

Advanced Metering Program Update

Public Utility Board
Reports of the Director
February 10, 2021



Agenda



1. Program Update

- Strategic Program
- Milestones
- Budget
- Schedule

2. Advanced Meters & Cybersecurity

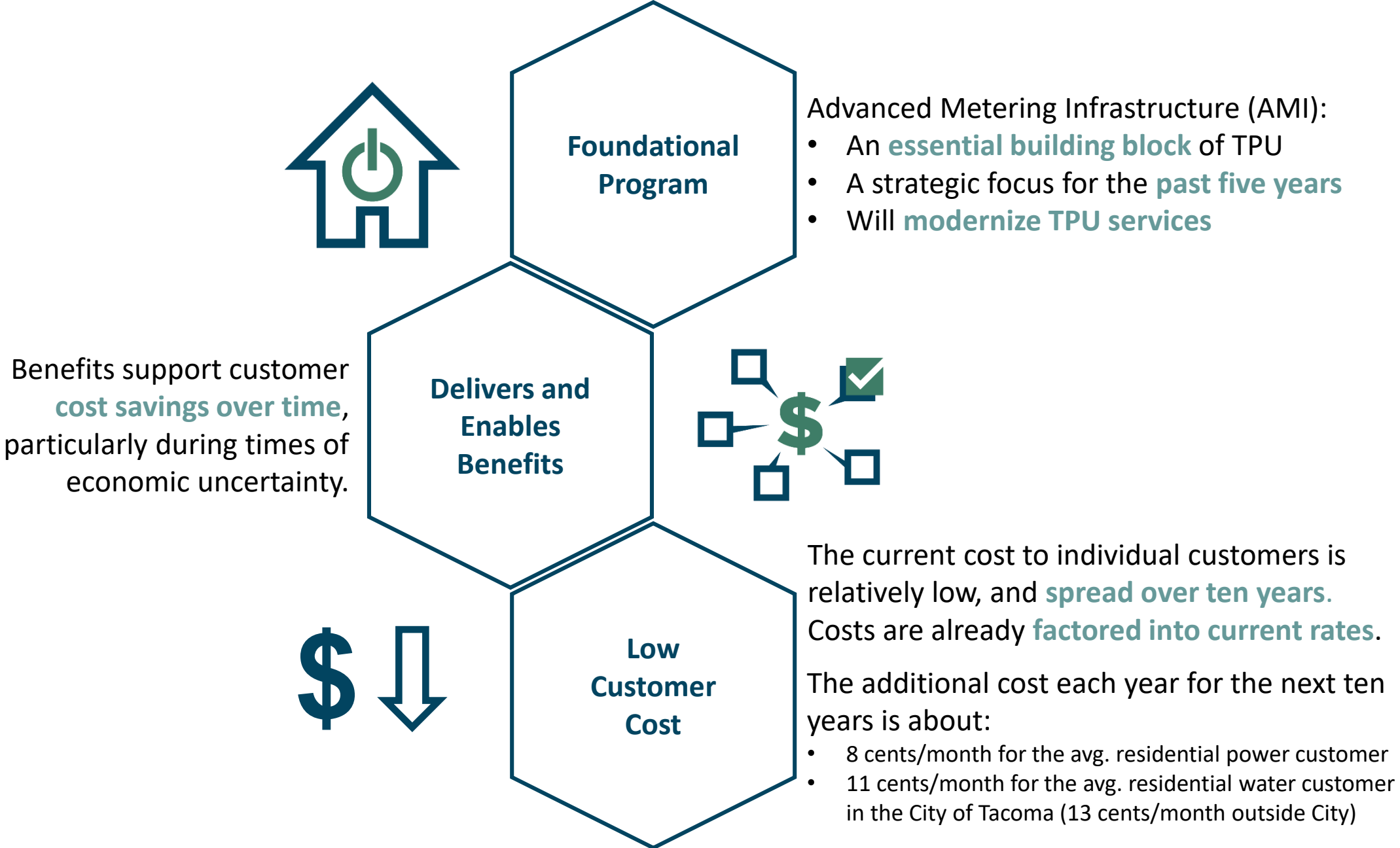
3. Meter Deployment Readiness

- Deployment Overview & Update
- Customer Side Repair Contract and Water Grants & Loans
- Communications

4. Customer Benefits

- Benefits Timeline
- Benefits Realization
- Customer Usage Portal

Advanced Metering: Strategic Program



Milestones & Schedule

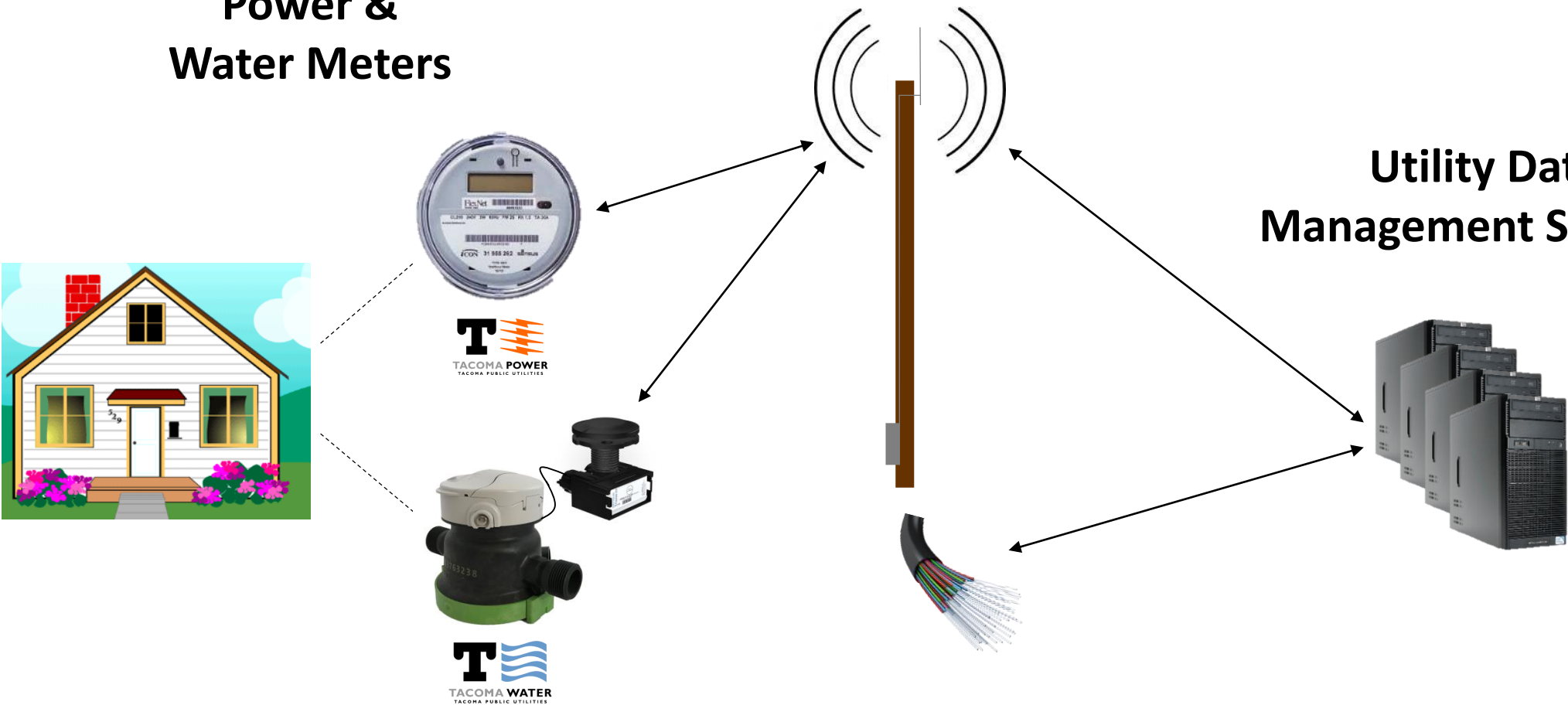
Advanced Metering Infrastructure (AMI)



