



# TOGA Conference

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# Natural Gas Generating Assets

- 8 owned Combined-Cycle (CC)
- 1 CC site via tolling arrangements \*
- 9 Combustion-Turbine (CT) sites

## CC Plants

- Allen
- Ackerman
- Caledonia
- Decatur \*
- John Sevier
- Magnolia
- Paradise
- Southaven
- Lagoon Creek

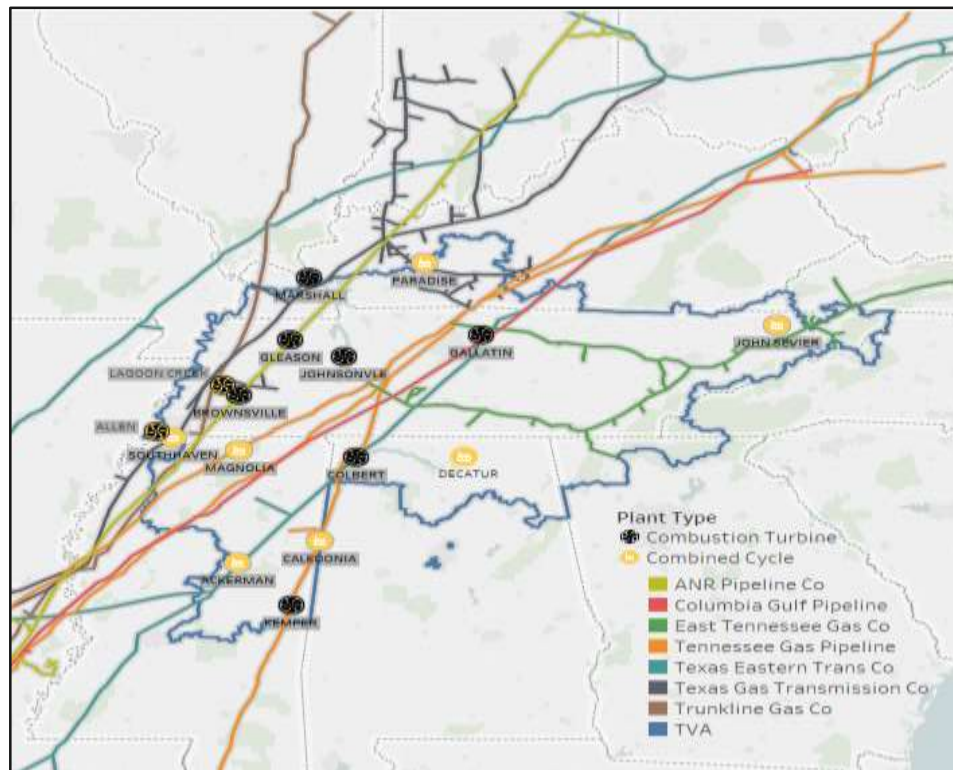
## CT Plants

- Allen
- Brownsville
- Colbert
- Gallatin
- Gleason
- Johnsonville
- Kemper County
- Lagoon Creek
- Marshall County

## Storage

- Egan Storage – 1.0 Bcf
- Pine Prairie – 4.5 Bcf
- Monroe Storage – 2.75 Bcf
- TGP Park/Un-park (PuPs) – 1.5 Bcf

TVA plants are located across 7 major natural gas pipelines



# FY20-22 Natural Gas Strategic Overview

*Provide excellent service to the gas-fired generation fleet in a reliable and cost effective manner by:*

- > Proactively managing the NG commercial portfolio contracts,*
- > Developing and executing strategies to mitigate economic and reliability risks, and*
- > Developing new products with external stakeholders*

## Fuel

- **Challenge** - Increased competition for natural gas due to exports, industrial utilization, and southeast (SE) region net importer of supply
- **Mitigation** – Execute multi-year contracts and expand diversification into various shale basins

## Transportation

- **Challenge** - Winter risk on interruptible transportation to the combustion turbine fleet as capacity tightens across the SE region
- **Mitigation** – Utilize asset management agreements; delivered gas structures

## Storage

- **Challenge** - Injection capability out of path firm transportation
- **Mitigation** – Enhance Park and Un-park products with the pipelines

# Hedge Management & Supplier Diversity

## Volumetric Hedge Detail

Period	Total Bcf	Hedge Percentage	Minimum	Maximum
Year 1	206	66%	30%	80%
Year 2	97	28%	15%	60%
Year 3	28	8%	0%	40%

