



Advanced Electric and Water Meters: Program Update

Tacoma City Council
Government Performance and Finance Committee
April 6, 2021

1

Agenda



- 1. Utility Modernization: Strategic Program**
- 2. Program Budget & Business Case**
- 3. Customer and Operational Benefits**
 - Utility Benefits
 - Customer Benefits Timeline
 - Realized Benefits

2



Our modernization journey...

Integrating technology & fostering innovation to deliver **affordable, flexible, secure, resilient, and sustainable** utility services

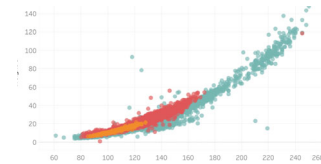
Advanced metering deployment



Customer digital engagement



Advanced data analytics



Mobile workforce mgmt.



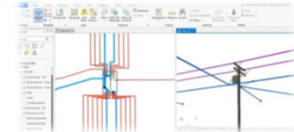
Cybersecurity maturity



Energy imbalance market



Geospatial systems



3

Advanced Metering Deployment Budget



March 2021

Category	Current Forecast ¹
Electric Meter Deployment	\$ 27,425,408
Water Meter Deployment ³	\$ 22,210,810
Communications Network Deployment	\$ 3,476,142
System Integration	\$ 8,590,222
Capital Internal Labor	\$ 5,009,550
Professional Services	\$ 4,455,550
Operations & Maintenance (O&M) Costs	\$ 7,808,359
AMI Customer Engagement Portal ⁴	\$ 250,000
Projected Total	\$ 79,226,041
Remaining Contingency	\$ 2,539,402
Total With Contingency²	\$ 81,765,443

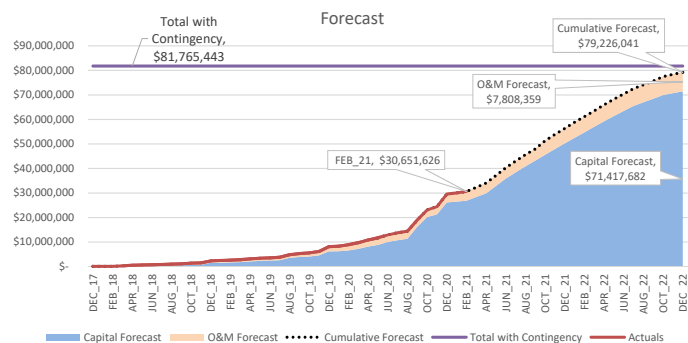
¹Includes actual costs through February 2021.

²In addition to business case costs shown, TPU Internal Support Costs are tracked separately and do not incrementally impact rates.

³Complementary budget for replacing end of life water meters is budgeted within the Water Division.

⁴Budget included for AMI specific web portal integration.

- Approx. \$30,650,000 spent to date (through Feb. 2021)
- Currently in year 4 of a 5 year project
- Budget is approved for remainder of the project



Internal Support Costs not included in graph.

4

Advanced Metering Deployment Budget



March 2021

Category	Current Forecast ¹
Electric Meter Deployment	\$ 27,425,408
Water Meter Deployment ³	\$ 22,210,810
Communications Network Deployment	\$ 3,476,142
System Integration	\$ 8,590,222
Capital Internal Labor	\$ 5,009,550
Professional Services	\$ 4,455,550
Operations & Maintenance (O&M) Costs	\$ 7,808,359
AMI Customer Engagement Portal ⁴	\$ 250,000
Projected Total	\$ 79,226,041
Remaining Contingency	\$ 2,539,402
Total With Contingency²	\$ 81,765,443

¹Includes actual costs through February 2021.

²In addition to business case costs shown, TPU Internal Support Costs are tracked separately and do not incrementally impact rates.

³Complementary budget for replacing end of life water meters is budgeted within the Water Division.

⁴Budget included for AMI specific web portal integration.

- Approx. \$30,650,000 spent to date (through Feb. 2021)
- Currently in year 4 of a 5 year project
- Budget is approved for remainder of the project

Rate Impact

- The current cost to individual customers is relatively low, and **spread over ten years**.
- Costs are already **factored into current rates**.
- Beginning in 2019, the additional cost increase each year for the next ten years is about:
 - 8 cents/month for the avg. residential power customer (\$0.96/year)
 - 11 cents/month for the avg. residential water customer in the City of Tacoma (\$1.32/year) and 13 cents/month outside City (\$1.56/year)

Example:

For the average residential power customer, the additional cost is projected to be about \$0.96 per year in year one, increasing \$0.96 each year to about \$9.60 per year in year ten.

