Naperville

PUAB – AMI Presentation

March 14, 2019

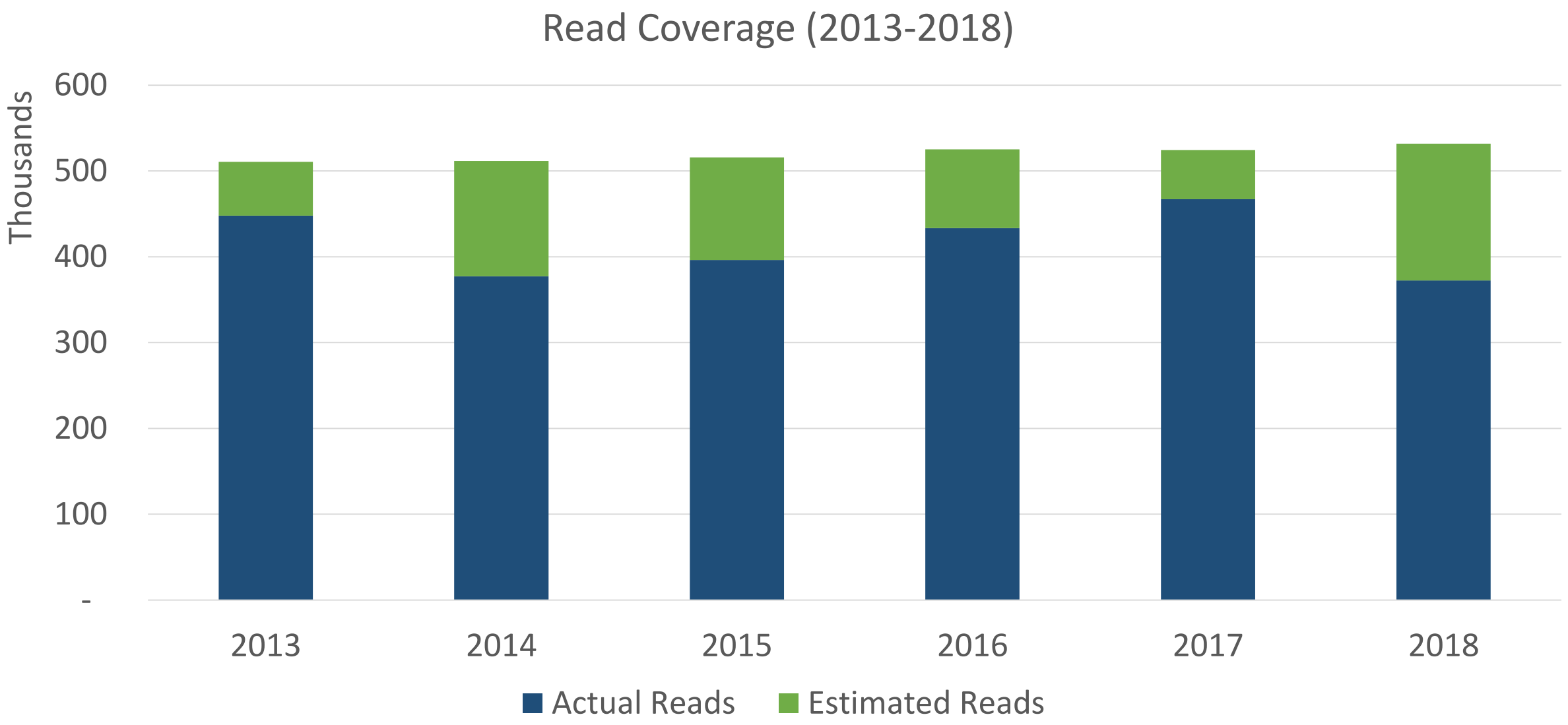
Presentation Overview

- Review the current state
- Electric’s Smart Grid project & benefits
- Review benefits of AMI
- Review Business Case assumptions
- PUAB Next Steps

