

# Impacts of the COVID-19 Quarantine on the Water & Energy Sector

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# Introductions



***Chelsea Conlon***



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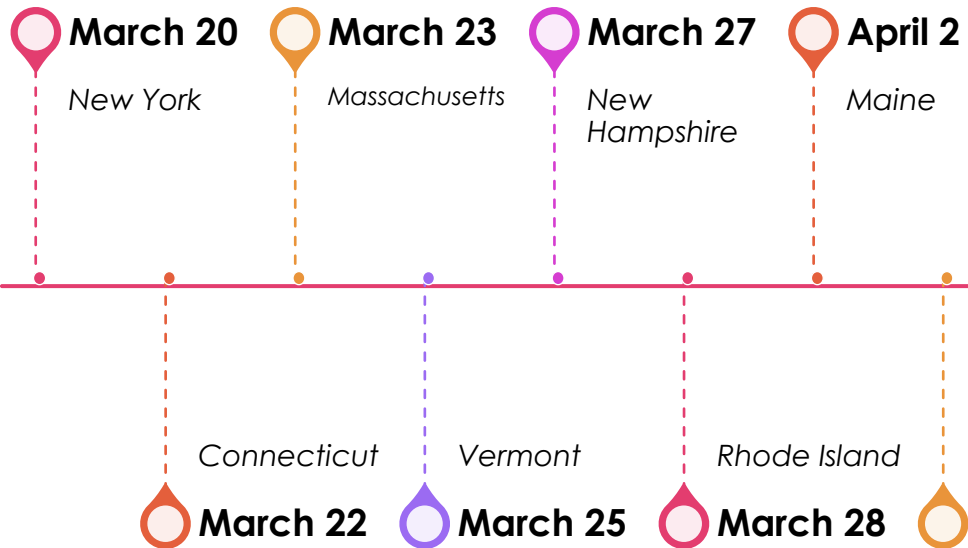


