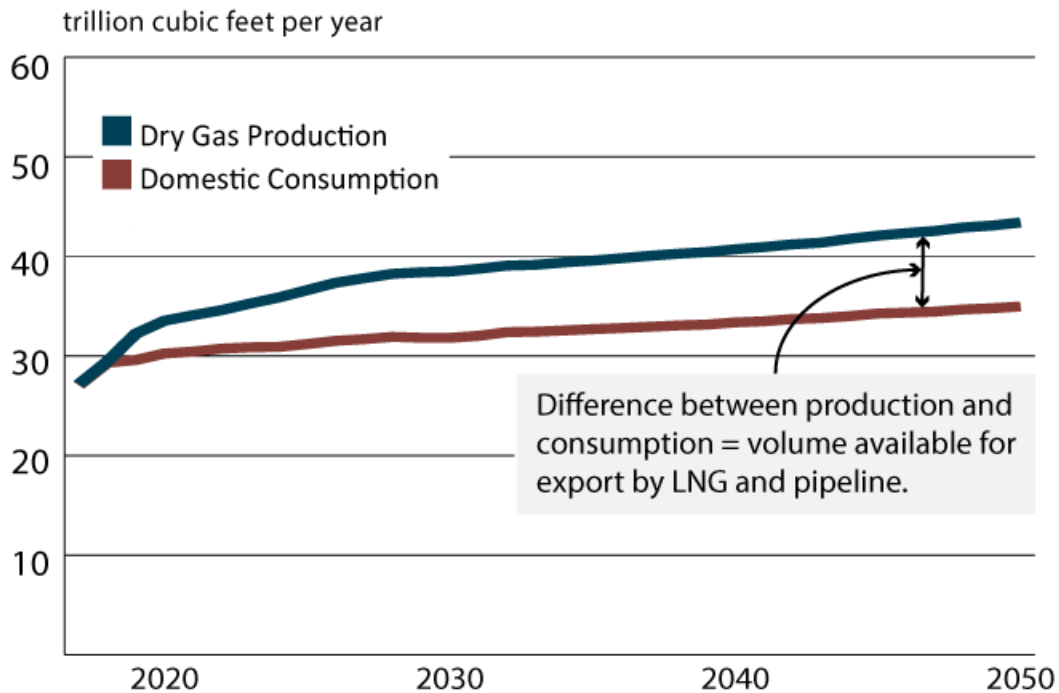
U.S. Future Gas Supply (Resources + Reserves)*



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

©LNG Allies, 2019

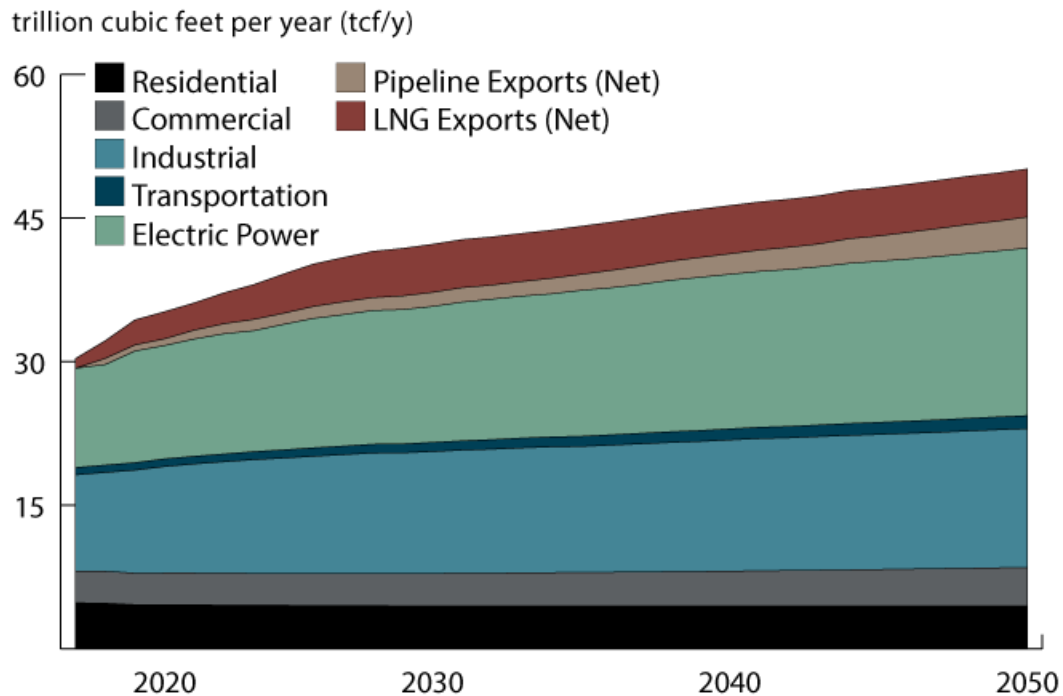
U.S. Natural Gas Production and Consumption



