CHUGACH ELECTRIC ASSOCIATION, INC.
ANCHORAGE, ALASKA

OPERATIONS COMMITTEE MEETING

AGENDA

Mark Wiggin, Chair
Jim Nordlund, Vice Chair

Sisi Cooper, Director
Bettina Chastain, Director
Sam Cason, Director

February 7, 2024 | **4:00 p.m.** | **Chugach Board Room**

I. CALL TO ORDER *(4:00 p.m.)*
   - *A. Roll Call*

II. APPROVAL OF THE AGENDA* *(4:05 p.m.)*

III. APPROVAL OF THE MINUTES* *(4:10 p.m.)*
   - *A. January 10, 2024 (Slocum)*

IV. PERSONS TO BE HEARD *(4:15 p.m.)*
   - *A. Member Comments*

V. NEW BUSINESS *(4:20 p.m.)*
   - *A. Sales Variance Analysis (Kornmuller/Chicola) (4:20 p.m.)*
   - *B. Natural Gas Supply Update (Rudeck/Thompson/Gerlek) (4:40 p.m.)*

VI. EXECUTIVE SESSION *(scheduled) (5:00 p.m.)*
   - *A. Natural Gas Supply Update (Rudeck/Thompson/Gerlek) (5:00 p.m.)*
   - *B. Beluga Power Plant (Ori) (5:45 p.m.)*

VII. NEW BUSINESS (*Scheduled*) *(6:15 p.m.)*
   - *A. Beluga Power Plant (Ori) (6:15 p.m.)*

VIII. DIRECTOR COMMENTS *(6:30 p.m.)*

IX. ADJOURNMENT* *(6:45 p.m.)*

* ***Denotes Action Items***
** ***Denotes Possible Action Items***
2/6/2024 2:27:57 PM

CHUGACH ELECTRIC ASSOCIATION, INC.
Anchorage, Alaska

January 10, 2024
Wednesday
4:00 p.m.

OPERATIONS COMMITTEE MEETING

Recording Secretary: Heather Slocum

I. CALL TO ORDER

Chair Wiggin called the Operations Committee meeting to order at 4:04 p.m. in the boardroom of Chugach Electric Association, Inc., 5601 Electron Drive, Anchorage, Alaska.

A. Roll Call

Committee Members Present:
Mark Wiggin, Chair
Jim Nordlund, Vice Chair
Bettina Chastain, Director
Sisi Cooper, Director
Sam Cason, Director

Board Members Present:
Susanne Fleek-Green, Director
Rachel Morse, Director

Guests and Staff Attendance Present:

Arthur Miller	Mark Henspeter	Josh Travis
Andrew Laughlin	Russ Thornton	Shawn Skaling
Matthew Clarkson	Emily Mueller	Dustin Highers
Sherri Highers	Bill Herman, Member	Kate Ayers
Allan Rudeck	Bernie Smith, Member	Trish Baker
	Scarlett Masten	

Via Teleconference:

Sandra Cacy	Kim Henkel, MEA	George Donart
Ky'yanna Hamilton	Sarah Nabirye	David Caye
Julian Ramirez, Alaska Center	Jenny Marie Stryker	Jim Henderson
Brad Authier	Aurora Roth	

II. APPROVAL OF THE AGENDA

Director Cooper moved, and Director Nordlund seconded the motion to approve the agenda. The motion passed unanimously.

III. APPROVAL OF THE MINUTES

Director Nordlund moved, and Director Cooper seconded the motion to approve the December 20, 2024, Operations Committee Meeting minutes. The motion passed unanimously.

IV. PERSONS TO BE HEARD

A. Member Comments

Julian Ramirez, Alaska Center, made comments regarding the format of the Eklutna Public Meetings.

Chugach member Bernie Smith made comments regarding the Integration of Renewable Power on the Railbelt System.

V. NEW BUSINESS

A. Integration of Renewable Power on the Railbelt System (Rudeck/D. Highers)

Allan Rudeck, Chief Strategic Officer, Dustin Highers, V.P., Corporate Programs, and Russ Thornton, V.P. Power Supply presented on the Integration of Renewable Power on the Railbelt System and responded to questions from the Committee.

VI. EXECUTIVE SESSION

None.

VII. NEW BUSINESS *(continued)*

None.

VIII. DIRECTOR COMMENTS

Comments were made at this time.

IX. ADJOURNMENT

At 6:24 p.m., Director Nordlund moved, and Director Cooper seconded the motion to adjourn. The motion passed unanimously.

CHUGACH ELECTRIC ASSOCIATION, INC.
ANCHORAGE, ALASKA

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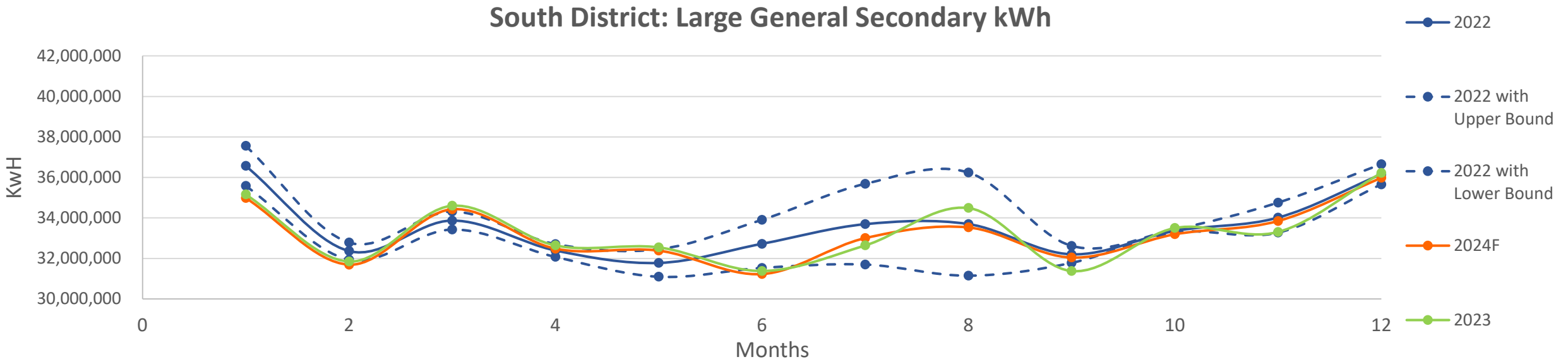
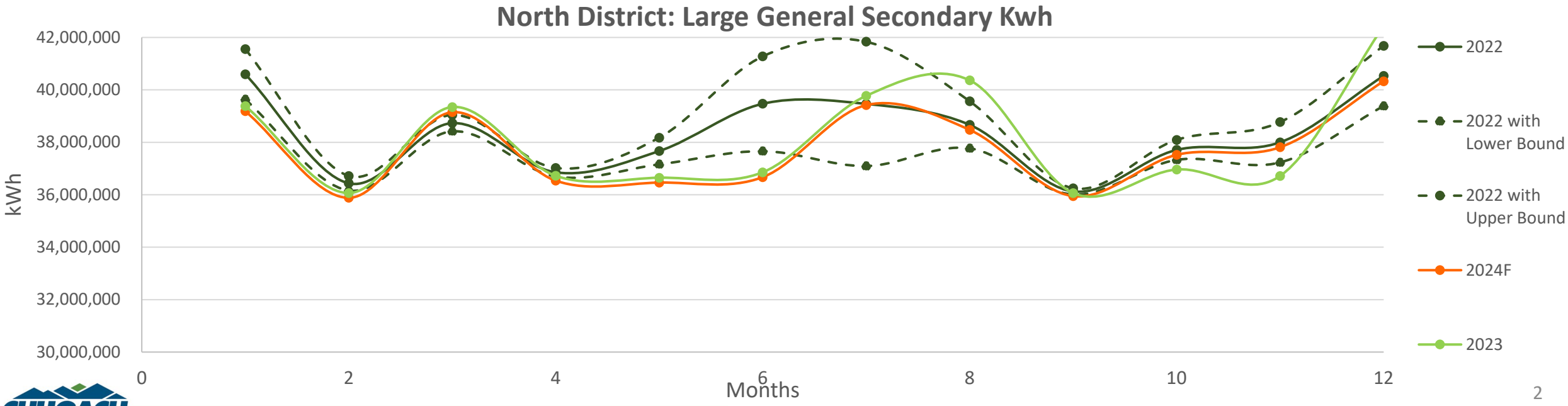
2024 Sales Forecast Methodology

- Sales determinant data used.
- July 2022 to July 2023 averages with the following % change assumptions:
  - Energy: -0.5%, Demand: -0.5%, Meters: Flat 0.0%
- 2021 to 2023 monthly standard deviations (+/- 1 σ) to create upper and lower bounds to capture seasonality.
- Results presented are aggregated to the broad service class level.

