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

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Outline

- Overview of the American Gas Association and Natural Gas Utilities
- Winter Heating Season Survey Background
- Why Do Utilities Plan for the Winter Season
- 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
- Safety is AGA's Top Priority

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

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

What is the AGA Winter Heating Season Survey?

- Every year, local natural gas utilities create strategies to meet customer energy requirements during the winter heating season. Guided by experience and regulatory oversight, utilities study several considerations when building out a seasonal natural gas supply portfolio.
- 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).
    - Demand requirements may be shaped by local weather conditions or system requirements from past years.
    - Gas utilities carefully consider supply resources such as firm pipeline capacity, access to on-system or pipeline storage, peak-shaving capabilities, local production, and even third-party transportation arrangements. Plans to manage supply pricing risks may also be in place. In many cases, these plans are submitted to state regulators for approval before the start of the winter heating season.

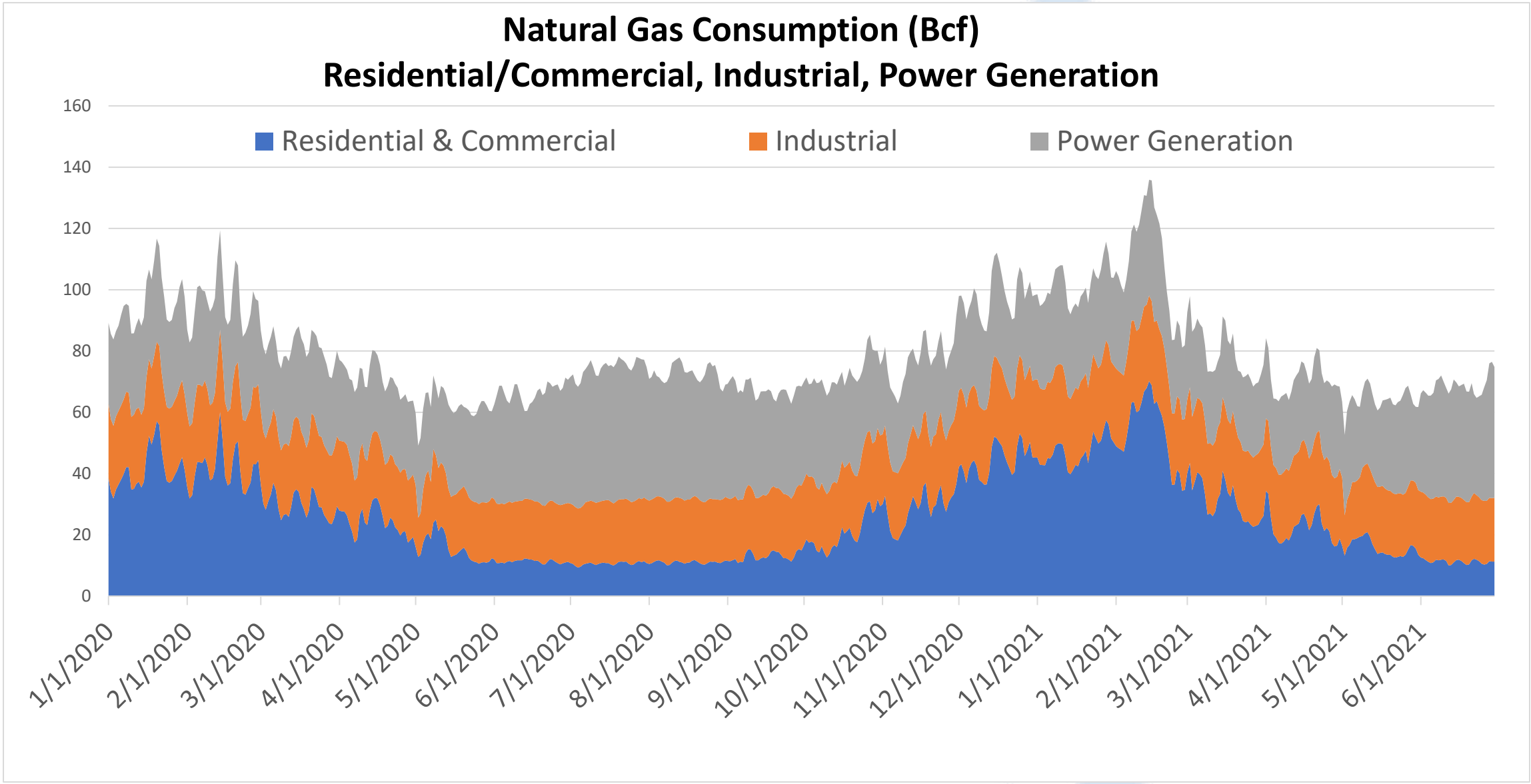
- The winter heating season survey and resources detail the critical elements of the winter heating season (WHS) from the perspective of natural gas utility supply portfolio planning.
- The information in the analysis originates from data collected from AGA member local distribution companies (LDCs) through the AGA LDC Winter Heating Season Performance Survey (around the end of summer for the prior heating season).
- The survey questions focus on peak-day and peak-month supply practices, pricing mechanisms, regulatory frameworks, and market hedging practices – acknowledging that each winter heating season may be unique or exceptional in many ways.
- This resource deck documents gas delivery system operations of the surveyed local gas utilities during the 2020-2021 winter heating season and helps provide insights into gas supply trends and procurement portfolio management.
- It represents a **snapshot of aggregated supply procurement practices of those companies that participated** in this survey.
- The aggregated data presented in this report are not to be interpreted as standards or best practices for gas supply management. The need for and timing of any of the described practices will vary with each operator based on several factors, including, but not limited to, unique regulatory, geographic, and operational characteristics.