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

©LNG Allies, 2019

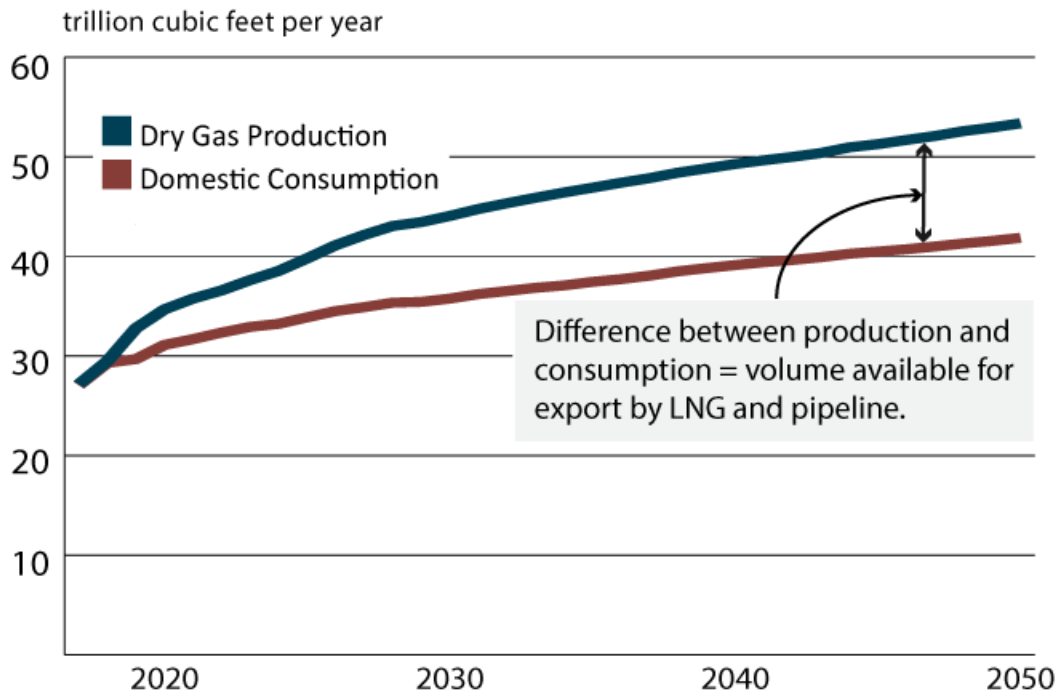
U.S. Natural Gas Consumption by Sector



Source: EIA Annual Energy Outlook 2019 (Reference Case)

©LNG Allies, 2019

U.S. Natural Gas Production and Consumption

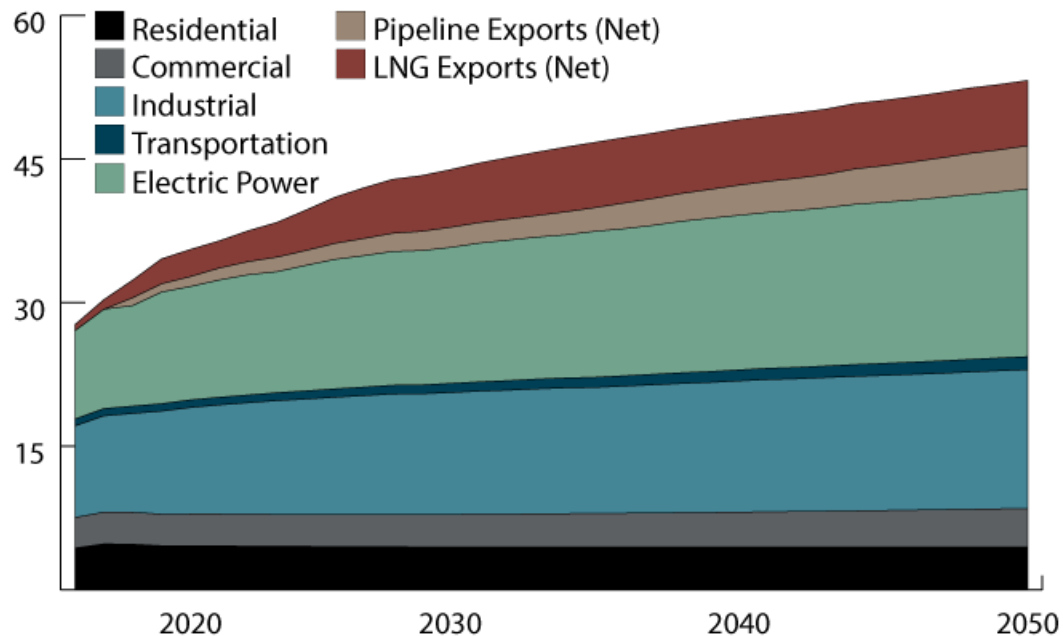


Source: EIA Annual Energy Outlook - 2019 (High Oil & Gas Case)

