

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)





Major Milestones Accomplished





AMI Deployment Budget: February 2021



\$81.77 M	Total With Contingency ⁺	Contingency	Amount*
\$79.47 M	Forecast Through 2022*	Original Contingency ⁺	\$11.41 M
\$70.36 M	 Original Forecast⁺ 	Allocated Contingency	\$9.11 M
		Remaining Contingency	\$2.30 M
¢50.40 M			
\$59.18 IVI ——	- Forecast Inrough 2021*	AMI Program Workstream	Percent Complete*
		Vendor Procurement	100%
		System Integration	85%
\$28.52 M	Spent Through Dec. 2020*	Communication Network Deployment	75%
		Electric Meter Deployment	<1%
		Water Meter Deployment	<1%
		Communications	30%
		Overall	40%
		*Updated February 2021, preliminary actuals throug *February 2019 AMI business case values for the per to business case costs shown, TPU Internal Support (and do not incrementally impact rates.	h December 2020. iod 2018-2022. In addition Costs are tracked separately

First AMI Meters – Fall 2020







Initial Meter Deployment Area



First advanced meters Advanced Meter timeline • Approx. 230 customers Critical business requirements identified. System design begins. Requests for 2018 Approx. 340 meters proposals sent out. Vendor evaluation and selection occurs. • 190 power Public Utility Board approves contracts. System design and integration continue. Installation of network infrastructure • 150 water 2019 occurs. A lab is created to test system functions. Public outreach and employee training start. Installed by TPU meter staff System integration and testing. Installations occurred Sept-Oct 2020 Installation of network infrastructure. 2020 **Employee readiness training and** customer communications. Begin meter installations. Small group ensures successful collection of Complete system integration and testing. **Complete installation of network** 2021 infrastructure. Employee readiness power and water usage data and billing. training and customer communications. Mass meter installations begin. System validation nearing completion and 2022 Meter installation completed. includes conversion to monthly billing. 2023+ Advanced features and enhancements.

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



Begin Large Commercial & Industrial Meter Installations

First Monthly Billing Conversions in Initial Deployment Area

Begin Mass Meter Communications

Mass Meter Installations

January – February 2021

February 2021

February – March 2021

April 2021 – Q4 2022



Advanced Meters & Cybersecurity

Advanced Meters: Security Update



TPU CYBERSECURITY AMI ARCHITECTURE & CONTRACT REVIEWS



Advanced Meters: 3rd Party Pen Test



External Testing (Internet)



Internal Testing (TPU Systems)

Advanced Meters: Data Privacy & Security



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



1. Efficiency of Installation Plan

(e.g., operational and cost efficiency)

2. Customer Equity

(e.g., areas of low historical investment)

Residential mass meter deployment begins April 2021 (target date)

3. Former PayGo Customers

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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



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TACOMA

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

TACOMA PUBLIC UTILITIES

Advanced Meter Program KPI Scorecard

Data as of December 31, 2020

	Category	Goal	Actual	Weight	Health	Notes
	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
nent ess	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
)eployn Readin	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
ent n	1. Meter Installation Vendor - Tribus	Metric	Specific			MIV has not started yet; IDA route installs completed on schedule
loyme ecutio	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
Dep Exe	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
c						Overall program is currently on schedule (2022 completion) underrunning
gram tatio	1. Program Management	Metric	Specific		•	budget & resource forecast, Change orders at 1% of budget, 9% of risks/issues are high or critical
Prog men	2. Billing Performance	Metric	Specific			1.89% estimated invoices, Implausible Meter Reads at 5%
AIVIT	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	Current
In Stock	Count
Power	61,000
Water	22,000
Total	83,000

Approximate counts as of Jan. 2021

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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 greate 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 paymen 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 emission

TACOMA PUBLIC UTILITIES

Facts about Advanced Meters and Radio Frequency Emissions



Customer communications

before, during, and after meter installation.



Customer Communications



5 specific residential customer communications *before* meter installation.

Residential Customers,	Large Commercial & Industrial						
Small & Meulum Commercial							
Installation Video	Notification Letter:						
Notification Letters:	 45 days 						
 45 days 	Scheduling Call From TPU Metering Staff						
 30 days 	Account Executive Outreach (as needed)						
14-Day Reminder Postcard	Reminder Call (as needed)						
7- Day Reminder Call (autodial from MIV)	Completed Install Door Hanger						
2-Day Reminder Call (autodial from MIV)							
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



Customer Portal Communication Plan



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



Easier Move-In & Move-OutRemote Reconnect/Disconnect for Electric

 Abnormal Consumption Notifications • Emergency Water Leak Notifications

2020-2021

2022



- Monthly Billing
- •PrePay for Electric



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

• Enhanced Customer Web Portal

•Selectable Bill Due Date



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).**



Advanced Meter Customer Benefits



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

Revised 2/5/2021

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





Service Usage	748 Ga	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 T	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 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







Usage Dashboard 🕁 Usage data may not match billed data. (j)
+ Options
Previous Chart (Reset)
Nov 2018 to Oct 2020
375
300
x ²²⁵
¥ 150
75 O
 DEC'18 MAY'19 OCT'19 MAR'20 SEP'20

Additional data.

Pinch for more data to display

Additional data.

Questions?



Additional Information

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



Reference Slides

Video - Meter Installation





Video - Why Advanced Metering





Advanced Meters: Customer Benefits



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

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

Advanced Meters: Customer 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.

• Improved Forecasting/Modeling:

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

• 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.

• 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.

Metering infrastructure

needs replacement.

Better planning keeps customer costs low.

More data means TPU can maximize existing infrastructure.

Increased savings

minimizes the growth of rates.