Winter Heating Season Report

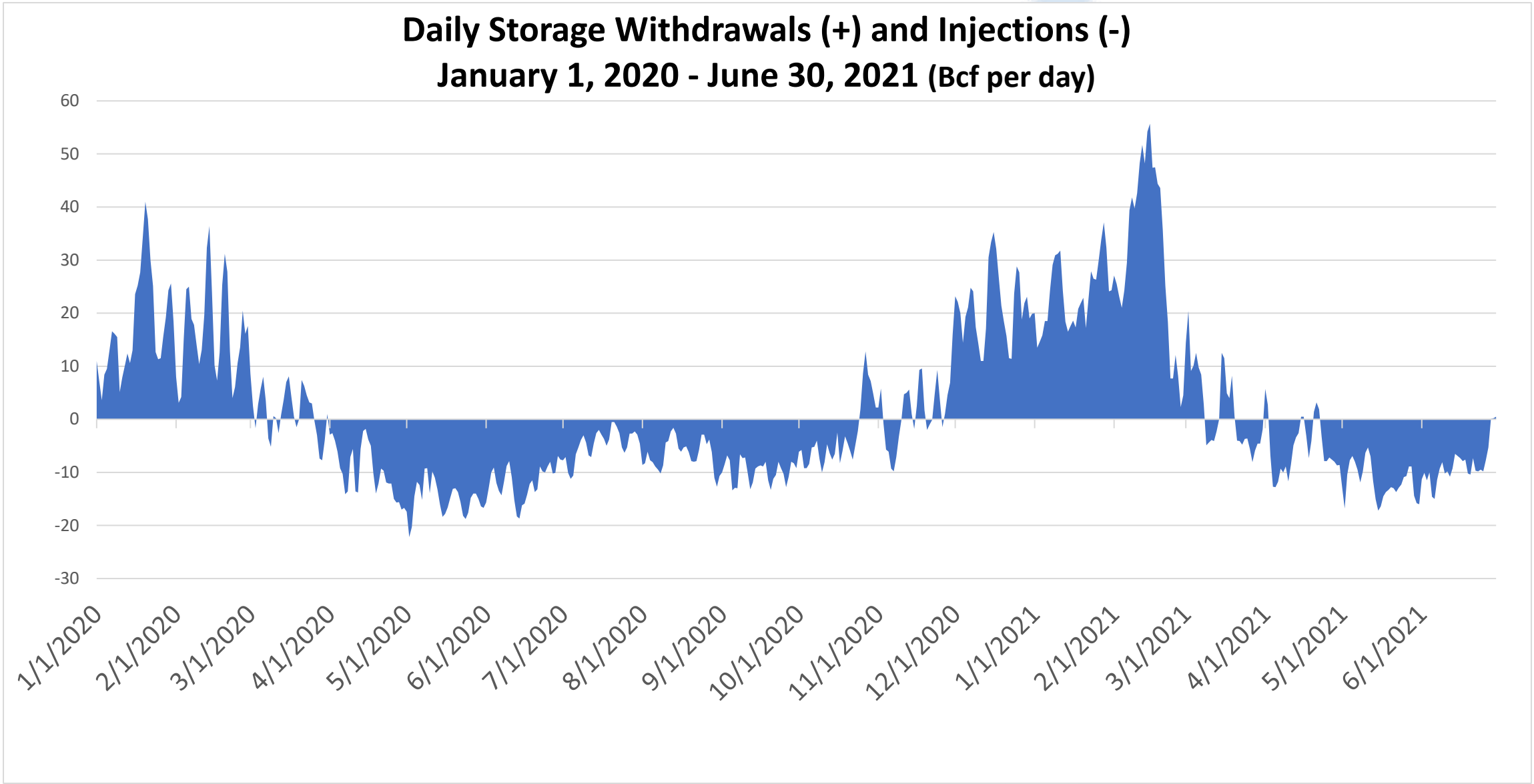
- Details critical elements of the 2020-2021 winter heating season (WHS) from the perspective of natural gas utility supply portfolio planning.
  - Documents gas delivery system operations
  - Insights into gas supply trends and procurement portfolio management
  - Represents a snapshot of aggregated supply procurement practices of participating LDCs