©LNG Allies, 2019

U.S. Natural Gas Consumption by Sector

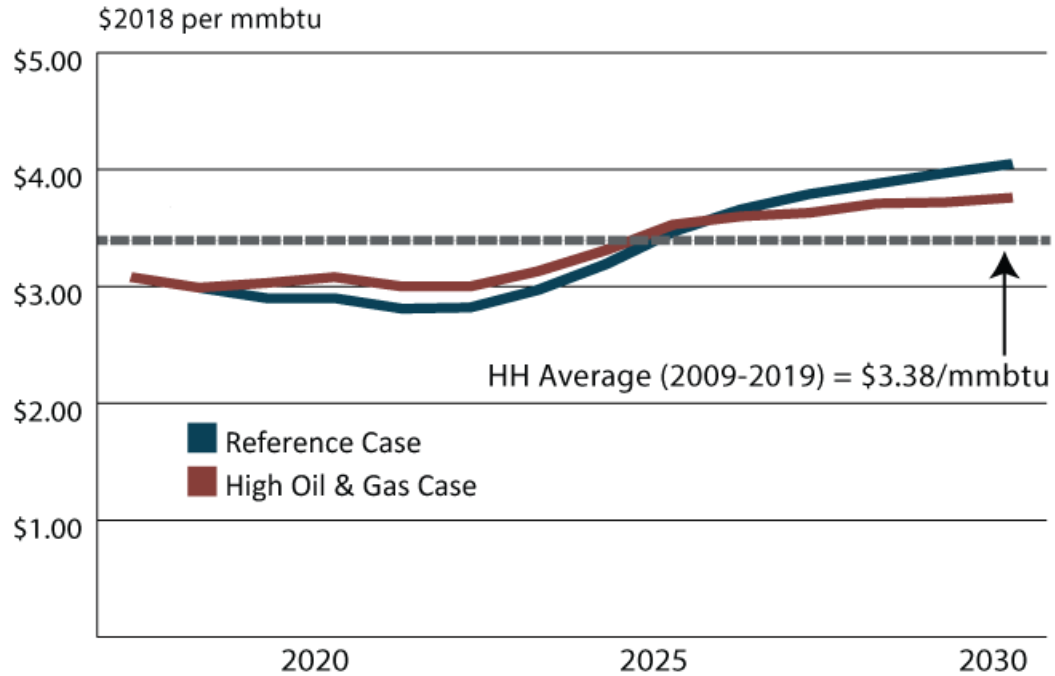
trillion cubic feet per year (tcf/y)