Meter Reading History

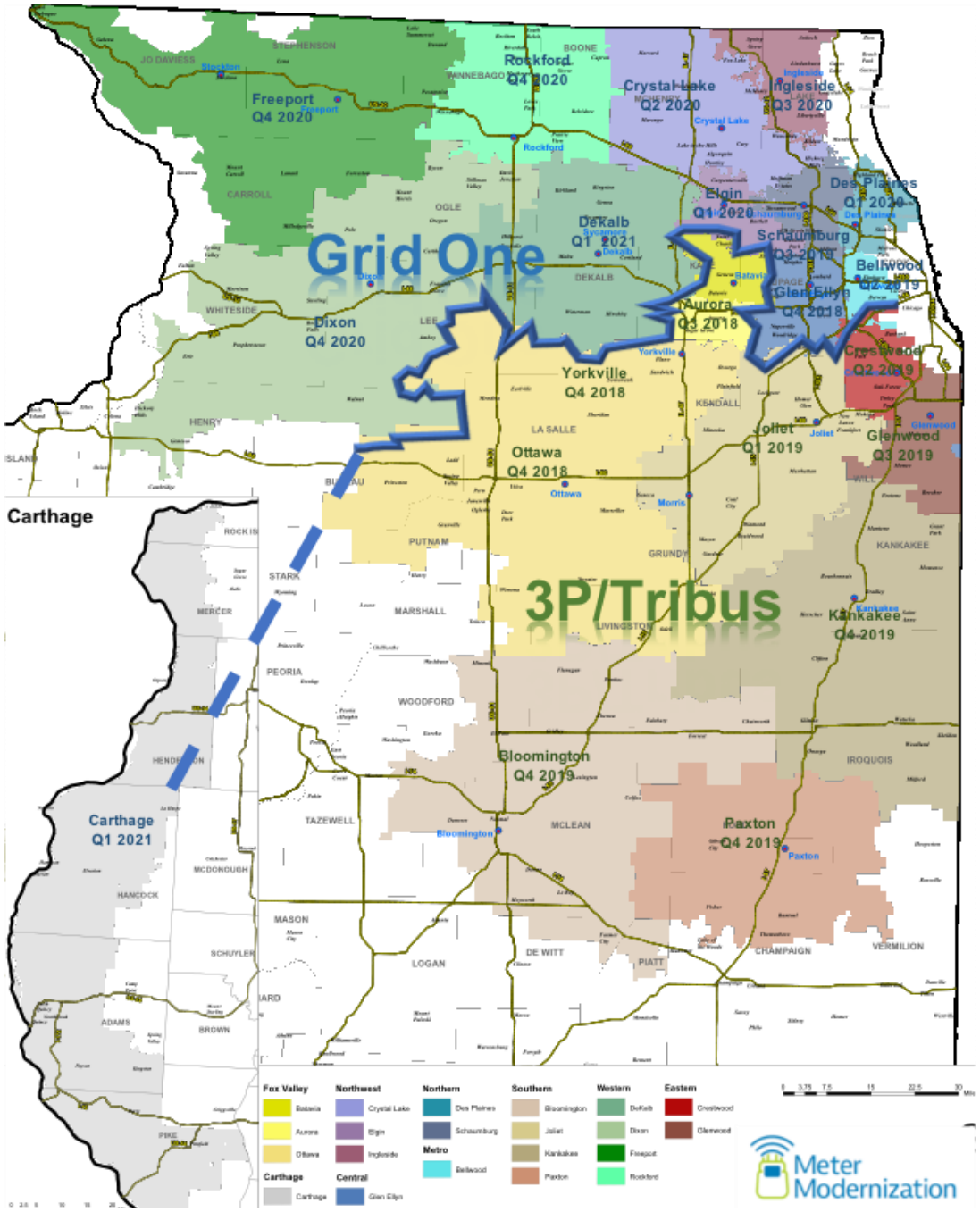
- **Electric and Water meters both read manually at $0.50 per meter read prior to May 2010**
- **AMR (Mobile radio) used for unincorporated area for water reads for more than 20 years**
  - Currently, more than 2,000 households are read through AMR
- **City began transition to Electric Smart Grid in 2010**
- **New contract (Rickman) approved for three years (May 2010 - April 2013)**
  - Rate per read increased from $0.50 to $0.56
- **In Sept. 2013, City begins new, three-year contract with updated water read rates through Rickman**
  - Regular Customers (incorporated): $0.88
  - Water Only (Unincorporated): $1.10
  - Remote Reads (AMR): $0.50
- **In Oct. 2016, Alexander Contract Services becomes new water meter reading contractor with two-year agreement, including three option years through August 2021**
  - Universal rate of $0.675 per water read
  - In June 2018 Alexander notified the City that of its intent to terminate their contract
  - Alexander is legally required to continue contracting with the city for manual read services until the current contract expires in August 2021 and have requested a $.10/read cost increase for the upcoming year

Contract Meter Reading



Current State

- NICOR
  - Implementing AMI
- ComEd
  - Completed AMI implementation



Technology – Comparable Communities

AMI	Aurora (in transition) Downers Grove Elmhurst Evanston Joliet Geneva (in transition)	Glen Ellyn (in transition) Glenview Lombard Orland Park Tinley Park
AMR	Batavia Carol Stream Plainfield	Wheaton Winfield
Manual	Lisle	Woodridge