Communications Network

Power & Water Meters

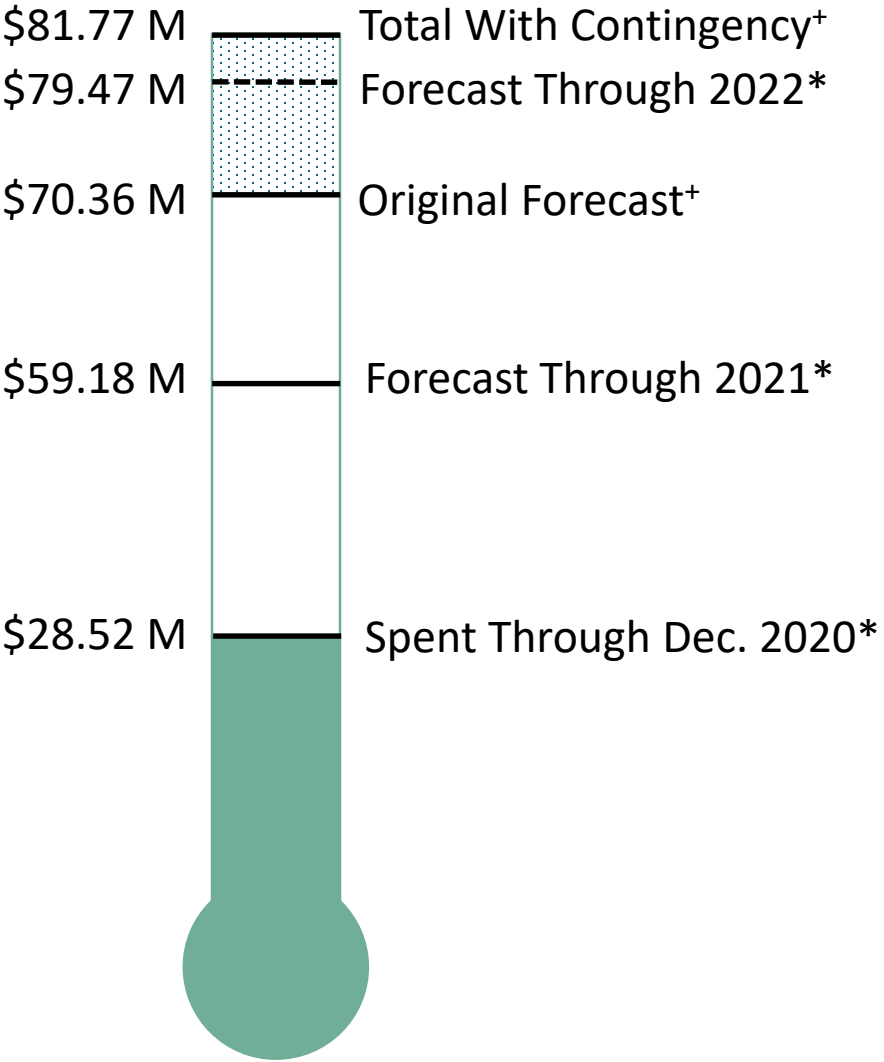
Utility Data Management Systems



Major Milestones Accomplished



AMI Deployment Budget: February 2021



Contingency	Amount*
Original Contingency+	\$11.41 M
Allocated Contingency	\$9.11 M
Remaining Contingency	\$2.30 M

AMI Program Workstream	Percent Complete*
Vendor Procurement	100%
System Integration	85%
Communication Network Deployment	75%
Electric Meter Deployment	<1%
Water Meter Deployment	<1%
Communications	30%
Overall	40%

*Updated February 2021, preliminary actuals through December 2020.

+February 2019 AMI business case values for the period 2018-2022. In addition to business case costs shown, TPU Internal Support Costs are tracked separately and do not incrementally impact rates.

First AMI Meters – Fall 2020



Initial Meter Deployment Area



- **First advanced meters**

- Approx. 230 customers
- Approx. 340 meters
 - 190 power
 - 150 water
- Installed by TPU meter staff
- Installations occurred Sept-Oct 2020

- **Small group ensures successful collection of power and water usage data and billing.**

- **System validation nearing completion and includes conversion to monthly billing.**

Advanced Meter timeline



12 Month Look Ahead

Winter 2020-2021

- Customer communications
- Technical system testing & training
- Begin commercial & industrial meter deployment
- Mobilize meter installation vendor (MIV)

Spring 2021

- Customer communications
- Complete technical system validation
- Complete mass deployment system integrations
- Begin residential mass meter deployment
- Complete initial network buildout

