winter safety
STAY SAFE DURING THE WINTER SEASON
1. Introduction (5 minutes)
2. TPU Digital Engagement Strategy (10 minutes)
3. AMI Refresher (10 minutes)
4. AMI Program Update (10 minutes)
5. AMI Business Case Calibration (20 minutes)
6. Vendor Contract Proposals (20 minutes)
7. Customer Communications & Outreach Strategies (5 minutes)
8. Wrap Up (10 minutes)
"We can no longer stay in our comfort zone on our side of the meter – providing basic electric service and sending bills. We must diversify the menu, develop new rate designs to handle increased demands on our distribution grids, adapt to changing customer preferences, and prove we can be our customers’ trusted energy advisors."

Sue Kelly, President of the American Public Power Association
Digital transformation is the application of modern technology to processes, products, and assets to improve efficiency, enhance customer value, manage risk, and uncover new revenue opportunities.

Digital Natives

Amazon

Digital Adapters

Uber

Netflix

Digital Deniers

Blockbuster

Kodak

Sears
Our business drivers

- Ever-increasing customer expectations
- Advanced metering infrastructure
- An evolving workforce
Digital vision for customers

- Value my time
- Value my money
- Value me
- Value my preferences

TPU Customers
Digital vision for employees

Collaboration

Communications

Culture

Safety

TPU Employees
A single TPU brand experience

Deliver a consistent TPU customer experience that accounts for our overlapping customer base, service offerings, and choice of channels our customers prefer to use.
### Improving the customer experience thru digital service offerings

#### Today as a TPU customer...

- I am only able to use a few channels to interact with TPU
- I have a hard time finding and accessing the resources I need to address my issues
- I have to contact TPU every time I have a problem or issue
- I get different information from different sources from TPU depending on which channel I use

#### Tomorrow, enabled by digital utility offerings...

- I can interact with TPU via my preferred channel and learn about utility services that I find valuable
- I can easily locate the answers to my questions and resolve issues myself
- TPU will proactively inform me of an issue or outage on my preferred communications channel
- I get the same information no matter how I contact TPU and know what to expect at every interaction
Digital Business Transformation Initiatives

**Equitable Access for All Customers**
- mytpu.org redesign
- Enhanced customer portal
- Customer analytics use cases
- Enhanced customer outage notifications
- Digital signage at TPU campus

**Tacoma Economic & Workforce Development**
- Workforce Connect
- Workforce analytics use cases
- CRM for commercial/industrial customers
- Office 365 & Microsoft Teams
- Smart City use cases

**Protect & Steward the Environment**
- ESRI GIS modernization
- Natural resources analytics
- Asset management analytics use cases
- Enhanced load forecasting
- Enhanced customer load profiling

**Resilience & Reliability**
- Advanced metering infrastructure
- Security & network operations center
- Cybersecurity program refinements
- Energy Imbalance Market
- Distribution automation
TPU Digital Business Roadmap

2019 – 2020 Biennium

- mytpu.org redesign
- Enhanced customer portal with preference center and self-service features
- Natural resources analytics
- ESRI GIS modernization

2021 – 2022 Biennium

- Refine cybersecurity program
- Asset management analytics use cases
- Customer analytics use cases
- Workforce analytics use cases
- Wide area network modernization
- Security & network operations center(s)
- Land mobile radio digital upgrades
- Outage communications customer portal
- Deploy digital signage at TPU
- Office 365 & Microsoft Teams
- Advanced metering infrastructure program delivery
- CRM for commercial & industrial customers
- New TPU employee intranet
- Enhanced social listening
- CRM web portal for joint pole usage

2023 and beyond...