- The survey focus on:
  - Peak-day and peak-month supply practices
  - Pricing mechanisms
  - Regulatory frameworks
  - Market hedging practices

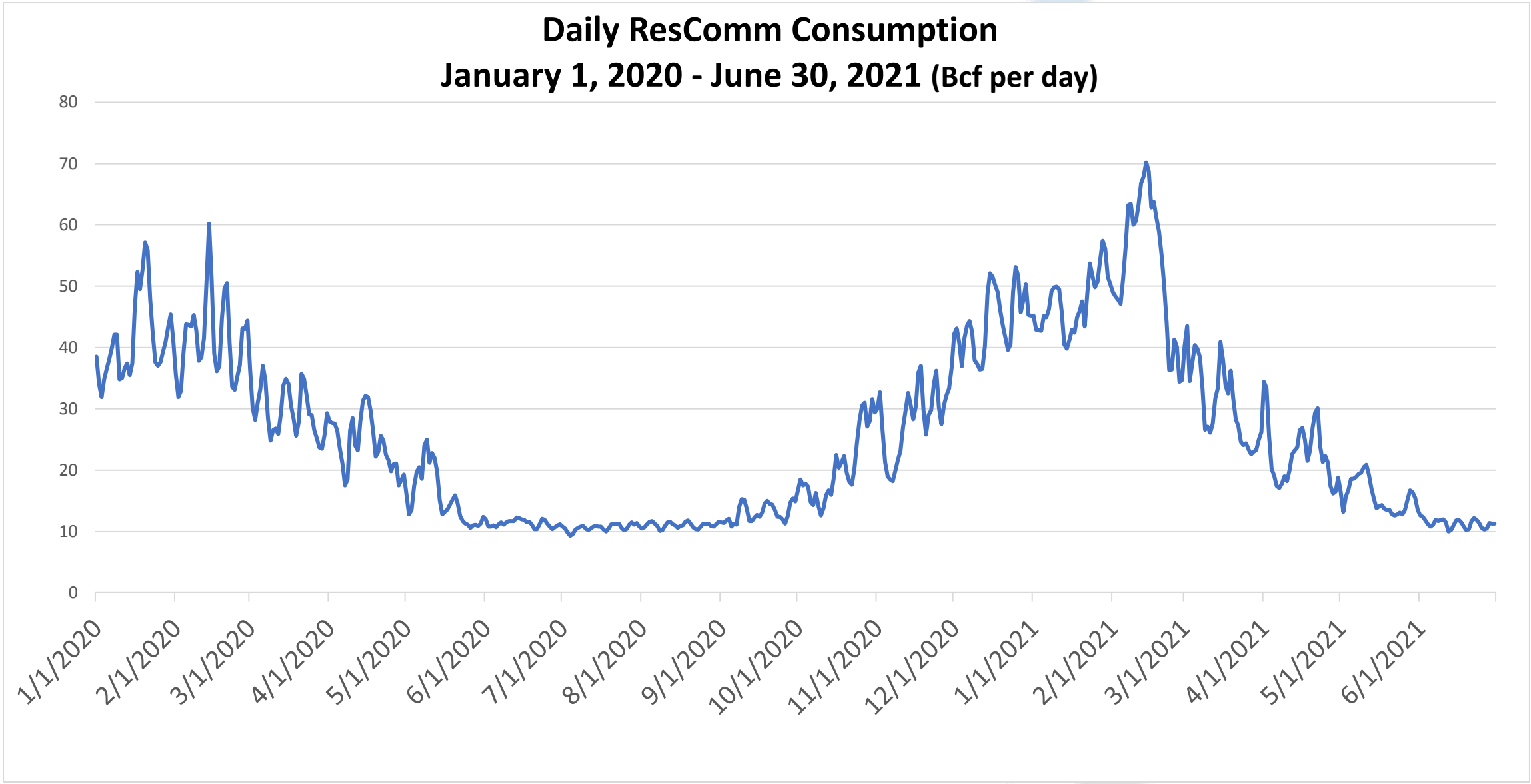
Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource



