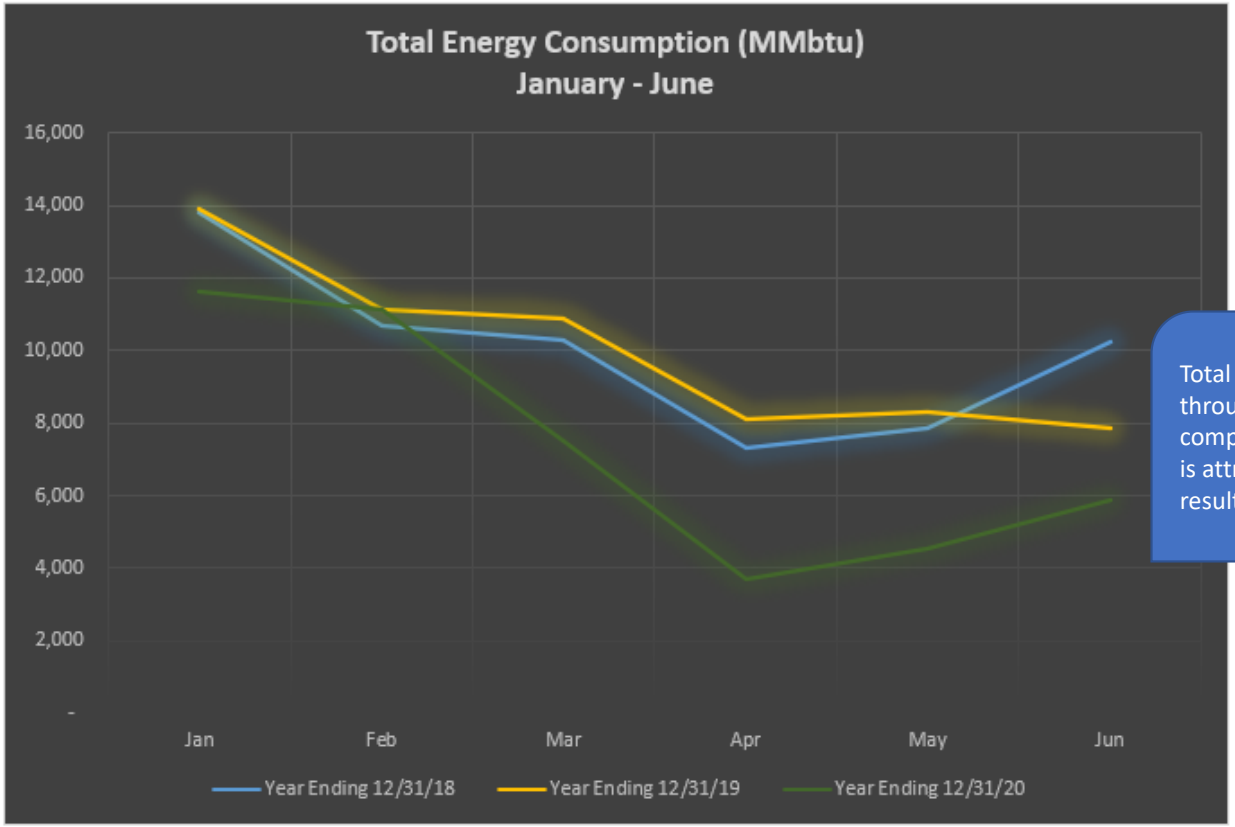
CY 2020 Semi-Annual Energy Report

January 2020 – June 2020

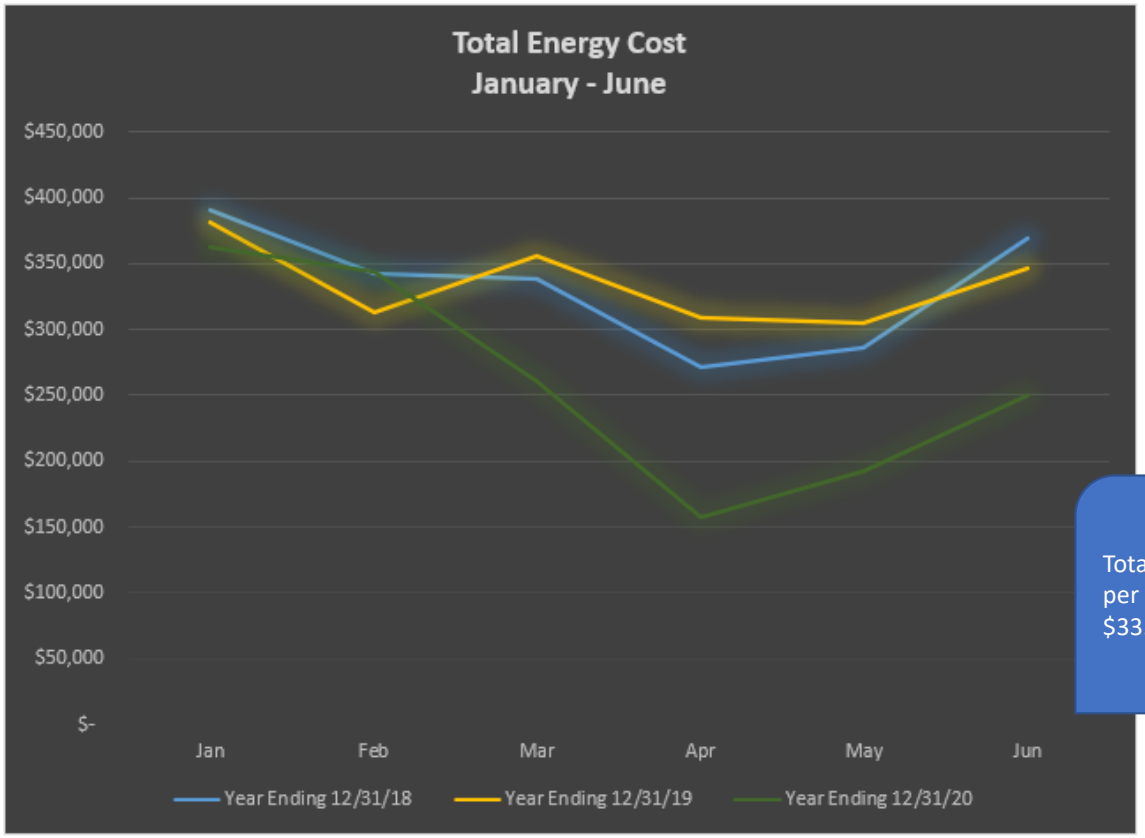
Kim Melander, Energy Manager

11/05/2020



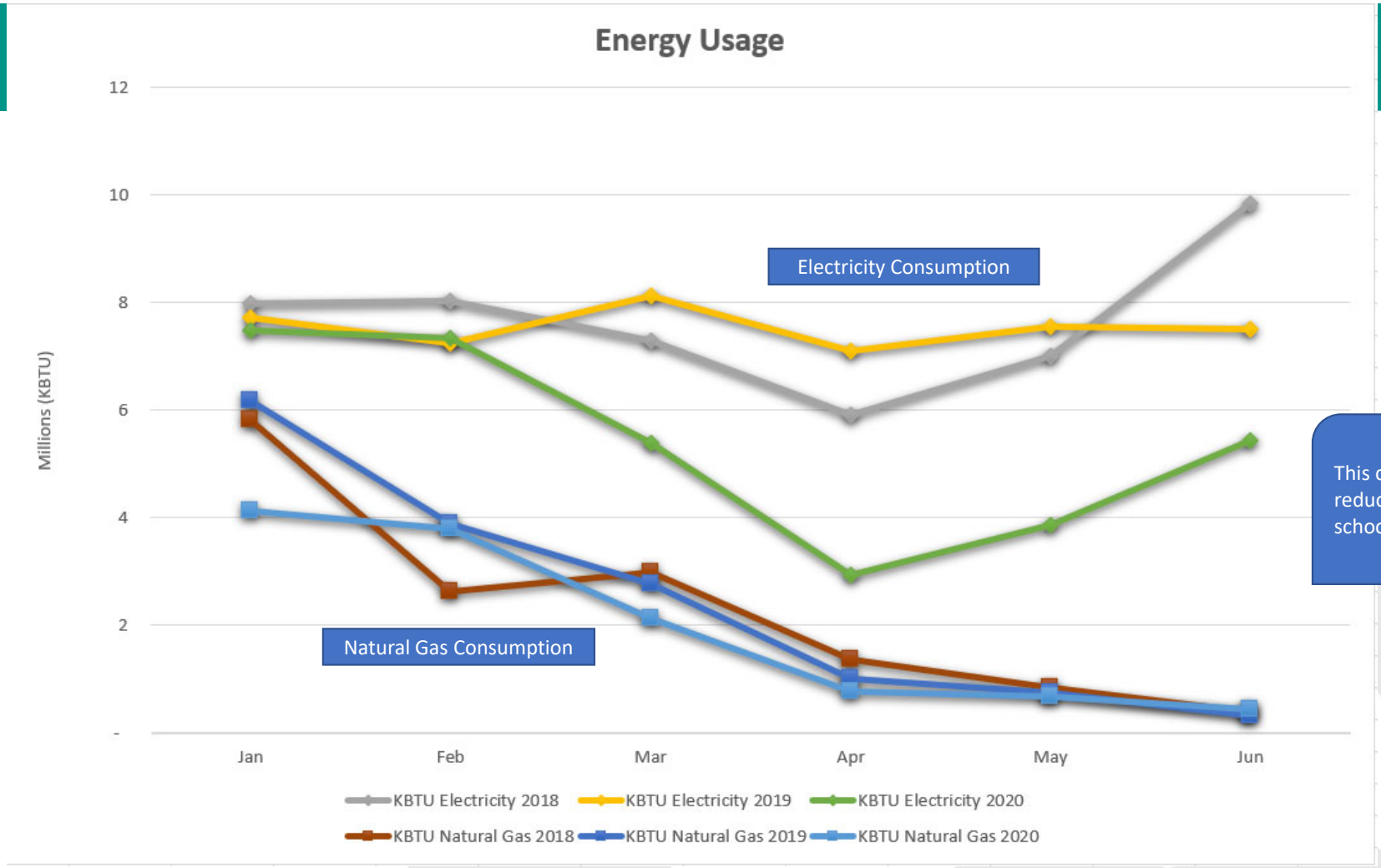
Total reported consumption for January through June 2020 decreased 26% compared to 2019. This significant change is attributed to the extended shut-down resulting from COVID-19.

Date	Jan	Feb	Mar	Apr	May	Jun	Total
Year Ending 12/31/18	13,801	10,663	10,277	7,293	7,857	10,234	60,125
Year Ending 12/31/19	13,881	11,140	10,900	8,114	8,305	7,836	60,176
Year Ending 12/31/20	11,616	11,141	7,514	3,696	4,546	5,876	44,389