## Price Hedge Detail

Period	Total Bcf	Fixed Price Hedge	Minimum	Maximum
Year 1	82	26%	5%	40%
Year 2	39	11%	0%	25%
Year 3	17	5%	0%	10%

## Top 20 Suppliers by % of Burn

COUNTERPARTY	VOLUME PURCHASED	% OF BURN
1*	21,271,444	10.04%
2	17,610,500	8.31%
3	14,537,257	8.86%
4	11,648,064	5.50%
5	10,913,305	5.15%
6	10,637,887	5.02%
7	10,607,757	5.01%
8	10,445,351	4.93%
9	10,367,578	4.89%
10	9,847,109	4.65%
11	8,656,594	4.09%
12	8,190,494	3.87%
13	7,123,288	3.36%
14	7,054,345	3.33%
15	6,585,285	3.11%
16	6,010,930	2.84%
17	4,552,885	2.15%
18	4,515,951	2.13%
19	4,449,575	2.10%
20	4,345,160	2.05%
<b>TOTAL</b>	<b>211,908,955</b>	<b>89.36%</b>
* Primarily floating to fixed price conversions		



# NYMEX Natural Gas Forward Curve

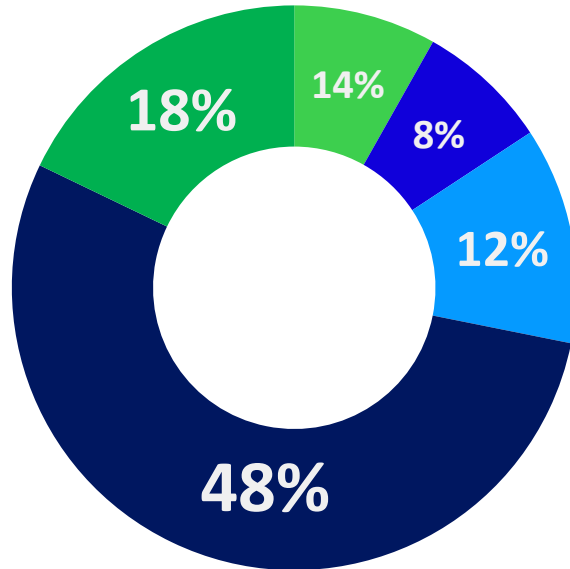


# Firm Transportation & Storage/PUP

Firm Transportation (FT) Portfolio				
Pipeline	Plant	Ending	Additional Comments	
ANR	Allen	2037		
ANR	Browns/Gleason	2022	CT sites with no fuel oil backup	
ETNG	John Sevier	2036		
TETCO	Ackerman	2021	AMA with EQT ending 2021 (FT & Supply)	
TGP	Caledonia	2029-2030		
TGP	Magnolia	2026-2031		
TGP	Decatur	2029		
TGT	Paradise	2036		
TGT	Southaven	2030		
TGT	Lagoon Creek CC	2030		
TKL	Lagoon Creek CC	2020	Lagoon served by TGT starting in 2020	
Storage & Park/UnPark (PUP) Agreements				
Location	Type	MSQ	Ending	Additional Comments
Egan	Salt Dome	1 BCF	2020	1 BCF may not renew in 2020 based on TGT PUP
Pine Prairie	Salt Dome	4.5 BCF	2020-2027	1 BCF may not renew in 2020 based on TGT PUP and 1.5 BCF rolls off 2025
Monroe	Salt Dome	2.75 BCF	2023	
TGP Pipeline	PUP	1.5 BCF	2023	
Texas Gas	PUP	1.5 BCF	2024	Deal Pending
Saltville	Salt Dome	.3 BCF	TBD	AMA Deal Pending with Knoxville Utility Board

# Peak Day Supply Distribution – 2.1 Bcf

## Gas Supply by Strategy



### Storage (18%)

- Provides flexibility to adapt to changing supply needs resulting from imbalances, changes in forecast, and price volatility

### Term Agreements (12%)

- One to three year contracts
- Provide reliable supply from market area producers
- Reduce cost/supply risk in this unique market area

### Seasonal Supply Agreements (8%)

- Reduces volume risk as well as the amount of monthly gas required.
- Reduces cost premiums associated with shorter term deals

### Monthly and Intra Month Supply Agreements (14%)

- Provides opportunities to more closely match supply needs as projected generation levels change during the period