- Distribution automation
- Real-time connectivity modeling
- Enhanced load forecasting
- Enhanced customer load profiling
- Smart city use cases

*Many of these initiatives span multiple strategic themes*
AMI Review
Advanced metering infrastructure

• Composite technology of meters, communications networks, and software systems that automated the collection of meter data and provides a two-way connection between customers and the utility
• Considered a mature technology based on industry standards
• Deployment costs have come down with improved security & reliability
• Over 70% of US electric meters have been upgraded to advanced meters and continues to grow
• A recent water utility survey has revealed that three quarters of US providers are planning to make AMI-based smart water investments in the next 24 months.
AMI Overview – selected vendors

Power & Water Meters

AMI Base Station(s) → AMI headend system

SAP
Customer Information System

UTEGRATION

OMNETRIC
A Siemens Company

Meter Data Mgmt. System
# Status of AMI in the PNW

<table>
<thead>
<tr>
<th>AMI/Metering Capabilities</th>
<th>Seattle City Light</th>
<th>Snohomish PUD</th>
<th>Puget Sound Energy</th>
<th>Clark Public Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMI Completed in 2010</td>
<td>AMI Completed in 2010</td>
<td>AMI Completed in 2014</td>
<td>AMI Completed in 2010</td>
<td>AMI Completed in 2010.</td>
</tr>
<tr>
<td>RF Star AMI from Sensus.</td>
<td>RF mesh AMI from Landis+Gyr in deployment</td>
<td>AMI Business Case Approved</td>
<td>Next Generation AMI Deployment underway. RF mesh AMI from Landis+Gyr</td>
<td>RF mesh AMI from L+G.</td>
</tr>
</tbody>
</table>
AMI governance structure
2018 Accomplishments

Tier 1 and Tier 2 Business Processes
- 20 sessions January through February
- 18 three hour sessions from September through November

Three vendor selections
- Completed the AMI, MDM, and SI vendor selection processes
- Requirements and RFP development
- RFP review: proposal sessions, shortlist presentations, interviews, and scoring

Business Case Refresh
- Develop business case narrative expressing the purpose, cost and benefits of AMI
- Reassessed and confirmed assumptions, costs, benefits, and calculations

Organization Change Mgmt. Plan
- Completed an organizational AMI alignment survey
- Drafted a stakeholder engagement and communications plan
- Developed internal and external messaging for talking points, web content, and responses to customers and community groups
# Program Schedule


<table>
<thead>
<tr>
<th>Quarter</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2018 – Q3 2018</td>
<td>Define requirements and RFPs for AMI, MDMS, and Meter Installation Vendor</td>
</tr>
<tr>
<td>Q2 2017</td>
<td>Program Charter &amp; Governance Plan</td>
</tr>
</tbody>
</table>

## 2019-2020: Systems Integration & AMI Network Deployment

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2019 – Q4 2019</td>
<td>MDMS Implementation &amp; Systems Readiness</td>
</tr>
<tr>
<td>Q4 2018 - Q2 2020</td>
<td>AMI Network Deployment</td>
</tr>
</tbody>
</table>

## 2020 – 2021: Mass Meter Deployment

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 2020</td>
<td>Complete AMI Network Deployment</td>
</tr>
<tr>
<td>Q2 – Q4 2020</td>
<td>Begin Meter Deployment (AMI Release 1)</td>
</tr>
<tr>
<td>Q1 – Q4 2021</td>
<td>Complete Meter Deployment (AMI Release 2)</td>
</tr>
</tbody>
</table>
Business Case Calibration
As AMI transitions from procurement to implementation TPU must recalibrate the AMI business case to accurately reflect known program costs and realized benefits.

The next comprehensive AMI Business Case calibration will occur in the mid-2020 timeframe as the program transitions from implementation to deployment.
### Business case assumptions

<table>
<thead>
<tr>
<th>Updated program costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• AMI meters and network</td>
</tr>
<tr>
<td>• Meter data mgmt. system</td>
</tr>
<tr>
<td>• System integration</td>
</tr>
<tr>
<td>• Program support</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Refined benefits analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Inclusion of monthly billing</td>
</tr>
<tr>
<td>• Inclusion of carbon reduction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Updated asset replacement methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Revised water meter replacement strategy based on updated meter replacement vs. retrofit costs.</td>
</tr>
<tr>
<td>• Updated installation costs associated based on recent field survey analysis.</td>
</tr>
</tbody>
</table>
AMI business case scope

- Installation of approximately 180,000 electric meters and 110,000 water meters
- Installation of the AMI network
- Implementation of a meter data management system
- AMI to SAP integration
- Transition to monthly billing
- Deployment of a customer usage portal
- All applications and functionality associated with Phase 1 and 2 of the AMI roadmap
New AMI customer benefits