Sample Results





Future Forecast Methodology Recommendations

1) Map & Streamline Current Input Data
2) Establish Metrics Dashboard (e.g.; Forecast bias, MAD, MAPE, MSE, RMSE) to measure prediction accuracy of any model that is incorporated.
3) Describe the rate class distribution by incorporating additional statistical measures. (e.g., median, std. dev., skewness, kurtosis)
4) Use multiple approaches for robustness that may use different data for additional context and comparison.
   - Q1: How relevant is past data in forecast to follow?
   - Q2: Incorporate external data
5) What software can/should be used to implement the model(s)? (standalone, open source)

Future Forecast Model Type Possibilities

- Non- Exhaustive, but a sample of possible modeling approaches.

Using Past Load Data Only:

- Linear Time Series (e.g., ARIMA, SARIMA)
- Nonlinear Time Series (e.g., ARCH, GARCH)

Incorporating Other Explanatory Variables (cooling/heating degree days, population growth, tariff prices, household size, GDP, etc.):

- Regression (linear, logistic, polynomial, decision tree, random forest, support vector)
- Artificial Neural Network (ANN) & deep learning (keras.io)*

Sales Determinant Variance Analysis

Operations Committee Meeting

February 07, 2024

CHUGACH
POWERING ALASKA'S FUTURE

Purpose: Explain Month and Year to Date Variances

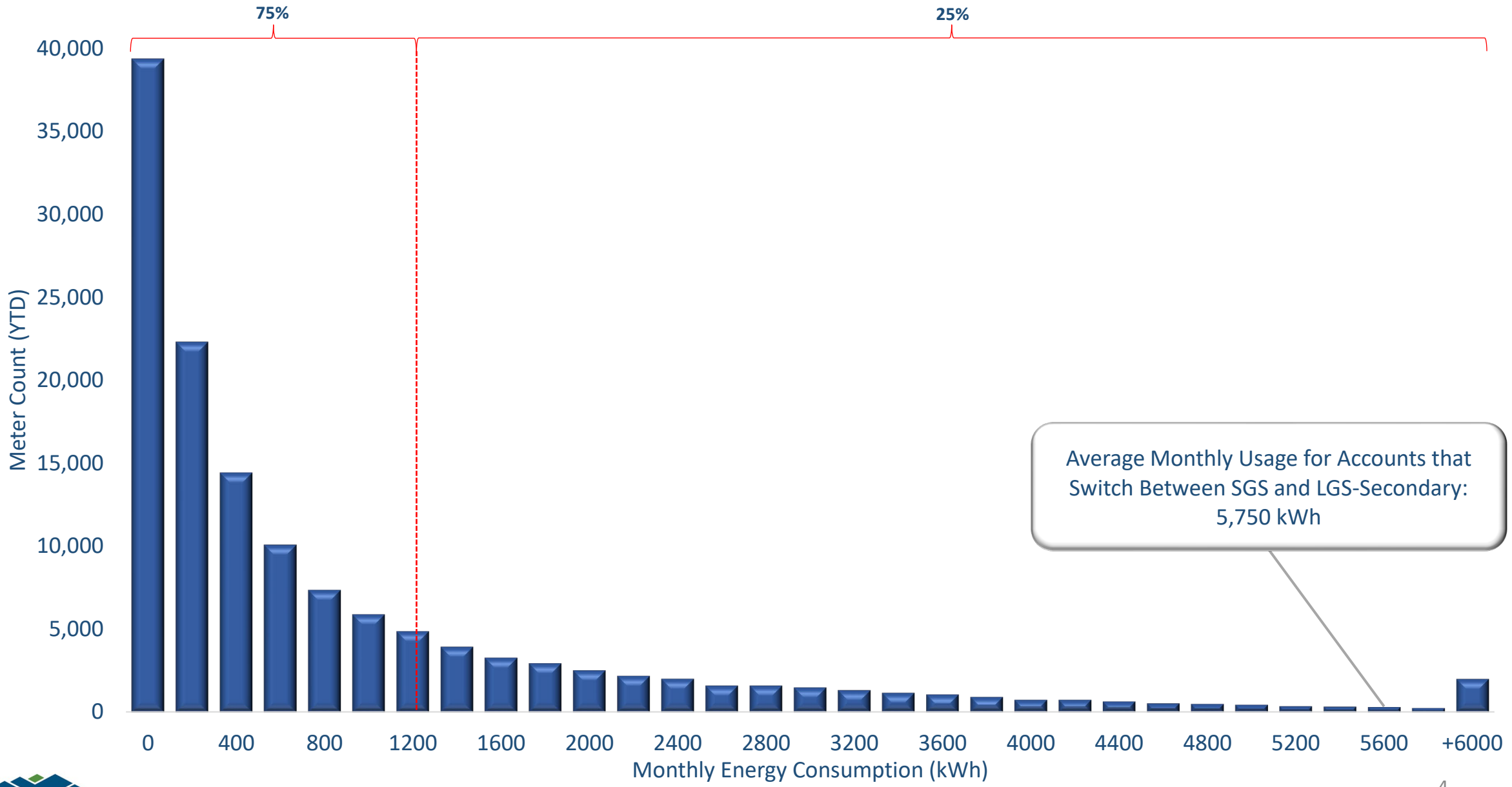
Monthly Retail Sales Tracking Report - BILLING DETERMINANTS

Year- to- Date	Actual	Variance (%)	
Energy (kWh)	**YTD 2023**	**Budget**	**YTD 2022 Actual**
Residential	379,398,587	(2.1%)	0.1%
SGS	115,113,916	(4.5%)	(3.2%)
LGS-Secondary	570,453,240	1.1%	(0.8%)
LGS- Primary	80,566,274	4.6%	1.6%
JBER	91,667,231	1.8%	2.8%
Total	1,237,199,248	(0.2%)	(0.3%)
Demand (kW)	**YTD 2023**	**Budget**	**YTD 2022 Actual**
LGS-Secondary	1,461,321	(0.1%)	(0.6%)
LGS- Primary	157,358	3.8%	1.6%
JBER	182,498	1.7%	0.8%
Total	1,801,177	0.4%	(0.3%)
Meter Count	**YTD Average**	**Budget**	**YTD 2022 Actual**
Residential	96,872	(0.0%)	0.2%
SGS	13,682	(0.5%)	(0.3%)
LGS-Secondary	2,466	4.1%	3.2%
LGS- Primary	38	(2.9%)	(3.2%)
JBER	2	0.0%	0.0%
	113,059	0.1%	0.2%