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

©LNG Allies, 2019

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



Source: EIA Annual Energy Outlook - 2019

©LNG Allies, 2019

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

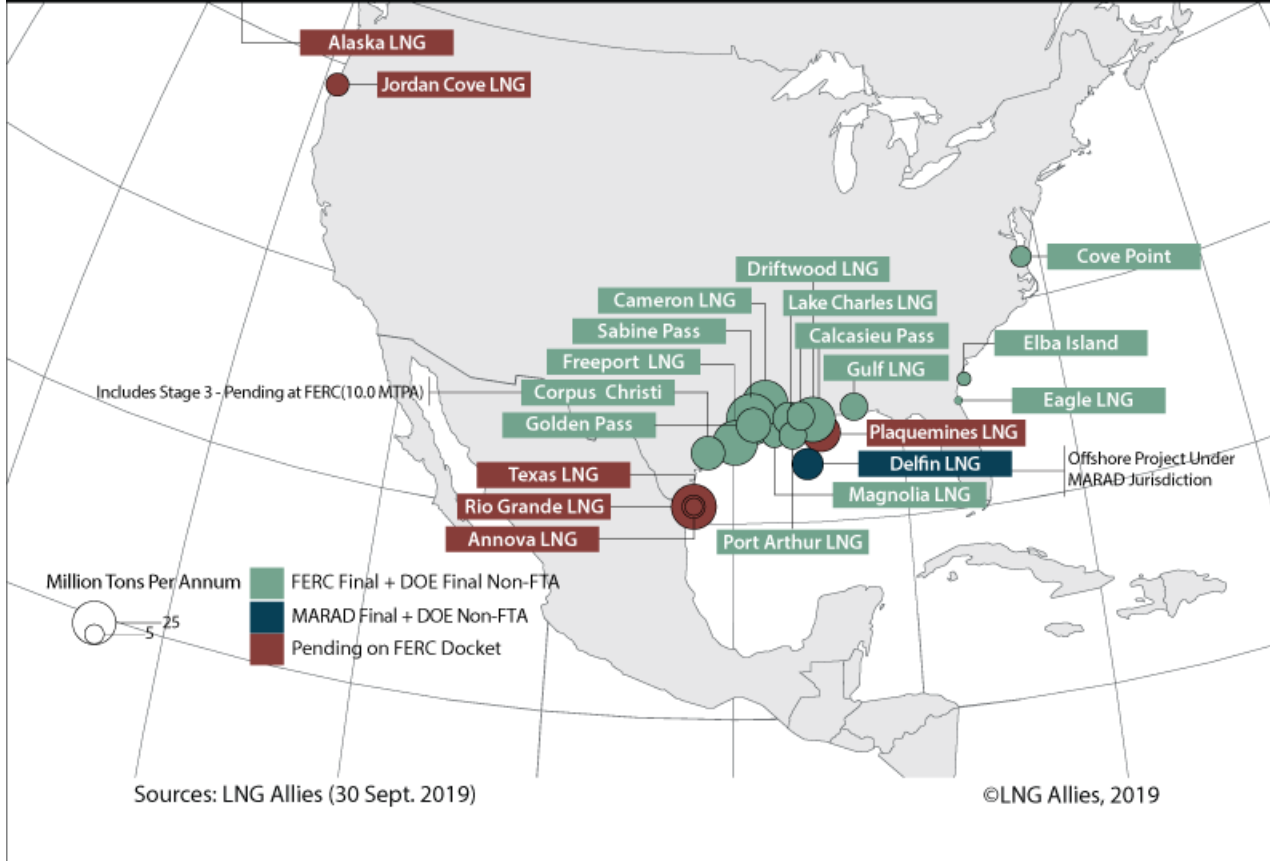
Project Stage	Projects	mtpa	bcm/yr	bcf/day
Permitted & Under Construction	8	107.9	148.8	14.2
Permitted Pre-FID	6	101.5	140.0	13.4
Formal FERC Review	8	105.0	144.8	13.8
FERC Pre-Filing	4	61.0	83.6	8.0
Total	26	375.4	517.3	49.4

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.

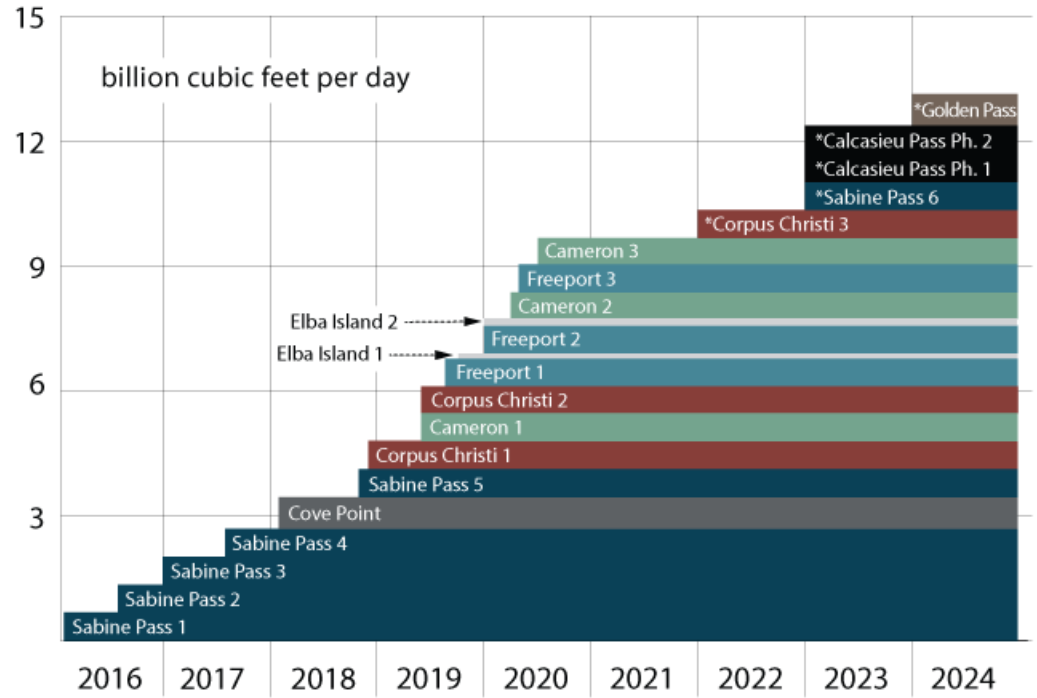
Source: Federal Energy Regulatory Commission & LNG Allies (21 Aug. 2019)

