

LDC Supply Portfolio Management During the 2020-2021 Winter Heating Season

January 2023

Agenda

- Overview of the American Gas Association and Natural Gas Utilities
- Utility Gas Planning
- Portfolio Management in Practice
- Winter Heating Season Survey Highlights

American Gas Association

- Overview of the American Gas Association
 - Represents more than 200 local energy companies (LDCs) that deliver clean natural gas throughout the United States
 - Everyday American's natural gas utilities provide clean, reliable, affordable natural gas to nearly half our population - 180 million Americans - and 5.5 million of our nation's businesses.
 - Natural gas meets more than thirty percent of the United States' energy needs
 - AGA is an advocate for natural gas utility companies and their customers and provides a broad range of programs and services for members

Gas Supply Planning

- Portfolio Design
- Demand (Load)
- Transportation Capacity
- Storage
- Commodity
- Plan Review and/or Approval by Utility Commission(s)

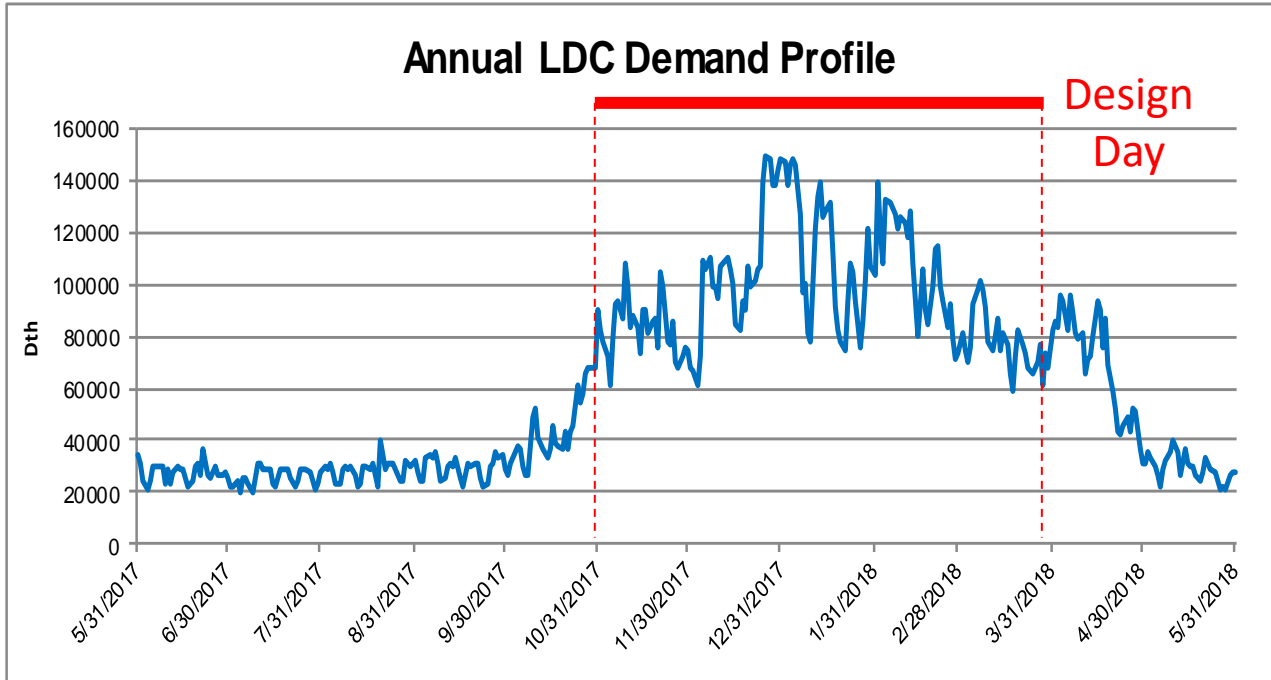
Gas Supply Planning Portfolio Design

- LDC's are Required to Supply their Firm Sales Customers
 - Regulatory Authorities Require
 - Parameters and Balance
- LDC's Aim to (and are Expected to) Provide Reliable Service
 - Multiple Supplies and Pipelines
- LDC's Wish to Provide Lowest Cost
 - Negotiating Price
 - Performance Incentives
- LDC's Need to Balance Risks and Costs of Supply Options
- Planning for Reliability Provides Resilience on Non-Peak Days

Gas Demand For An LDC

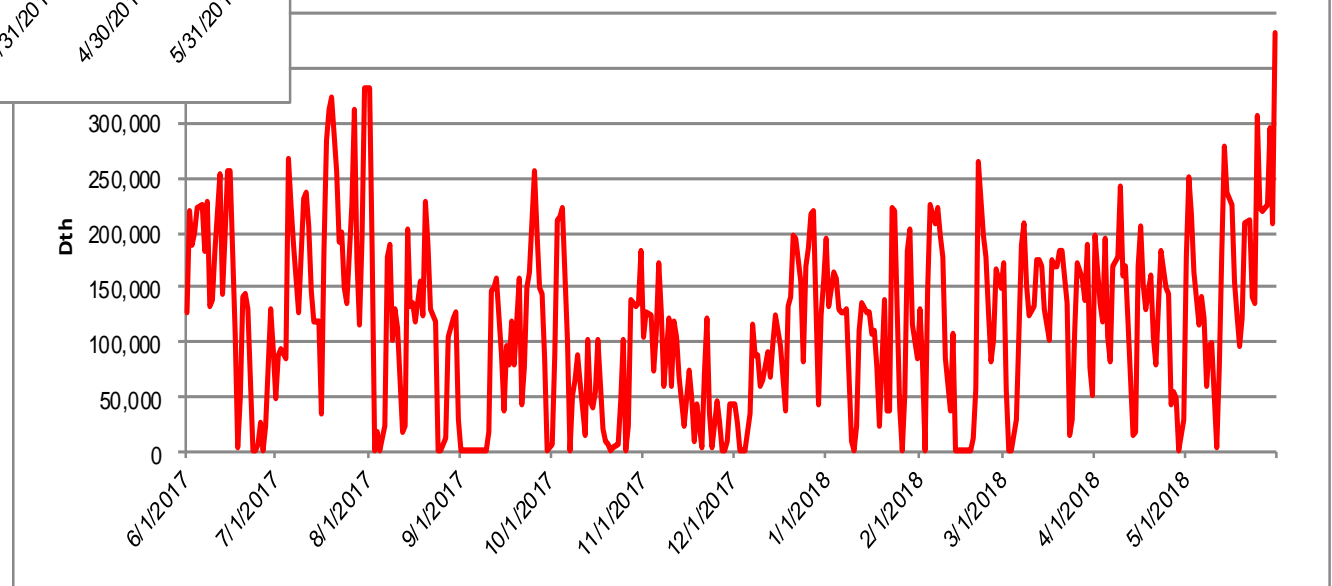
- Firm Sales Customers
 - Residential / Commercial / Industrial
 - Fundamentally Weather Dependent
- Interruptible Sales Customers
- Transportation Customers
 - Firm
 - Interruptible
 - Power Plants
- Peak Day Demand
 - Historical Peak Days
 - Design Day Calculation





Daily peaks in demand occur throughout the year. “Design Peak” is based on lowest temperature and highest demand in previous years. This is normalized to current demand profile.