# WASTEWATER

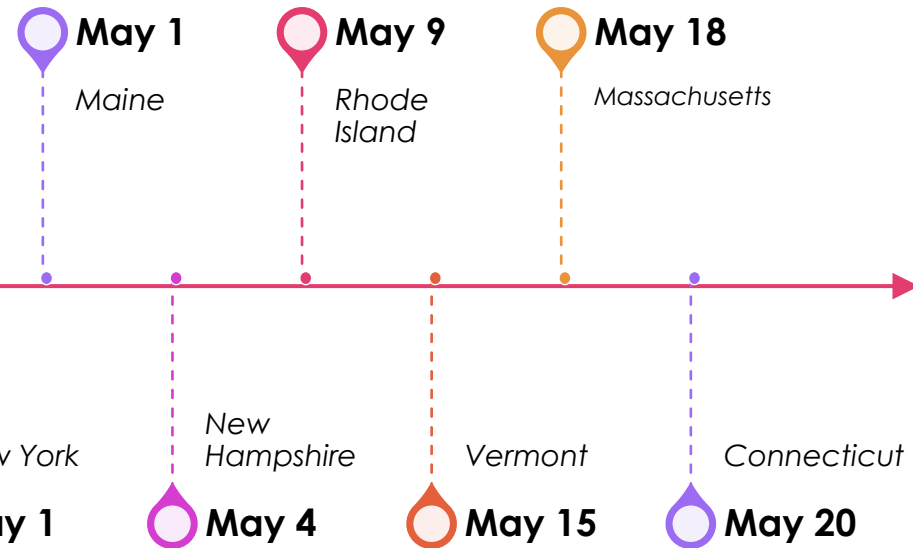


# Timeline

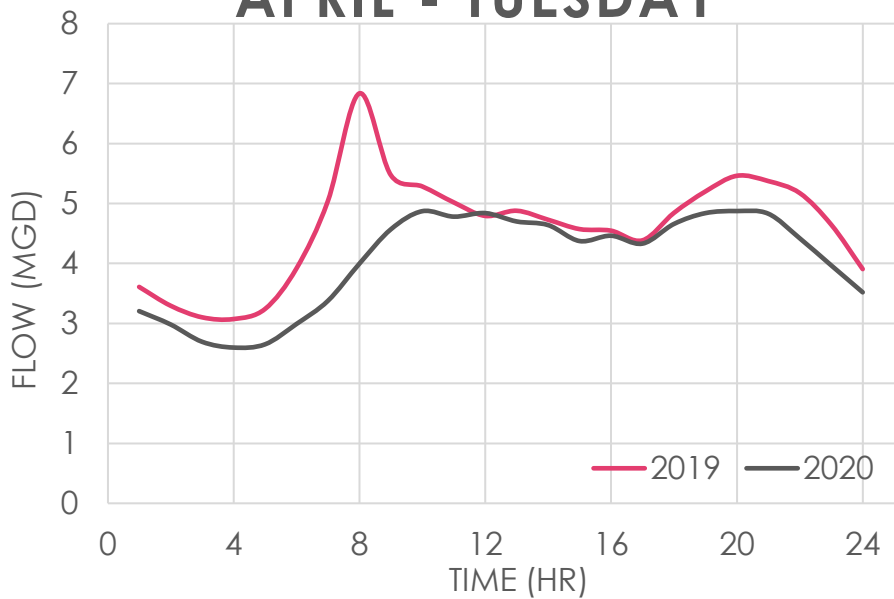
## State Stay at Home Orders



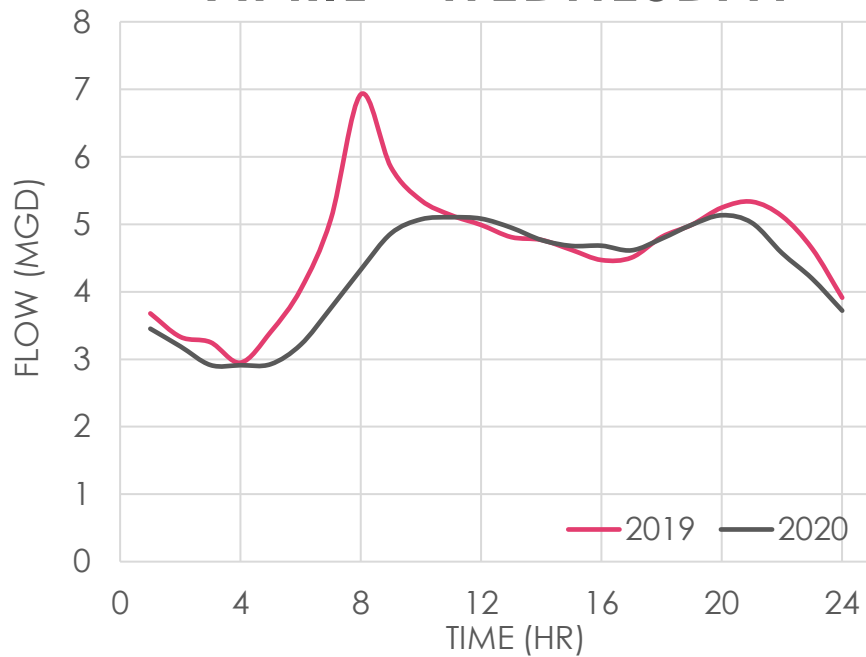
## Lifting Stay at Home Orders



### APRIL - TUESDAY



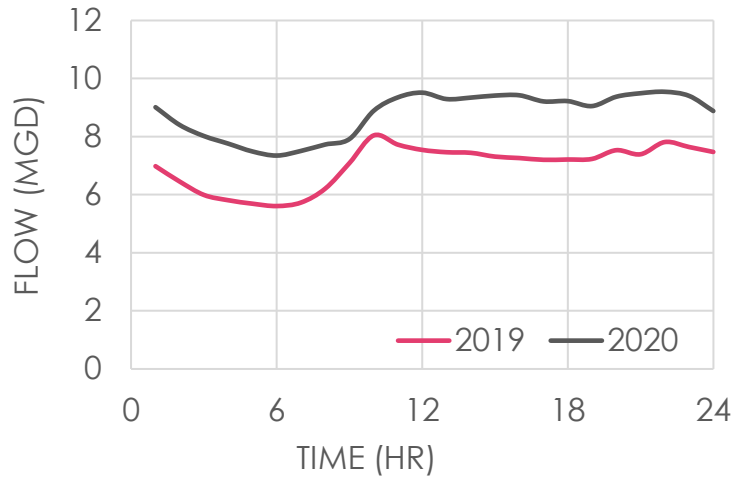
### APRIL - WEDNESDAY



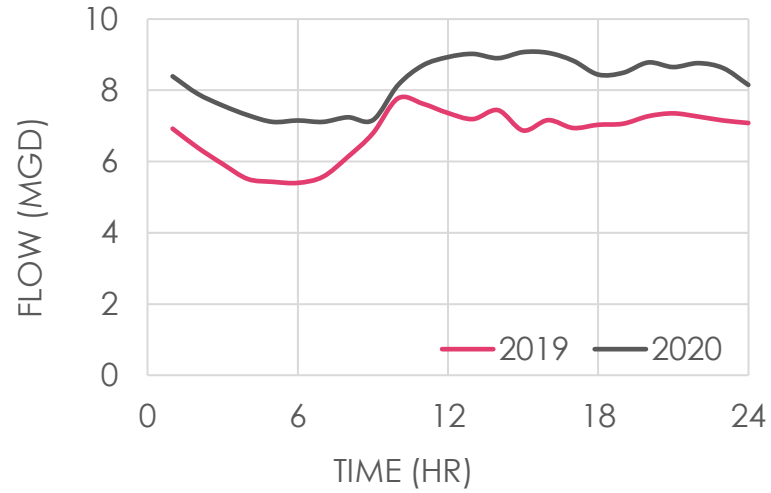
# FLOW: WWTP Flow Diurnal Shift



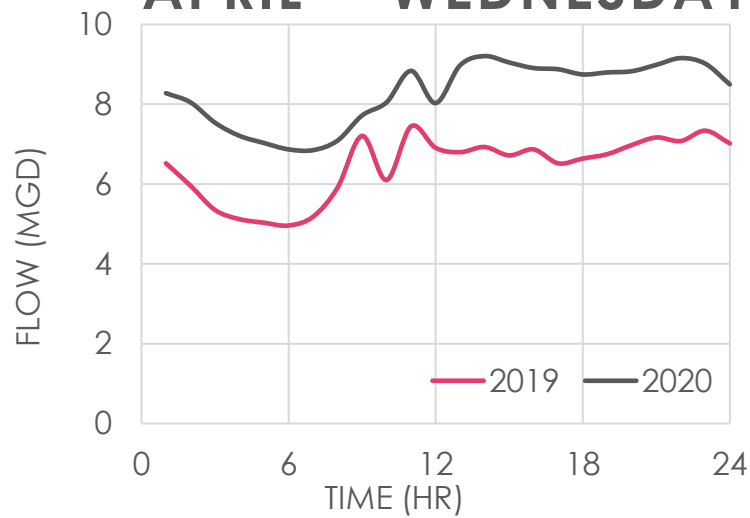