©LNG Allies, 2019

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



U.S. LNG Liquefaction Capacity Growth

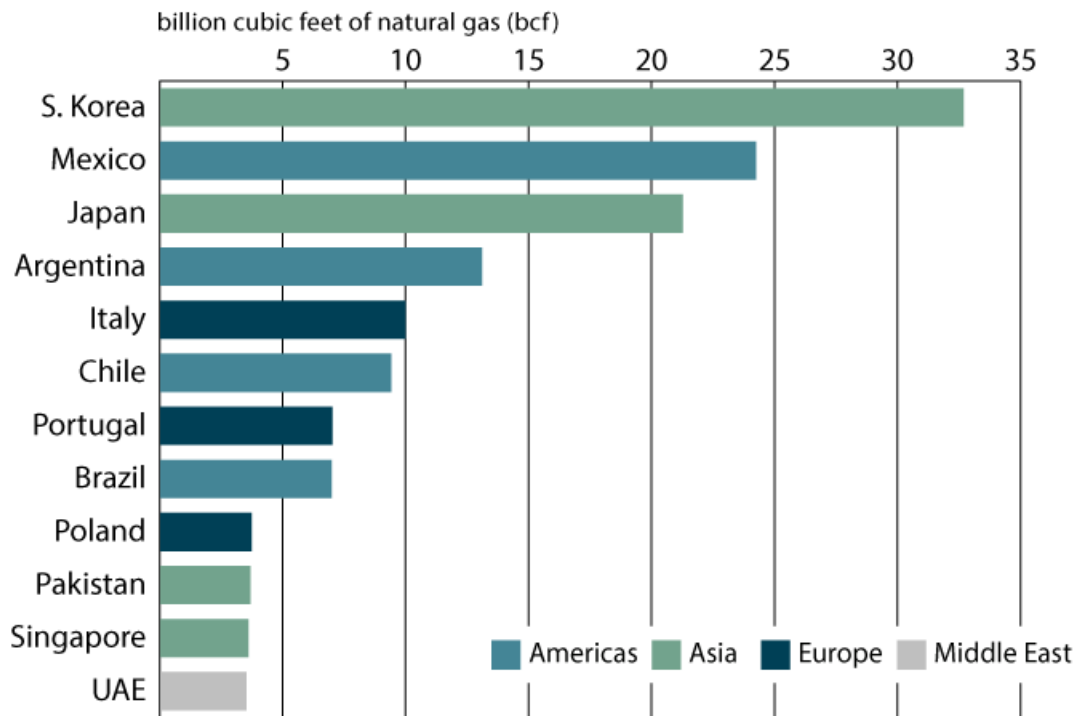


Source: EIA and LNG Allies (21 Aug 2019) *Rough Estimate Only

©LNG Allies, 2019

U.S. LNG Exports

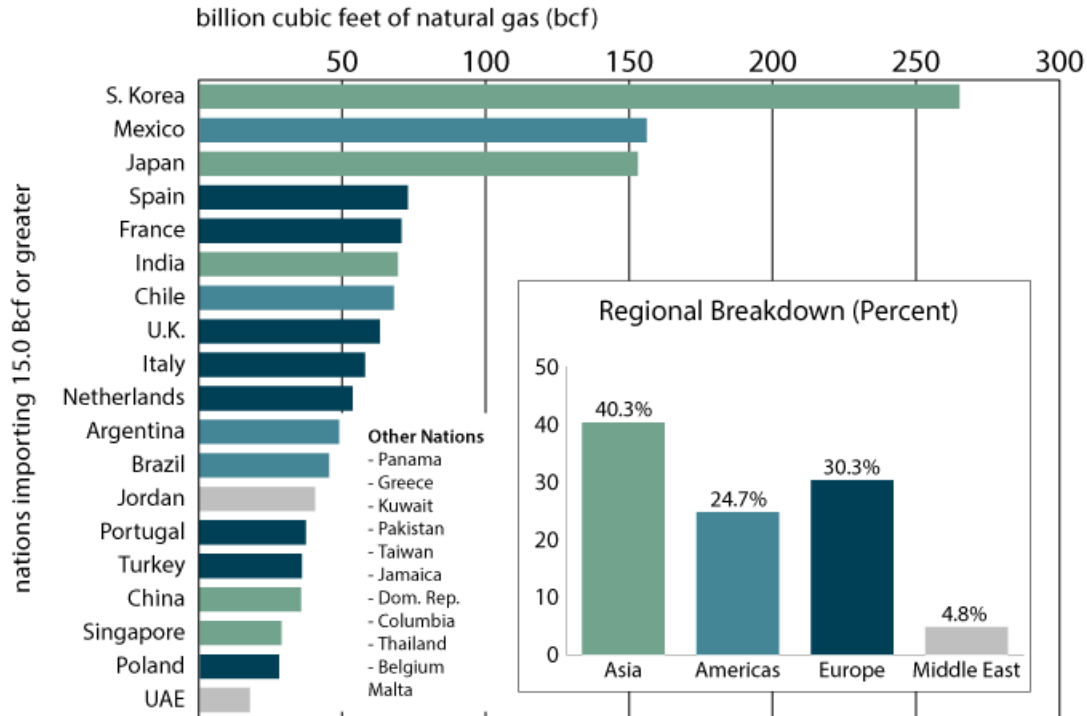
Top 12 U.S. LNG Export Destinations - July 2019