Summer-Fall 2021

- Customer communications
- Mass meter deployment
- Network hardening



Upcoming Target Dates



**Begin Large Commercial & Industrial
Meter Installations**

January – February 2021

**First Monthly Billing Conversions
in Initial Deployment Area**

February 2021

Begin Mass Meter Communications

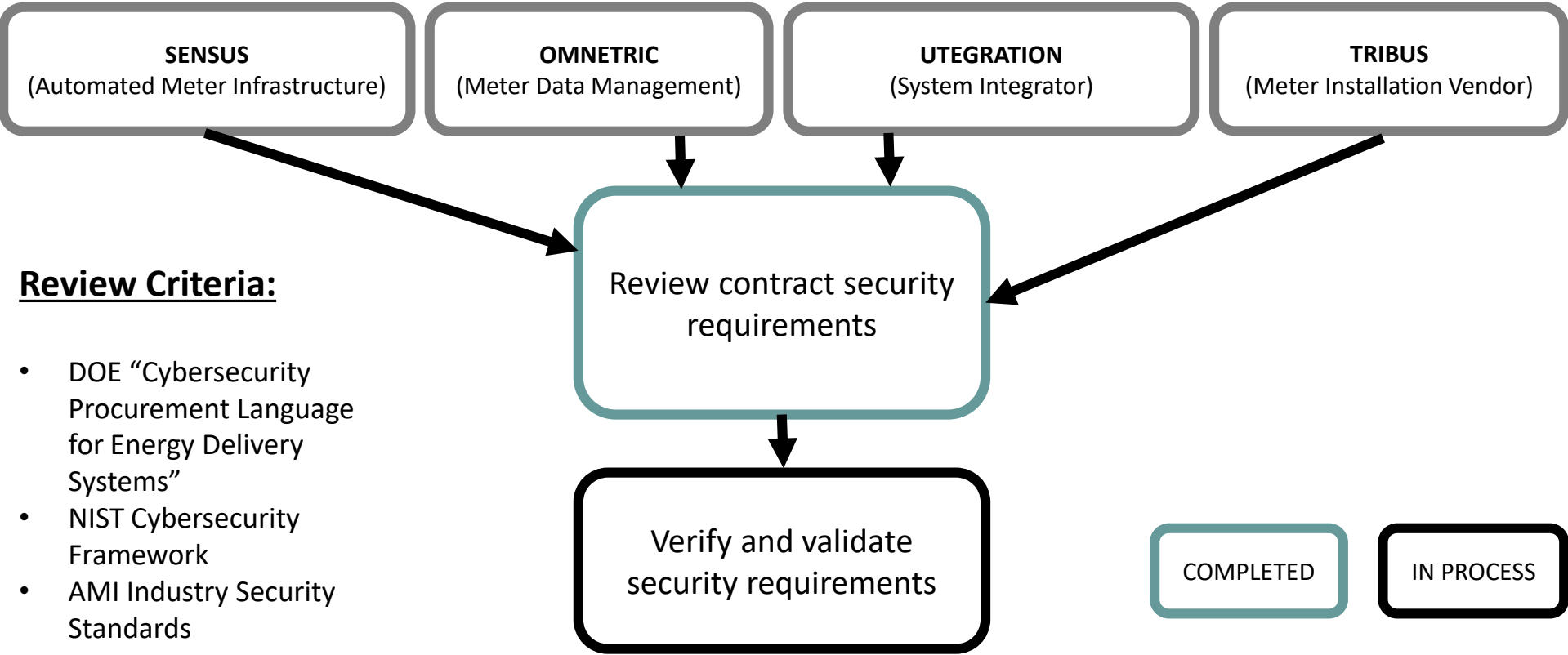
February – March 2021

Mass Meter Installations

April 2021 – Q4 2022

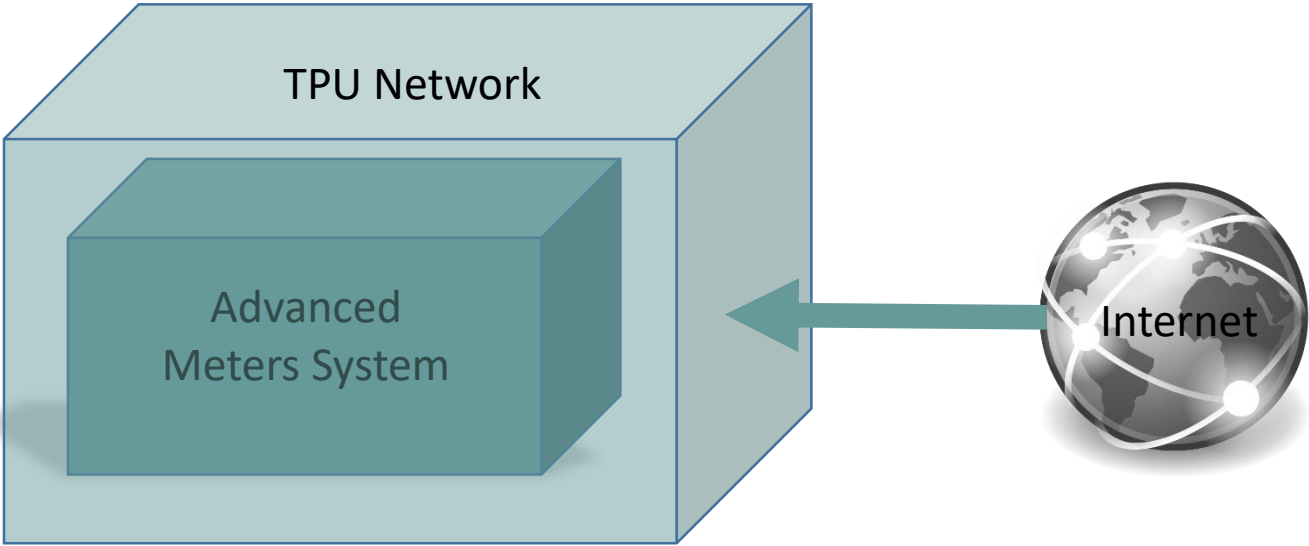
Advanced Meters & Cybersecurity

TPU CYBERSECURITY AMI ARCHITECTURE & CONTRACT REVIEWS

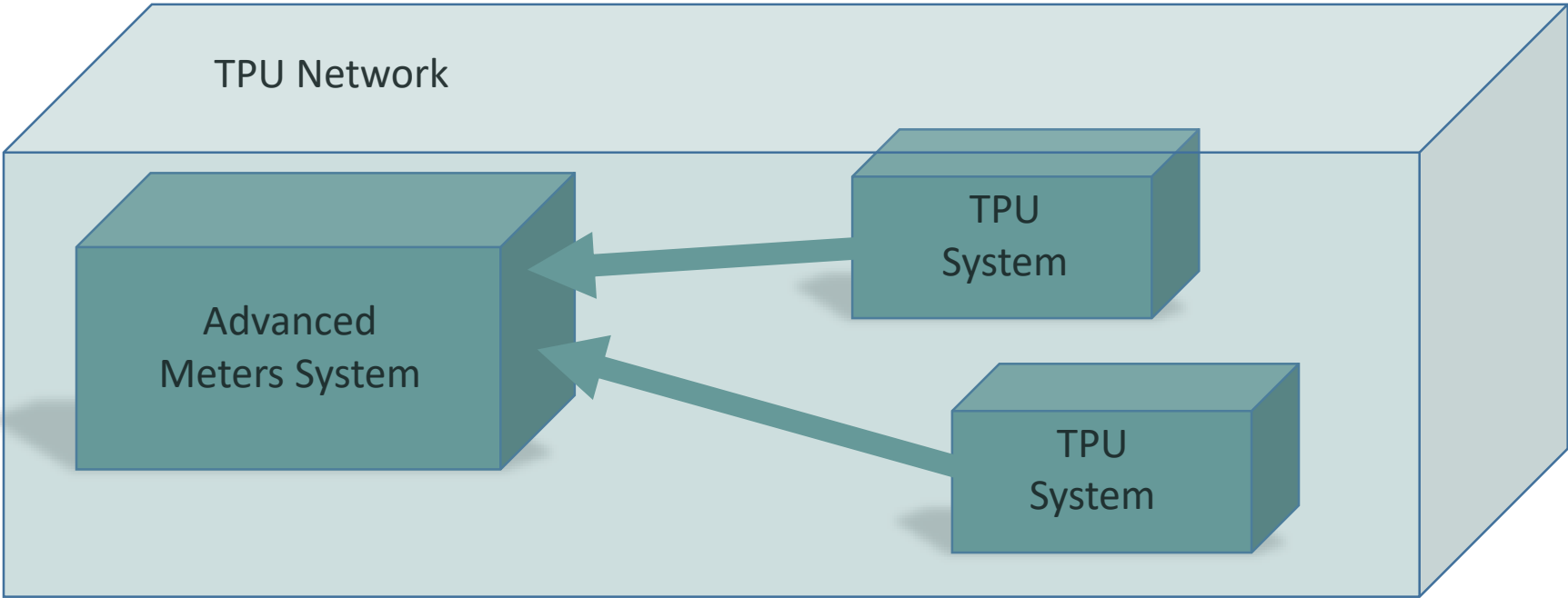


Advanced Meters: 3rd Party Pen Test

**External Testing
(Internet)**



**Internal Testing
(TPU Systems)**



Sensus – Advanced Metering Infrastructure (AMI)

Sensus Senior Director, Global Security Technologies, Information Security:

“Sensus AMI system does not collect Consumer’s Privacy protected information such as customer names, email-ID, addresses, SSN, etc. Other information such as customer meter read information is protected per Sensus and SaaS security architecture...”

Omnetric – Meter Data Management System (MDMS)

TPU Cybersecurity:

“TPU Cybersecurity ensured that customer data privacy has been addressed in the vendor contract language regarding the MDMS.”

Utegration – System Integrator

TPU Cybersecurity:

“TPU Cybersecurity ensured that customer data privacy has been addressed in the vendor contract language regarding advanced metering system integration.”

Tribus - Meter Installation Vendor (MIV)

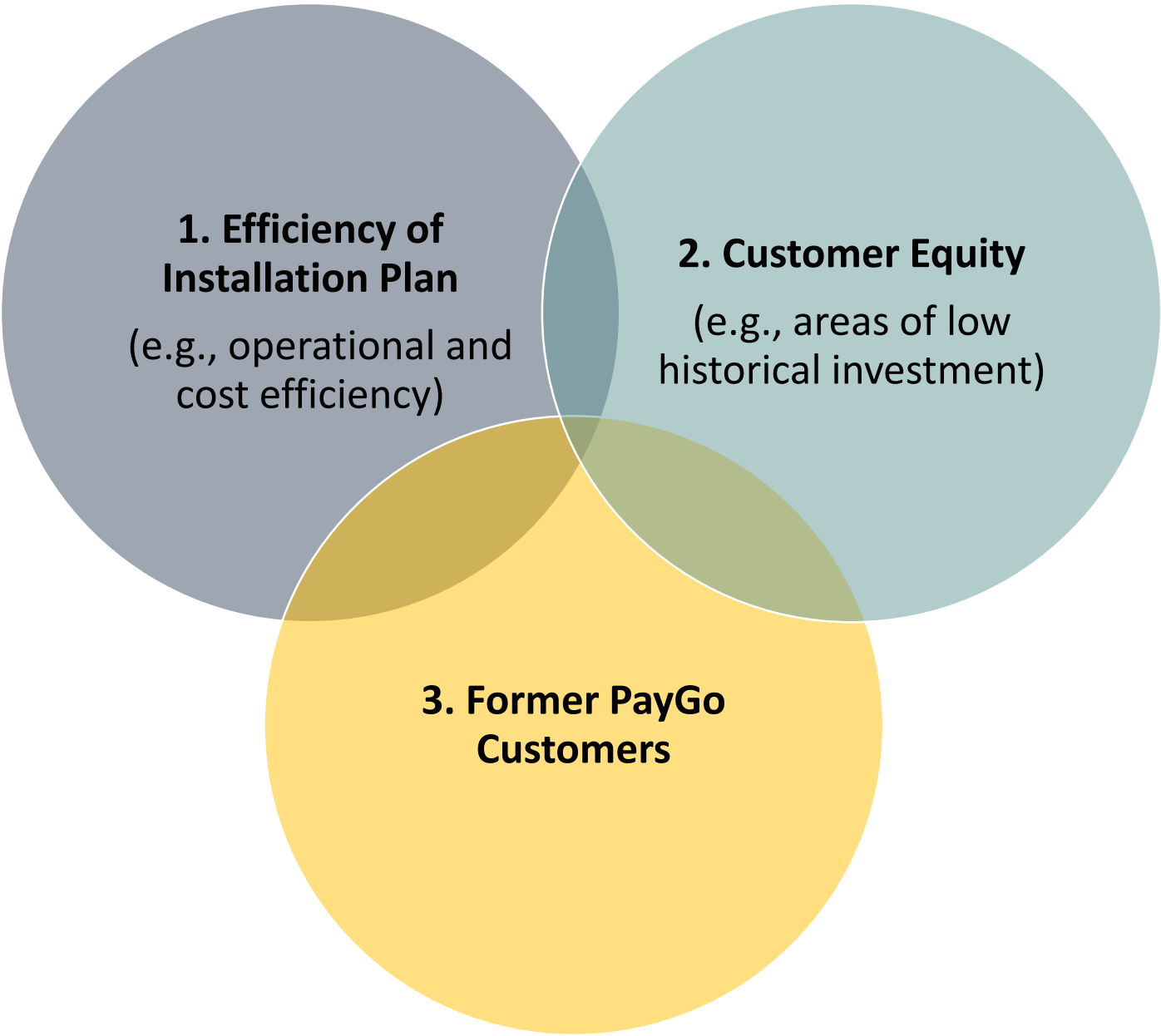
TPU Cybersecurity:

“TPU Cybersecurity ensured that customer data privacy has been addressed in the vendor contract language for work associated with meter installation.”

Deployment Readiness

Deployment Overview, Customer Side Repairs, and Communications

Deployment Planning Considerations



Residential mass meter deployment begins April 2021 (target date)

Ways to Assist Customers

Assistance Methods

1. Advanced Meter Customer Side Repair Policy – Power & Water
2. Water Service Line Grant Program
3. Water Service Line Loan Program