### MARCH - THURSDAY



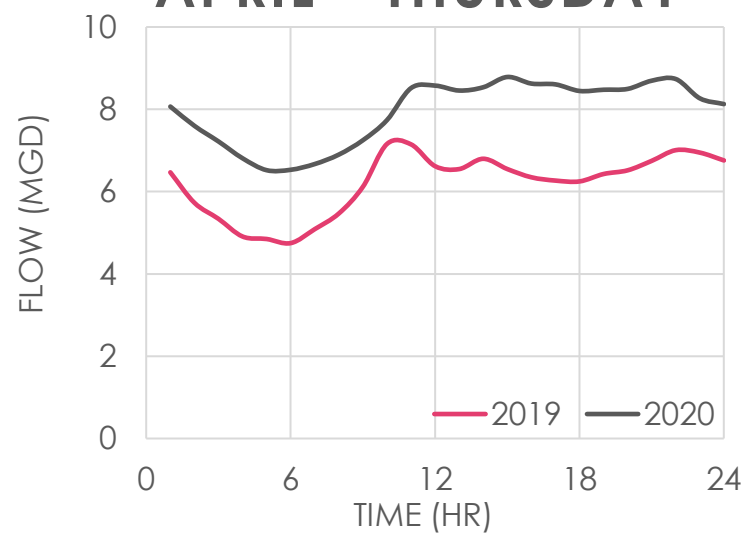
### MARCH - FRIDAY



### APRIL - WEDNESDAY



### APRIL - THURSDAY



# FLOW: WWTP Flow Diurnal Shift






# Ragging

- ▶ Varying flows can create ragging issues
- ▶ A clogged pump impeller decreased pump efficiency
- ▶ Regularly clearing clogs or replacing pumps with new technology to prevent clogging are both options to boost efficiency







# Co-Digestion & Food Waste



# Summary of WWTP Impacts

- ▶ Flow data may not be representative of future years
  - ▶ Potential shift in diurnal flow patterns during quarantine period
  - ▶ Reduced peak flow at some facilities
  - ▶ Impact to evaluations & design
  - ▶ Pump and unit process sizing
- ▶ Ragging could reduce pump efficiency
- ▶ Co-Digestion and Food Waste remain impacted
- ▶ Additional testing for presence of COVID-19 in plant flows