Benefits of AMI - Electric

Operational Benefits – $550,000/year

- Elimination of the manual turn off/on
- Elimination of manual final reads for customers closing an account
- Manual reading savings

Distribution Efficiency

- Conservation voltage reduction(CVR) program saves customers $3.0 million annually in rates
- Utility awareness of low service voltage
- Future Demand Response and outage notification program

Social Benefits

- Reduction in power outage cost to community from Distribution Automation (based on DOE Interruption Cost Estimate Calculator). Distribution automation saves customers an average $1.4M million annually

Customer Energy Management

- The e-portal will be implemented in Q4/2019 that will allow customers to track their energy usage

Electric Smart Grid Timeline

- October 2009 – Received grant
- December 2010 – Completed contracts
- February 2011 – Customer Bill of Rights Approved
- October 2011 – Created Non-Wireless Meter Alternative NWMA program
- January 2012 – Started mass Meter Deployment
- October 2012 – Completed mass Meter Deployment
- May 2013 – Started billing from Smart Electric Meters

Overview of AMR/AMI deployment options

KEY CONSIDERATIONS

Naperville faces ongoing challenges with the water meter reading contract and is working to reduce the volume of estimated bills. In lieu of developing an in-house meter reading program, Naperville is evaluating the viability of an automated reading system. The following are four network designs under consideration.

1 **NAPERVILLE NETWORK** *Naperville utilizes the existing DPU-E AMI network*	2 **PtMP – Low Site** *Naperville builds a new, point to multipoint (PtMP) AMI network*	3 **PtMP – High Site** *Naperville builds a new, point to multipoint (PtMP) AMI network*	4 **MOBILE RADIO** *Naperville leverages a mobile collector, forgoing need for a fixed network*
◆Existing electric AMI footprint could allow an accelerated AMI rollout and decreased capital investment ◆Water AMI endpoints relay consumption data via electric endpoints and data collectors	◆Upfront investment in network infrastructure requires low site mounting for data collectors (~30 ft. high, oftentimes street lights) ◆Approximately one data collector is required per square mile ◆Water AMI endpoints relay consumption data via one or more data collectors	◆Upfront investment in network infrastructure requires high site mounting for base stations (~150-190 ft. high) ◆Approximately six base stations would be required ◆Water AMI endpoints relay consumption data via one or more base stations	◆Upfront investment in infrastructure is low, as there are no mounted network devices ◆Technology/processes already exist for approx. 1.6k Naperville endpoints ◆Meter reads are gathered via mobile collection once per month

What are the differences between AMR and AMI?

Automatic Meter Reading (AMR)	Advanced Meter Infrastructure (AMI)
◆ Automatic meter reading (AMR) transmits consumption data to a handheld or mobile collector on a monthly basis ◆ AMR is used to reduce the volume of bill estimations, but provides little customer or operational benefits beyond meter reading ◆ AMR transmits a singular meter read, rather than interval/hourly consumption data ◆ Without interval consumption data, Customer Service has limited information to troubleshoot consumption or leak questions; meaningful leak detection cannot be performed ◆ Consumption data presented in a customer portal is stale, as only one data point is available over a 30-day period.	◆ Advanced metering infrastructure (AMI) uses a telecommunications network to relay consumption data multiple times per day ◆ AMI is used to reduce the volume of bill estimations and also provides numerous customer and operational benefits ◆ Hourly interval data can be used to troubleshoot high bill questions (e.g., pinpointing usage to 800 gallons at 4:00am 3x/week, indicating a sprinkler system) ◆ Analytics can identify high or continuous consumption (leaks) and proactively notify customers in hours or days vs. weeks or months ◆ AMI provides indirect benefits including reduced greenhouse gases and the ability to manage/enforce water conservation goals ◆ AMI currently exists for electric and gas utilities in the region

In addition to direct financial benefits, AMI programs offer a variety of indirect benefits to customers & society

1. **IMPROVED CUSTOMER SERVICE**

   Transitioning to AMI will reduce the volume of estimated bills, and help Naperville provide customers with proactive leak notifications, consumption alerts, and better data real-time.

2. **IMPROVED CUSTOMER LEAK DETECTION**

   Hourly interval data from water meters, analytics, and a customer portal/mobile application could proactively identify leaks and notify account holders – reducing the risk of water waste & catastrophic damage.

3. **IMPROVED CONSERVATION OPPORTUNITIES**

   Hourly interval data can be used for empowering customers to make their own choices regarding consumption reduction and resource conservation.

4. **IMPROVED SAFETY – FOR STAFF & CUSTOMERS**

   Transitioning to AMI will reduce safety risks that meter readers encounter in the field. Additionally, reduction in driving miles associated with AMI will reduce the likelihood of car accidents – making roads safer for both customers and Naperville staff.