5

Advanced Metering Business Case



Advanced Metering Infrastructure (AMI)

Return on Investment evaluation includes:

- Incremental costs to TPU
- Contracted vendor pricing
- Detailed, projected program costs
 - AMI Program staff
 - Consultants
 - Vendors
 - Hardware (meters, network, systems)
 - Software and Software as a Service (including ongoing maintenance costs)
- AMI to SAP integration
- Transition to monthly billing
- AMI customer usage portal integration
- Recalibrated business case benefits
- Carbon as a soft benefit
- Long term TPU AMI Operations staffing

Return on Investment Summary

Description	2020 Business Case NPV
Capital Expenses	\$(60.58 M)
O&M Expenses	\$(25.18 M)
Electric Benefits	\$69.61 M
Water Benefits	\$30.60 M
NPV w/o Contingency	\$14.45 M
Contingency	\$(6.04 M)
NPV w/ Contingency	\$8.41 M

Return on Investment (ROI) evaluation completed February 2020.

Conclusion: Utility and Customer Benefits Offset Costs

6



Customer & Operational Benefits

7

Advanced Metering Utility Benefits



Meter Upgrades

***Metering infrastructure
needs replacement.***



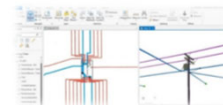
Improved Forecasting & Modeling

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



Improved Asset Management & Resiliency

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



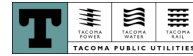
Improved Operational Efficiency & Safety

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



8

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).

9

As a TPU Customer



Before

It was hard to understand my energy and water usage.
I received an expensive bill every two months...

Now with an advanced meter

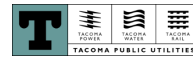
I can track my energy and water usage weekly, daily, hourly, and more!
My monthly bill is much more manageable!

MyTPU.org/MyAccount (253) 902-8600 3628 S. 35th St. Tacoma, WA 98409		Account # 123456789
EDGAR ALLAN DOE		Amount Due \$443.93
For service address: 123 Aveny Ave. Tacoma, WA 98409		Due Date 9/12/16
Billing period - Jun. 24 to Aug. 23 (60 days)		Previous Amount Due \$484.96 Payments -\$484.96 Balance \$0.00
Electricity \$161.13 Average cost per day \$2.68		Current Charges Due 9/12/16 \$443.93 Amount Due \$443.93
Drinking water \$79.24 Average cost per day \$1.32		



10

As a Power and Water Engineer



Before

I had limited visibility into real-time power operations...

It was difficult to identify water leaks in the system...



Now with advanced metering

I can ensure a resilient grid through alerts, alarms, and indicators of system health!

I can remotely detect leaks, high flow events, and other system issues!



11

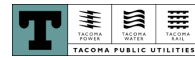
2021 Target Dates



- ✓ **Begin Large Commercial & Industrial Mass Meter Installations** January – February
- ✓ **First Monthly Billing Conversions in Initial Deployment Area** February
- ✓ **Begin Residential Mass Meter Communications** March
- ➔ **Begin Residential Mass Meter Installations** April

12

Questions?



Additional Information

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



13

Supplemental Slides

- Detailed Customer & Operational Benefits
- Meter Deployment Readiness:
 - Deployment Planning
 - Customer Assistance
 - Customer Communications



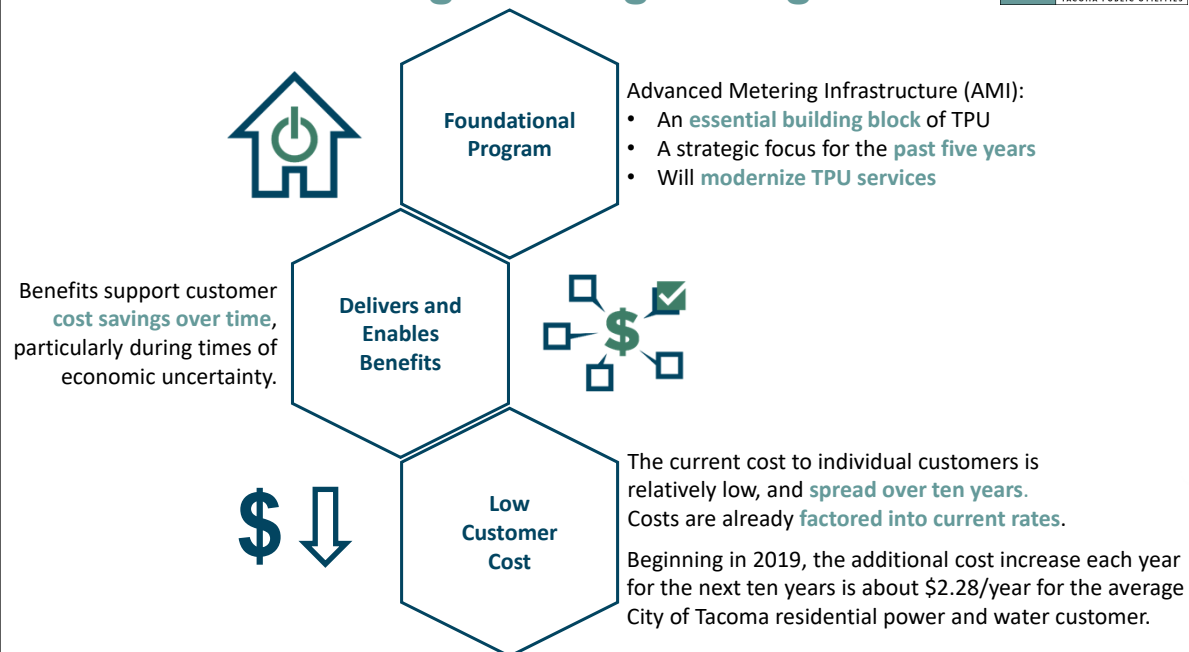
14



Detailed Customer & Operational Benefits

15

Advanced Metering: Strategic Program



16

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

17

Advanced Meters: Customer Benefits



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.