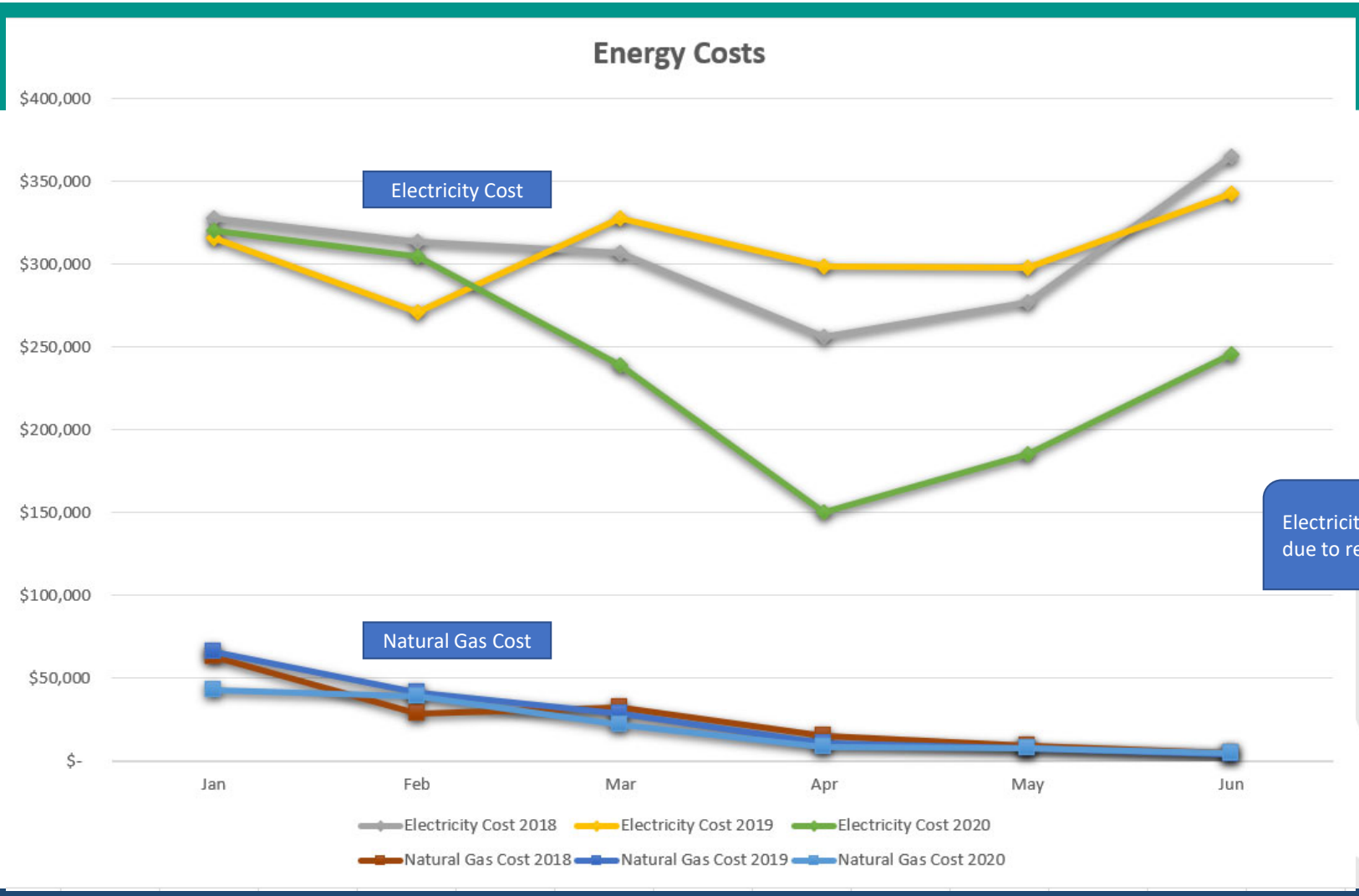


Total cost for 2020 decreased 22%. Our cost per unit of energy increased 5.7% from $33.41/MBTU to $35.33/MBTU.