Annual Generation Demand Profile



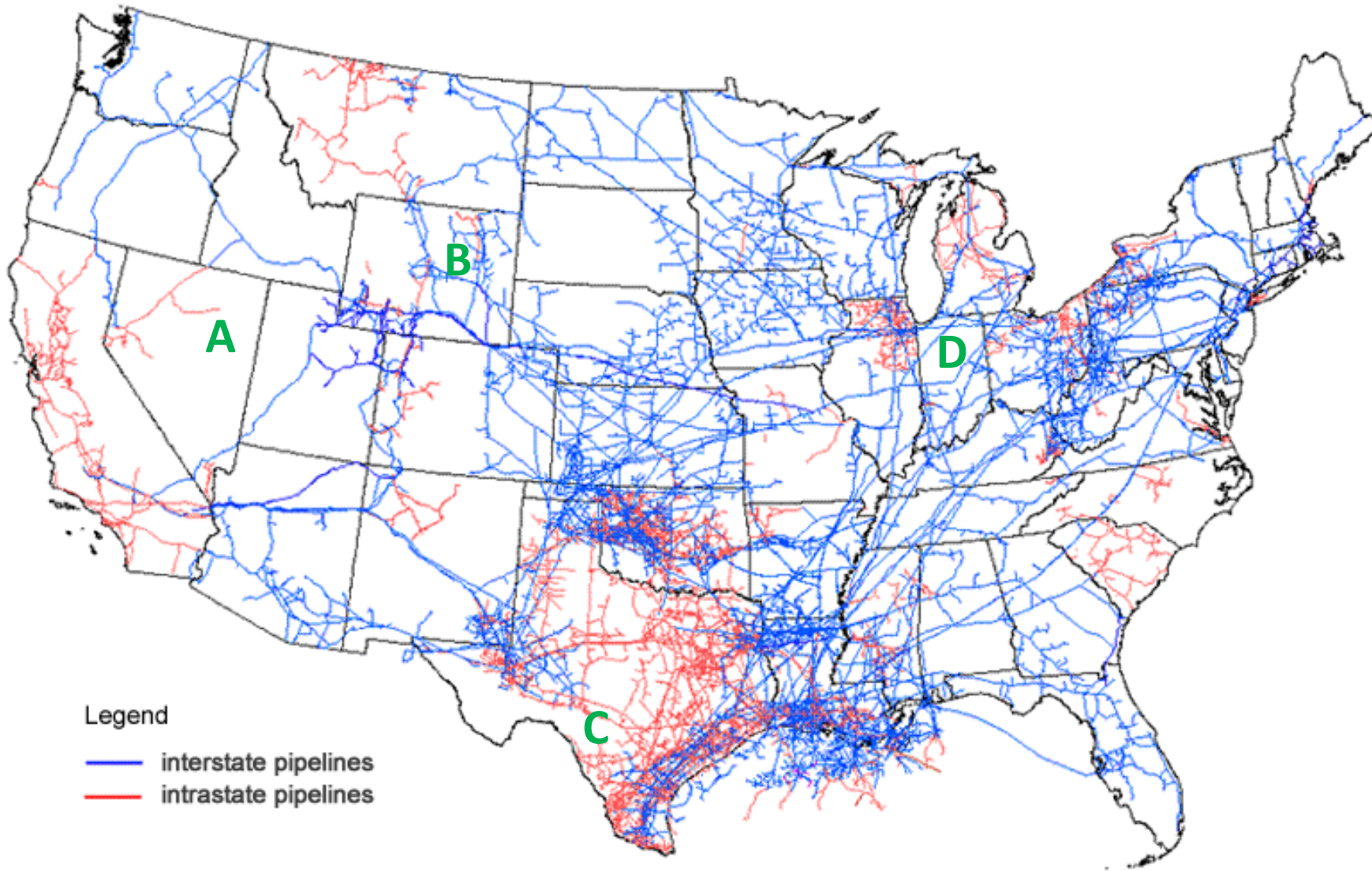
Gas Fired Power Generation may be On System or connected to the same interstate pipelines as the LDC. Their firm contracted capacity must be considered in any peak day demand estimates.

Peak Day Demand

- How do LDC's know how much gas they need?
 - Design Day Assumptions
 - Customer Data
- What is a "Design Day"
- Determining Connected Load
- Residential/Commerical Generators
 - How Are They Factored?
- Contingencies/System Reinforcement
 - System Planning Is A Continuous Process

Transportation Capacity

- Moving Gas from Purchase Location to City Gate
 - Firm v. Interruptible
 - In Path
 - Out of Path
 - Delivered
- Moving Gas On-System for Transportation Customers
 - Firm
 - Interruptible
 - Backup and/or "Supplier of Last Resort"



Producer

- Location
- Quantity
- Connections

Pipelines

- Available Capacity
- Pricing
- Available Delivery Points

Legend

- interstate pipelines
- intrastate pipelines

Source: U.S. Energy Information Administration, *About U.S. Natural Gas Pipelines*

Gas Storage

- Off System
 - Location
 - Transport to System
- On System
 - Location
 - Delivery to Market Centers
- Inventory Management
 - Maintaining Inventory for Late Season Peaks
 - Managing Balance During Cold and Warm Winters
- Pricing
 - LIFO/FIFO/Average
- Peak Deliverability

Gas Commodity

- Seasonal and Monthly Activities

- Base Load Purchases – meet minimum daily requirements
 - Diversified Supply – mix of seasonal and monthly contracts matched to primary transport receipt points
 - Monthly Index Price - supplemented with financial hedges for the LDC portfolios
 - Procurement methods - electronic exchanges, bi-lateral markets, reverse auctions, and RFPs
- Storage – inject summer/withdraw winter