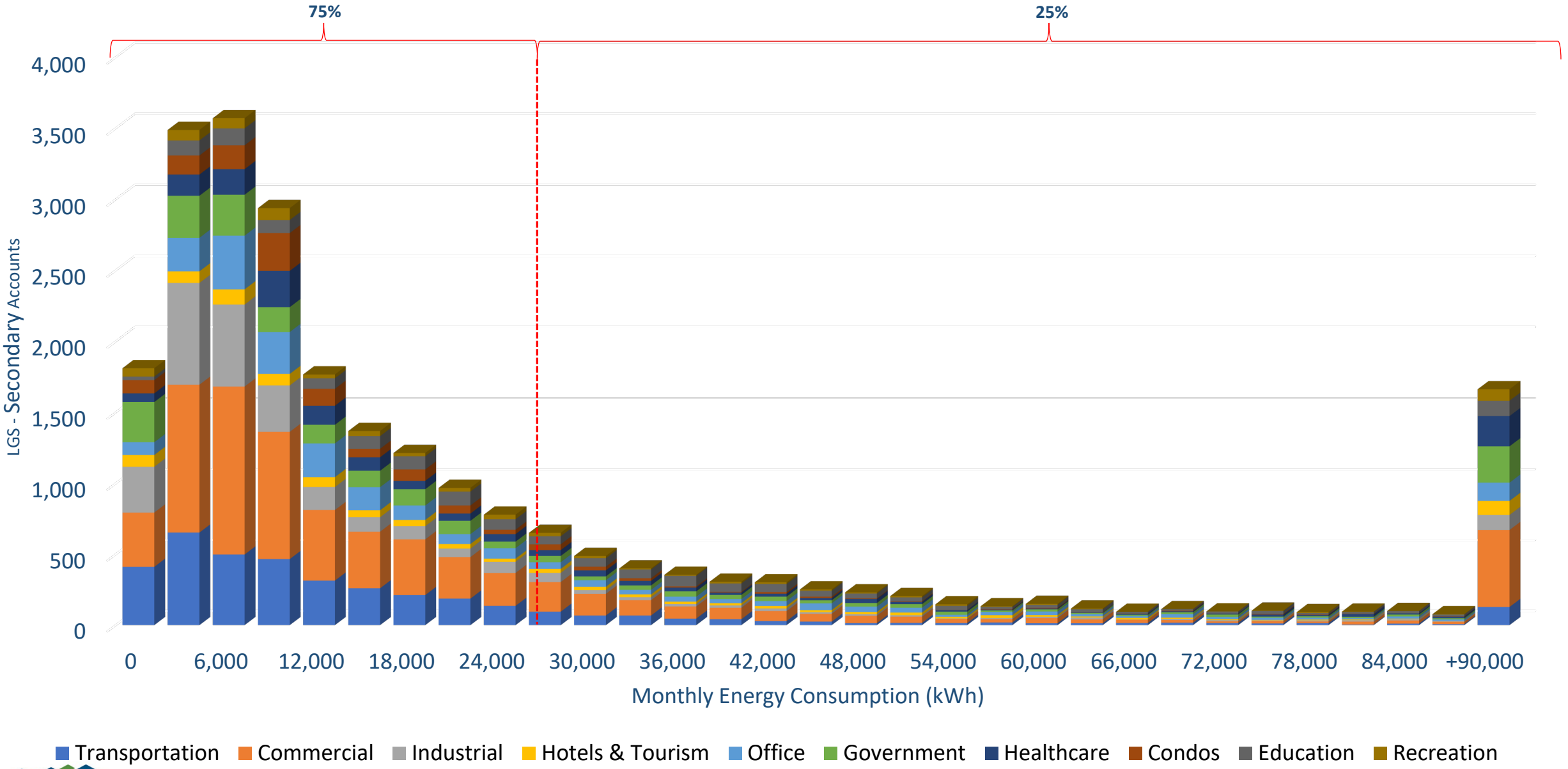
Primary Factors that Impact Usage Levels

- Seasonal Changes
  - Temperature
  - Hours of darkness
- Industry and Economy
  - Specific industry usage behavior
  - Pandemic conditions
  - Sales decline due to efficiencies
  - Growth in beneficial electrification
- Reporting and Recording
  - Billing system and processes
  - Operating tariff rules

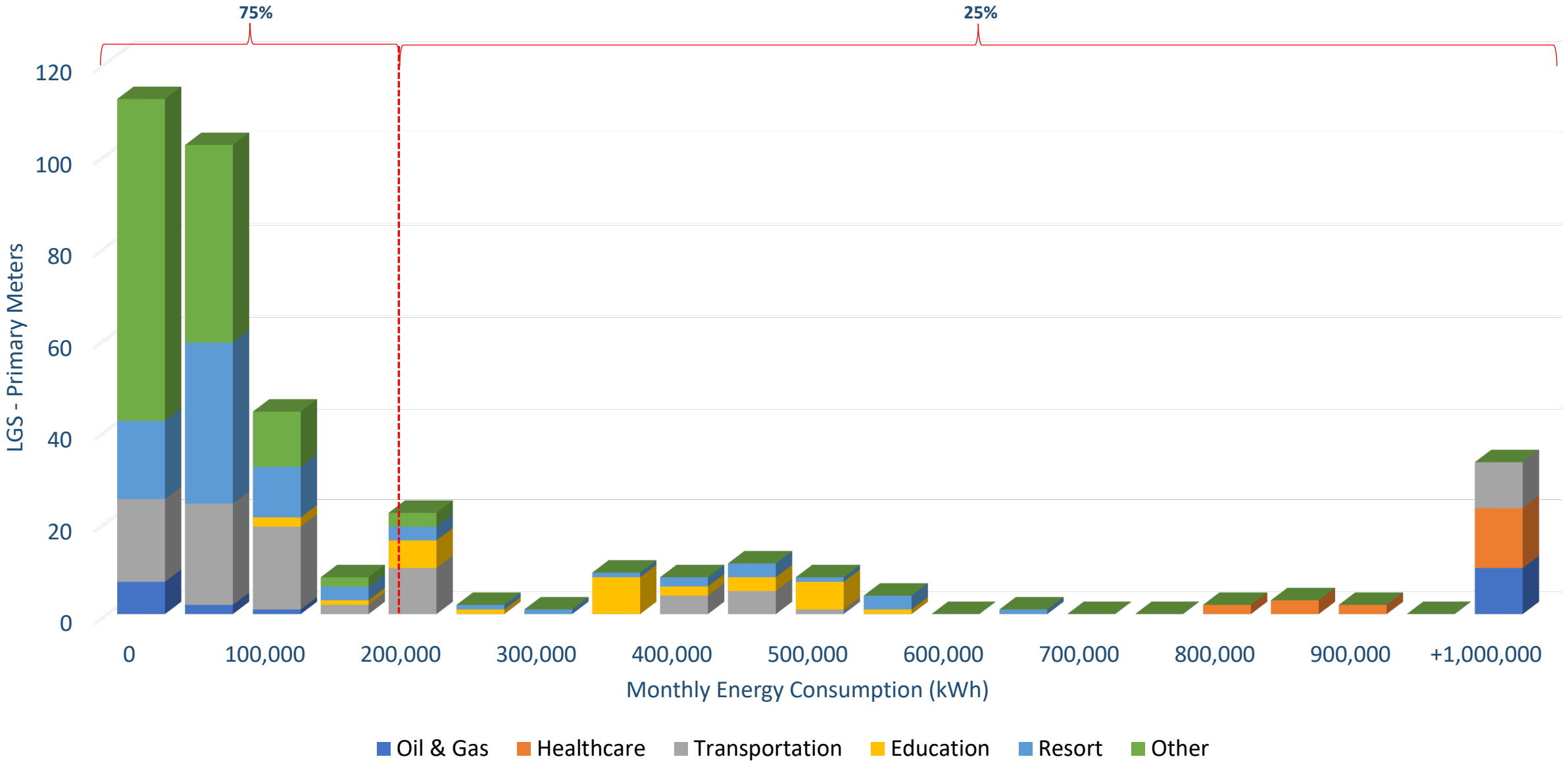
Small General: Distribution of kWh Usage