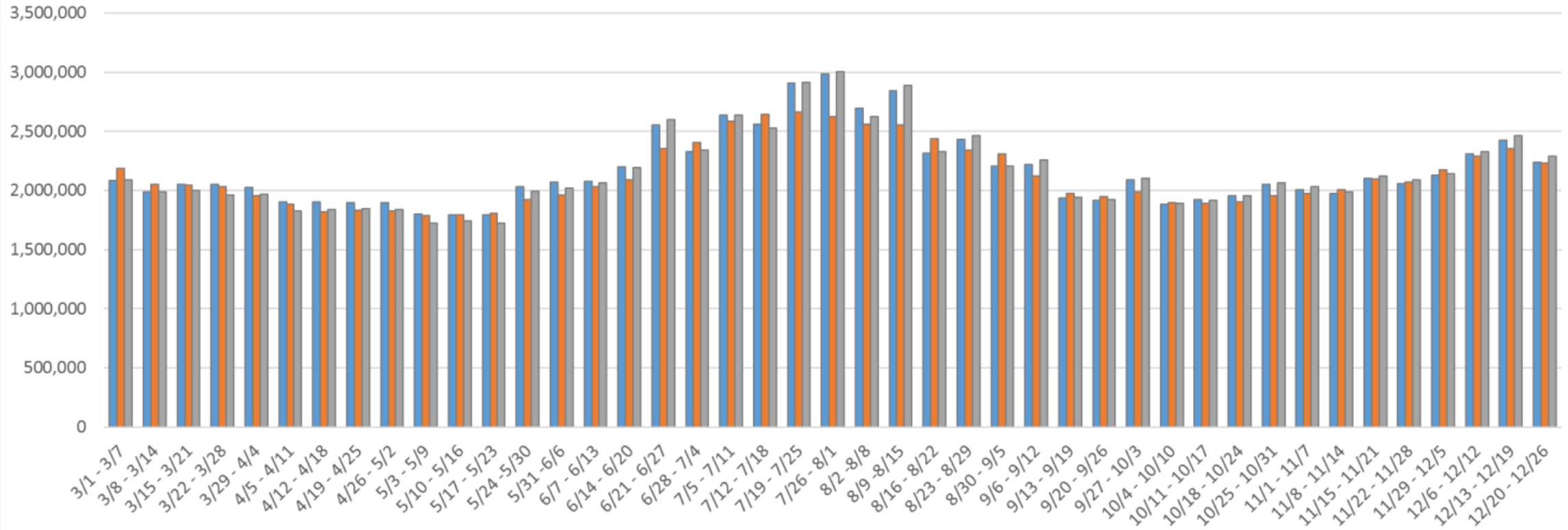
# Energy Market Impacts

- ▶ Energy use
- ▶ Energy prices
- ▶ Predicted energy prices
- ▶ Energy costs for wastewater facilities



Backcast vs Actual Loads (MWh)

Modeled w/Observed Weather    Modeled w/Normal Weather    Actual Load



# ISO-NE COVID-19 Loads





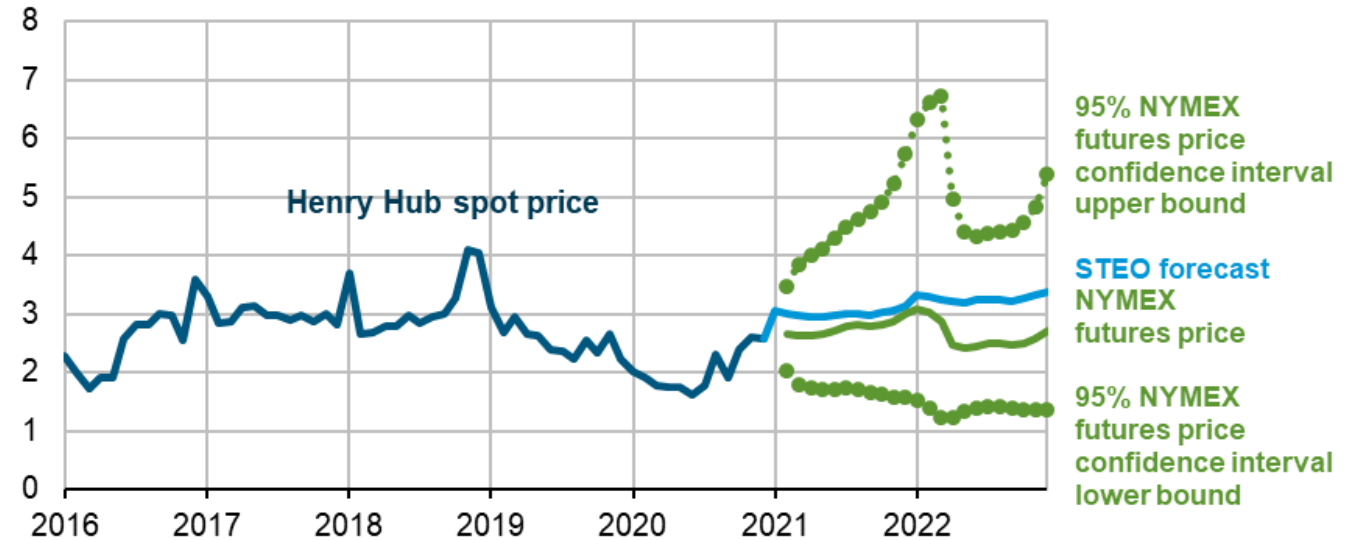
| <b>APRIL 2020 AND PERCENT CHANGE FROM APRIL 2019</b>    | <b>April 2020</b> | <b>April 2019</b> | <b>NOVEMBER 2020 AND PERCENT CHANGE FROM NOVEMBER 2019</b> | <b>NOVEMBER 2020</b> | <b>NOVEMBER 2019</b> |
|---|-------------------|-------------------|--|----------------------|----------------------|
| Average Real-Time Electricity Price (\$/megawatt-hour*) | \$18.09           | -33%              | Average Real-Time Electricity Price (\$/megawatt-hour*)    | \$24.64              | -28%                 |
| Average Natural Gas Price (\$/MMBtu**)                  | \$1.64            | \$2.56            | Average Natural Gas Price (\$/MMBtu**)                     | \$1.98               | \$3.35               |