Source: Bentek Energy



Source: Bentek Energy



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

Sources of Participant Peak Gas Supplies by Number of Companies

2020-2021 Winter Heating Season

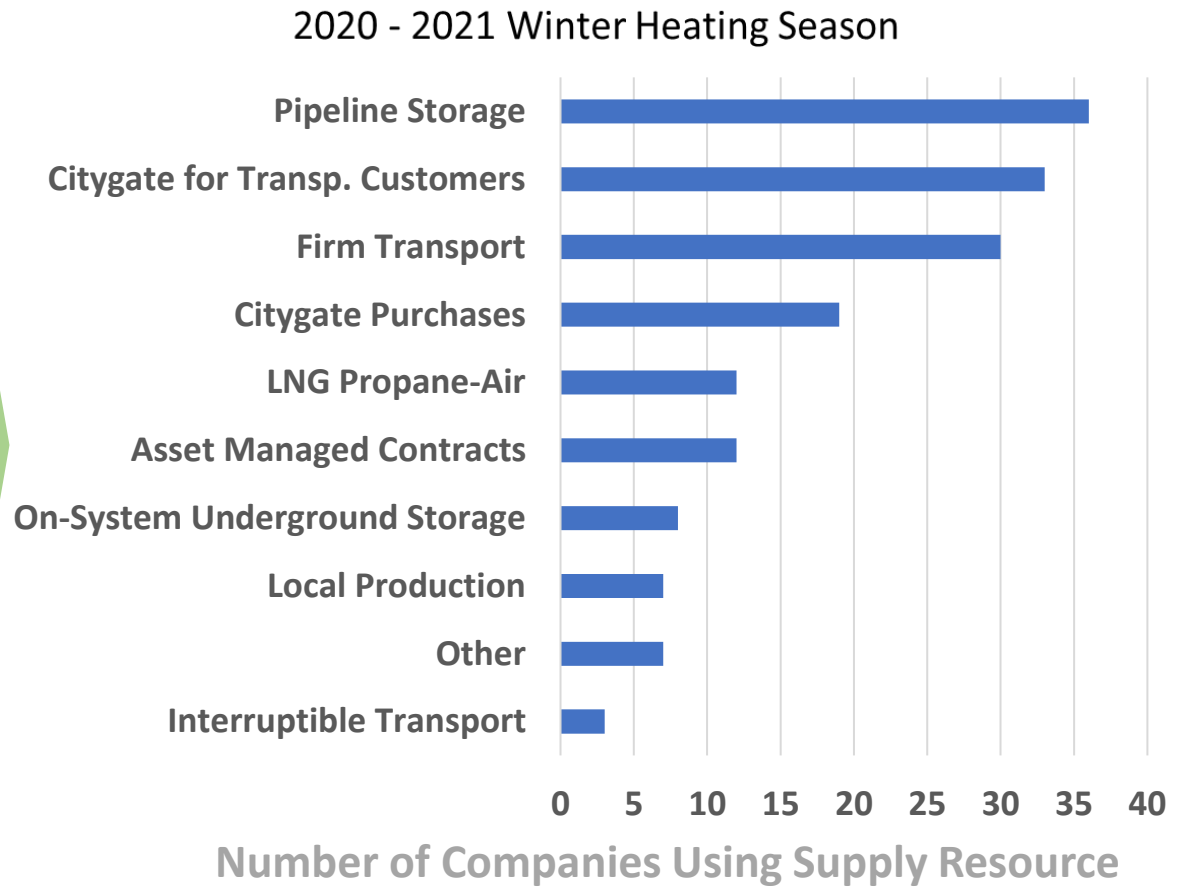
Supply Volume Percentage Ranges	Interruptible Transport	Local Production	On-System Underground Storage	LNG Propane-Air	Citygate Purchases	Firm Transport	Citygate for Transp. Customers	Pipeline Storage	Other	Asset Managed Contracts
Peak Day										
1 - 25%	1	6	4	11	13	9	16	19	6	5
26 - 50%	1	0	4	1	4	13	15	9	0	2
51 - 75%	0	1	0	0	1	7	0	8	1	3
76 - 100%	1	0	0	0	1	1	2	0	0	2
0%	45	41	40	36	29	18	15	12	41	36
Peak Month										
1 - 25%	1	7	6	10	13	8	15	21	4	5
26 - 50%	1	0	3	0	4	14	16	10	0	1
51 - 75%	0	0	0	0	2	5	2	3	0	3
76 - 100%	1	1	0	0	2	3	2	0	1	3
0%	45	40	39	38	27	18	13	14	43	36