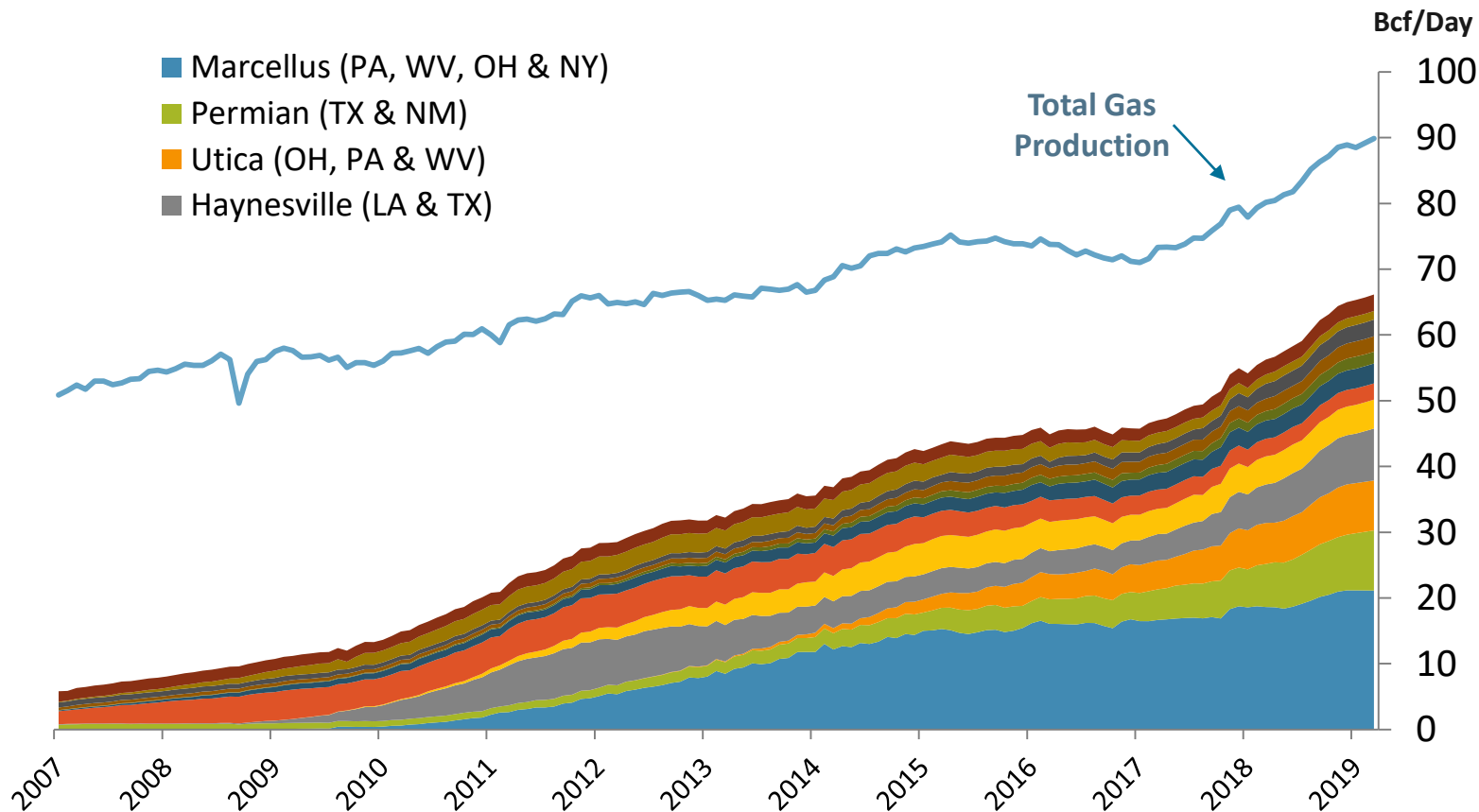
### Weekly, Next day, and Intra-day Purchases (48%)

- Allow adjustments in supplies to match changes in intra month and daily requirements