- Daily Activities

- Daily Purchases – meet incremental daily requirements
 - Locational Supply – based on transport availability and pricing
 - Pricing – daily index price, fixed price
- Storage – Intraday balancing/WACOG pricing
- Scheduling – minimize delivery costs and penalties

Plan Review and/or Approval by Utility Commission(s)

- Does the LDC's Portfolio Design (from previous slide)
 - Supply their Firm Sales Customers
 - Provide Reliable Service
 - Provide Reasonable Cost (if not Lowest)
 - Balance Risks and Costs of Supply Options
- Few if Any Commissions Allow (in Rate Base)
 - Planning for Resilience
 - Planning to Serve Interruptible Transportation

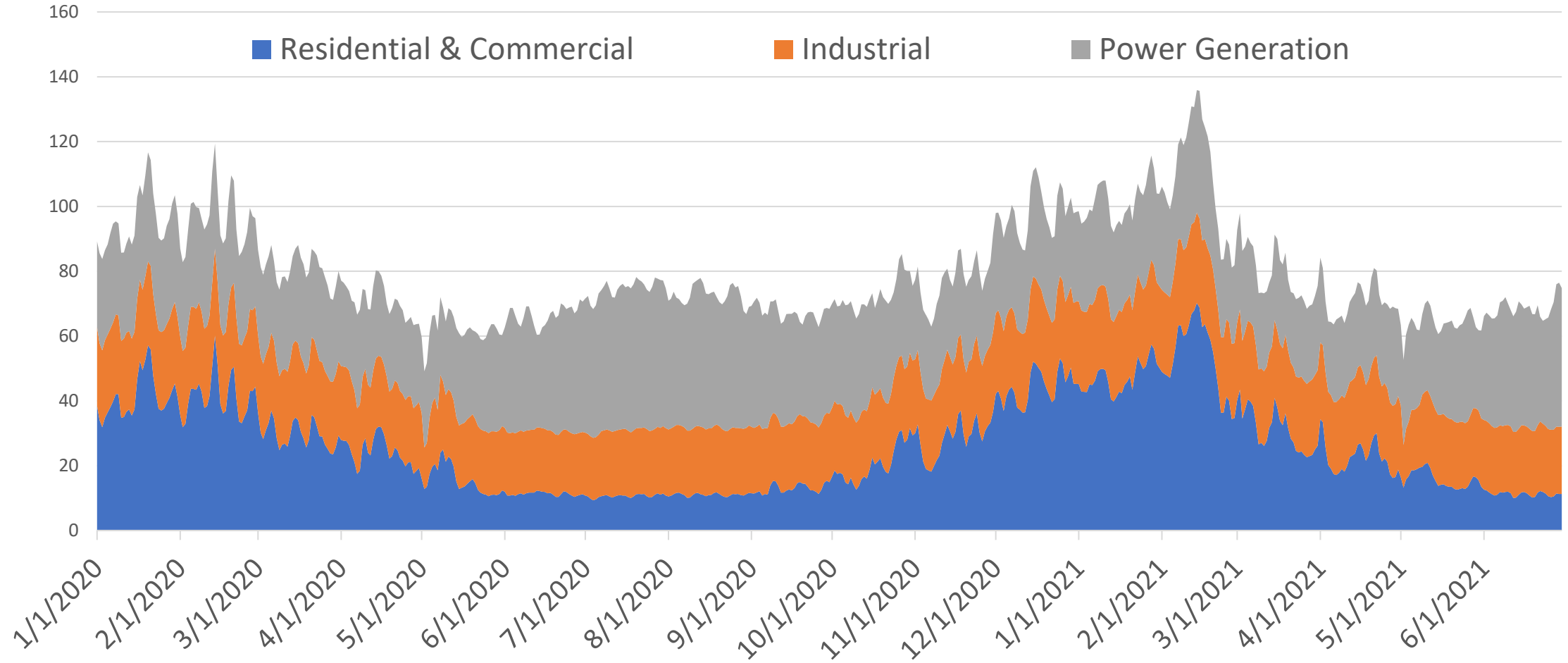
Why do utilities plan for the Winter Heating Season?

- Anticipate demand
- Mitigate physical flow and market fluctuations
 - Extreme day to day demand and consumption fluctuations due to weather
- Diversify sources of gas
 - Balances consumption with domestic and international suppliers
- Deliver low-cost and reliable natural gas to customers
 - On the coldest day, week and year of the season

Winter Heating Season Report

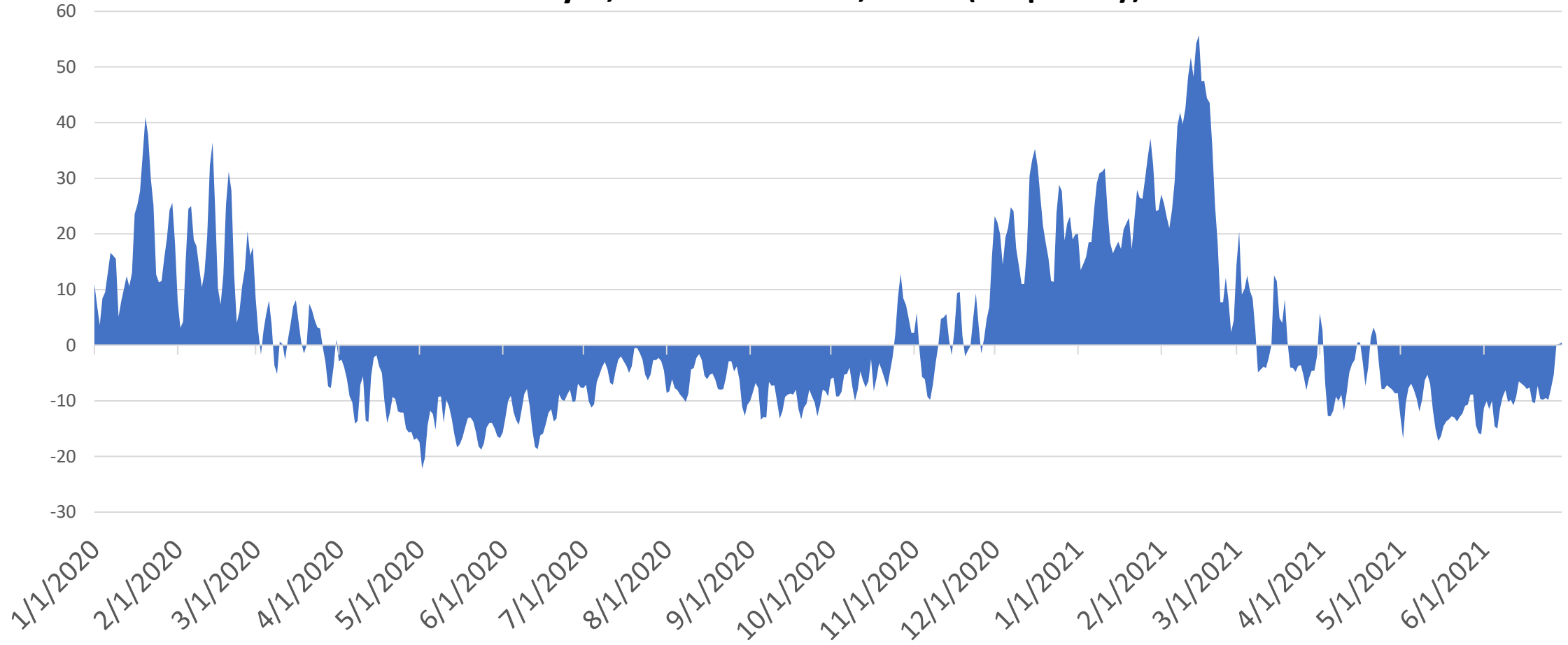
- Details critical elements of the 2020-2021 winter heating season (WHS) from the perspective of natural gas utility supply portfolio planning.
 - Documents gas delivery system operations
 - Insights into gas supply trends and procurement portfolio management
 - Represents a snapshot of aggregated supply procurement practices of participating LDCs
- The survey focus on:
 - Peak-day and peak-month supply practices
 - Pricing mechanisms
 - Regulatory frameworks
 - Market hedging practices