5. **REDUCED GREENHOUSE GAS EMISSIONS**

   Fewer truck rolls – attributed to AMI deployment – will reduce Naperville's greenhouse gas emissions. 95% of mileage associated with metering reading activity is expected to be eliminated via AMI.

YourEnergy Dashboard

User Guide | My Account | Change

Meter Number

Customer Information

Account Information
Status: ACTIVE
Begin Date: 5/18/1996
End Date: Current

Download Usage Data

Select Date | Select End Date | Export

Select the time period to view

Weekly Usage | 01/01/2019 | Search

Select the week to compare

Select Week | 01/01/2019 | Add to Chart

Week of 12/30/18 thru 1/5/19

The chart displays daily usage for the week.

Previous | Next

Total Usage kWh

94.14

Total usage for the week

Peak Hour kW

1.87

Most usage on Sat at 6pm

Usage Comparison

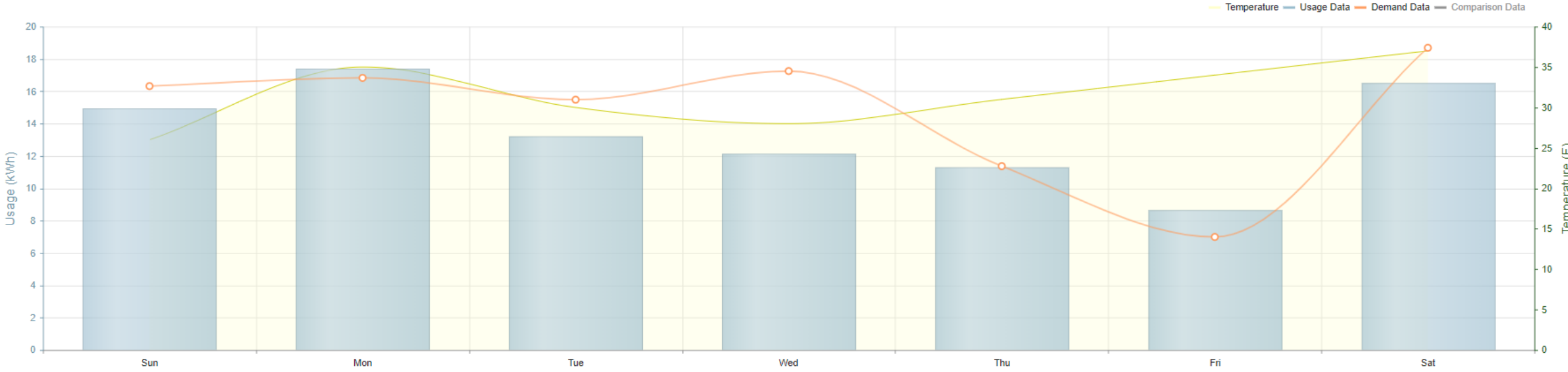
This Week	94.14
Last Week	90.73
2 Weeks Ago	70.5

Daily Distribution

Information Displayed: Usage | Peak | Temperature | Comparison

Usage Interval: Show Days | Show Hours

Display Period: Month | Week | Day



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Daily Usage | 12/31/2018 | Search

Select the day to compare

Select Day | 01/01/2019 | Add to Chart

Monday, December 31st 2018

The chart below displays fifteen minute usage totals for the selected days.