Grant and Loan Process Overview



MIV Customer Side Repair Contract

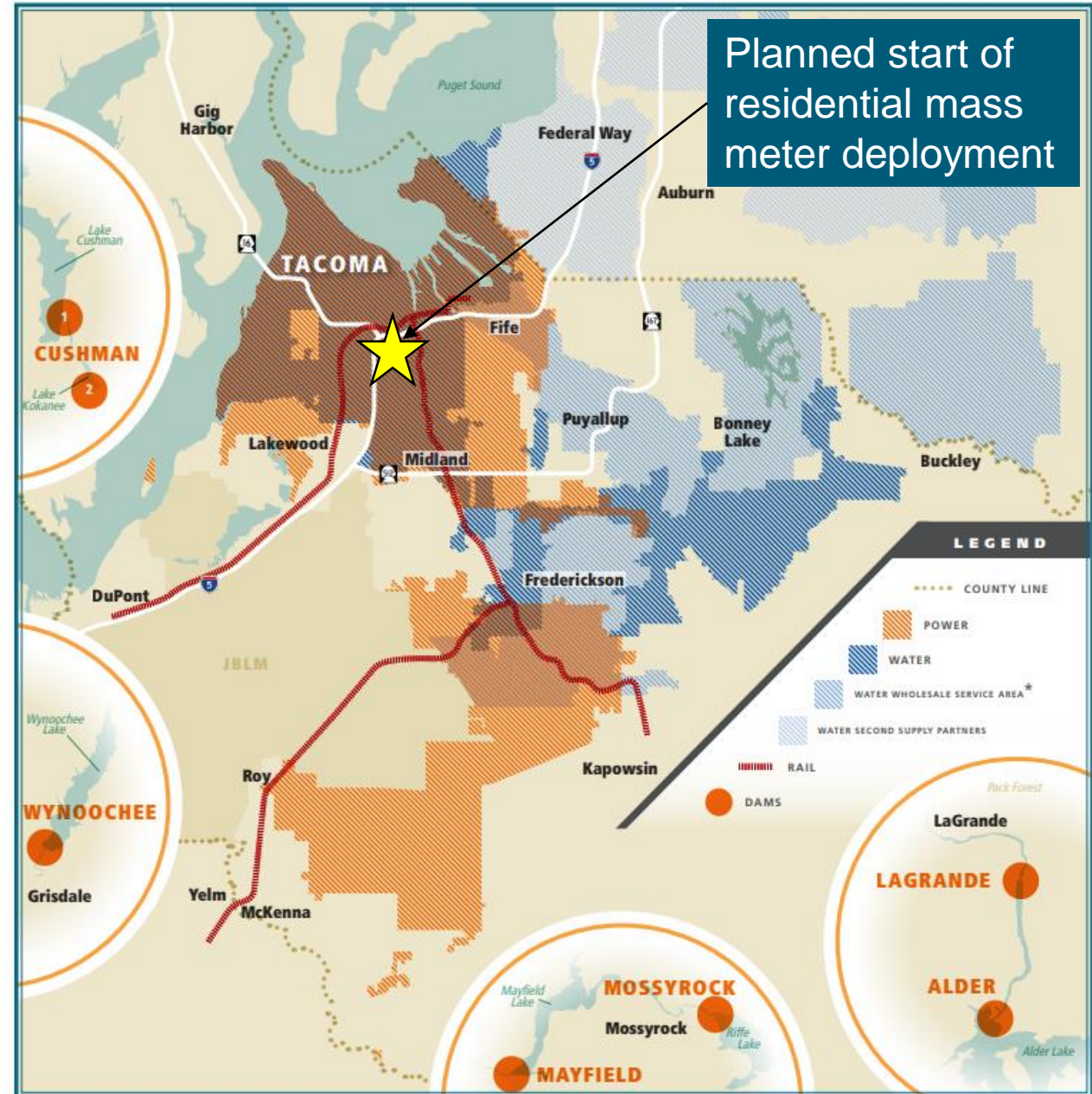


- Scope
 - Aligns with approved Customer Side Repair Policy
 - Meter Installation Vendor (MIV) sub-contractor performs work
 - 2 hour response times
 - Detailed repair tracking
- Amount
 - Approx. \$1.6 M, plus applicable taxes (*preliminary amount*)
 - Based on TPU's best estimate of anticipated work
 - Includes 15% contingency and 10% MIV overhead
- Approval Timing
 - Targeting Board approval on Feb. 24th

Deployment Scope



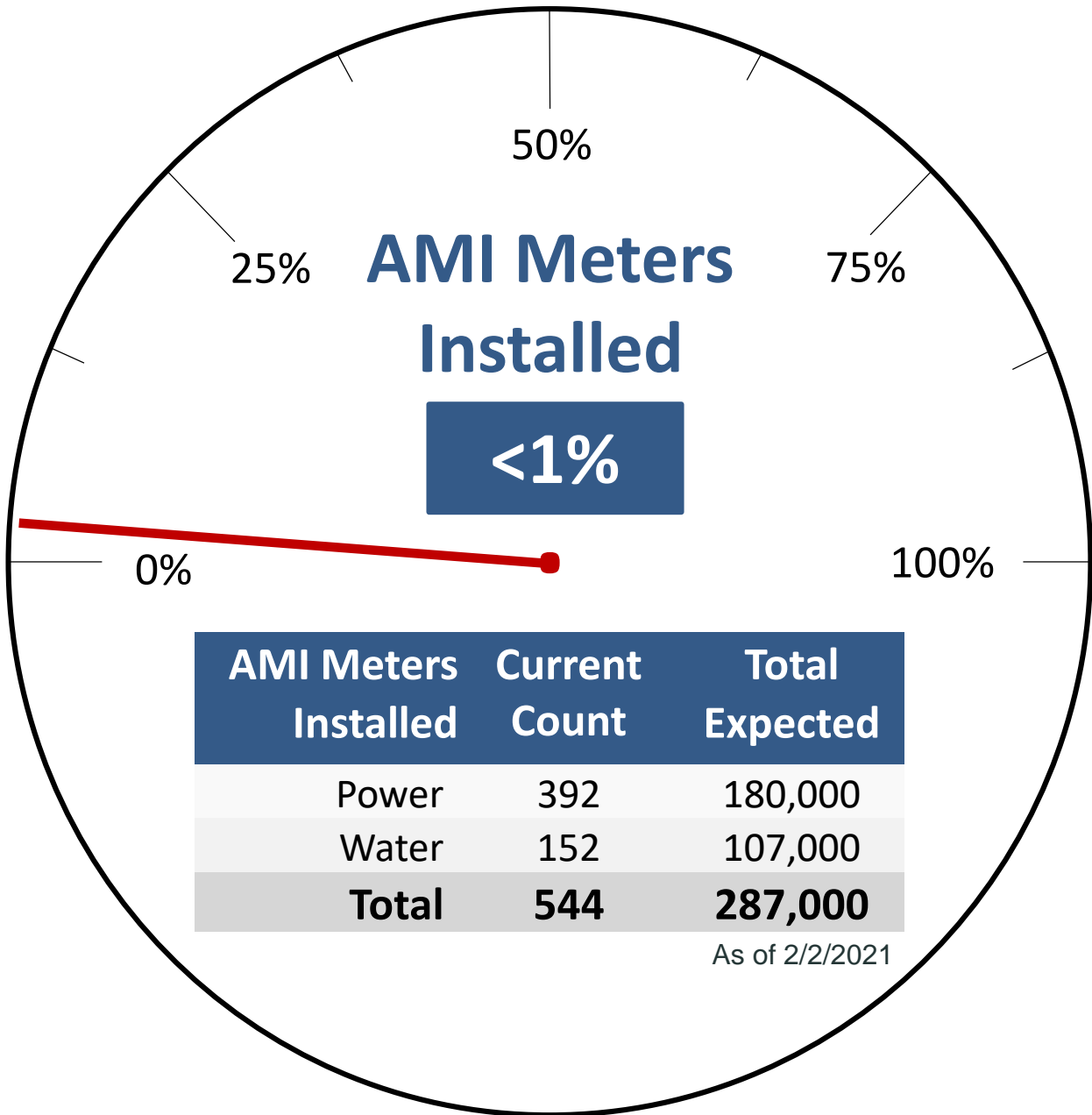
- Power
 - 180,000 meters
 - 180 mi² of service area
- Water
 - 107,000 meters
 - 117 mi² of service area
- At full speed, the team will install up to (approx.):
 - 500 electric meters/day
 - 300 water meters/day
- Communication Network
 - Approx. 65 base stations



Deployment Update: February 2021



- **Fall 2020**
 - Advanced meter installations began
- **January-February 2021**
 - Begin large commercial & industrial meter deployment
- **April 2021 (target)**
 - Begin mass residential meter deployment
- **Q4 2022 (target)**
 - Meter deployment completed



Deployment Readiness Scorecard



Advanced Meter Program
KPI Scorecard
Data as of December 31, 2020

	Category	Goal	Actual	Weight	Health	Notes
Deployment Readiness	1. Training	90-100%	83%		●	14 classes were moved from Sept 2020 to Jan 2021 because training materials needed refinement and there were SI resource constraints; Class attendance is high
	2. Vendor and Deployment Preparation	90-100%	104%		●	Vendor & deployment preparation is on track; mass deployment entry checklist items are being completed ahead of schedule
	3. Systems	Metric Specific			●	Technical Go-Live is complete; POP Go-Live started; Mass Meter Readiness & Release 3 testing scheduled to start Feb 2021; no Priority 1 or 2 issues in the IDA; NOC/SOC is operational
	4. Network Deployment	90-100%	75%		●	Installing & commissioning of base stations and the Sensus network survey are behind the baseline schedule
	5. Communications	90-100%	102%		●	Communications are ahead of schedule
Deployment Execution	1. Meter Installation Vendor - Tribus	Metric Specific			●	MIV has not started yet; IDA route installs completed on schedule
	2. TPU Power Meter Installation	Metric Specific			●	TPU is installing C&I meters ahead of targeted dates, Inventory levels are sufficient, we have not experienced cutover latency for Power meters
	3. TPU Water Meter Installation	Metric Specific			●	TPU completed IDA installs per schedule, Inventory levels are sufficient, we have not experienced cutover latency for Water meters
AMI Program Implementation	1. Program Management	Metric Specific			●	Overall program is currently on schedule (2022 completion), underrunning budget & resource forecast, Change orders at 1% of budget, 9% of risks/issues are high or critical
	2. Billing Performance	Metric Specific			●	1.89% estimated invoices, Implausible Meter Reads at 5%
	3. Customer Experience	Metric Specific			●	Customer Service goals on track, 69 customers have contacted TPU regarding Opt Out

Key Performance Indicator (KPI) data updated monthly

AMI Meters In Stock	Current Count
Power	61,000
Water	22,000
Total	83,000

Approximate counts as of Jan. 2021

General Awareness & Community Outreach

- **General Customer Awareness**
 - Web content (constant)
 - Web banner ads
 - *U* - Utilities & You* articles
 - E-newsletter
 - Bill inserts
 - Social media
- **Ongoing Community Outreach**
 - Tacoma's Neighborhood Councils
 - Tacoma City Council
 - The Black Collective
 - Neighborhood block groups
 - Community organizations
 - Franchise cities
 - Pierce County
 - Joint Municipal Action Committee

TACOMA PUBLIC UTILITIES
Advanced Meter Project

The Tacoma Public Utilities (TPU) Advanced Meter Project will provide you with greater control, choice, and convenience. Starting in mid 2020, TPU will begin upgrades to its electric and water meters with modern digital technology that brings many new customer benefits over time, including monthly billing, remote electric service reconnection, more options to control your costs, improved reliability through faster outage and leak detection, and more flexible payment options in a safe and secure way.