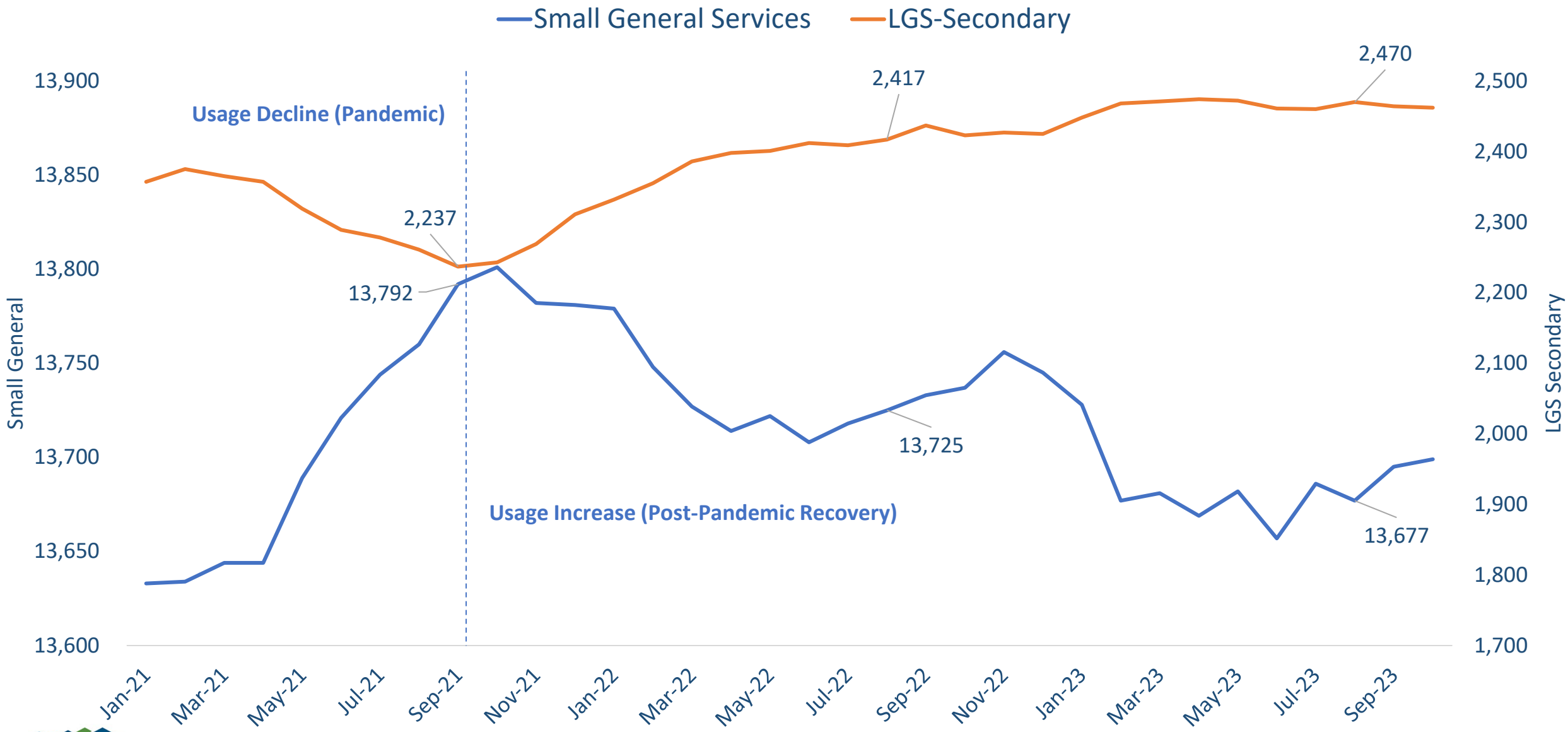
Large General – Secondary: Distribution of kWh Usage