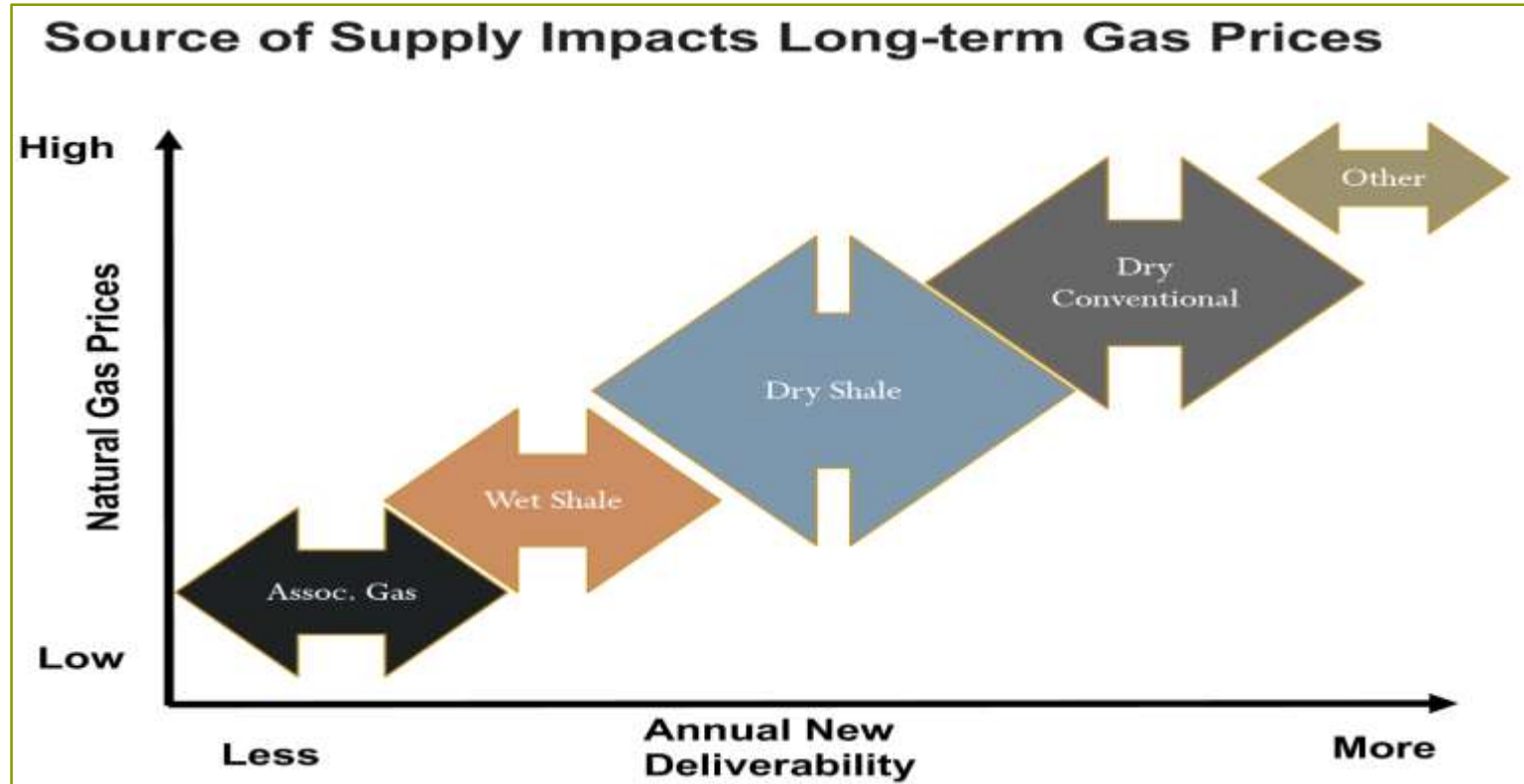
# **Natural Gas Supply / Demand**



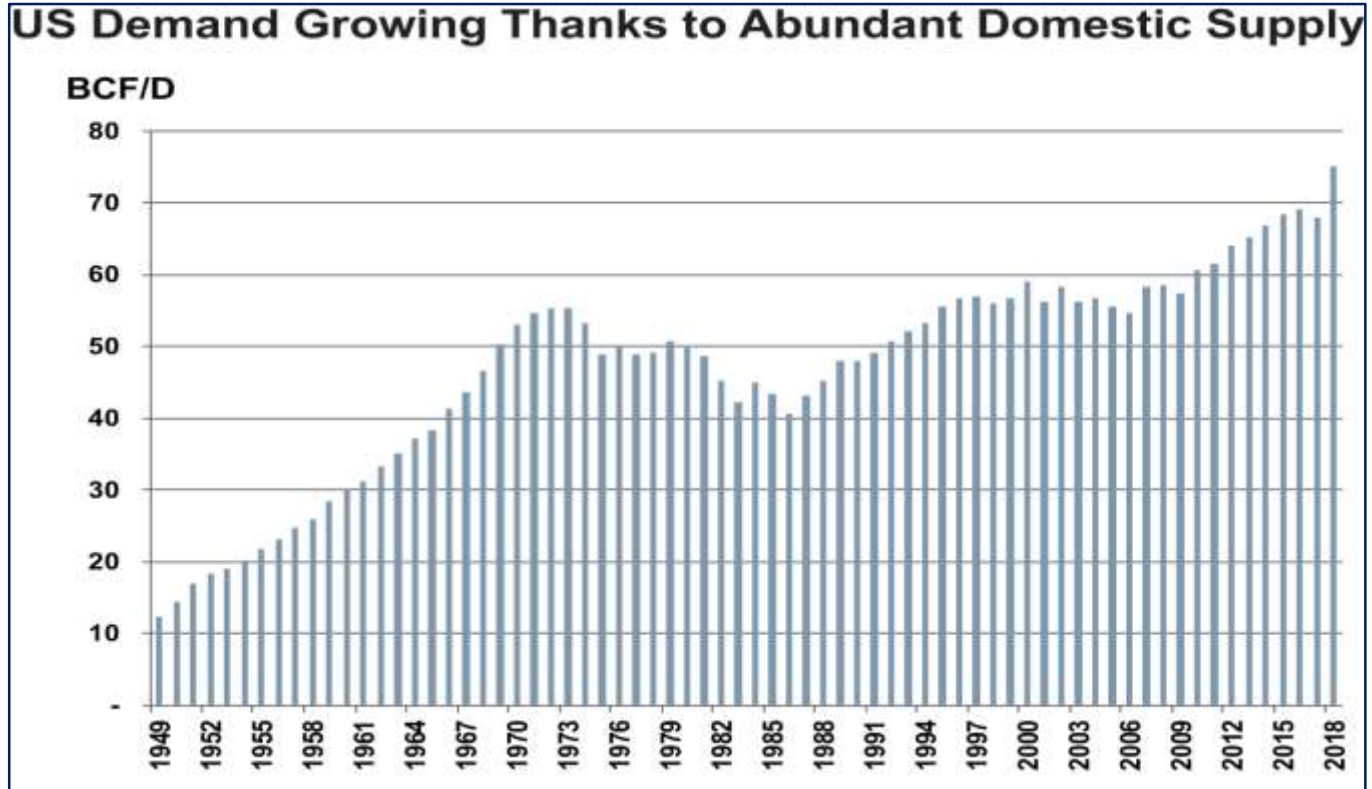
# 75% of US Gas Production is Shale Gas



# Where is the Supply Growth Coming From?