TPU has been a trusted service provider in the region for more than 125 years and will continue to provide you with the reliable, affordable, and environmentally-responsible service you expect by replacing and upgrading aging meters. With technology that is used in more than 75 million households nationwide, the advanced meter project enables a shift to a modern digital utility, making operations more efficient and helping the environment through reduced carbon emissions.

Your benefits over time

 Your Control, Choice, and Convenience Access more usage data anytime to manage your use and costs.	 Automated Meter Reading More accurate, timely bills based on real-time data.
 Monthly Billing Advanced meters will allow a switch to monthly utility bills, which most people prefer.	 Enhanced Personal Privacy No need for regular physical access to read your meter.
 Easier Move In, Out, and Reconnection Remote turn on and off of electric service saves you time.	 Expanded Ways to Save Providing data about your use increases your ability to save money, water, and energy.
 Faster Outage and Leak Detection Locating and fixing issues helps us restore service to you sooner.	 Flexible Payment Options More options over time include prepay for electric service and custom due dates.
 Improved Operational Efficiency Better information about our systems helps us manage costs.	 Reduced Environmental Impact Fewer vehicle miles traveled for meter reading, basic field services, and outage detection lowers our carbon footprint.

MyTPU.org/AdvancedMeters








TACOMA PUBLIC UTILITIES
Facts about Advanced Meters and Radio Frequency Emissions

Your concerns about radio frequency (RF) emissions are important. The intent of the information below is to help you better understand advanced meters and provide reassurance about the health and safety questions often associated with them.

How do advanced meters work?
Advanced meters measure your usage throughout the day, just like your current meter. The meters transmit data via RF to us up to twenty-four times per day. The meters emit RF only when they transmit data, which is typically less than one minute per day.

Radio Frequency (RF) Exposure Values (in microWatts)
*Based on average usage


FM RADIO / TELEVISION	WIFI ROUTER	ADVANCED METER	MICROWAVE OVEN	CELL PHONE AT EAR
NEARBY	3 FEET AWAY	10 FEET AWAY	3 FEET AWAY	AT EAR
				
0.005-1 microWatts	0.2-1 microWatts	4 microWatts	50-200 microWatts	1000-5000 microWatts

Scientific Research about Advanced Meters and Health

- A study by Washington State University determined the amount of energy absorbed from advanced meter radio frequency is substantially less than the Federal Communications Commission (FCC) safety guidelines, even when a person stands close to a meter.

continued on reverse »

MyTPU.org/AdvancedMeters



Customer communications
before, during, and after meter installation.

Customer Communications



5 specific residential customer communications ***before*** meter installation.

Residential Customers, Small & Medium Commercial

- Installation Video
- Notification Letters:
 - 45 days
 - 30 days
- 14-Day Reminder Postcard
- 7- Day Reminder Call (autodial from MIV)
- 2-Day Reminder Call (autodial from MIV)
- Completed Install Door Hanger

Large Commercial & Industrial

- Notification Letter:
 - 45 days
- Scheduling Call From TPU Metering Staff
- Account Executive Outreach (as needed)
- Reminder Call (as needed)
- Completed Install Door Hanger

Communication materials available in multiple languages.

Monthly Billing Communication



Before Meter Exchange

45-Day Letter: Reference to monthly billing change within letter

30 Day Letter: Reference to monthly billing change within letter

14-Day Reminder Postcard

7- Day Autodial

2-Day Autodial

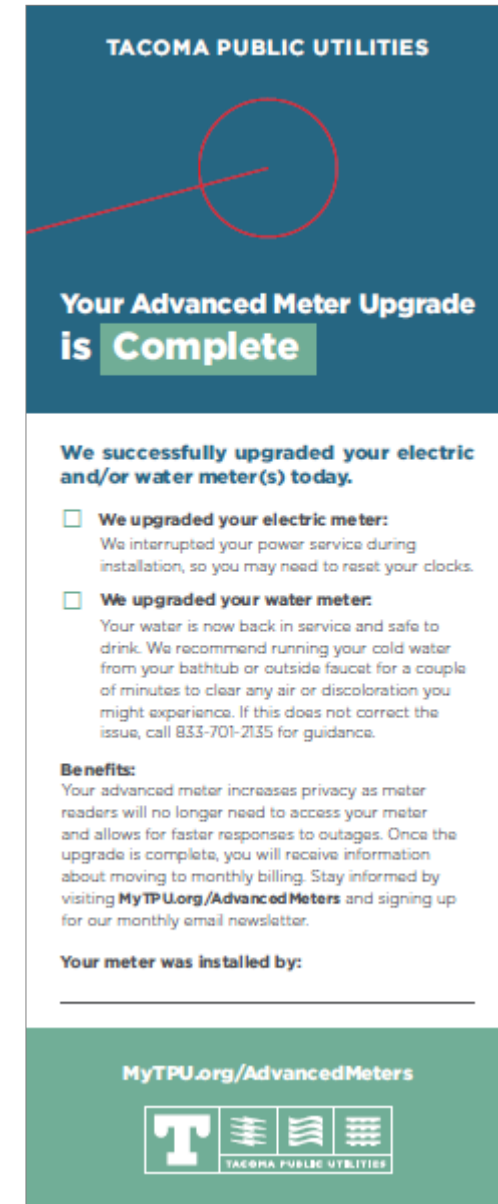
Completed Install Door Tag: Reference to monthly billing change

After Meter Exchange (specific to monthly billing)

30- Day Letter: Dedicated monthly billing letter with message on envelope

14-Day Postcard: Dedicated monthly billing reminder postcard

1st Monthly Bill: ~30 days following the customer's first regular bi-monthly bill after advanced meter upgrade



Draft door tag shown.

Customer Portal Communication Plan

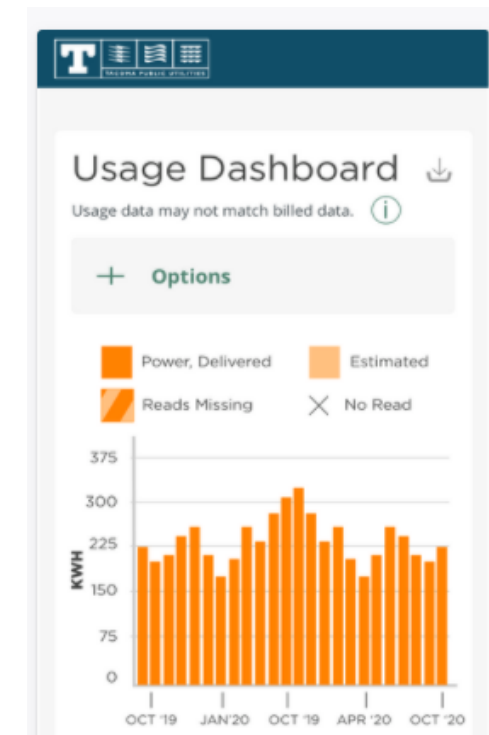


Phase 1: Q1-Q3 2021

- **Coordinate with AMI/monthly billing notices**
 - References on door tag and direct mail letter
- **Look for ways to reach specific AMI installation routes**
 - Postcard
- **Focuses on how to use data for understanding power and water use**
 - Segment messages based on commercial vs. residential customers

Portal Functionality:

- Advanced meter data display launched from existing MyAccount



Phase 2: Q3 2021

- **Coordination with AMI/monthly billing notifications**
- **Leveraging all communications channels for mass messaging**
 - Direct mail postcards and letters
 - Bill inserts
 - On-bill messaging
 - Web banner ads
 - MyTPU.org landing page
 - Social media (Facebook, twitter, Instagram, LinkedIn)
 - E-newsletter inclusion
 - *U* - Utilities & You* newsletter
- **Look for ways to reach specific AMI installation routes**
- **Advanced Meter benefits realization**
 - Tie back to themes of control, choice, and convenience
- **Customer education through print and digital**
 - Brochure
 - Videos

Portal Functionality:

- Replacement of MyAccount – like for like plus enhancements
- Phase two messaging to highlight specific benefits

Customer Benefits

Benefits Over Time:



Monthly Billing



Easier Move In, Out,
and Reconnection



Faster Outage and
Leak Detection



Improved
Operational Efficiency



Automated Meter Reading



Enhanced Personal Privacy



Expanded Ways to Save

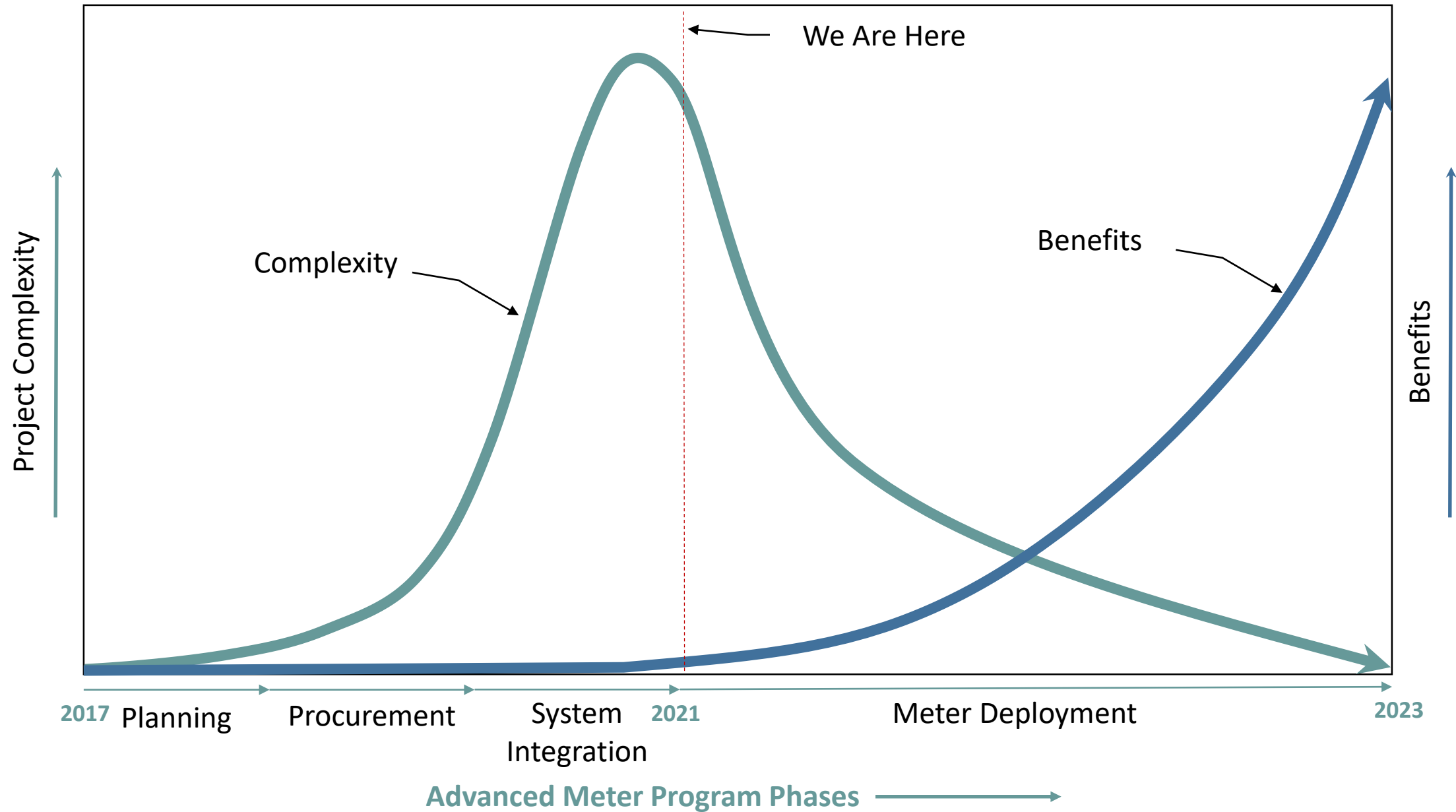


Flexible Payment Options



Reduced
Environmental Impact

Complexity & Benefits Over Time



Customer Benefits Timeline

2020-2021



- Automated Meter Reading
- Enhanced Personal Privacy



- Easier Move-In & Move-Out
- Remote Reconnect/Disconnect for Electric



- Abnormal Consumption Notifications
- Emergency Water Leak Notifications



- Monthly Billing



- PrePay for Electric



- Expanded Ways to Save: Detailed Usage Data on Web Portal

Advanced Meter Customer Benefits



Benefits Available As
Customers Receive
New Meters Over Time:
2020-2022

Revised 2/5/2021

2022



- Enhanced Customer Web Portal



- Selectable Bill Due Date



- Enhanced Customer Outage Notifications

Did you Know?

Advanced Meters are a foundational modernization project. Modernization projects typically build on one another over time. Some customer benefits or data are enabled by advanced metering and delivered through related projects (e.g., **Customer Engagement Portal**).

Benefits Realization: Initial Meter Deployment Area

- **Alarms & Notifications**
 - Hot socket (meter jaws open)
 - Continuous usage
 - High flow
 - Tamper (weather damage to meter socket)
- **Detailed usage data (from meter data management system)**
 - Example water meter usage data



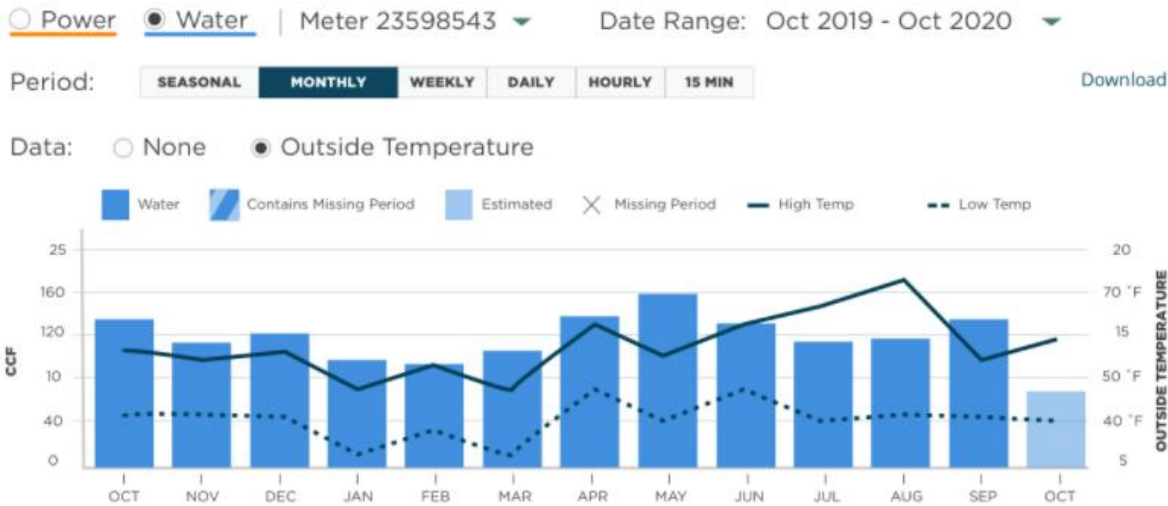
Portal Usage Data - Desktop



Usage Dashboard

Usage data may not match billed data. ⓘ

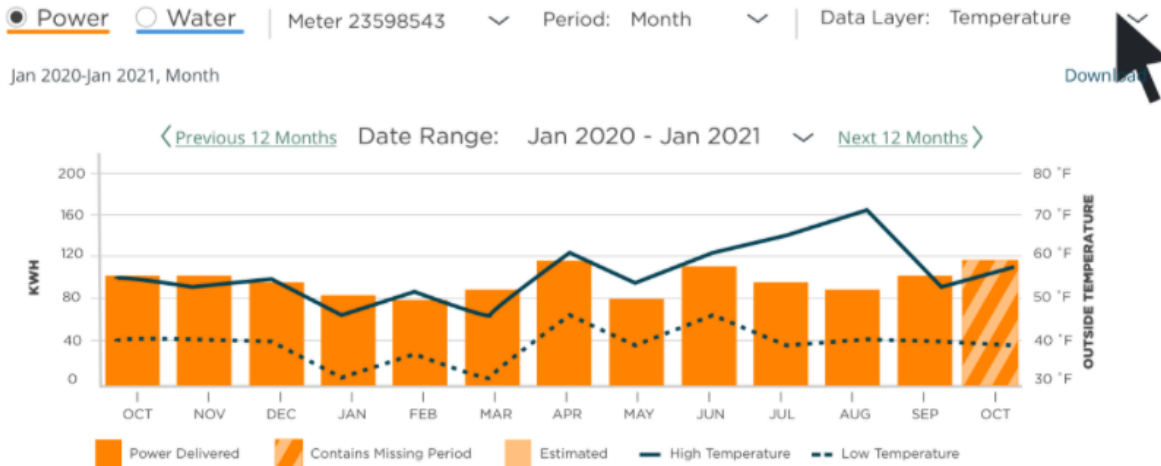
Service Usage



Service Usage			748 Gal = 1 CCF	Download
	Water - Gal	Water - CCF		
Monthly High Usage	119,680 Gal	160.8 CCF		
Monthly Low Usage	65,225 Gal	87.2 CCF		
Monthly Average Usage	90,059 Gal	120.4 CCF		
Total Usage	1,170,769 Gal	1,565.2 CCF		

Outside Temperature		Oct 2019 - Oct 2020													
Month		Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20	Aug '20	Sep '20	Oct '20	
Average High	<	61°F	51°F	46°F	45°F	50°F	53°F	58°F	65°F	70°F	75°F	75°F	68°F	62°F	>
Average Low		44°F	37°F	35°F	33°F	36°F	37°F	40°F	45°F	50°F	53°F	54°F	50°F	44°F	