Large General – Primary: Distribution of kWh Usage



Pandemic Impact on Switching Between Rate Classes

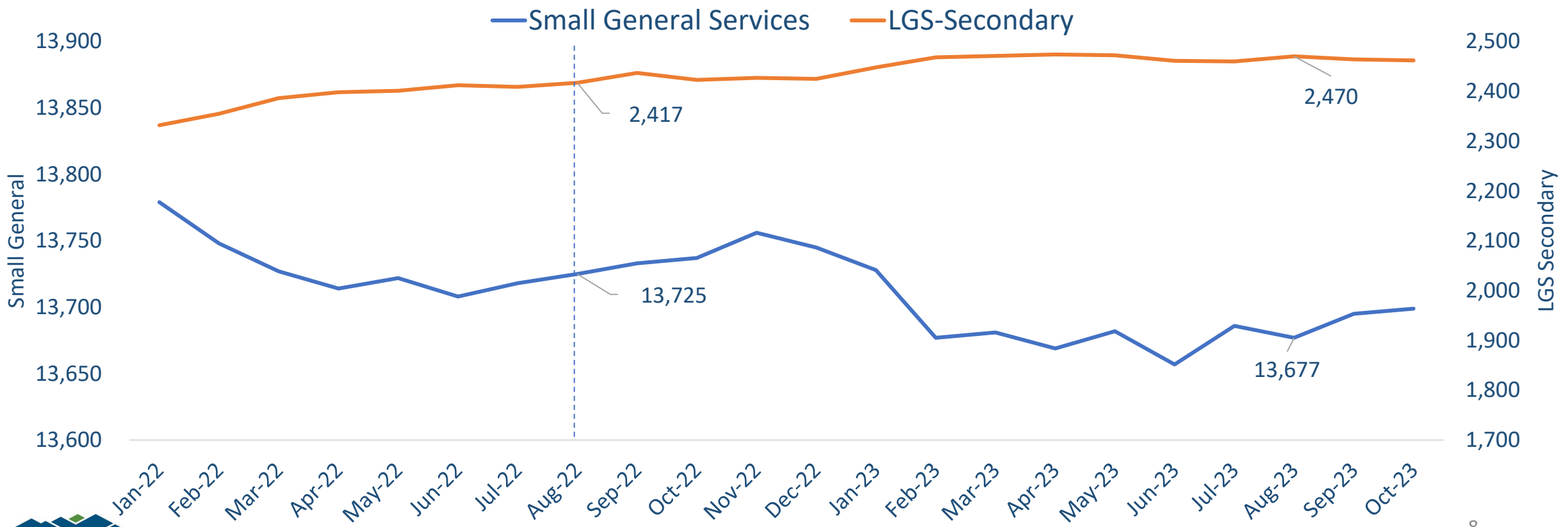


Impact of Rate Class Switching

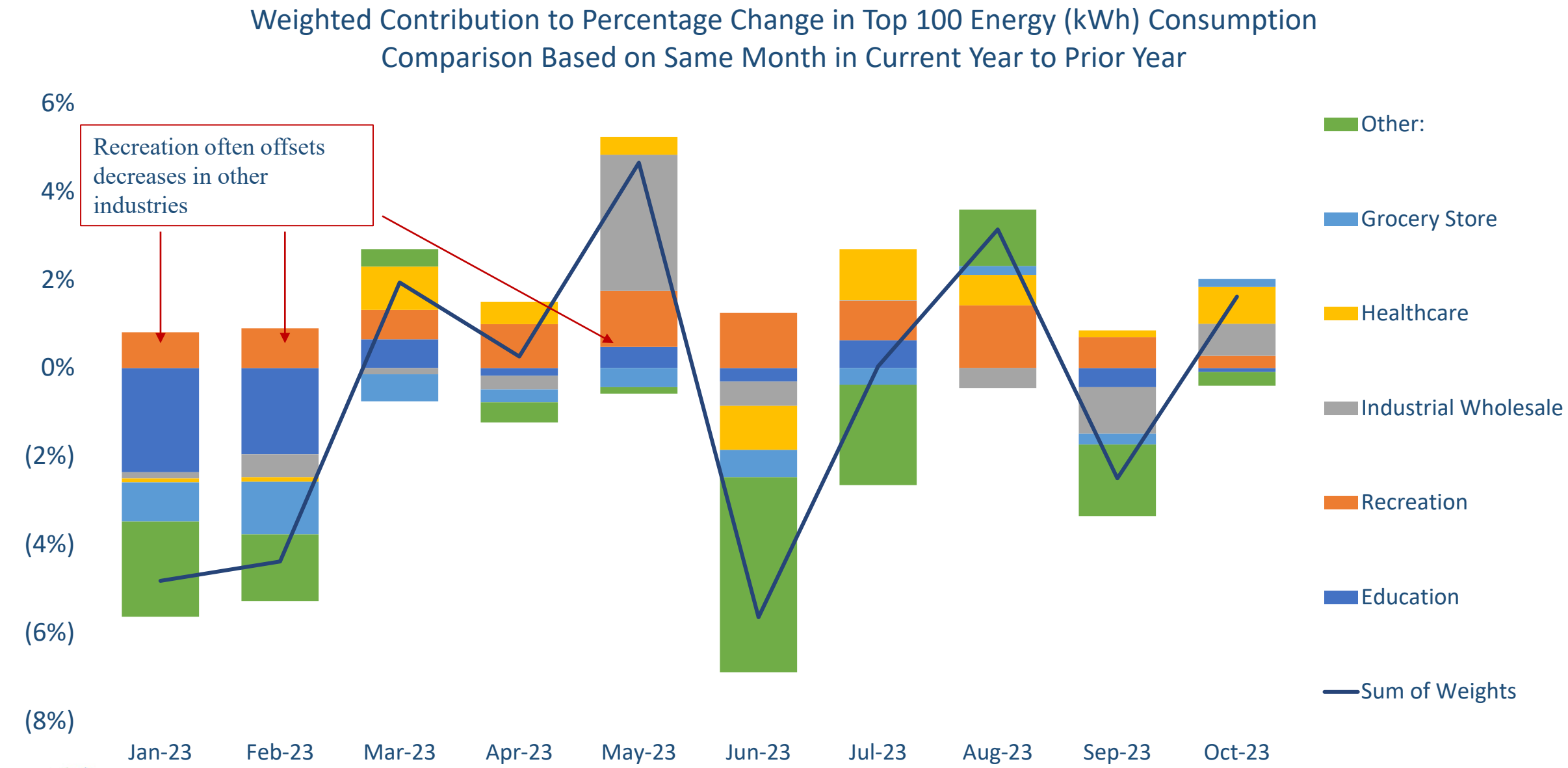
Switching Comparison				
	Meters	% of Class	YTD kWh	% of Class
Small General	(66)	(0.48%)	(4,554,000)	(3.83%)
Large General -Secondary	66	2.73%	4,554,000	0.79%