Natural Gas Consumption (Bcf) Residential/Commercial, Industrial, Power Generation



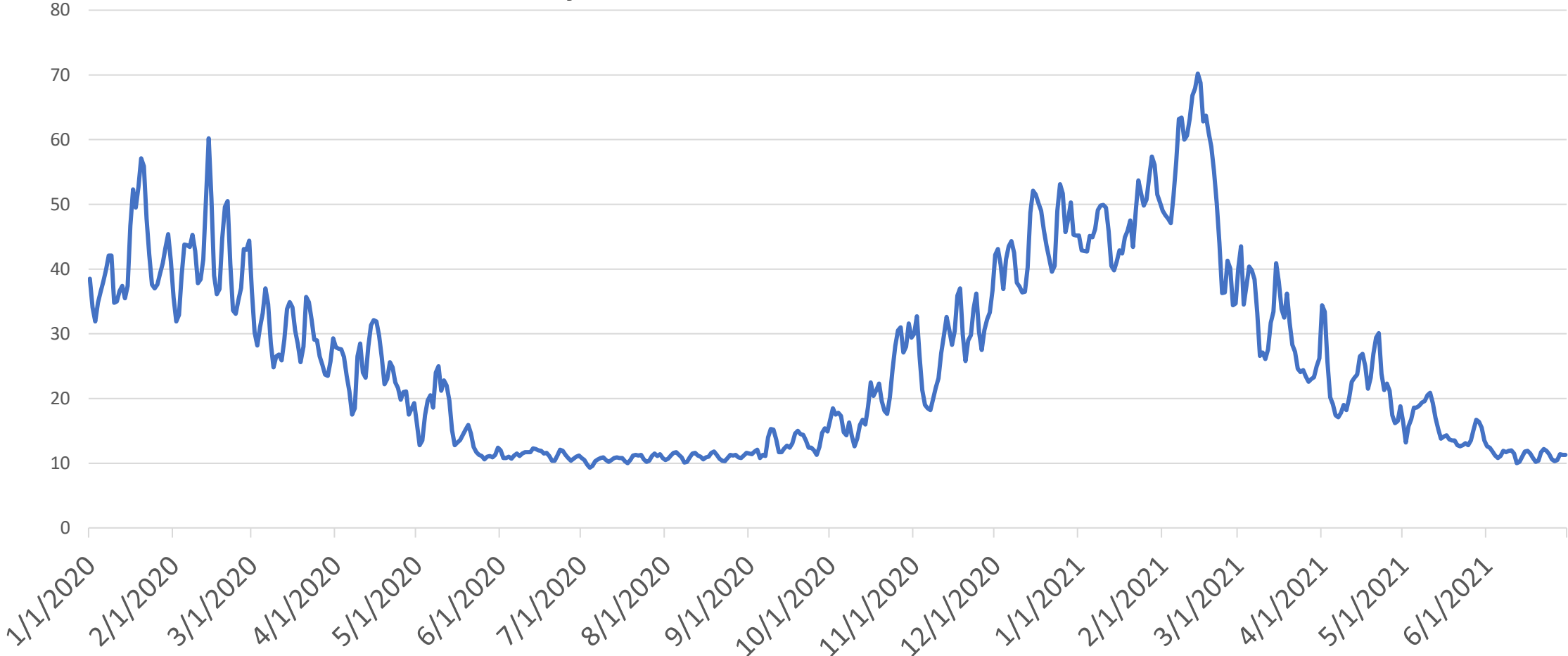
Source: Bentek Energy

Daily Storage Withdrawals (+) and Injections (-) January 1, 2020 - June 30, 2021 (Bcf per day)



Source: Bentek Energy

Daily ResComm Consumption January 1, 2020 - June 30, 2021 (Bcf per day)



Source: Bentek Energy

Monthly Comparison of National Heating Degree Data

October 2014 - March 2021

Month	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
October	-19.7%	-19.7%	-40.3%	-27.7%	-2.9%	-4.8%	-5.2%
November	12.4%	-17.5%	-23.3%	-9.2%	10.9%	9.3%	-20.9%
December	-12.9%	-16.3%	-2.4%	-1.0%	-11.1%	-12.0%	-8.5%
January	-2.5%	-5.4%	-15.3%	-3.2%	-4.6%	-18.5%	-11.6%
February	20.3%	-12.2%	-24.3%	-11.5%	1.6%	-7.5%	12.5%
March	-0.9%	-23.7%	-6.9%	2.0%	8.8%	-14.9%	-12.6%
TOTAL	0.7%	-14.5%	-15.9%	-6.1%	-0.5%	-9.6%	-7.4%