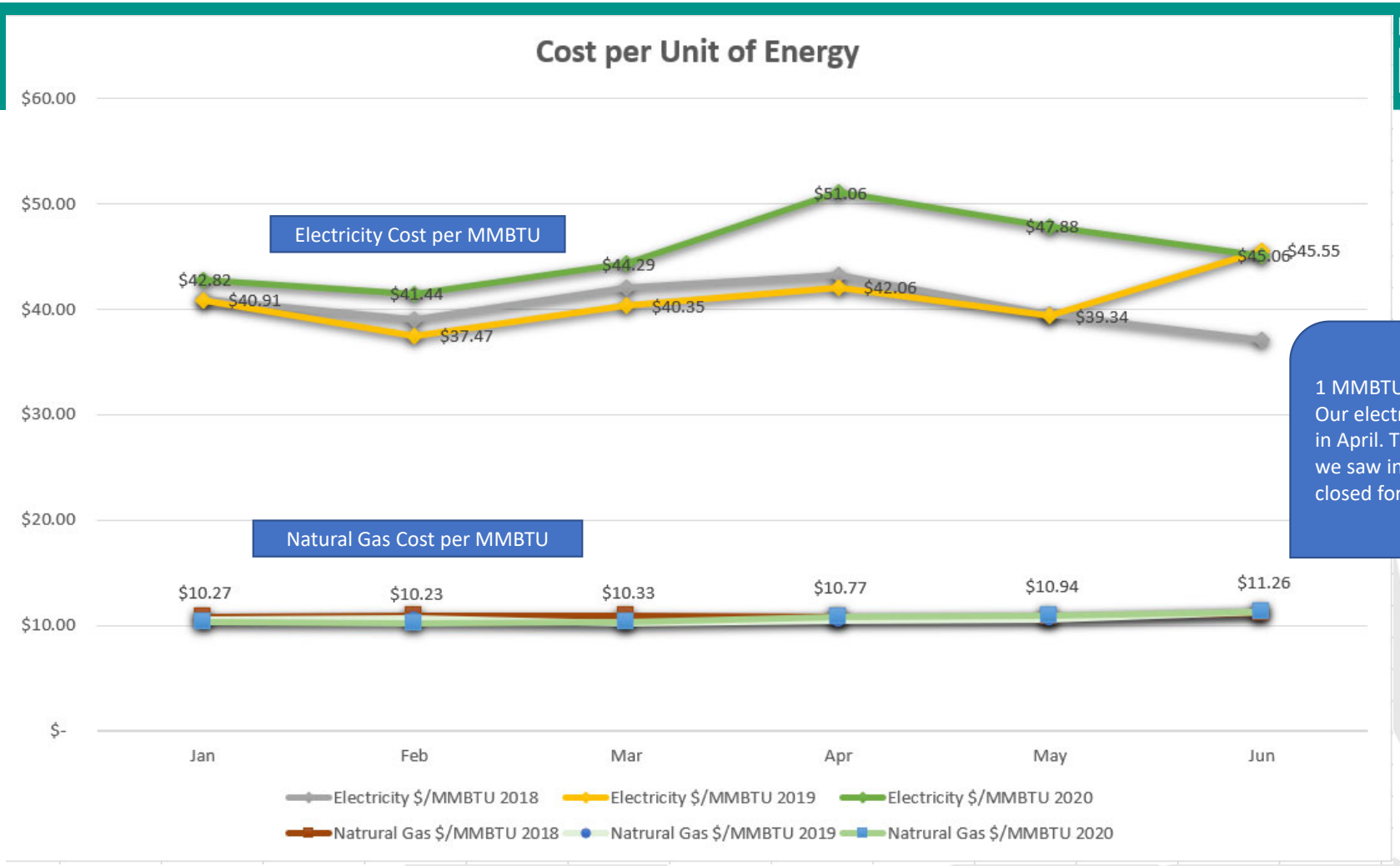
Date	Jan	Feb	Mar	Apr	May	Jun	Total
Year Ending 12/31/18	$390,780	$342,450	$338,628	$271,053	$286,075	$369,371	$1,998,357
Year Ending 12/31/19	$380,897	$312,700	$356,138	$309,130	$305,353	$346,071	$2,010,289
Year Ending 12/31/20	$362,784	$343,337	$260,906	$158,090	$192,733	$250,332	$1,568,182