Industries Switching

- Restaurants
- Places of Worship
- Large Storefronts

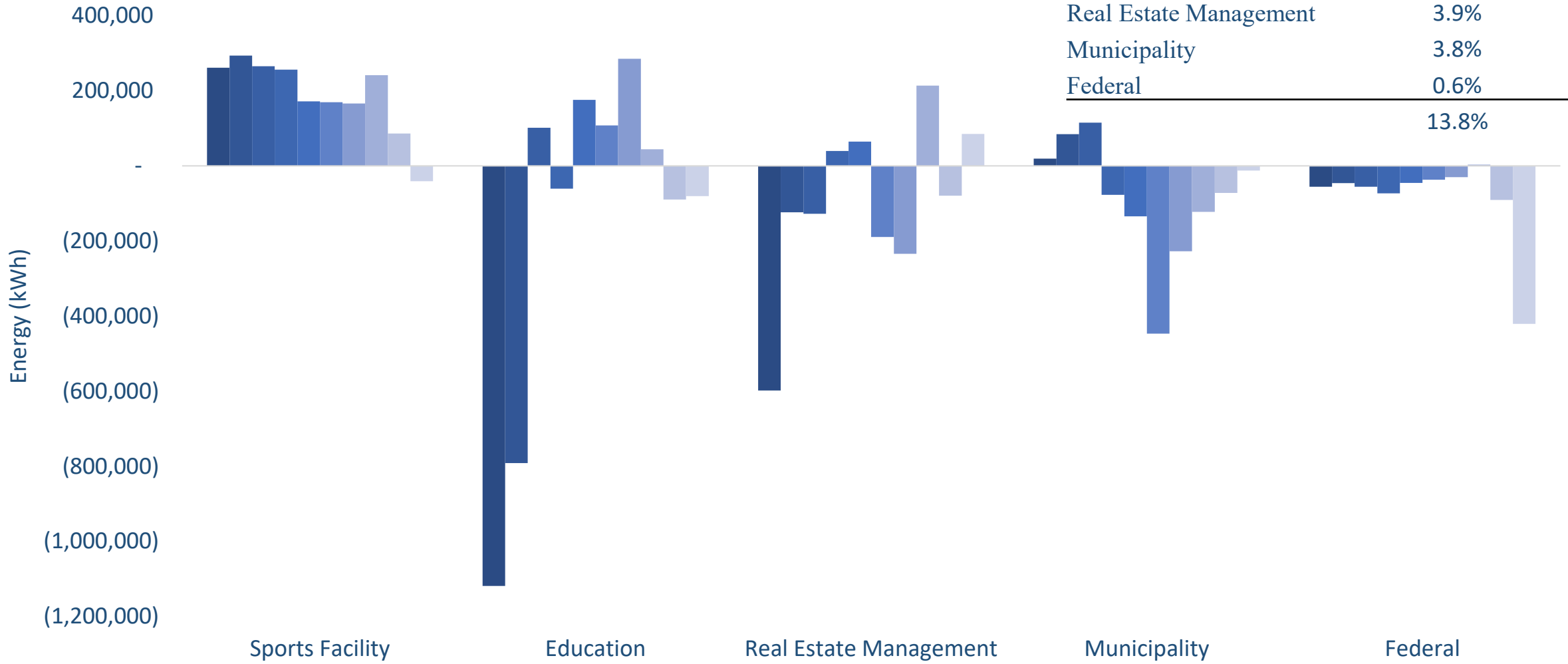


LGS-Secondary: Industry Contribution to Energy Sales Level Changes



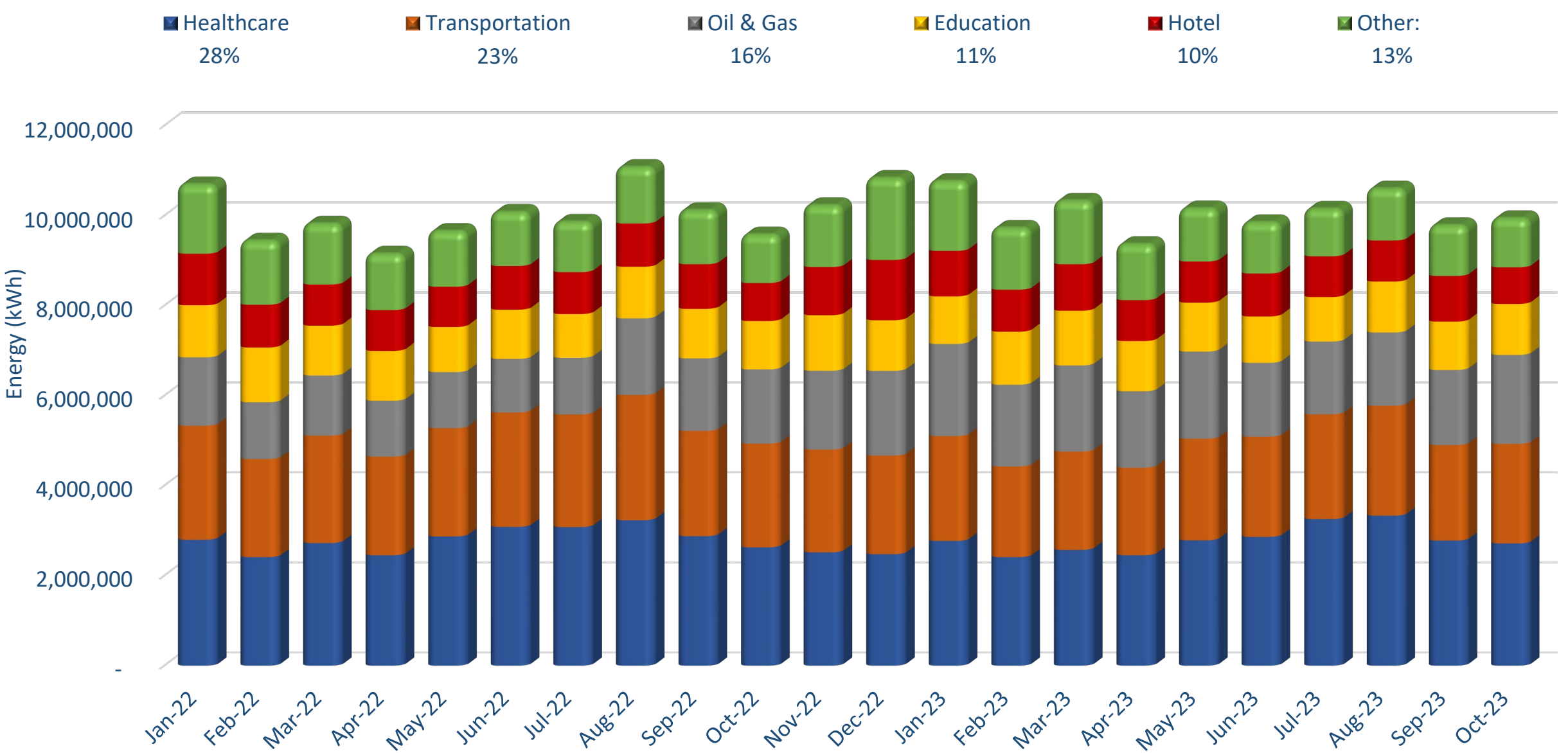
LGS-Secondary

Year over Year Variance
2022-2023 Monthly Variance by Industry
Top 5 by kWh



Top 5 LGS-S by Industry	% of total LGS-S kWh
Sports Facilities	0.4%
Education	5.5%
Real Estate Management	3.9%
Municipality	3.8%
Federal	0.6%
	13.8%

LGS-Primary: Energy Sales by Industry



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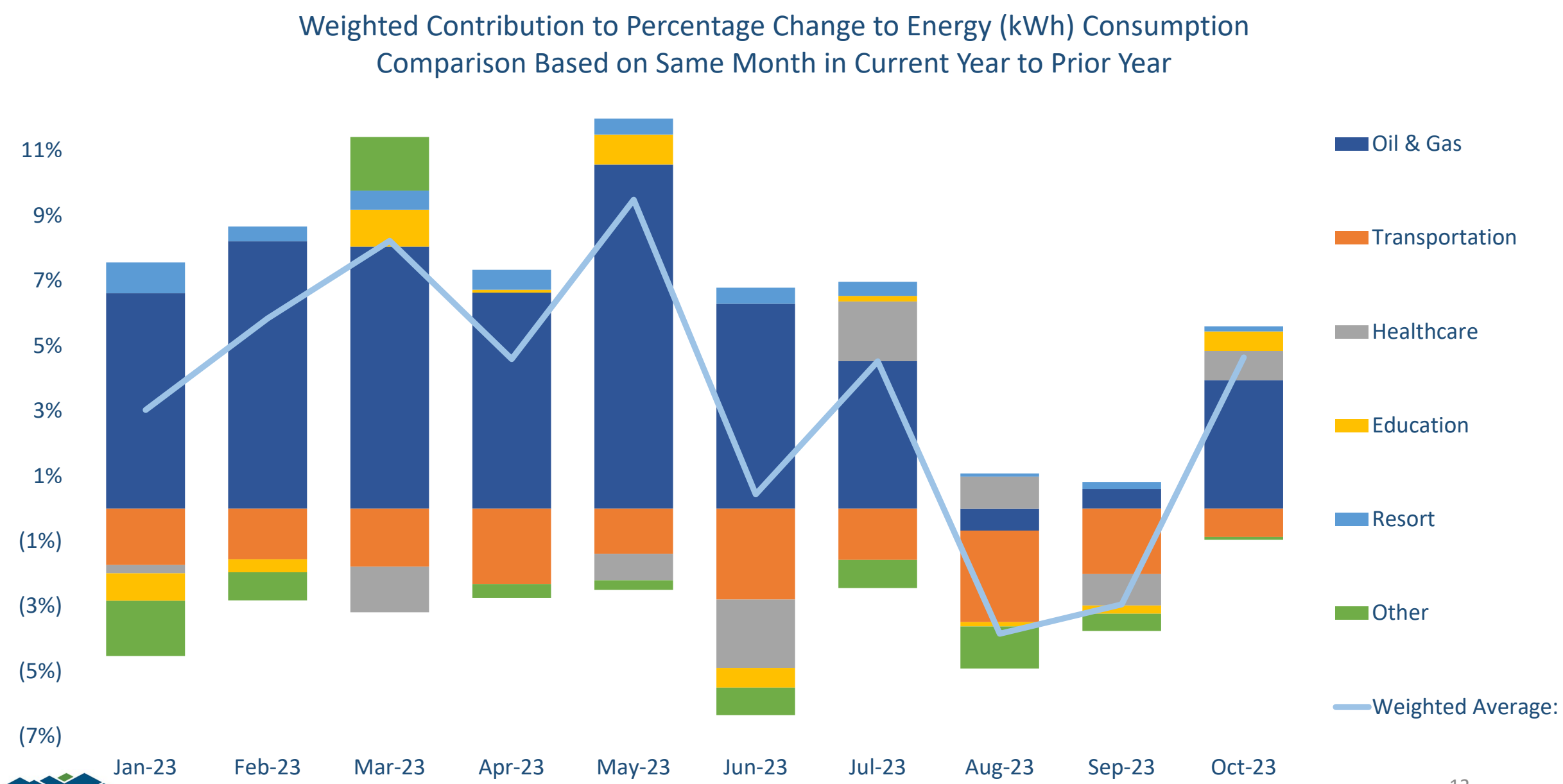
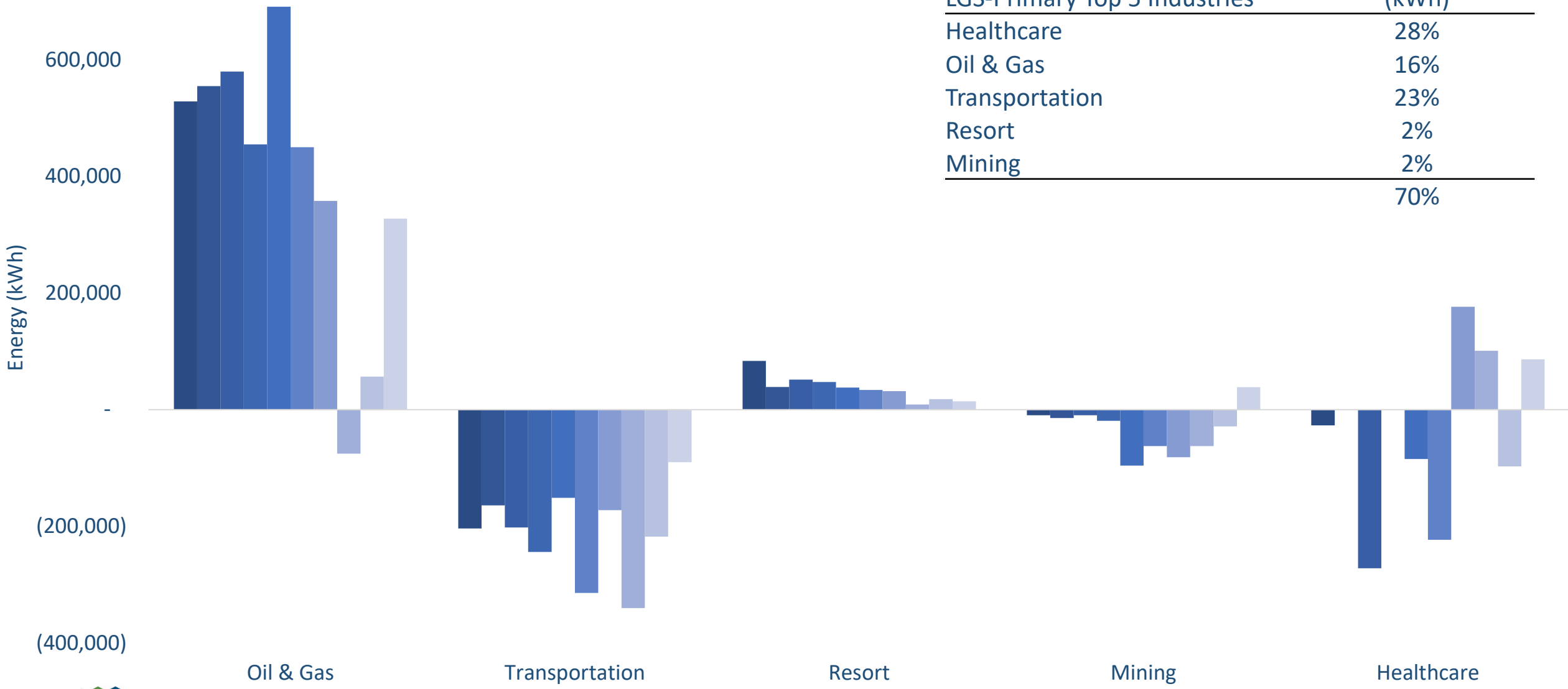