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

LDC Diversification of Supply Strategy for Peak Day and Month Delivery

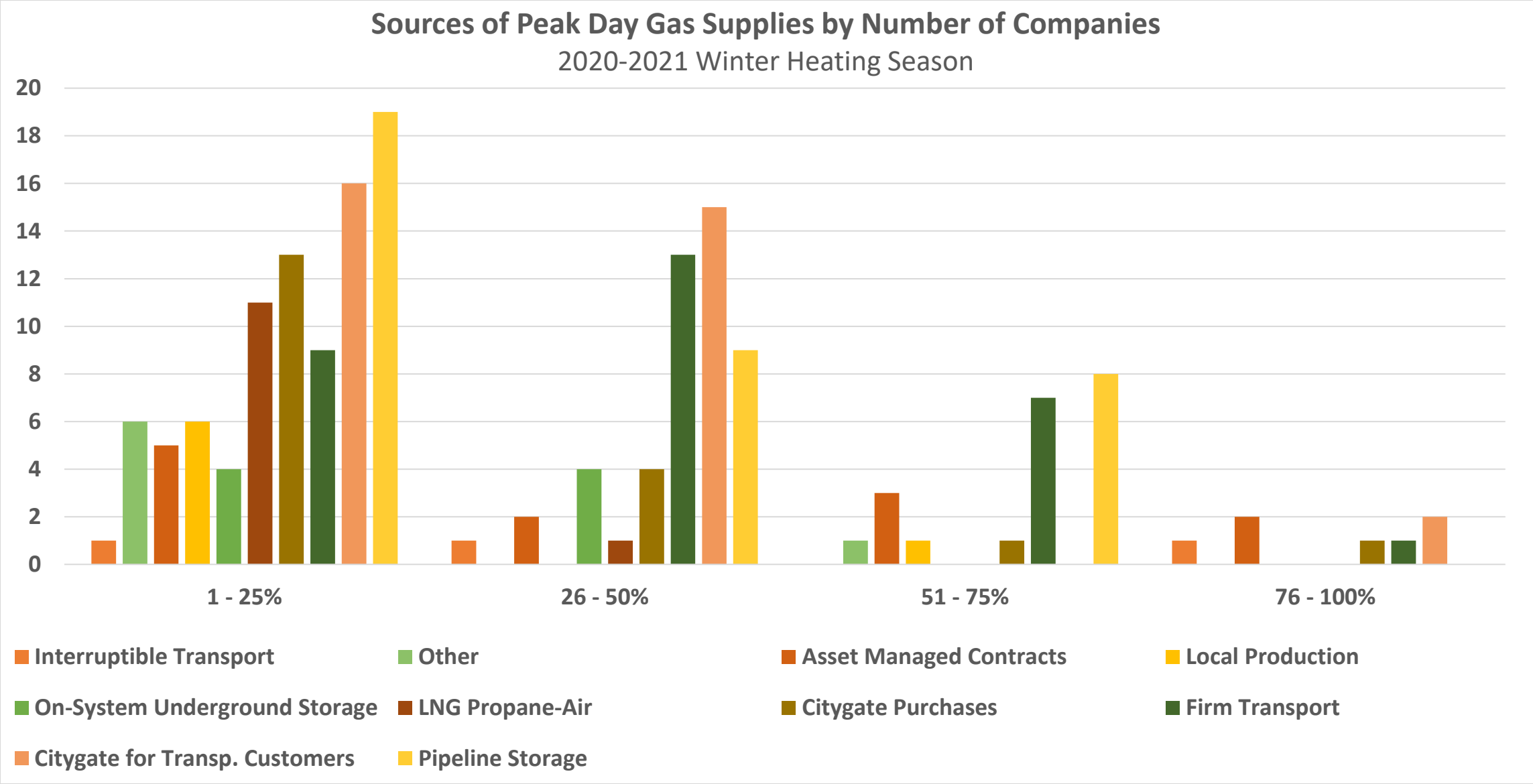
- Companies tend to diversify their supply strategy in increments that often amount to less than 50 percent of their total supply package.

Source of Peak Day Gas Supplies



- 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: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource



Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

Aggregate Peak Day and Peak Month Supplies

2020 - 2021 Winter Heating Season

Supply Source	Peak Day		Peak Month		February 7 - 20	
	Volume	%	Volume	%	Volume	%
Citygate purchases for sales customers	1,172,799	**4%**	21,758,675	**3%**	10,536,281	**5%**
Citygate supplies for transportation customers	5,612,461	**17%**	153,715,936	**23%**	50,811,928	**26%**
LNG / Propane-air / SNG	578,485	**2%**	2,481,463	**0%**	2,111,828	**1%**
Local production	356,128	**1%**	9,959,059	**1%**	3,547,419	**2%**
On-system underground storage	4,649,891	**14%**	68,408,169	**10%**	26,984,620	**14%**
Pipeline or other storage	3,993,025	**12%**	66,861,423	**10%**	28,902,052	**15%**
Purchases moved via firm transportation	9,051,761	**28%**	182,242,271	**27%**	57,097,002	**29%**
Purchases moved via interruptible transportation	3,716,978	**11%**	65,706,719	**10%**	4,369,807	**2%**
Asset managed contracts	848,279	**3%**	19,326,582	**3%**	8,659,448	**4%**
Other	2,877,494	**9%**	80,655,782	**12%**	2,012,412	**1%**
TOTAL	32,856,897	**100%**	671,116,079	**100%**	195,032,797	**100%**