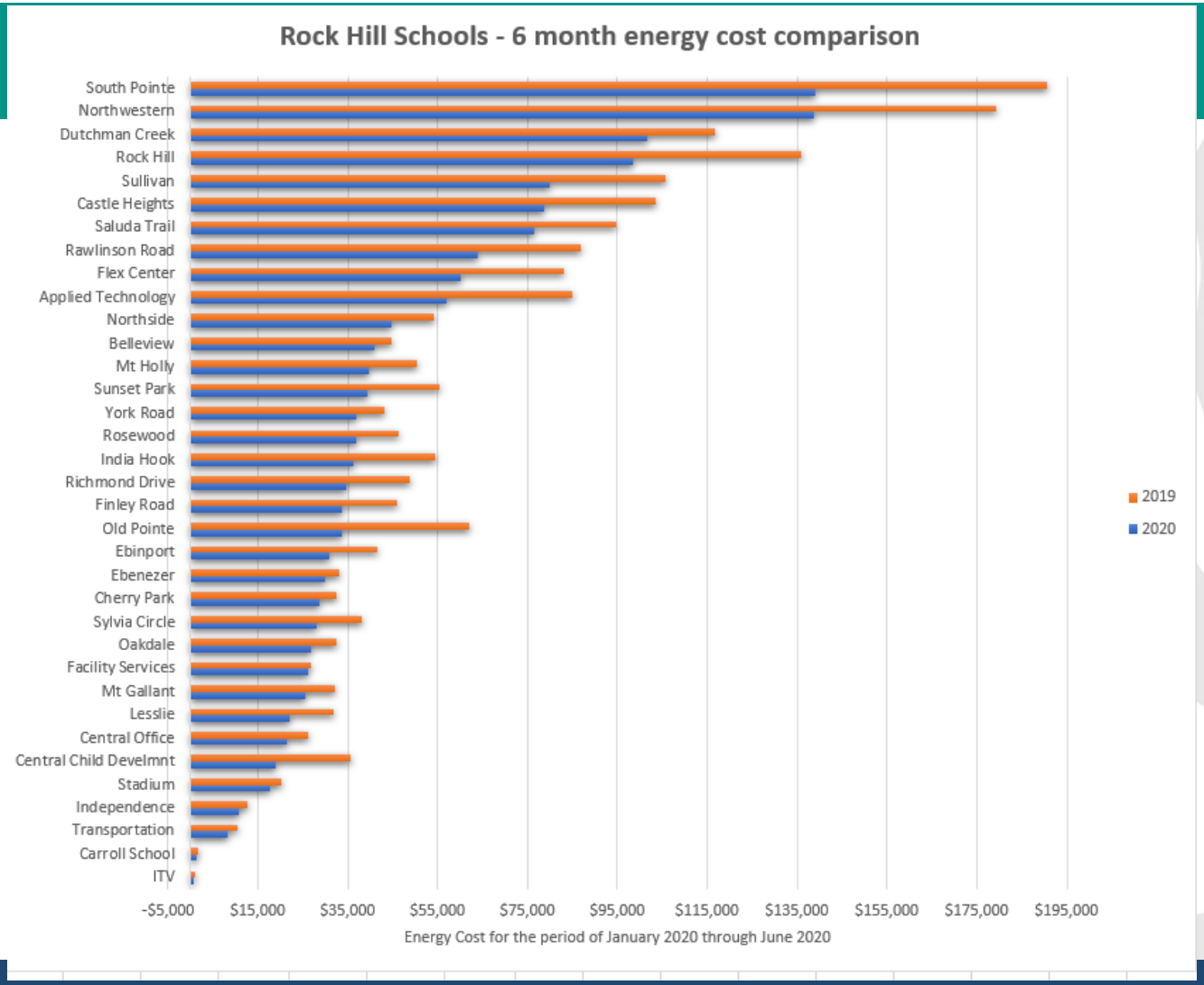
This chart illustrates the significant reduction in electricity usage resulting from school closings in March.



Electricity costs dropped sharply in March due to reduced usage.



1 MMBTU = 1,000,000 BTU
Our electricity cost per unit increased 13% in April. This is consistent with the increase we saw in June of 2019 when our schools closed for summer break.



This chart ranks our 6-month energy costs by location. It also shows the costs for the same period of the previous year. As part of our District wide building automation upgrade, we completed many efficiency measures. Unfortunately, we can not take credit for the remarkable reductions across our District because a very large percentage of them are the result of shutting down our schools due to COVID-19.

Baseline period (CY2009)

Current period (CY2019)

Difference between baseline and current periods

Adjustments to baseline data using current weather and cost data

Actual Use and Cost for Base Period (1/2009 through 6/2009)

Energy Type	Base Use Recorded	Units	Avg Unit Cost	Energy Cost
Electric	17,180,855	kWh	0.1043	$1,792,325
Natural Gas	192,152	Therm	1.2626	$242,618
Total Energy:	77,853,458	kBtu	Total Cost	***$2,034,943***

Actual Use and Cost With Energy Management Program (1/2020 through 6/2020)

Energy Type	Current Use Recorded	Units	Avg Unit Cost	
Electric	9,520,384	kWh	0.1517	$1,444,687
Natural Gas	119,063	Therm	1.0372	$123,494
Total Energy:	44,399,371	kBtu	Total Cost	***$1,568,181***

Energy Saved 2019 Compared to Base Period

Energy Type	Base - Current	Units	Percent Saved	Total Cost
Electricity	7,660,471	kWh	45%	$347,638
Natural Gas	73,089	Therm	38%	$119,124
Total EnergySaved:	33,454,088	kBtu	Gross Savings:	***$466,762***
Percent Savings:	43%			***23%***

Cost Avoidance - Without Our Energy Program:

Rates: Base period consumption at current period rates would be an additional:	$771,498
"Load Creep": Additional equipment, operating hours and efficiency lost due to age would cost:	$26,071
Adjustments for weather, bill period differences & other deviations.	($338,684)
Total Cost Avoidance:	***$925,648***
Adjusted Savings:	***38%***