Previous | Next

Total Usage kWh

17.38

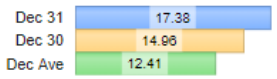
Total usage for the day

Peak Hour kW

1.68

Most usage at 11am

Usage Comparison



Daily Distribution

Information Displayed

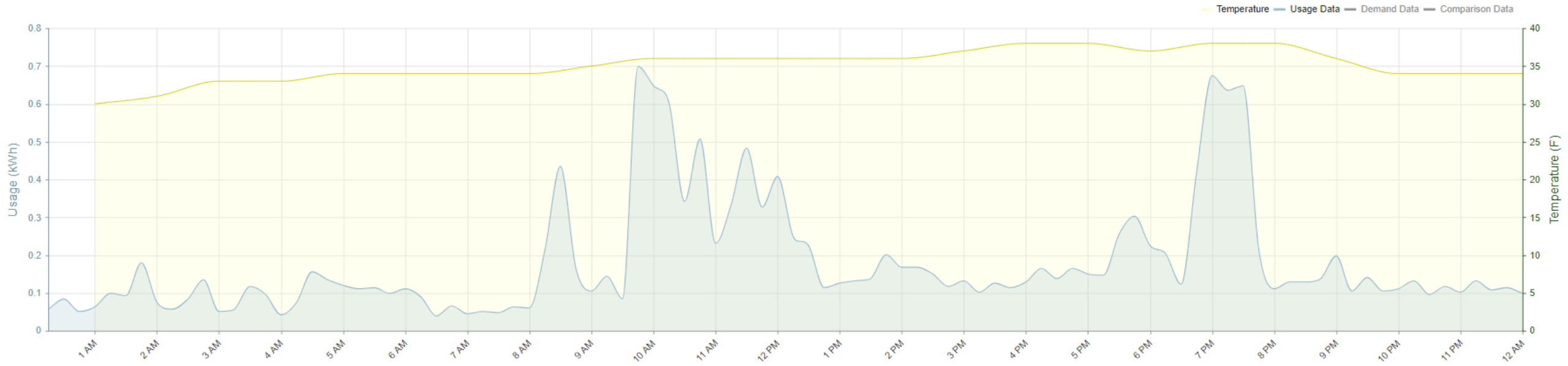
Usage | Peak | Temperature | Comparison

Usage Interval

Show Hours | Show 15 Mins

Display Period

Month | Week | Day



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Usage | 12/31/2018 | Search

Select the day to compare

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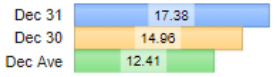
us | Next

Total Usage kWh
17.38
Total usage for the day

Peak Hour kW
1.68
Most usage at 11am

Usage Comparison



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Usage Interval

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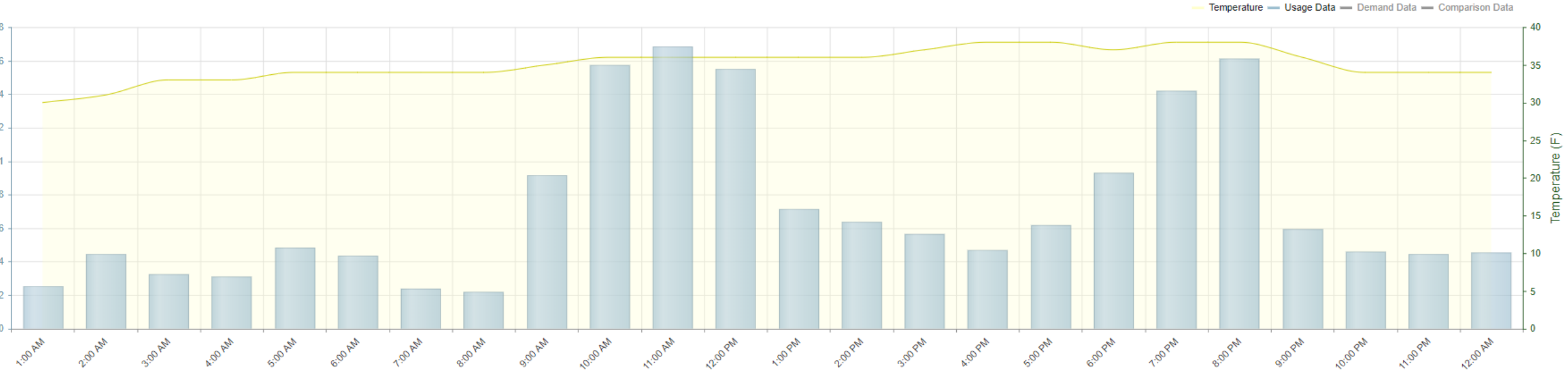
Display Period

Month | Week | Day



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End Date: Current

Download Usage Data

Select Date | Select End Date | Export

Select the time period to view

Monthly Usage | January 2019 | Search

Select the month to compare

Select Month | January 2018 | Add to Chart

Month of January 2019

The chart displays daily usage totals for the month.