**Value my time**
- Improved outage and system restoration times
- Advanced water leak detection capabilities
- Remote turn-on/turn-off
- Advanced self-service capabilities

**Value my money**
- Automated billing
- Monthly billing
- Prepayment options
- Selectable bill date
- Detailed usage information

**Value me**
- Lower cost of service model
- Reduction of manual processes
- Paperless billing capabilities
- Demand response capabilities

**Value my preferences**
- Near Real-time usage information
- Alerts and notifications
- Billing and payment notifications
- Conservation options
- Multi-channel capabilities
AMI Customer Benefits Roadmap
Updated January 3, 2019

**Phase 1: Delivered Functionality**
To be completed by end of 2021

1. Basic meter to bill
2. Basic meter data reporting
3. Monthly billing
4. Customer meter options policy
5. Support for existing manual prepay process
6. Enhanced customer portal
7. Consumption data available via new portal
8. Remote meter reading
9. Remote disconnect/reconnect
10. Automated service order creation

**Phase 2: Delivered Functionality**
To be rolled out between 2021 and 2023

1. Enhanced prepay functionality (via customer portal)
2. Enhanced outage notifications
3. Abnormal consumption notifications
4. Emergency water leak notifications
5. Asset analytics use cases
6. Engineering analysis & systems planning use cases
7. Enhanced voltage monitoring
8. Revenue protection
9. New real-time rate models
10. Support for multi-service prepay (water, sewer, trash)
11. Choose your own bill date

**Enabled Functionality**
Features enabled by AMI not in program scope
To be prioritized after 2023

1. Enhanced SAP contact center tools via CIC upgrade
2. Enhanced demand & load forecasting
3. Enhanced grid & outage mgmt. operations
4. Distribution automation
5. Smart City integration
For Tacoma Water & Tacoma Power

Benefits are based on industry benchmarks

Labor-meter reading benefit assumes the transition to monthly billing

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor-Meter Reading</td>
<td>$56.72M</td>
</tr>
<tr>
<td>Labor-Call Center</td>
<td>$5.04M</td>
</tr>
<tr>
<td>Meter Replacement</td>
<td>$8.42M</td>
</tr>
<tr>
<td>Asset Management</td>
<td>$4.82M</td>
</tr>
<tr>
<td>Carbon Reduction</td>
<td>$2.69M</td>
</tr>
<tr>
<td>Reduced Write-offs</td>
<td>$2.51M</td>
</tr>
<tr>
<td>Reduced Energy Losses</td>
<td>$2.46M</td>
</tr>
<tr>
<td>Avoided Truck Rolls</td>
<td>$2.55M</td>
</tr>
<tr>
<td>Leak Forgiveness</td>
<td>$0.10M</td>
</tr>
<tr>
<td>Reduced Outage Duration-SAIDI</td>
<td>$0.01M</td>
</tr>
<tr>
<td><strong>Total NPV of Quantifiable Benefits</strong></td>
<td><strong>$85.61M</strong></td>
</tr>
</tbody>
</table>

This is a conservative benefit analysis that does not incorporate significant customer “soft” benefits associated usage information, self-service applications and system and account notifications.
AMI Costs are based on the following:
- Contracted vendor pricing
- Transition to monthly billing
- Updated asset replacement strategy
- Costs include additional TPU staffing and contractors

<table>
<thead>
<tr>
<th>Program Element</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Meter Deployment</td>
<td>$30.7M</td>
</tr>
<tr>
<td>Water Meter Deployment</td>
<td>$11.8M</td>
</tr>
<tr>
<td>AMI Communications Network Deployment</td>
<td>$1.7M</td>
</tr>
<tr>
<td>Systems Integration and Meter Data Management</td>
<td>$7.7M</td>
</tr>
<tr>
<td>Planning, Procurement, and Program Management Support</td>
<td>$7.1M</td>
</tr>
</tbody>
</table>

Subtotal $70.0M

Contingency $10.7M

Total Deployment Cost with Contingency $80.7M

<table>
<thead>
<tr>
<th>Biennium Costs</th>
<th>2017-18</th>
<th>2019-20</th>
<th>2021-22</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1.54M</td>
<td>$21.9M</td>
<td>$46.6M</td>
</tr>
</tbody>
</table>