Red = Warmer

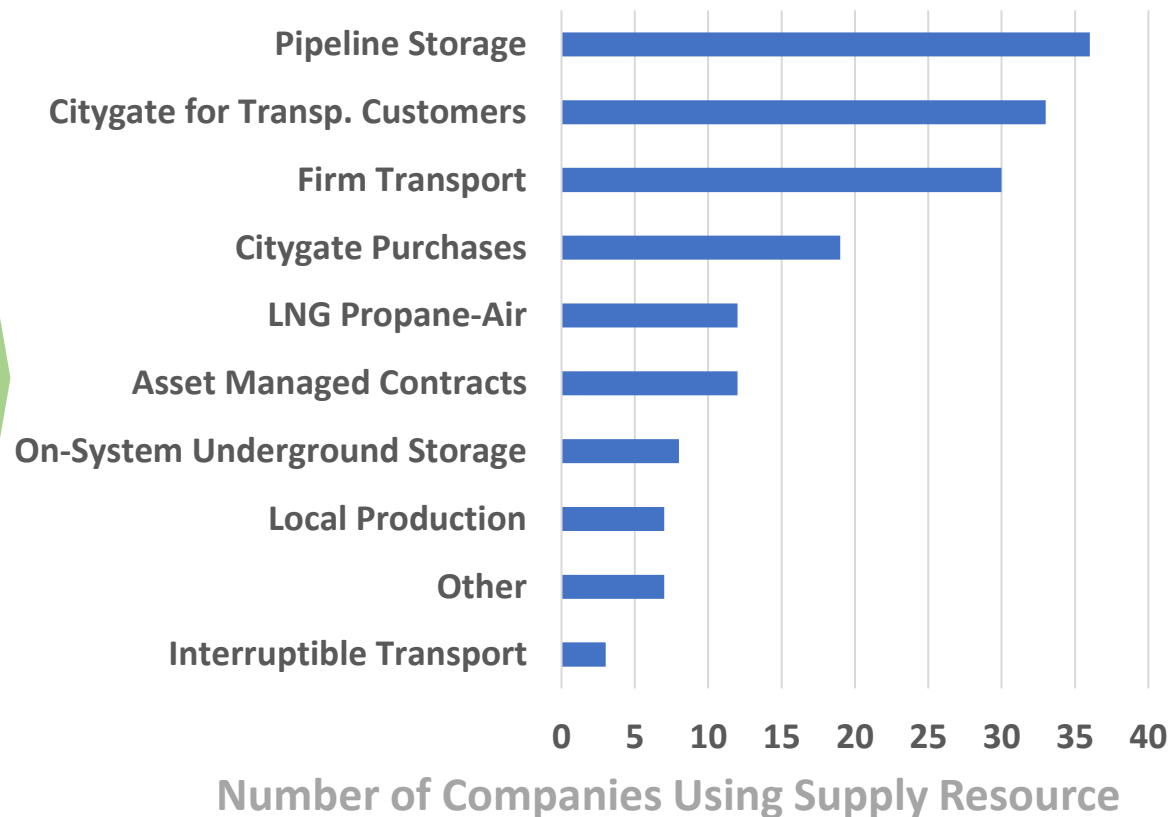
Blue = Colder

Source: U.S. Department of Commerce, National Oceanic, and Atmospheric Administration

LDC Diversification of Supply Strategy for Peak Day and Month Delivery

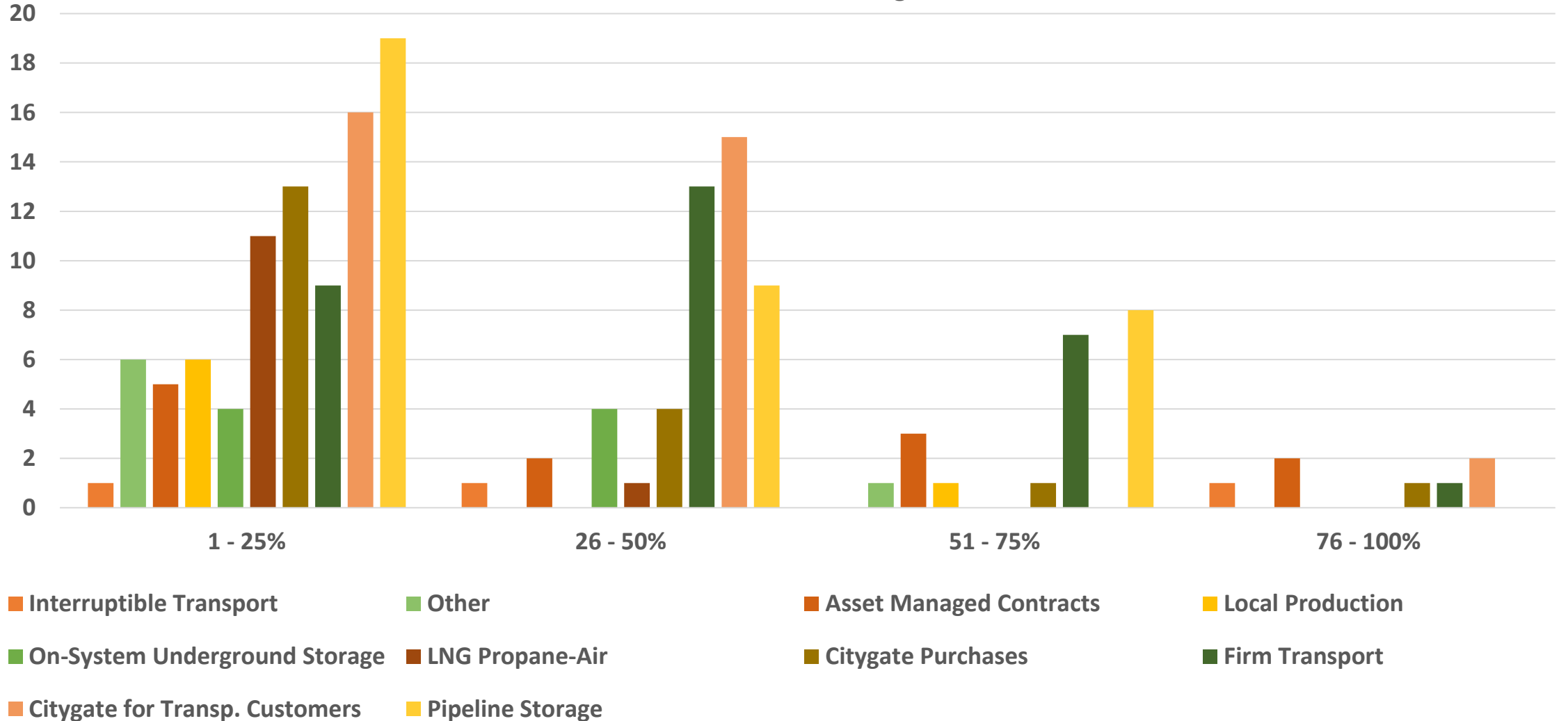
- Companies tend to diversify their supply strategy in increments that often amount to less than 50 percent of their total supply package.