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

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

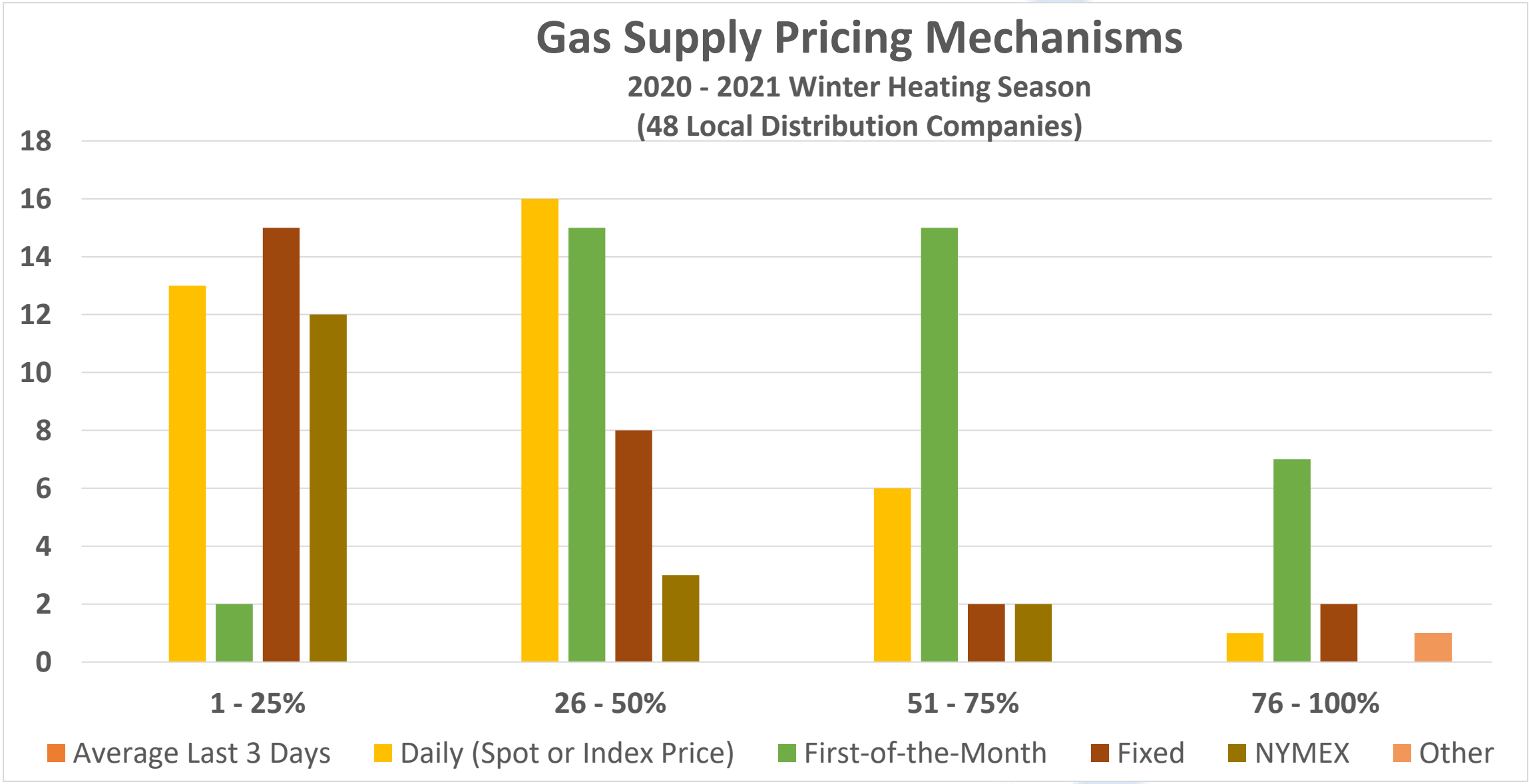
Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

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

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource


Gas Supply Pricing Mechanisms
2020 - 2021 Winter Heating Season
(48 Local Distribution Companies)
18
16
14
12
10
8
6
4
2
0
1 - 25%
26 - 50%
51 - 75%
76 - 100%
Average Last 3 Days
Daily (Spot or Index Price)
First-of-the-Month
Fixed
NYMEX
Other

Gas Supply Pricing Mechanisms by number of Companies							
Winter Heating Season 2020 - 2021							
Supply Volume Percentage Ranges	Average Last 3 Days	Daily (Spot or Index Price)	First-of-the-Month	Fixed	NYMEX	Weekly	Other
1 - 25%	0	13	2	15	12	0	0
26 - 50%	0	16	15	8	3	0	0
51 - 75%	0	6	15	2	2	0	0
76 - 100%	0	1	7	2	0	0	1
0	48	12	9	21	31	48	47

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

Source: Energy Information Administration.

Weekly Working Gas in Underground Storage (Bcf)