Note: Biennium costs exclude contingency
AMI Return on Investment:
- W/ Contingency = $(649,967)
- W/o Contingency = $10,080,705

AMI Costs are based on the following:
- Contracted vendor pricing
- Transition to monthly billing
- Updated asset replacement strategy

Costs include additional TPU staffing and contractors

Financial summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Expenses (NPV)</td>
<td>$61.4M</td>
</tr>
<tr>
<td>O&amp;M Expenses (NPV)</td>
<td>$14.2M</td>
</tr>
<tr>
<td>Electric Benefits</td>
<td>$58.7M</td>
</tr>
<tr>
<td>Water Benefits</td>
<td>$23.9M</td>
</tr>
<tr>
<td>Carbon Reduction Benefits</td>
<td>$3.0M</td>
</tr>
<tr>
<td><strong>NPV w/o Contingency</strong></td>
<td><strong>$10.1M</strong></td>
</tr>
<tr>
<td><strong>Contingency</strong></td>
<td><strong>$10.7M</strong></td>
</tr>
<tr>
<td><strong>NPV w/ Contingency</strong></td>
<td><strong>-$0.65M</strong></td>
</tr>
</tbody>
</table>
Solution Providers
Selected AMI vendors & contracts

- **Sensus** (*AMI meter and network provider*)
  - Hardware Statement of Work

- **Omnetric** (*Meter Data Management System*)
  - Implementation Statement of Work

- **Utegration** (*System Integrator*)
  - Implementation Statement of work

- **Z2 Solutions** (*Program Advisor*)
  - Contract Amendment
Vendor components

Advanced Meter Infrastructure (AMI)
- AMI power and water meter supplier
- Meter communication network infrastructure
- Head-end System (HES) system to manage the RF network and collect data from the meters

Meter Data Management System (MDMS)
- System of record for all meter data
- Collects and converts raw meter data into meaningful information of other systems
- Collects, processes, sends billing determinants
- Synchronizes with CIS (Customer Information System) and maintains synchronization of AMI
- Collects and analyzes meter events and alarms

System Integrator (SI)
- Configure and build the system integrations between the AMI HES, MDMS and SAP
- Orchestrates Blue Print workshops to capture SAP business and configuration workshops
- Coordinates and manages integration testing and user acceptance testing
- Coordinate go live and post go live support

Meter Installation Vendor (MIV) - TBD
- Manages the warehousing and installation of the AMI meters
- Delivers installation data to TPU’s systems
- Provides customer service for installation appointments and claims
Vendor selection approach

- Engaged consultant to facilitate our vendor selection process
- The selection panels were comprised of key SME’s across TPU and City IT
- Vendors were equally evaluated via competitive RFP process

Selection process

1. General and Solution Requirements
2. Shortlist Selection
3. Vendor Presentations
4. Reference Interviews
5. Award!
AMI meter & network vendor

- **Power & Water Meters**
- **AMI Base Station(s)**
- **AMI head-end system**
  - Power & Water Meter Supplier
  - Meter Communication Network Infrastructure
  - Head-end System (HES) data collector
  - Sandbox Deployment

Customer Information System

**SAP**

Meter Data Mgmt. System

**OMNETRIC**

A Siemens Company
Sensus

✓ Best water meter support
✓ Best network and communications
✓ Solid electric support
✓ Strong network coverage
✓ Robust distribution automation capability
✓ Strong project team/methodology
✓ Lowest price
## Sensus contract

<table>
<thead>
<tr>
<th>Contract Component</th>
<th>Description</th>
<th>Price</th>
<th>Target PUB Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Service Agreement (MSA)</td>
<td>General Terms and Conditions</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sandbox Statement of Work</td>
<td>Implementation of a test/non production environment</td>
<td>$185,000</td>
<td>TBD</td>
</tr>
<tr>
<td>Hardware Statement of Work</td>
<td>Meter and network infrastructure</td>
<td>$33,000,000</td>
<td>1/23</td>
</tr>
<tr>
<td>Implementation Statement of Work</td>
<td>Professional services for implementing the AMI system</td>
<td>$642,500</td>
<td>1/23</td>
</tr>
<tr>
<td>Software as a Service (Saas) Statement of Work</td>
<td>Network and system management</td>
<td>$1,326,000</td>
<td>1/23</td>
</tr>
<tr>
<td>Spectrum SOW</td>
<td>Network licensing agreement</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total Contract Value</strong></td>
<td></td>
<td><strong>$35,153,500</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Meter Data Management System**