Source: DOE LNG Monthly (Data through July 2019)

©LNG Allies, 2019

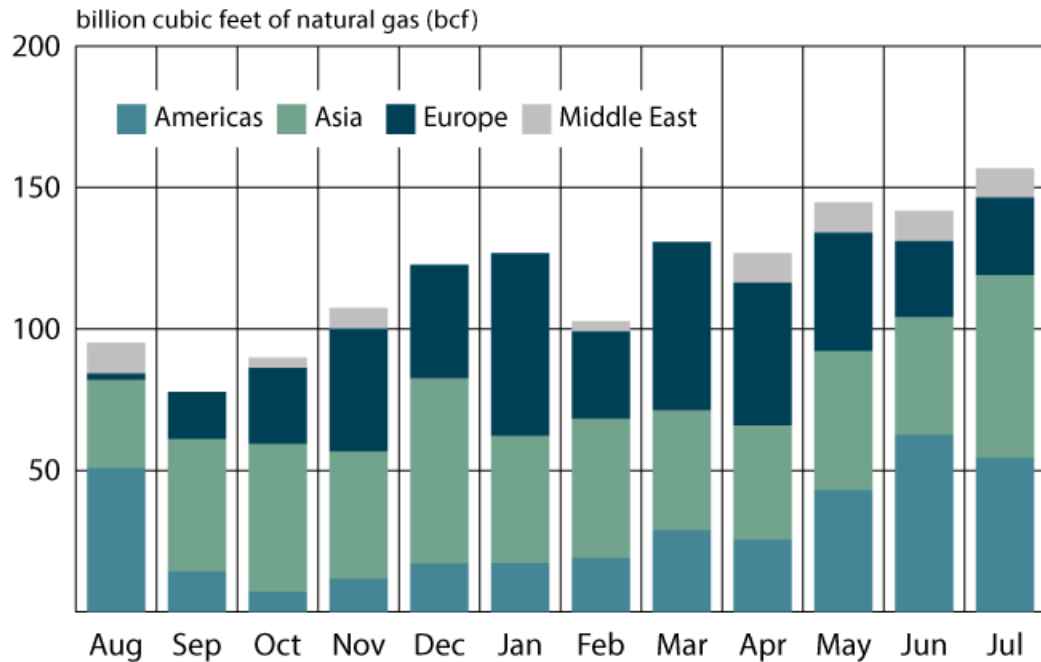
U.S. LNG Destinations - Past 12 Months



Source: DOE LNG Monthly (Data through July 2019)