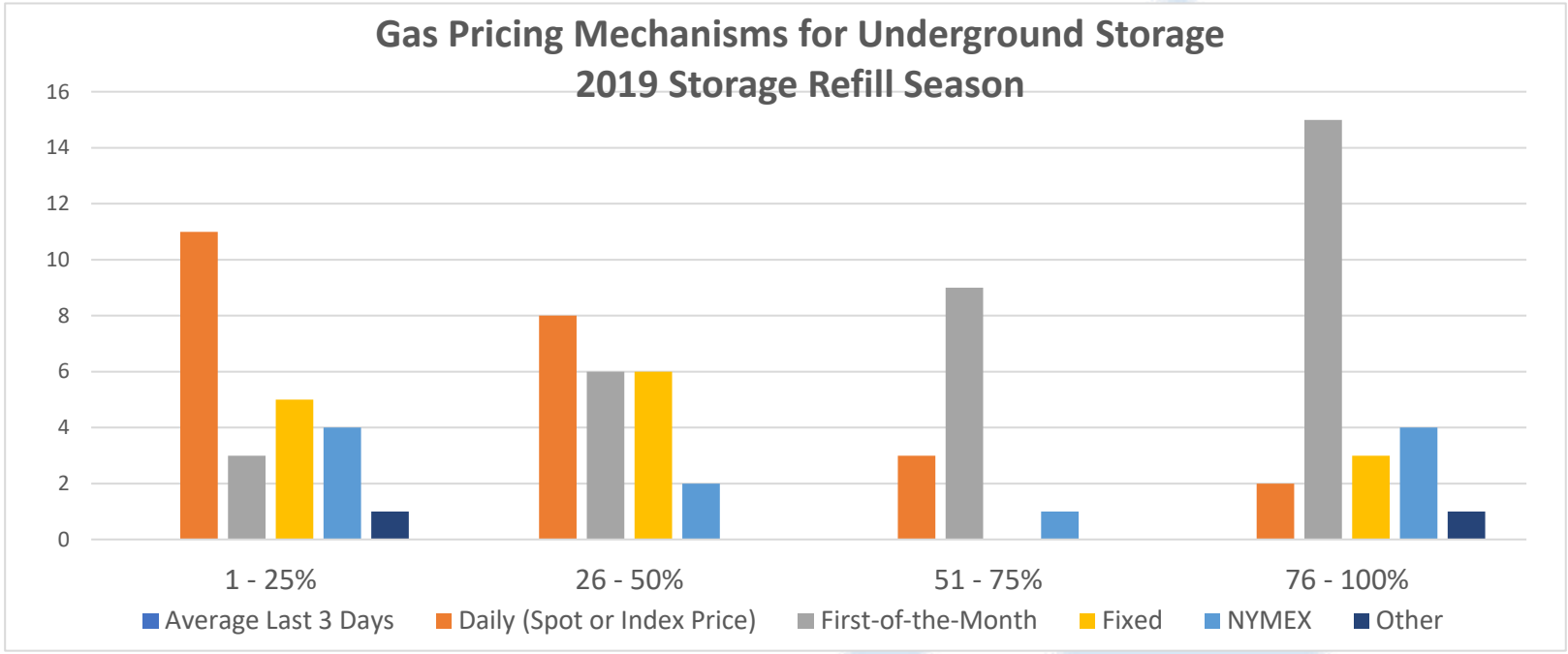
2020 – 2021 Winter Heating Season

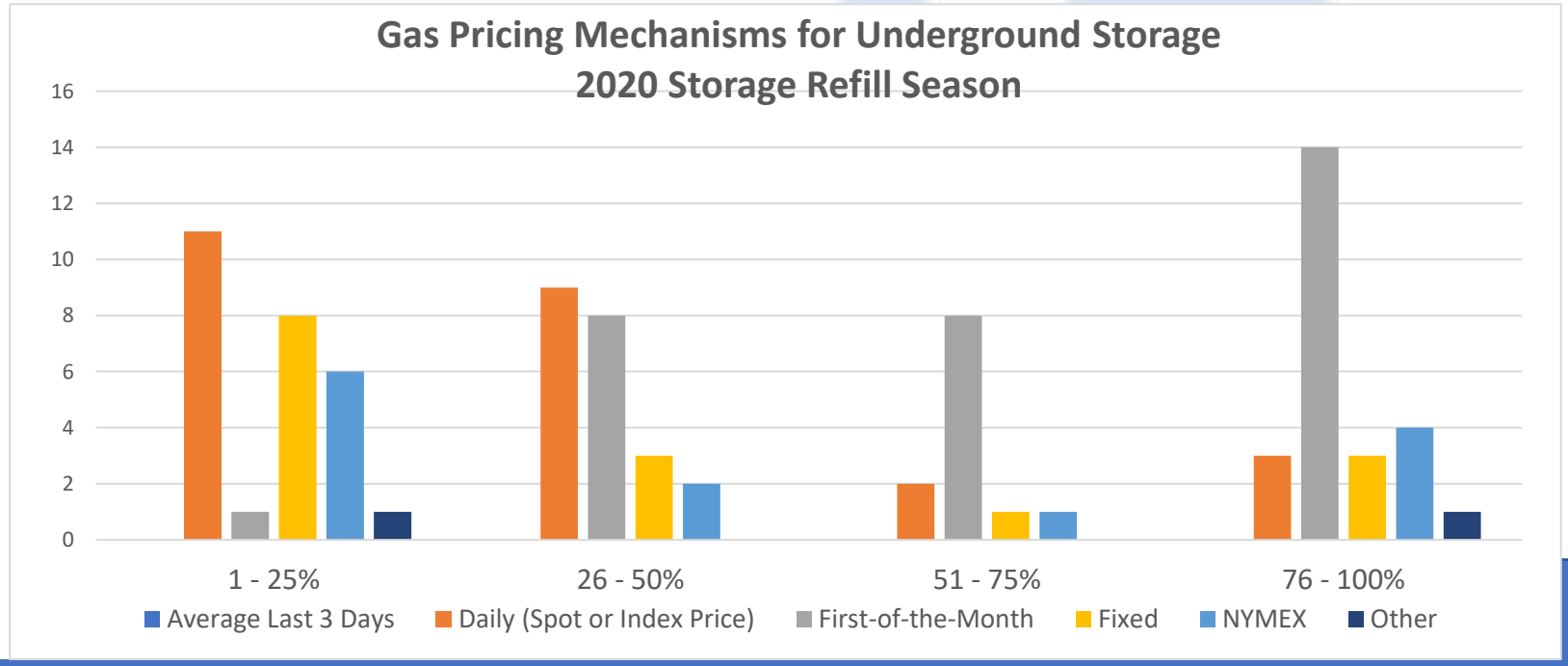
2020									2021								
Date	Lower 48 States	East	Mid-west	Mountain	Pacific	South Central	Salt South Central	Nonsalt South Central	Date	Lower 48 States	East	Mid-west	Mountain	Pacific	South Central	Salt South Central	Nonsalt South Central
27-Dec	3192	771	905	173	251	1093	313	780	25-Dec	3460	810	973	204	289	1183	334	849
3-Jan	3148	756	885	166	244	1097	323	774	1-Jan	3330	765	923	196	282	1163	333	830
31-Jan	2609	598	725	136	210	941	281	660	29-Jan	2689	582	719	158	261	970	281	689
7-Feb	2494	569	694	126	202	903	269	634	5-Feb	2518	529	666	150	257	915	261	654
28-Feb	2091	451	558	101	197	784	229	555	26-Feb	1845	383	465	117	210	670	159	511
6-Mar	2043	426	529	97	200	791	235	556	5-Mar	1793	350	440	113	205	685	176	509
27-Mar	1986	382	476	92	197	840	256	585	26-Mar	1764	307	401	112	194	749	226	523
3-Apr	2024	382	475	92	203	872	265	607	2-Apr	1784	305	398	115	198	768	235	533
24-Apr	2210	405	506	103	218	979	314	664	30-Apr	1958	332	442	124	224	836	264	572
1-May	2319	424	530	111	228	1027	331	695	7-May	2029	347	458	131	235	857	269	588
29-May	2714	536	634	140	273	1131	353	778	28-May	2313	413	522	151	268	959	300	659
5-Jun	2807	563	662	148	281	1153	357	797	4-Jun	2411	445	547	160	276	983	302	681
26-Jun	3077	639	740	173	304	1222	368	854	25-Jun	2558	513	623	173	244	1005	296	709
3-Jul	3133	657	761	180	310	1226	364	862	2-Jul	2574	521	638	177	246	991	286	705
31-Jul	3274	718	830	202	311	1214	336	878	30-Jul	2727	604	719	184	244	976	250	726
7-Aug	3332	738	856	206	314	1219	337	883	6-Aug	2776	629	741	185	241	979	247	732
28-Aug	3455	789	924	212	304	1225	331	895	27-Aug	2871	678	812	190	243	948	214	734