- **AMI head-end system**
- **AMI Base Station(s)**
- **Power & Water Meters**
- **System of record for meter data**
- **Collects and converts raw meter data into meaningful information of other systems**
- **Collects, processes, sends billing determinants**
- **Collects and analyzes meter events and alarms.**
- **Synchronizes with SAP and maintains synchronization of AMI**

---

**Customer Information System**

**SAP**

**OMNETRIC**

**A Siemens Company**

**Meter Data Management System**
✓ Solid methodology
✓ Robust security and support
✓ Best-in-class system architecture
✓ Best functionality
✓ Experienced project team
✓ Excellent references
✓ Lowest price
## Omnetric contract

<table>
<thead>
<tr>
<th>Contract Component</th>
<th>Description</th>
<th>Price</th>
<th>Target PUB Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Service Agreement</td>
<td>General Terms and Conditions</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sandbox Statement of Work</td>
<td>Implementation of test/non-production environment</td>
<td>$90,482</td>
<td>1/23</td>
</tr>
<tr>
<td>Implementation Statement of Work</td>
<td>Implementation and integration of the MDMS</td>
<td>$1,168,452</td>
<td>1/23</td>
</tr>
<tr>
<td>Software License</td>
<td>MDMS Licenses</td>
<td>$50,000</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Total Contract Value</strong></td>
<td></td>
<td><strong>$1,308,934</strong></td>
<td></td>
</tr>
</tbody>
</table>
Orchestrates blueprint workshops to capture SAP business processes & configurations

Coordinates and manages integration testing and user acceptance testing

Coordinate go live and post go live support

Configure & build the system integrations between AMI HES, MDMS, and SAP

Utegration
(System Integrator)
✓ Strongest team
✓ Excellent reference checks
✓ Proven project methodology
✓ Significant municipal and combination utility experience
✓ Best minimum requirements score
✓ Good overall compliance requirements
✓ Strong SAP knowledge
✓ Local presence
# Utegration contract

<table>
<thead>
<tr>
<th>Contract Component</th>
<th>Description</th>
<th>Price</th>
<th>Target PUB Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Service Agreement</td>
<td>General Terms and Conditions</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Implementation Statement of Work</td>
<td>Integration services</td>
<td>$3,885,804</td>
<td>1/23</td>
</tr>
</tbody>
</table>

**Total Contract Value** $3,885,804
Z2 Solutions & sub Exergy
contract amendment

Scope of additional services:

• Meter and network deployment management support
• Stakeholder engagement and OCM services
• Systems integration advising services
• Program management support

Contract amendment request: $800,000
AMI contract proposal summary

Sensus (AMI Vendor)
- Hardware Statement of Work: $33,000,000

Omnetric (MDMS Vendor)
- Implementation Statement of Work: $1,308,934

Utegration (System Integrator)
- Implementation Statement of Work: $3,885,804

Z2 Solutions (Program Advisor)
- Contract Amendment: $800,000
Updated resolution – special project of limited duration

• Transition from procurement to implementation phase
• Staffing needs for temporary and special project positions
• Tonight’s session for approval
Customer Communications & Outreach Planning
Communications & outreach strategies

• Provide ongoing messaging updates to leadership, employees and customer-facing materials

• Highlight customer benefits and value

• Coordinate messaging timelines with project phases

• Use all available marketing channels as well as community and stakeholder relationships for outreach, similar to our rates process
Communications & outreach timeline

• 2018
  • Developed message map and confirmed customer benefits
  • Updated web content and FAQs
  • Provided talking points to leadership and outreach staff
  • Responded to customer and community group questions

• 2019/2020
  • Q1: Finalize 2019-2020 biennium Communications & Outreach Plan
  • Q2: Early communications of project timelines
  • Q3: Deployment communications to test group
  • Q4-Q1: Deployment communications to larger community
Summary

• How AMI provides the digital foundation to enhance the customer experience
• Refresher on AMI technology
• Reviewed calibrated business case
• Provided an overview of selected solution providers
• Preparation for contract approvals during upcoming PUB meetings
Questions