Previous | Next

Total Usage kWh

This Month	421.66
Compare Month	436.11

Total usage is 3.3% lower

Peak Hour kW

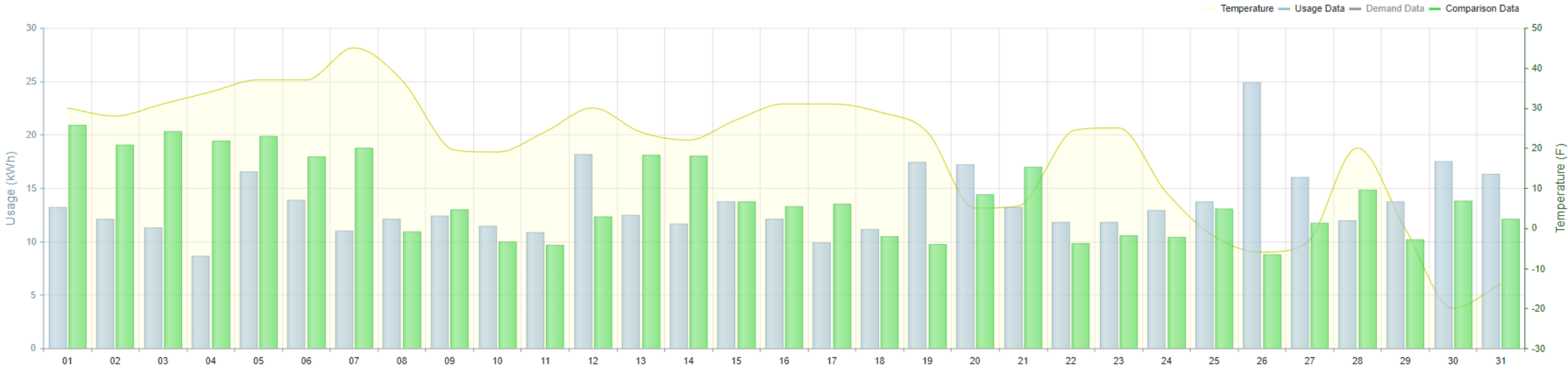
This Month	2.052
Compare Month	2.93

Peak hour is 30% lower

Information Displayed: Usage | Peak | Temperature | Comparison

Usage Interval: Show Days | Show Hours

Display Period: Month | Week | Day



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Select the month to compare

Select Month | Select Date | Add to Chart

onth of January 2019

hart displays daily usage totals for the month.

vious | Next

Total Usage kWh

421.66

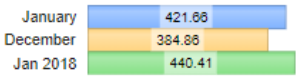
Total usage for the month

Peak Hour kW

2.05

Most usage on Tue 29th at 7pm

Usage Comparison



Daily Distribution

Information Displayed

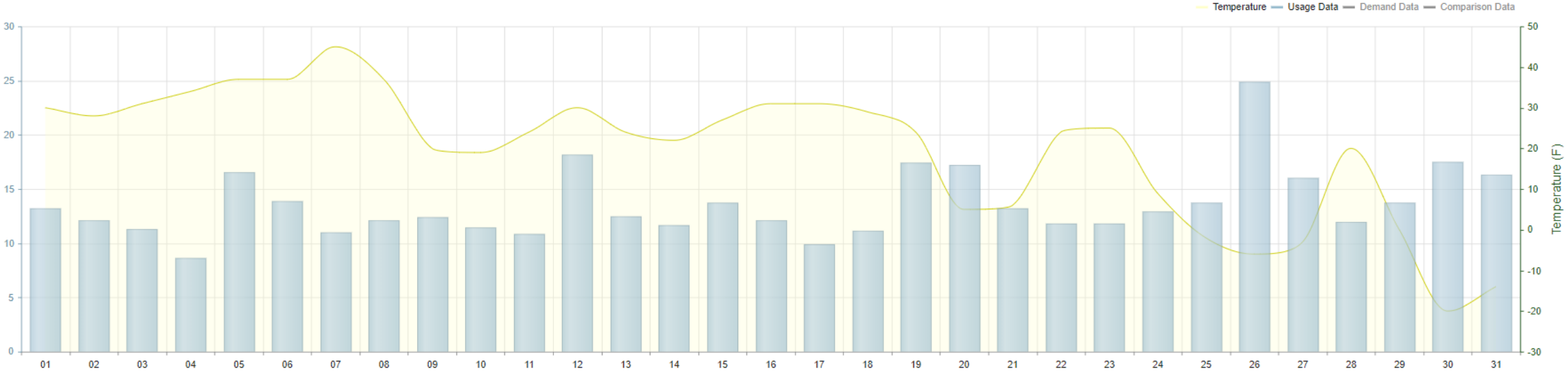
Usage | Peak | Temperature | Comparison

Usage Interval

Show Days | Show Hours

Display Period

Month | Week | Day



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Select the time period to view

Monthly Usage | Select Date | Search

Select the month to compare

Select Month | Select Date | Add to Chart

Months from 09/18 to 03/19

The chart displays monthly usage totals for the range of months.