LGS-Primary: Variance by Industry – 2023 to 2022 by Month (Jan-Oct)

LGS-Primary Top 5 Industries	Percent of Total (kWh)
Healthcare	28%
Oil & Gas	16%
Transportation	23%
Resort	2%
Mining	2%
	70%



Proposed Modifications to Sales Tracking Report

	System: Energy (kWh) October 2023 Actuals						System: Energy (kWh) October 2023 Year-to-Date Actuals					
Energy (kWh)	Oct-23	Oct-22	Difference	% Difference	2023 % Weight	% Weighted Contribution	Oct-23	Oct-22	Difference	% Difference	2023 % Weight	% Weighted Contribution
Residential	49,625,469	50,367,158	(741,689)	(1.47%)	30.71%	(0.45%)	471,541,617	472,090,186	(548,569)	(0.12%)	30.71%	(0.03%)
Small General	15,206,567	15,609,955	(403,388)	(2.58%)	9.41%	(0.24%)	143,370,840	147,993,957	(4,623,117)	(3.12%)	9.41%	(0.28%)
LGS - Secondary	70,460,964	71,065,402	(604,438)	(0.85%)	43.60%	(0.37%)	708,354,433	714,342,532	(5,988,099)	(0.84%)	43.60%	(0.37%)
LGS - Primary	10,348,849	9,943,345	405,504	4.08%	6.40%	0.26%	100,683,596	99,100,480	1,583,116	1.60%	6.40%	0.10%
JBER	11,334,603	11,598,253	(263,650)	(2.27%)	7.01%	(0.16%)	112,894,871	110,808,654	2,086,217	1.88%	7.01%	0.13%
Wholesale	4,617,132	4,655,418	(38,286)	(0.82%)	2.86%	(0.02%)	49,938,863	50,371,817	(432,954)	(0.86%)	2.86%	(0.03%)
Total	161,593,584	163,239,531	(1,645,947)	(1.01%)	100.00%	(0.99%)	1,586,784,220	1,594,707,626	(7,923,406)	(0.50%)	100.00%	(0.48%)

A large percentage change does not always correspond to a material effect if it is a small proportion

YTD Shows some service class increases offsetting decreases in others.

Going forward: Modify the Sales Tracking Report to add Proportional Magnitudes & Directionality

Key Take-Aways:

- Results approximate the same percentages shown in current version of report.
- Proposed report
  - Adds proportionality relative to other service classes
  - Adds magnitude to show the materiality of the determinant level changes
  - Component contributions of both magnitude and direction can be readily seen