18

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.

19

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 & Resiliency:

- 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 & Safety:

- 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.**

TPU Strategic Directives



20

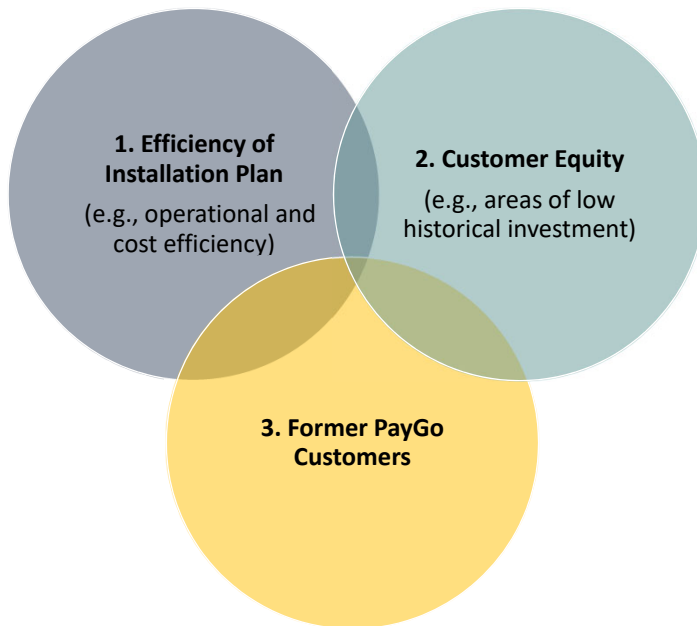


Meter Deployment Readiness

*Deployment Planning, Customer Assistance, and
Customer Communications*

21

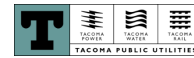
Deployment Planning Considerations



**Residential mass meter
deployment is planned
to begin April 2021**

22

Customer Assistance During Deployment



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



Draft Grant & Loan Process

23

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 upgrading 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 100 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 control over expenses to manage your use and costs.
- Monthly Billing**
Advanced meters will allow a switch to monthly utility bills, which most people prefer.
- Leak Detection and Shut-Off**
Detecting leaks and shutting off water service to you sooner.
- Improved Operational Efficiency**
Reduced costs and faster response times on system help in outage rates.
- Automated Meter Reading**
More accurate, timely bills based on real-time data.
- Enhanced Personal Privacy**
No need for regular physical access to read your meter.
- Expanded Ways to Save**
Providing data about your use increases your ability to save money, water, and energy.
- Flexible Payment Options**
More options over time include prepay for electric service and custom due dates.
- Reduced Environmental Impact**
Fewer vehicle trips required for meter reading, less fuel service, and outage detection means less 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 nearly 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

Device	RF Exposure (mW)
TPU Advanced Meter	0.000001
Mobile Phone (in use)	0.001
Mobile Phone (in pocket)	0.0001
Wi-Fi Router	0.0001
Wi-Fi Laptop	0.0001
Wi-Fi Smartphone	0.0001
Wi-Fi Smartwatch	0.0001
Wi-Fi Smartwatch (in use)	0.0001
Wi-Fi Smartwatch (in pocket)	0.0001
Wi-Fi Smartwatch (in use) (in pocket)	0.0001
Wi-Fi Smartwatch (in use) (in pocket) (in use)	0.0001
Wi-Fi Smartwatch (in use) (in pocket) (in use) (in pocket)	0.0001
Wi-Fi Smartwatch (in use) (in pocket) (in use) (in pocket) (in use)	0.0001

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.

MyTPU.org/AdvancedMeters

Customer communications
before, during, and after meter installation.

24

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.

25

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

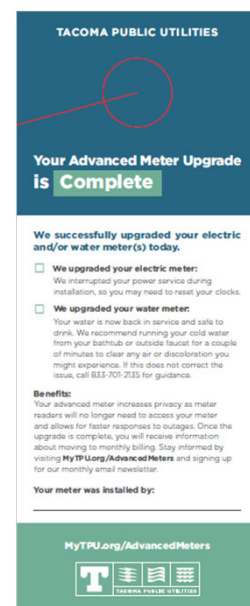
Completed Install Door Tag: Reference to monthly billing change

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.

26