2020 - 2021 Winter Heating Season



- Since last year, the option for pipeline storage and citygate supplies for transportation customers were the most used sources of peak gas supplies for the 2020 – 2021 winter heating season.
- Besides pipeline transportation, other gas supply sources are also important for peak-day deliveries such as Citygate purchases for sales customers, LNG / Propane-air / SNG, local production, on-system underground storage, purchases moved via firm transportation, and asset managed contracts.
- The other also included purchases to supplement imbalances with third party suppliers, on-system balancing and linepack.

Sources of Peak Day Gas Supplies by Number of Companies 2020-2021 Winter Heating Season



A Closer Look At How LDCs Use Contracts To Balance Pricing Mechanisms

Many factors play a role in the market pricing of the gas commodity and transportation services, including weather, storage levels, end-use demand, pipeline capacity, operational issues, and financial markets.

1 The market fundamentals that impact price have also expanded to include interest rates, other investment opportunities, the price of other commodities and even currency exchange rates.

2 To address the inherent uncertainty of the market supply planners use a portfolio approach to pricing gas supplies mirroring their approach to supply sources, providers, and transportation options.

3 The portfolio approach includes pricing mechanisms and contract terms, such as fixed-price and long-term contracts; however, while their prevalence waned for many years, the idea of fixed-price longer-term as a value-added tool for managing price stability is regaining traction in today's market.

4 For example, future key gas supply projects, such as those aimed at coordinating natural gas and power generation loads, may require longer-term demand-pull contract arrangements to be successful.



Gas Supply Contract Terms by Number of Companies

2020 - 2021 Winter Heating Season

Supply Volume Percentage Ranges	Short Term % 1 Month or Less	Mid Term % 1 Month - 1 Year	Long Term % Greater Than 1 Year
1 - 25%	9	4	7
26 - 50%	15	6	4
51 - 75%	2	14	0
76 - 100%	6	13	3

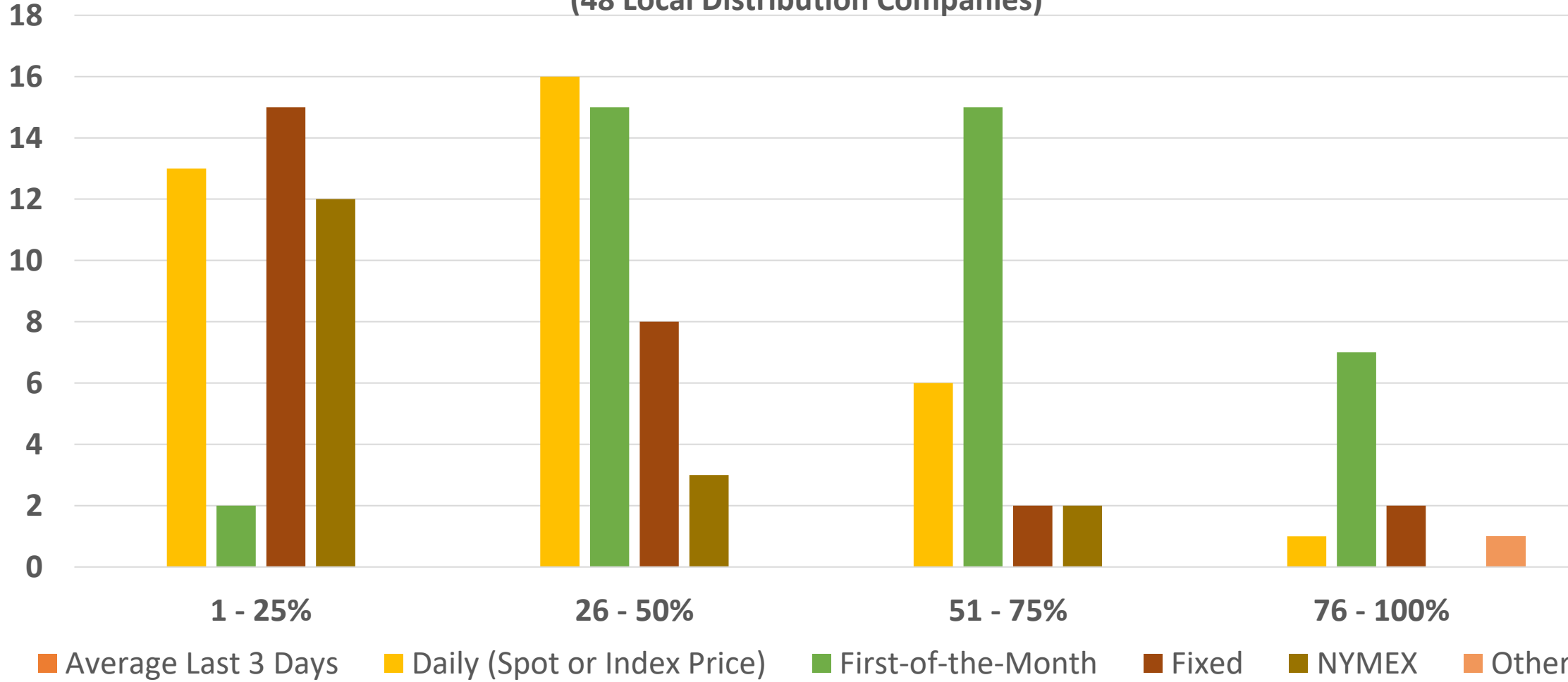
Portions of Winter Heating Season Acquisitions Via Asset Management

Agreements for Peak-Day Supply by Number of Companies

Supply Volume Percentage Ranges	Peak Day	Winter Season	Annual
1 - 25%	4	4	5
26 - 50%	5	5	5
51 - 75%	7	7	3
76 - 100%	6	7	9
0%	2	2	2