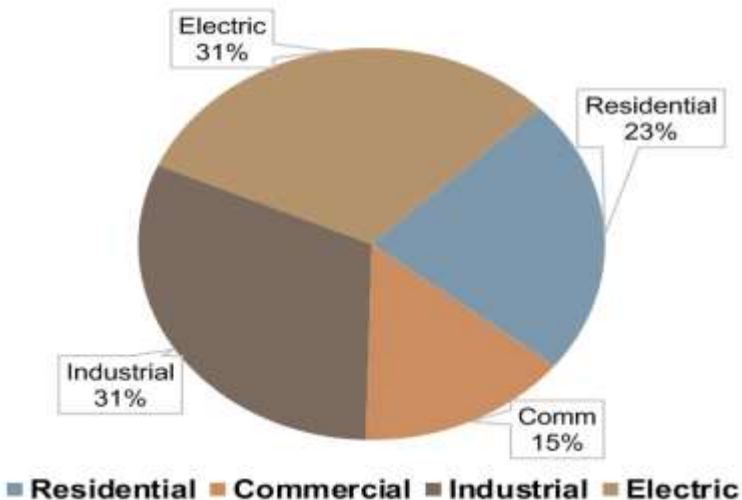
# US Demand Growth



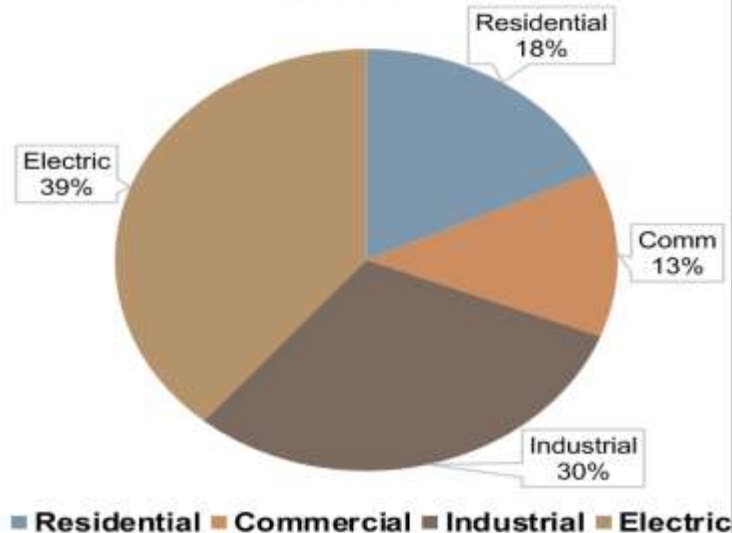
# Power Generation Driver of Demand Growth

## Shale Impact on US Demand

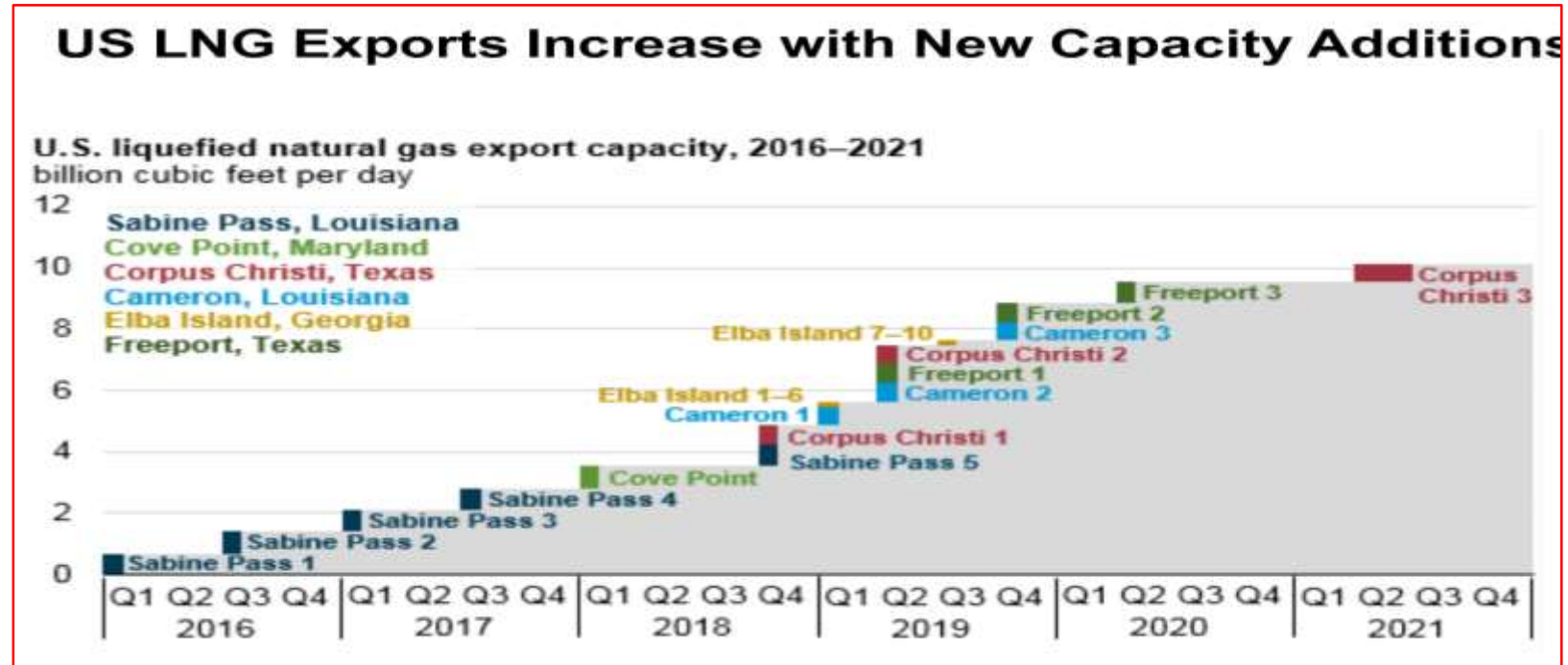
**2008 Demand Composition  
(58.5 Bcf/d)**



**2018 Demand Composition  
(75 Bcf/d)**



# Exports: Large Newest Driver of Demand



Exports to Mexico ~5 BCF



**Questions?**