Previous | Next

Peak Usage Month

September

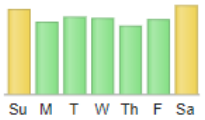
76% above ave usage for period

Peak Hour kW

4.16

Peak hour on 9/5/18 at 5pm

Weekly Distribution



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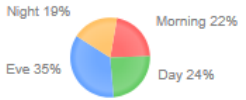


Information Displayed

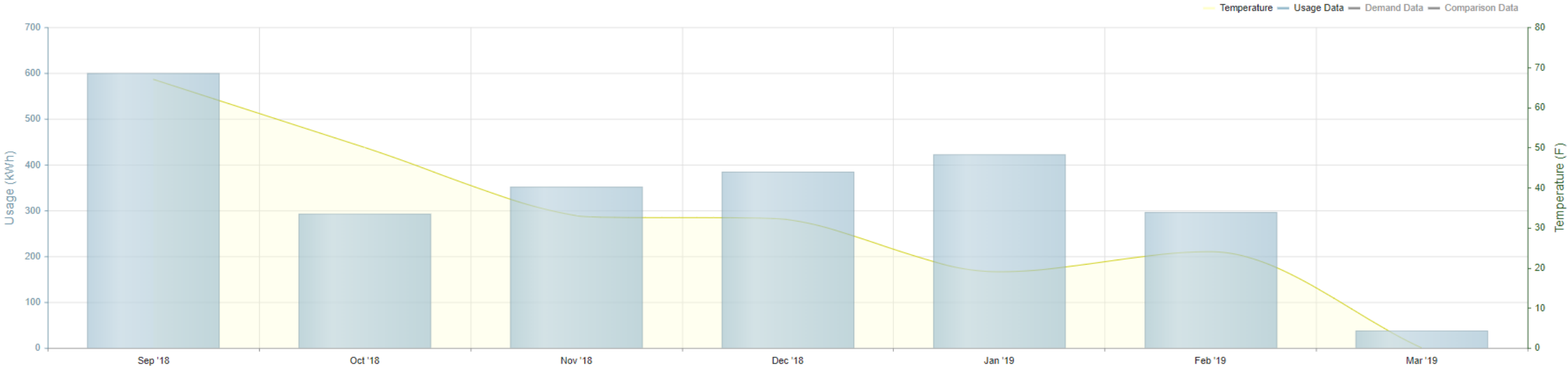
Usage | Peak | Temperature | Comparison

Usage Interval

Show Months | Show Days

Display Period

Month | Week | Day



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End Date: Current

Download Usage Data

Select Date | Select End Date | Export

the time period to view

kly Usage | 01/29/2019 | Search

Select the week to compare

Select Week | 01/22/2019 | Add to Chart

ek of 1/27/19 thru 2/2/19

rt displays daily usage for the week.

ous | Next

Total Usage kWh

This Week	98.50
Compare Week	105.73

Total usage is **6.8%** lower

Peak Hour kW

This Week	2.052
Compare Week	1.88

Peak hour is **9.1%** higher

nformation Displayed

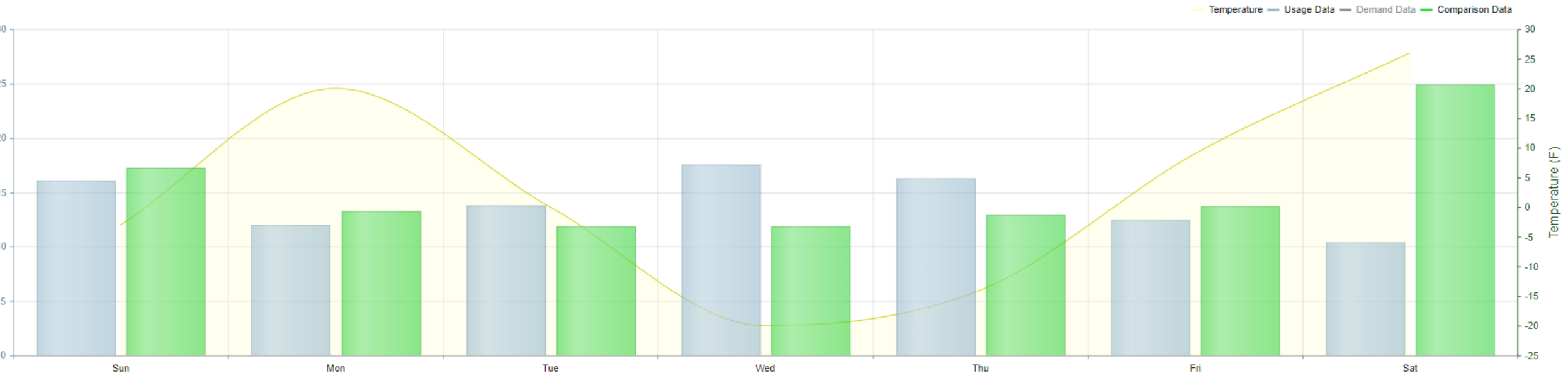
Usage | Peak | Temperature | Comparison

Usage Interval

Show Days | Show Hours

Display Period

Month | Week | Day



Naperville's business case covers 6 different scenarios

BATTERY LIFE

Assesses the impact of 10, 15, 17, and 20 year battery life on AMI program costs and benefits