4-Sep	3525	805	953	216	308	1243	335	908	3-Sep	2923	703	842	191	243	943	208	735
25-Sep	3756	872	1033	231	316	1304	358	945	24-Sep	3170	779	934	201	243	1013	239	774
2-Oct	3831	893	1062	236	318	1322	366	955	1-Oct	3288	810	971	206	248	1054	259	795
30-Oct	3919	947	1119	240	320	1293	348	945	29-Oct								

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

Pricing Mechanisms for Gas Injected into Underground Storage by Number of Companies							
2019 Refill Season (April - October)							
Supply Volume Percentage Ranges	Average Last 3 Days	Daily (Spot or Index Price)	First-of-the-Month	Fixed	NYMEX	Weekly	Other
1 - 25%	0	11	3	5	4	0	1
26 - 50%	0	8	6	6	2	0	0
51 - 75%	0	3	9	0	1	0	0
76 - 100%	0	2	15	3	4	0	1
0	48	24	15	34	37	48	46
2020 Refill Season (April - October)							
Supply Volume Percentage Ranges	Average Last 3 Days	Daily (Spot or Index Price)	First-of-the-Month	Fixed	NYMEX	Weekly	Other
1 - 25%	0	11	1	8	6	0	1
26 - 50%	0	9	8	3	2	0	0
51 - 75%	0	2	8	1	1	0	0
76 - 100%	0	3	14	3	4	0	1
0	48	23	17	33	35	48	46

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource





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

Sources: AGA 2018-2019 Winter Heating Season Report & AGA 2020-2021 Winter Heating Season Resource

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?

Contacts

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- Morgan Hoy, Senior Market & Regulatory Analyst, mhoy@aga.org

www.aga.org

The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 76 million residential, commercial and industrial natural gas customers in the U.S., of which 95 percent — more than 72 million customers — receive their gas from AGA members. Today, natural gas meets more than thirty percent of the United States' energy needs.