ENERGY STAR

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Energy/Public Utility - Budget Performance

2019-2020 Budget Performance - Actual

- Total Budget $4.919M, actual $4.351M
  - Energy - $4.385M, actual $3.825M = $560k Surplus
  - Public Utilities - $534k, actual $526k = $8k Surplus

2020-2021 Budget Planning

- Total recommended Budget $4.990M, ***January - 2020***
  - Energy - $4.429M (1% increase)
  - Public Utilities - $561k (5% increase)

2020-2021 Expectations & Performance, ***November – 2020***

- Total expected cost $4.99M ($4.429M energy, $561k public utilities)
  - Energy – 1st quarter (July – September) actual cost is 17% less than last year.
  - Public Utilities – 1st quarter actual cost is 10% less than last year.
- Performance to date (1st Quarter, July through September)
  - Energy - $872k
  - Public Utilities - $129k

Energy News, Projects, Programs and Initiatives

- COVID-19 Pandemic has drastically affected our operations:
  - Most buildings were shut down from March through July of this year.
  - District wide HVAC operational changes (ASHRAE guidelines) were implemented in July and August for returning to school. This included running all HVAC fans constantly during occupied hours and increasing the outdoor air introduction to all possible units. This change increases the energy consumption during occupied hours operation. For the 1st quarter of this school year, our energy expenses have averaged about 18% less than last year. This is because our schools have been operating in the occupied mode much less (roughly 20%) than last year. As our schools ramp up their operations back up to normal, we can expect our energy consumption (and costs) to increase.
  - Significant increase in HVAC service requests resulting from HVAC operational changes.
  - Increased energy usage/cost data monitoring, analysis and reporting.
  - In March, we completed a necessary District-wide Building Automation Systems hardware replacement and software upgrade project. This large project was not contracted out. Instead, School District staff performed all the work. By doing this work, we estimate that we saved the District about $500k in contractor costs. It was certainly good fortune that we completed this work when we did because it greatly helped us accomplish all the changes that were necessary as part of our COVID-19 response. In addition, the improved systems helped us increase operational efficiencies and reliability.

Thank You for your support!

ROCK HILL Schools
YORK COUNTY DISTRICT THREE
FACILITIES SERVICES

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Reference - Measuring the performance of an energy conservation program – M&V, IPMVP

1. We use the industry accepted standard for energy measurement and verification (M&V) known as the International Performance Measurement and Verification Protocol (IPMVP). The first step is to establish a baseline period of time and energy data set. This will be historic information about energy consumption and costs prior to the implementation of any conservation programs. This information is entered into a special utility accounting software package.

    - The baseline is a fixed period of time – typically 1 year. Ours is CY 2009. We then:
        - Record all energy consumption – standardized unit of measure is typically kBTU which abbreviates kilo British thermal unit. Electrical kWh and Natural Gas (NG) therm units are converted.
        - Record all energy costs.
        - Record measureable variables that affect energy consumption such as weather and occupancy.
    - Our baseline comparisons are expressed as “Cost Avoidance” because the savings figures are calculated or “normalized” to account for differences in weather conditions, utility rates, billing cycles and changes in construction.

1 kBTU = 1,000 BTU

1 MMBTU = 1,000,000 BTU

1 Therm NG = 100,000 BTU

1 kWh = 3,412 BTU

1 MWh = 1,000,000 kWh

2. Benchmarking is comparing common performance measurements to similar, "competing" facilities. For example, we benchmark against other National and State K-12 public school districts.

   - Common and universally accepted benchmark performance measurements are referred to as "Key Performance Indicators" abbreviated as KPI.
   - Consumption per square foot of conditioned floor area – units are ***kBTU/sq.ft***. This value is also known as the "Energy Usage Intensity" abbreviated as EUI.
   - Energy cost per square foot of conditioned floor area – units are ***$/sq.ft***.
   - Consumption and cost per student. – ***kBTU/student and $/student.***

3. Periodic comparisons of historical and current data are done through regular reporting.

- Our baseline report will always compare the current year to the baseline year.
- KPI reporting will typically compare the current period to the previous reporting period or may cover several reporting periods.
- Total consumption and cost reports are usually compared to the previous period as well as several periods prior to that. This will give the energy manager a better picture of energy long term trends.