Service Usage



+ Commercial Analysis

Service Usage Summary

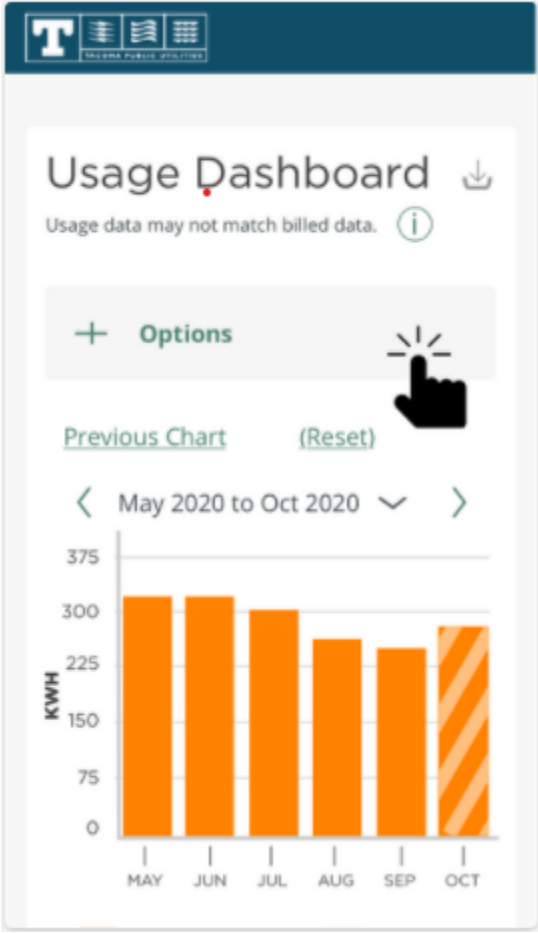
	Power
Monthly High	241.4 kWh
Monthly Low	153.2 kWh
Monthly Average	182.3 kWh
13-Month Total	2,369.8 kWh

Outside Temperature

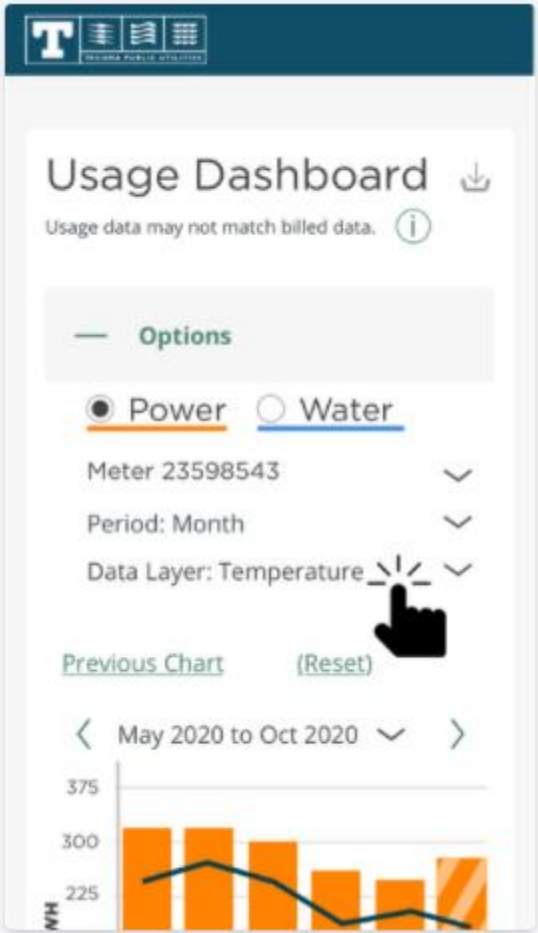
Month	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20	Aug '20	Sep '20	Oct '20
Average High	61°F	51°F	46°F	45°F	50°F	53°F	58°F	65°F	70°F	75°F	75°F	68°F	62°F
Average Low	44°F	37°F	35°F	33°F	36°F	37°F	40°F	45°F	50°F	53°F	54°F	50°F	44°F