Gas Strategy Update

Operations Committee
February 7, 2024

Reliable and Affordable Gas Supply

Gas Strategy Objectives

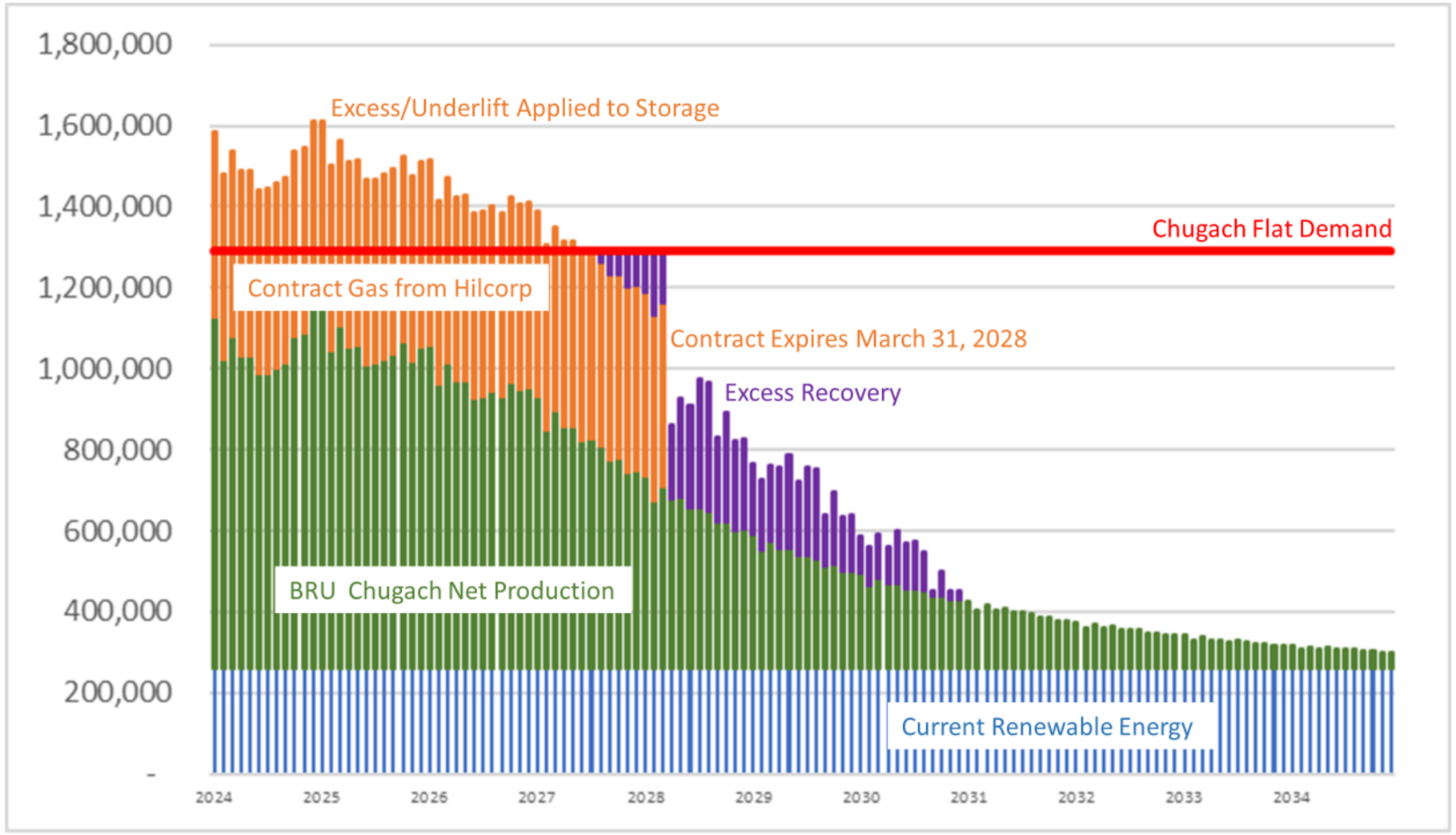
Reliable Supply

- Augment declining Cook Inlet Gas Supply by accessing world LNG markets
- Expand geologic gas storage
- Deliver timely solution to meet expected gas shortfall

Lowest Possible Cost

- Develop a common, scalable regional gas supply solution
- Align gas buyers for economies of scale
- Leverage regional infrastructure and industry

Chugach Base Gas Forecast



Cook Inlet Gas Value Chain

Cook Inlet LNG Import Value Chain											
gas supply	pipeline transport	liquefaction process	export terminal	marine shipping	import terminal	liquid storage	regas process N2 blending	injection to local grid	reservoir storage	pipeline transport	end users
Supply										Demand	

LNG Supply Operational Concept

thruput over time

marine shipping	liquid storage	regas process

optimize ship schedule with tanker size to minimize slack time between sailings

1. empty tanks at steady regas rate
2. fill tanks at shipping schedule

regas send-out at steady average annual Railbelt demand rate

BCF/year
2025 18.2
2028 36.5
2034 54.7

Reservoir Storage Operational Concept

12-18 months annual demand in existing depleted Cook Inlet reservoirs

50-75 bcf

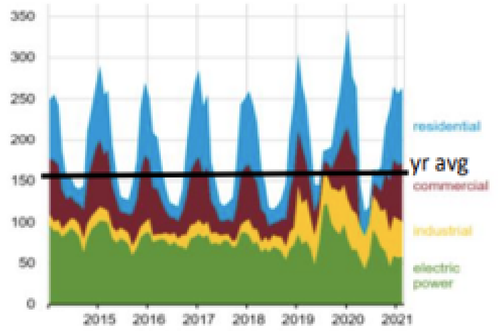
input at steady average annual Railbelt demand rate

BCF/year
2025 18.2
2028 36.5
2034 54.7

output to meet Railbelt demand swings via existing infrastructure

BCF/year
36.5-109.5

Railbelt Historical Deliverability Requirements MMSCFd



Uncontracted Demand Volume BCFy

Railbelt Utilities		2025	2028	2034
electric utilities		0	12.1	21.3
gas utilities		0	0	35.5
Cook Inlet industry				
Marathon		4.7	4.7	4.7
LNG Truck Rack				
Total		x	y	z
Project Total	bcfy	4.7	16.8	56.8
	mmscfd	12.9	46.0	155.6

Current Focus Areas

1) Finalize gas supply option studies
   - Utility Working Group - BRG Phase 2
   - Chugach - B&V Phase 2

2) Select best solution and alternative
   - Schedule
   - Projected cost
   - FERC technical requirements for permitting
   - Constructability/risk management

3) Expand underground gas storage capacity
   - BRU gas storage
   - Other across Cook Inlet

4) Advance business structure and launch project

Beluga Power Plant

OPERATIONAL ASSESSMENT AND STRATEGIC ALTERNATIVES ANALYSIS

CHUGACH ELECTRIC ASSOCIATION, INC.

ANCHORAGE ALASKA

FEBRUARY 7, 2024

Agenda

- Executive Summary
- Background, History, and Current Use
- Plant Operations
- Future Use of Plant
- Benefits
- Recommendations
- Next Steps
- Key Considerations
- Questions

Executive Summary

Objective:

Determine future direction of the Beluga Power Plant factoring strategic importance and alternative.

Recommendations:

- Maintain ownership of the Beluga Power Plant and continue operating to serve load for economic dispatch and contingencies.
- Recognize strategic advantages of location for economic development and decarbonization potential.
- Further evaluate operational structure for increased efficiencies.

Background

- Beluga is a 352 MW Simple Cycle***(SC)*** Power Plant
  - 6 Combustion Turbines ***(CT),***
  - Combined cycle operation ceased in 2015
  - Interconnected by three transmission lines: (2) 230 kV and (1) 138 kV lines (1,166/697 MVA)

History and Current Use

- Constructed 1960s through early 1980s
- Current generation capacity 232 MW
- Interconnected to Railbelt
  - (2) 230 kV & (1) 138 KV circuits (1,166/697 MVA)
- For ~35 years served base load
- 2015-2020 served as peaking plant
- 2020-Current (post-acquisition) – plant serves as peaking, N-1 and N-2 situations

Operations

- Historic staffing was approximately 70 personnel
- Current staffing is 18 personnel
- Current annual cost is approximately $6.5 M
- Hilcorp agreements (sharing camp, shipping and rolling stock)
- Beluga is called upon to balance gas delivery constraints or economics
- Provides power to the BRU under contingencies
- ***Beluga provides strategic advantage with respect to natural gas transportation contingencies and mitigating risk of impacts from natural disasters***

Operational Benefits

- Contingencies: transmission (electric/gas) and generation
- Geographically diverse generation site provide resilience to natural disasters (earthquakes and volcanoes)
- Provides key generation backup to the BRU and Tyonek
- Potential future gas storage and reduced transportation risk

Strategic Benefits

- Decarbonization Program: keep electrical interconnect from retired units for Decarb Program interconnection including Little Mount Susitna Wind, Long Duration Energy Storage, green aviation fuels, and other potential projects.
- Potential subsea DC cable interconnect
- Potential load growth
  - Mining operations
  - Supporting oil and gas industry development/ beneficial electrification of drilling
- Camp - West Cook Inlet support services (Hilcorp, DC interconnect, and other third-party development)

Recommendation

- Maintain ownership and control of the facility for:
  - Contingency response with respect to geographic diversity and fuel delivery
  - Implement increased remote capability for remote control of Beluga units
  - Evaluate:
    - O&M changes to reduce operational costs
    - Camp operations
  - Supported by third-party recommendations

Next Steps

- Plant
  - Evaluate realignment of assets and retirement schedules
    - Maintain enough generation to strategically serve BRU, Tyonek, system contingency needs
    - Asset utilization for Decarbonization Program
    - To be verified via the IRP
- Camp
  - Evaluate operations for increased efficiencies and opportunities in the region

Key Considerations

- Decarbonization Projects
- Impacts of BRU operations
- Grid Resilience and Innovation Partnership: undersea HVDC interconnection requirement

Questions

Chugach Electric Association, Inc.
Anchorage, Alaska

Summary of Executive Session Topics for
Operations Committee Meeting on February 7, 2024
Agenda Item VI.

A. Discussion of confidential and sensitive information regarding the natural gas supply, public disclosure of which could have an adverse effect on the finances and legal position of the Association. (AS 10.25.175(c)(1) and (3))

B. Discussion of confidential and sensitive information regarding the Beluga Power Plant, public disclosure of which could have an adverse effect on the finances of the Association. (AS 10.25.175(c)(1))