TELECOM NETWORK

Assesses the costs and benefits of four deployment options, (1) AMI – Naperville Network, (2) AMI – Low Site Point to Multipoint, (3) AMI – High Site Point to Multipoint, (4) AMR – Mobile

AMI DEPLOYMENT YEAR

Models the year AMI meter reading devices (endpoints) begin field deployment

AMI DEPLOYMENT LENGTH

Models the costs and savings associated with a 1 or 2+ year meter reading device (endpoint) deployment timeframe

TECH DEPLOYMENT YEAR

Models the year in which AMI technology is implemented for the back office (e.g. MDM, portal, analytics)

AMI BENEFIT REALIZATION YEAR

Models the benefits of AMI from this point in time forward

Note: the AMI benefit realization year must be at least one year after AMI & technology deployment

BUSINESS CASE ASSUMPTIONS

Scenario Selection Assumptions

- Assumes one business case with fixed and variable costs over 20 years
- Model assumes 20 year battery life
- Model represents four network design options

Timeline Assumptions

- Business case assumes year 1 begins immediately in 2020
  - Note: random failure is modeled at 1% for years 1-10 and 2% for years 11-20
- Baseline costs assume termination of contracted meter reading in 2021
- Naperville will utilize contractors to perform AMI/AMR reading device (endpoint) installations during a one-year period through both a mass deployment effort and via day-to-day operations (e.g. accelerated meter replacement program, new business/home, etc.)
- The IT development and system integration work will be performed over two releases focusing efforts on the most critical functionality first (meter exchange, billing) and other functionality in a second release (customer portal, data analytics)

Data Assumptions

- All 45,000 endpoints will be converted to AMI/AMR with the option for an opt-out program
- West Monroe applies inflation to all expenses over the 20 year business case period

AMI Program Headcount – Deployment & Ongoing Staff

Department	Deployment	Post-Deployment	Responsibilities
Customer Service & Billing Rep	1,040 hrs. across 2019 and 2020 (heavier workload in 2020)	0 hrs./year	• Create and lead water AMI training for Customer Service/Billing • Develop / update call center scripts based on AMI questions • Update call center staff on AMI deployment progress • Address customer service escalations related to AMI • Troubleshoot AMI billing issues
Field Operations / Project Management / Engineering	2,080 hrs. across 2019 and 2020 (heavier workload in 2020)	520 hrs./year	• Assist in AMI vendor selection, field deployment vendor selection, and vendor QA/management activities • Assist in propagation studies & network design as needed • Oversee day to day contractor management / deployment • Update meter reading routes/bill cycles (as required) • Maintain network hardware & devices in the field
IT – General / Integrations / Software Maintenance	Naperville Network: 1,040 / Non: 2,080 hrs. across 2019 and 2020 (heavier workload in 2020)	Naperville Network: 1,040 Non: 2,080 hrs./year	• Provide network monitoring & maintenance • Provide incremental deployment & ongoing support for technical AMI hardware (e.g. servers, disaster recovery, log monitoring, technical change management, etc.) • Provide deployment & ongoing support for new water portal and analytics • Develop and support new system integrations with MDMS (if not leveraging existing network)
Program & Change Management/ Training	2,080 hrs. across 2019 and 2020 (spread equally across the 2 years)	0 hrs./year	• Manage water AMI program • Lead vendor selection & contracting activities • Create & execute change management plan • Create & execute training plan
Communication / City Management	1,040 hrs. across 2019 and 2020 (spread equally across the 2 years)	0 hrs./year	• Communications plan and AMI training • Support the AMI deployment from a political perspective, including design of an opt-out program, Council memos, vendor selections, and escalated resident inquiries
Legal	260 hrs. across 2019 and 2020 (heavier workload in 2019)	0 hrs./year	• Provide legal guidance and support for opt-out program and Bill of Rights

12-month Outlook

- Continue with manual water meter reading
  - Current contract ends in August with 2 option years remaining
- PUAB recommendation
- City Council discussion
- Request for Proposal for vendors
- Update Customer Bill of Rights
- Work on water Customer opt-out program
- Deployment of automated meter reading will allow for integration with the Tyler Utility Billing module (July 2021)
  - Delaying deployment could require an additional $450,000 in additional integration costs

Next Steps

- Action Items
  - Discuss any requests for additional or clarifying information
  - Recommend approval of the assumptions

- Tentative April 18 PUAB meeting
  - Review Business Case and Implementation Plan
  - Review costs & funding options
  - Make a recommendation for City Council

Naperville