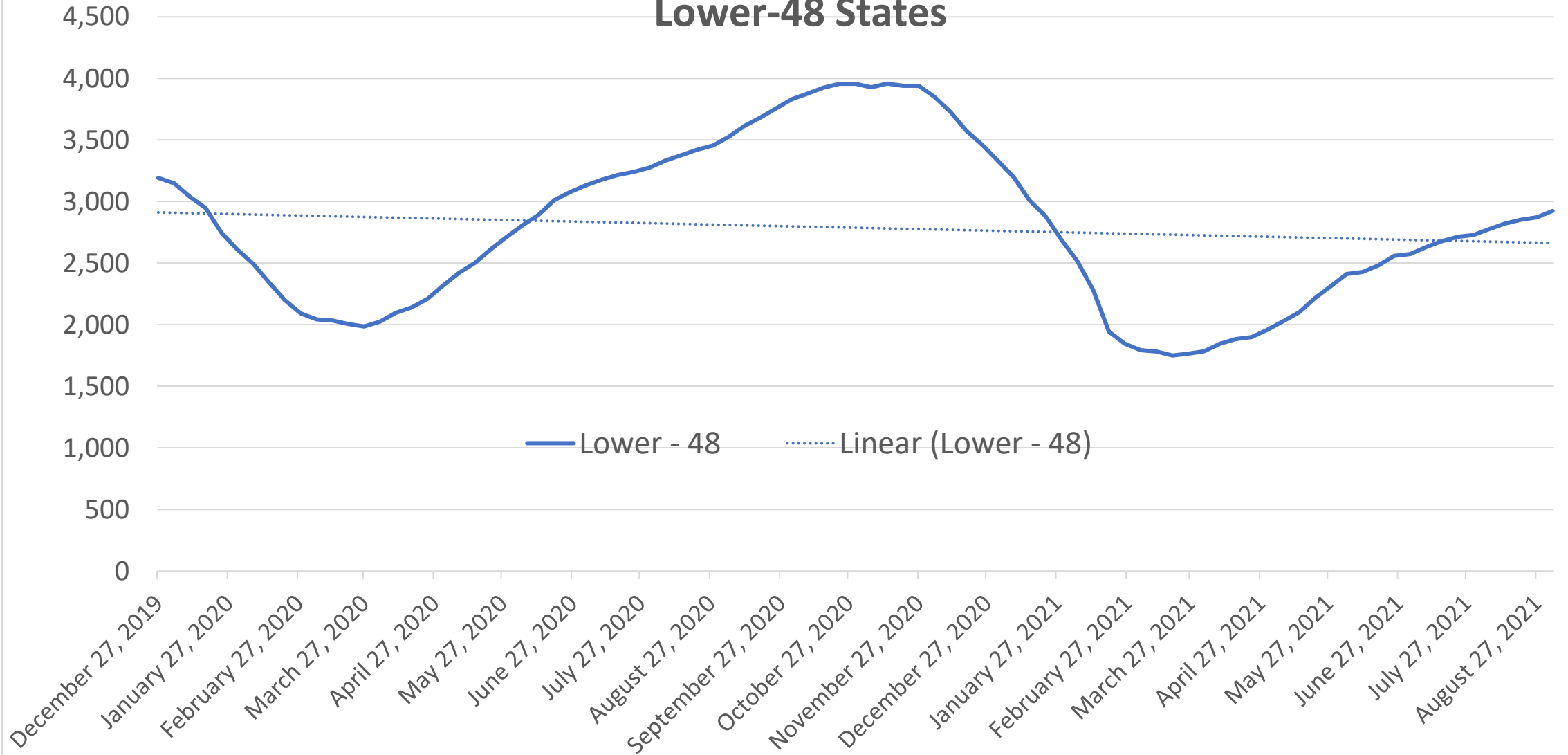
Gas Supply Pricing Mechanisms

2020 - 2021 Winter Heating Season
(48 Local Distribution Companies)

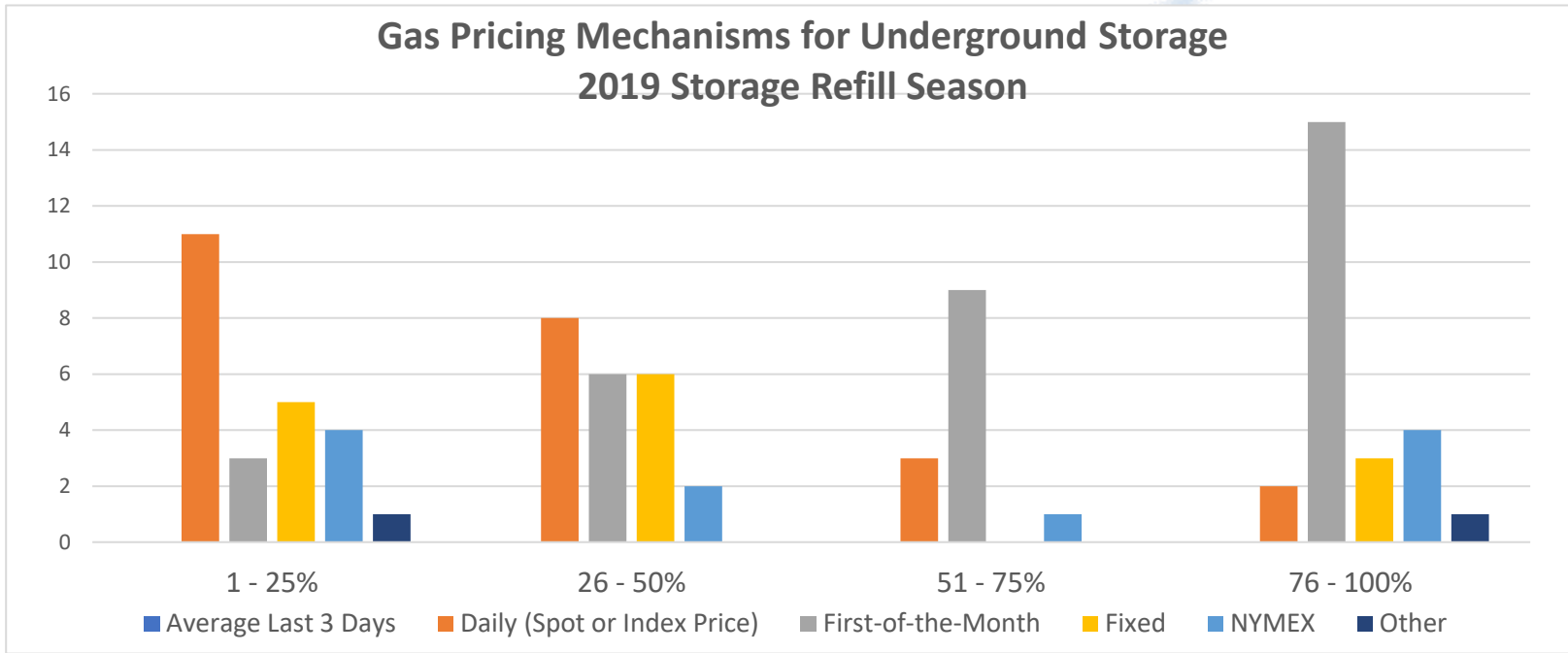


Sources: [AGA 2018-2019 Winter Heating Season Report](#) & [AGA 2020-2021 Winter Heating Season Resource](#)