To Return to MyAccount, Close Browser Tab

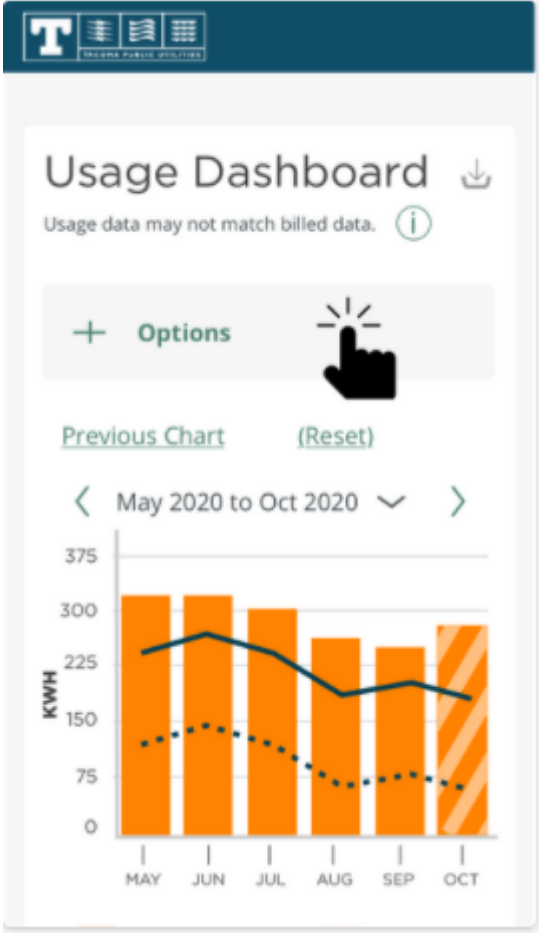
Portal Usage Data - Mobile



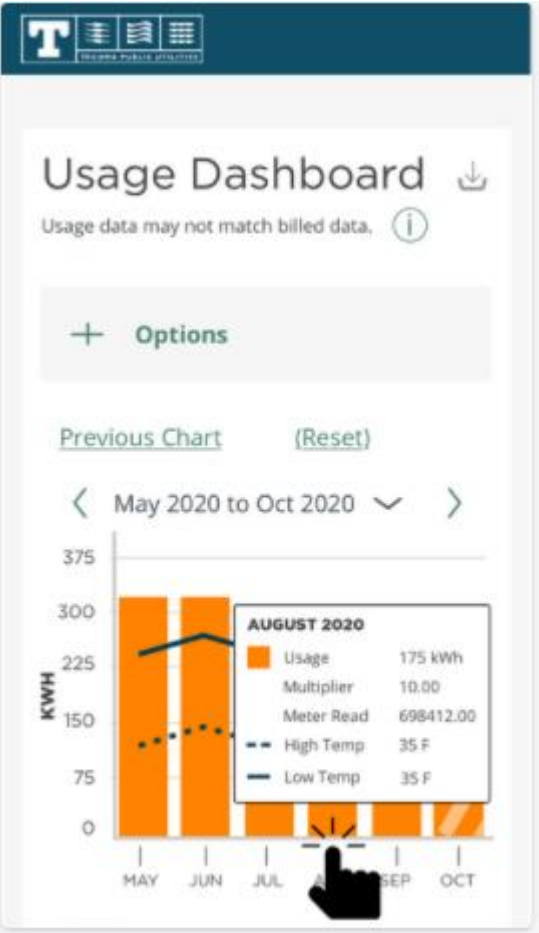
Landing page



View Options

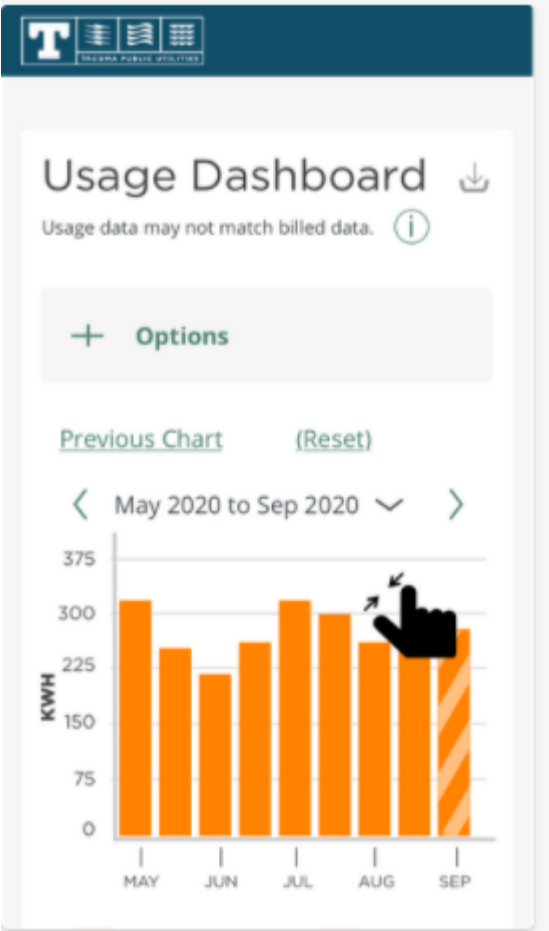


Weather Overlay

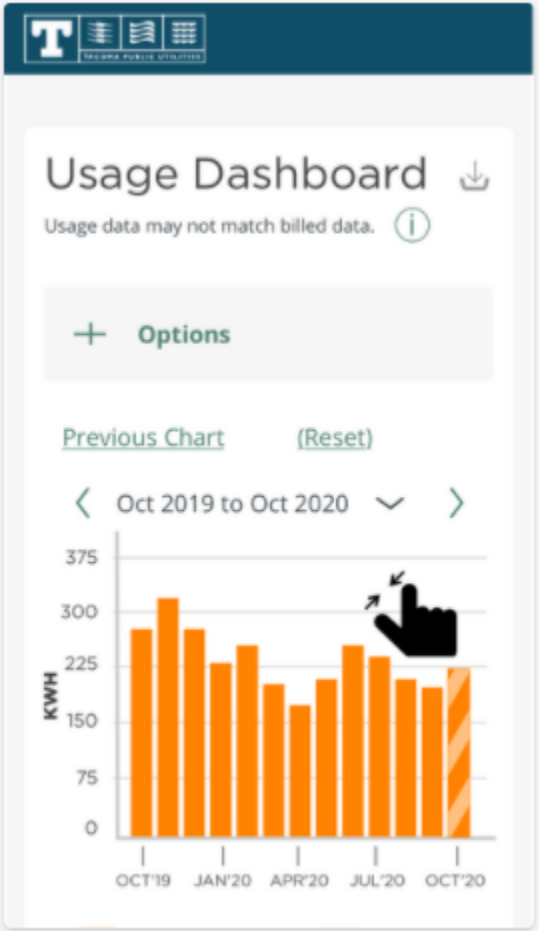


Tool Tip

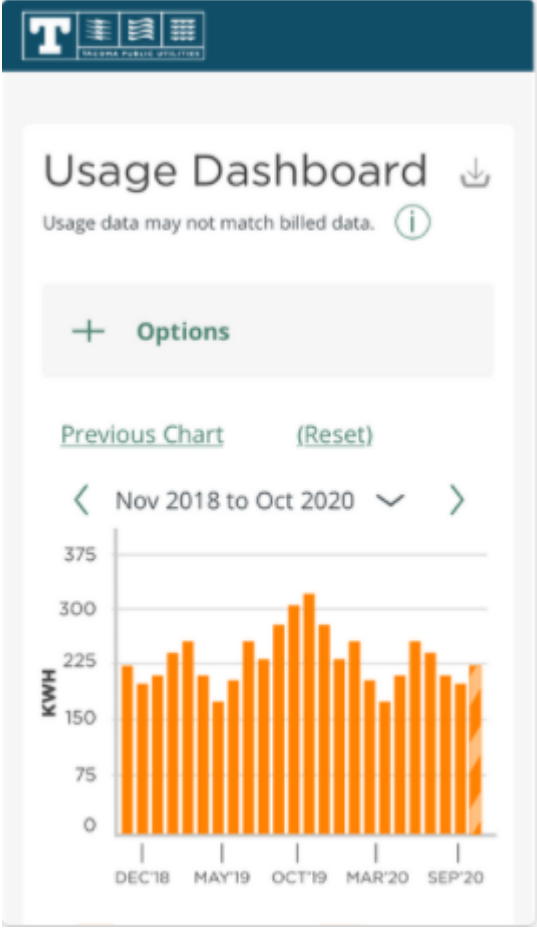
Portal Usage Data - Mobile



Pinch for more data to display



Additional data.



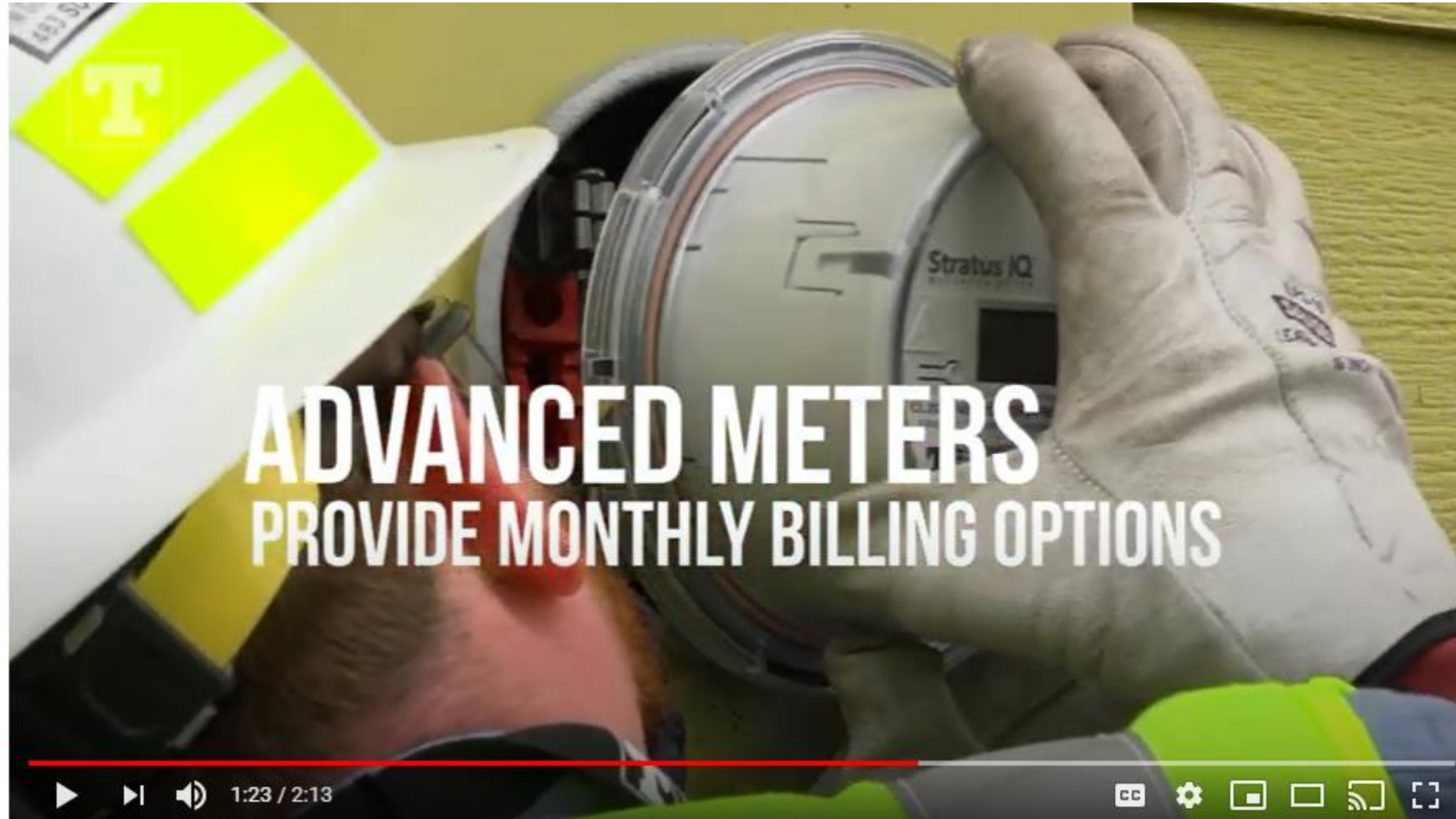
Additional data.

Additional Information

- www.MyTPU.org/AdvancedMeters
 - Program Fact Sheets
 - Program Timeline
 - FAQs - Frequently Asked Questions
 - Public Process
 - Advanced Meter Policies

Reference Slides

Video - Meter Installation



Video - Why Advanced Metering



Advanced Meters bring new **cost savings benefits** over time, including:

Cost Savings Benefits



Monthly Billing: Advanced meters allow a switch to monthly utility bills, which most people prefer since billing amounts are smaller and more manageable than larger bills once every two months—especially for 5-service City of Tacoma customers.



PrePay: Advanced meters enable PrePay for residential electric service, helping customers with irregular paychecks manage their bills by empowering them to pay-as-they-go.



Selectable Bill Due Dates: Selectable bill due dates help customers with fixed incomes by allowing them to choose a bill due date that coincides with their income or payment schedules.



Expanded Ways to Save: Providing detailed data about usage increases the ability to save money, water, and energy.

Advanced Meters: Customer Benefits



Modernization Benefits



Easier Move in, Move Out, Reconnection: Remote turn-on and turn-off of service saves time since it requires no appointments, and reconnects customers that were disconnected almost instantly.



Faster Outage and Leak Detection: Locating and fixing issues speeds service restoration whether it's a power outage or a water leak at a customer location.



Automated Meter Reading: More accurate, timely bills based on real-time data that show where and when unnecessary usage is taking place.



Enhanced Personal Privacy: No need for regular physical access to read a customer meter. No need for businesses to schedule a meter read due to challenging meter locations.



Improved Safety: New electric meters will provide high temperature alarms and automated disconnect switches to help prevent fires and improve safety. In the long term, AMI also reduces unnecessary customer exposure to staff and vice-versa.



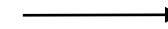
Reduced Environmental Impact: Fewer vehicle miles for meter reading, basic field services plus leak & outage detection results in lower carbon & resource conservation.

Advanced Meters: Utility Benefits



- ***Meter Upgrades:***

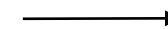
- TPU's metering infrastructure is aging and obsolete
- **Water:** Approx. **45% are deemed beyond end of life**, the average age is 20 years old, and the oldest meters are 45 years old.
- **Power:** Approx. **67% of residential and 23% of commercial/industrial** meters are obsolete, less accurate, electrometrical meters.



***Metering infrastructure
needs replacement.***

- ***Improved Forecasting/Modeling:***

- Near real-time data to monitor load and revenue forecasts
- Better understand and respond to economic changes



***Better planning
keeps customer costs low.***

- ***Improved Asset Management:***

- Easily track critical asset health information (e.g. **voltage, power factor, water pressure**)
- Identify the best areas for infrastructure investment
- Similar to stretching life out of an older car, with AMI data TPU can target the most critical parts for replacement without replacing entire systems.



***More data means TPU can
maximize existing infrastructure.***

- ***Improved Operational Efficiency:***

- More **automated systems** result in O&M efficiencies and savings
- Critical for TPU to be able to provide vital assistance programs to our low income and assistance customers.



***Increased savings
minimizes the growth of rates.***