# ISO-NE Electric Demand 2019 vs 2020

# Energy Price Forecast

- ▶ 2020 saw lower than average natural gas prices
- ▶ Prices are predicted to return to average in 2021

Henry Hub natural gas price and NYMEX confidence intervals  
dollars per million Btu



Note: Confidence interval derived from options market information for the five trading days ending Jan 7, 2021. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Sources: U.S. Energy Information Administration, Short-Term Energy Outlook, January 2021, and CME Group



# Energy Bill Review

- ▶ Changes in Energy Bill Charges
- ▶ Review your historic peak demands over the past year
  - ▶ A graph of the peak demand for the past 12 months can typically be found in energy bills
- ▶ Check your distribution rate to see if it's changed
- ▶ If you are billed on kVA or power factor check to see if your power factor has decreased
- ▶ Check time of day charges – if your load shifted you may be charged more for energy during on-peak hours

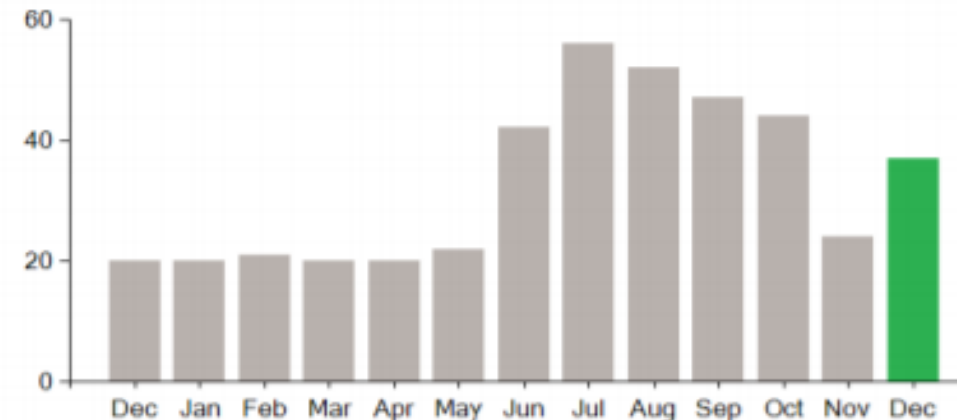
## Delivery

(DISTRIBUTION RATE: 030)

|                                   |                          |                   |
|-----------------------------------|--------------------------|-------------------|
| Transmission Dmd Chrg             | 35.20KW X \$6.74000      | \$237.25          |
| Distr Cust Svc Chrg               |                          | \$44.00           |
| Distribution Dmd Chrg             | 35.20KW X \$14.52000     | \$511.10          |
| Electric Sys Improvements***      | 35.20KW X \$0.82000      | \$28.86           |
| Revenue Adj Mechanism             | 11150.00kWh X \$-0.00011 | -\$1.23           |
| CTA Demand Chrg                   | 35.20KW X \$-0.06000     | -\$2.11           |
| FMCC Delivery Chrg                | 11150.00kWh X \$0.01412  | \$157.44          |
| Comb Public Benefit Chrg*         | 11150.00kWh X \$0.00801  | \$89.31           |
| <b>Subtotal Delivery Services</b> |                          | <b>\$1,064.62</b> |

## Demand Profile

Max. Demand

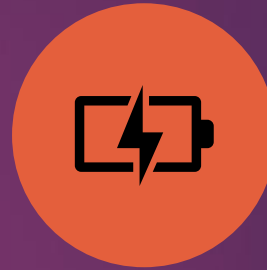




# What to expect in the future



Cost of energy



Renewables and  
battery storage



Remote Work



Travel



Thank You

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