©LNG Allies, 2019

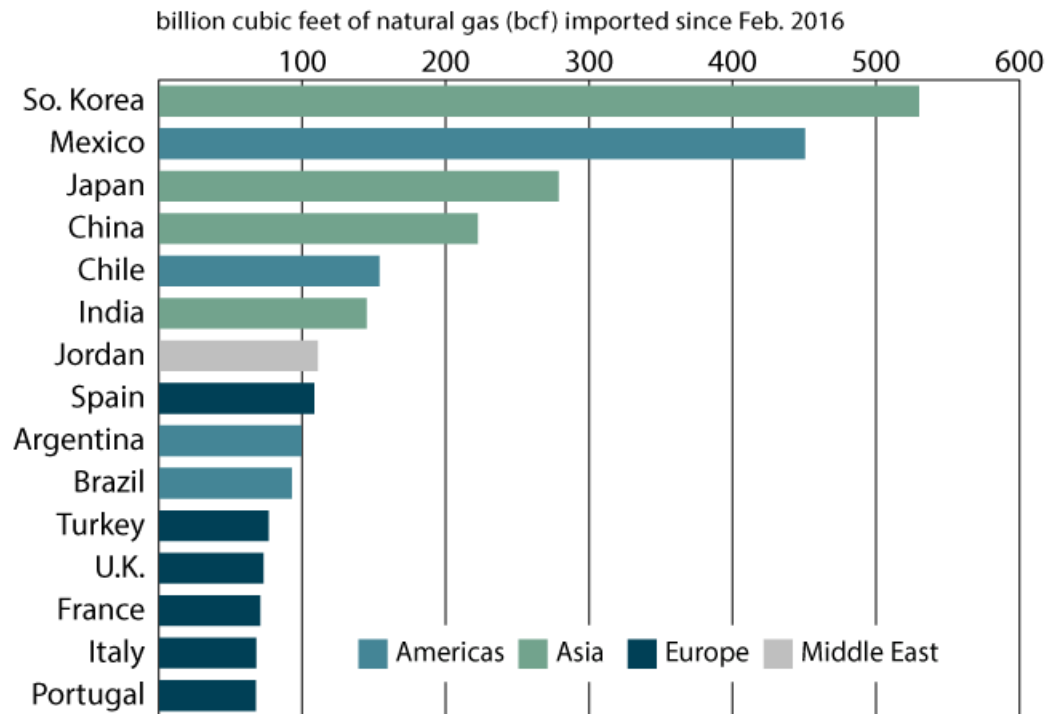
Regional Distribution of U.S. LNG - Past 12 Months



Source: DOE LNG Monthly (Data through July 2019)

©LNG Allies, 2019

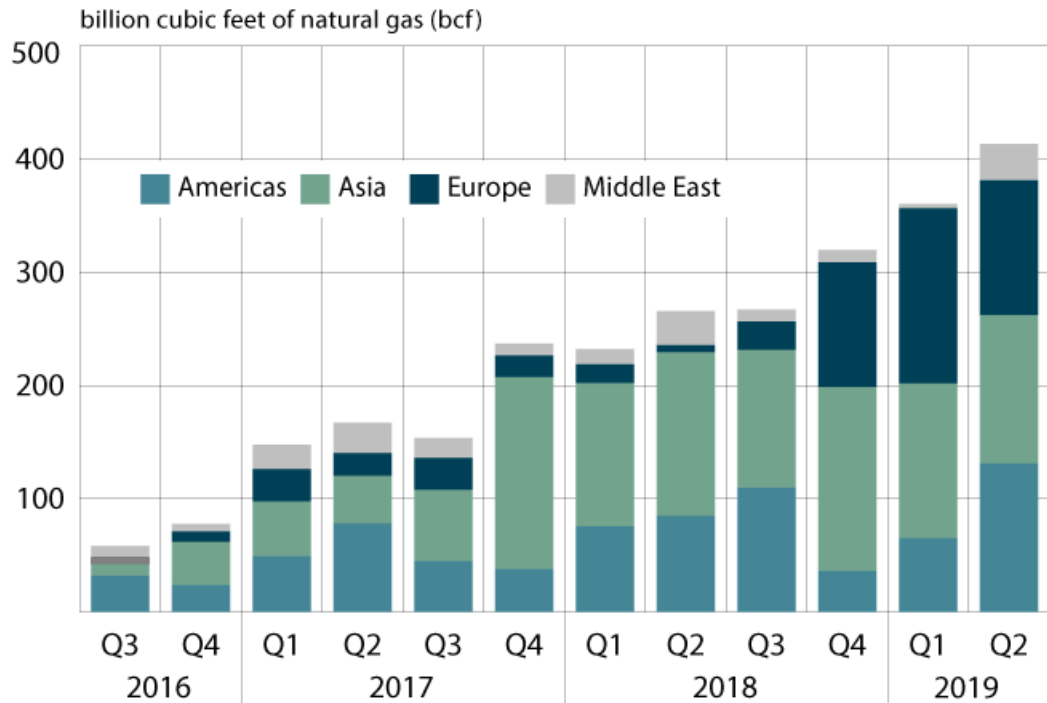
Top 15 Importers of U.S. LNG - Since Feb. 2016



Source: DOE LNG Monthly (Data through July 2019)