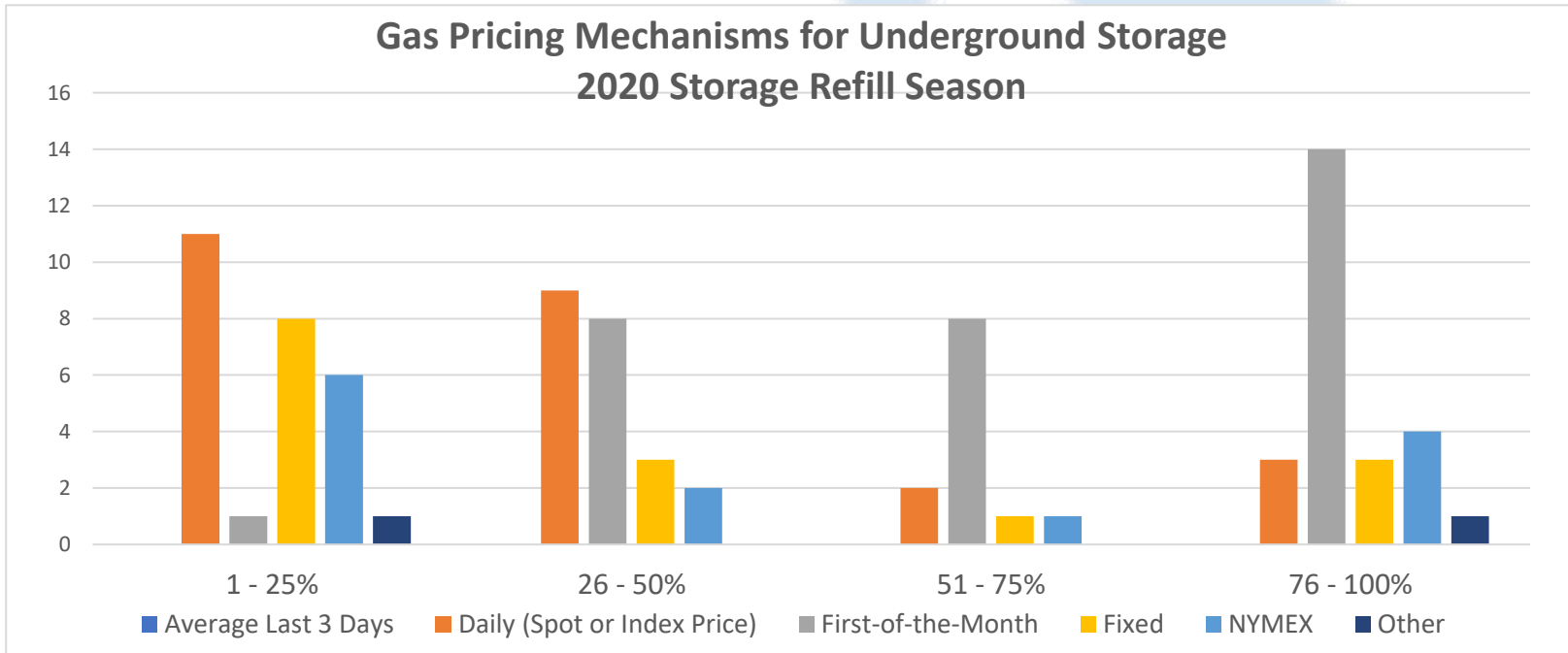
Weekly Working Gas in Underground Storage (Bcf) Lower-48 States



Gas Pricing Mechanisms for Underground Storage 2019 Storage Refill Season



Gas Pricing Mechanisms for Underground Storage 2020 Storage Refill Season



Sources: [AGA 2018-2019 Winter Heating Season Report](#) & [AGA 2020-2021 Winter Heating Season Resource](#)

Percent of Pipeline Capacity Released by Local Distribution Company

April 2020 - March 2021

Capacity Percentage	Injection Season 2020							Winter Heating Season 2020 - 2021				
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	March
1 - 25%	14	15	15	13	13	14	13	14	14	14	14	14
26 - 50%	2	3	3	4	4	4	3	2	2	1	2	1
51 - 75%	0	0	0	1	1	0	1	0	0	0	0	0
76 - 100%	4	4	4	4	4	4	4	4	4	4	4	4
0	28	26	26	26	26	26	27	28	28	29	28	29

Key Highlights

- Based on individual utility-specific conditions, utilities plan for reliable natural gas deliveries on a daily, weekly, monthly, and seasonal basis by matching supply resources to forecasted demand and preparing for “design day” conditions (or a historic peak day load).
- Companies tend to diversify their supply strategy in increments that often amount to less than 50 percent of their total supply package.
- Supply planners use a portfolio approach to pricing gas supplies mirroring their approach to supply sources, providers, and transportation options.

Next Steps

- Currently Collecting data for the 2021-2022 winter heating season.
 - If you haven't participated yet, we would love to ensure your utility is represented; contact Morgan Hoy.
- Keep a look out for the 2022-2023 season data collection survey in late summer of 2023.
- If your utility doing something new, implementing a new supply strategy, pricing mechanism, etc., LET US KNOW! The intent of the survey is to document the data as a snapshot of supply behavior by our member LDCs.

Thank You

Thank you to the local gas utilities that participated in the survey. We value their continued participation tremendously and would not be able to provide these reports valuable takeaways without their time and effort!

Thank you to all members of the AGA Energy Analysis team that contributed to the data analysis and report creation for the year's 2020-2021 winter heating season resources.

Questions?

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