©LNG Allies, 2019

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

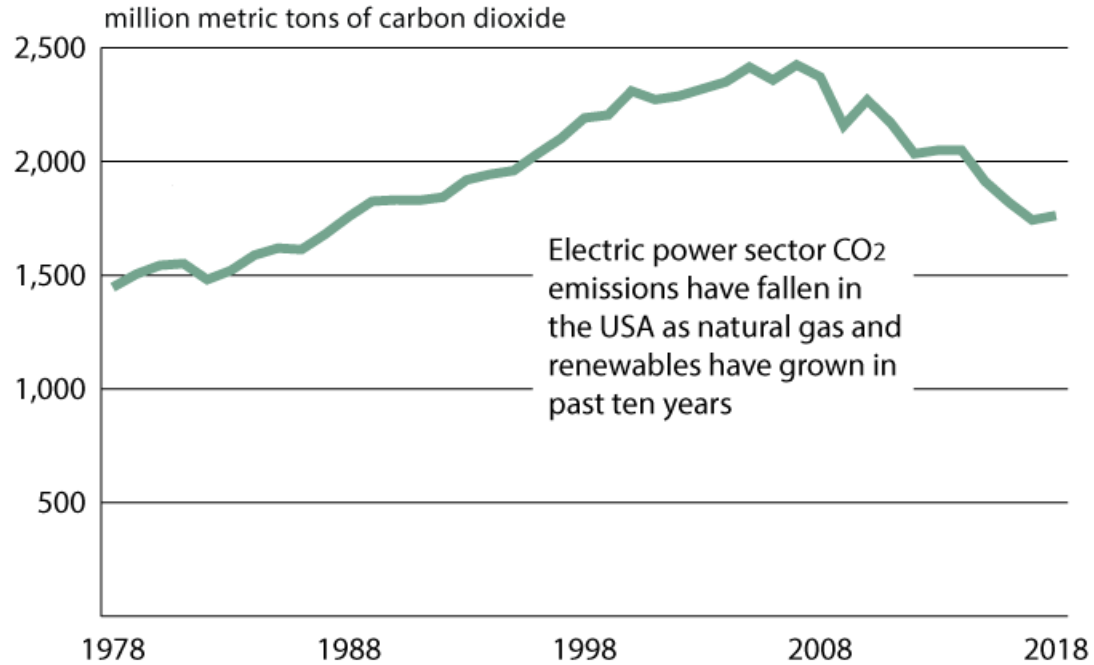


Source: DOE LNG Monthly (Data through 30 June 2019)

©LNG Allies, 2019

Environmental Benefits of U.S. Natural Gas

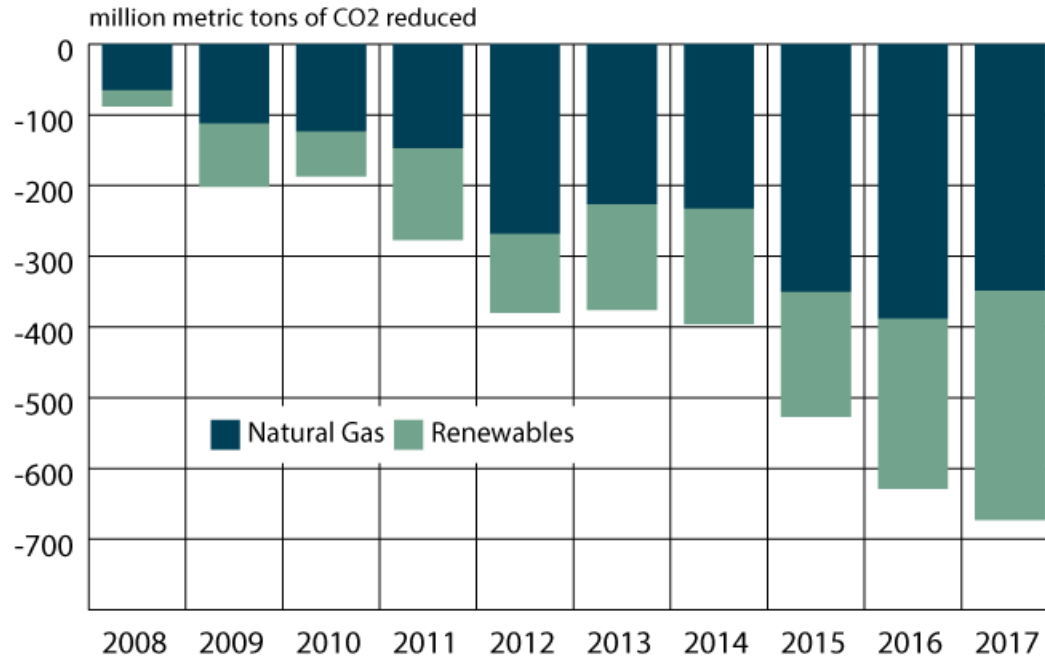
CO2 Emissions from U.S. Electric Power Sector



Source: EIA Monthly Energy Review, July 2019

©LNG Allies, 2019

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



Source: EIA Monthly Energy Review (Aug. 2018)

©LNG Allies, 2019

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

©LNG Allies, 2019

www.Ingallies.com

@Ingallies