Utility Modernization 2.0

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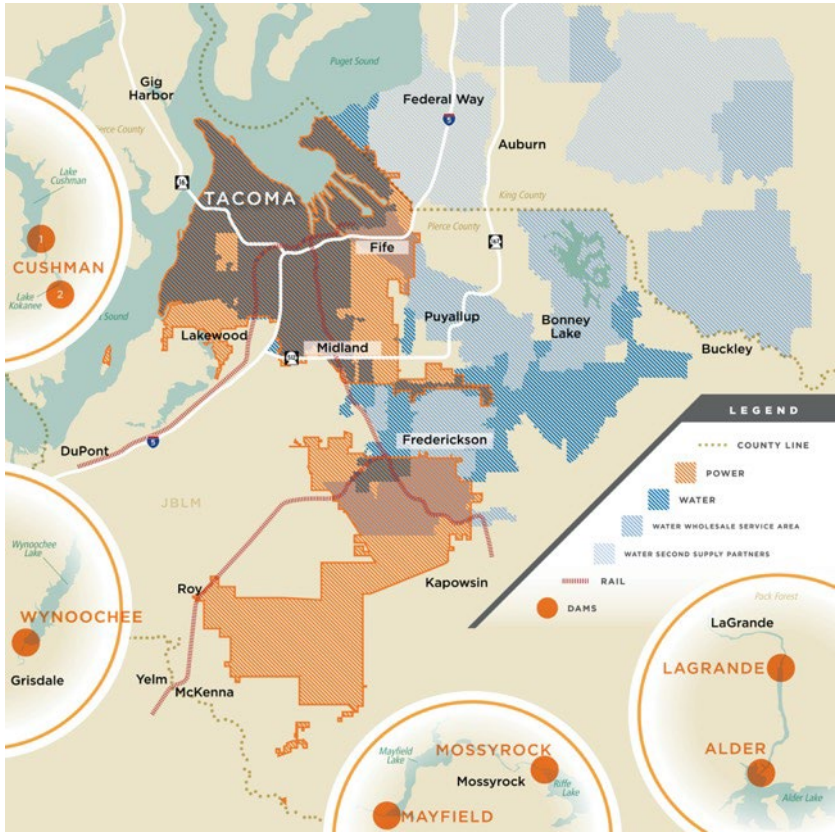
TACOMA PUBLIC UTILITIES

Agenda



- Where we started
- What we accomplished
- Key Technology Enablers by Business Domain
- Technology Disrupters
- Utility Modernization 2.0

Where we started (2018-Through 2025)

Equitable Access for All Customers

mytpu.org redesign

Enhanced customer portal

Customer analytics use cases

Customer outage & leak notifications

Digital signage at TPU campus

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

Natural resources analytics

Geospatial technology

Asset management analytics use cases

Enhanced load forecasting

Enhanced customer load profiling

Resilience & Reliability

Advanced metering infrastructure

Security & network operations center

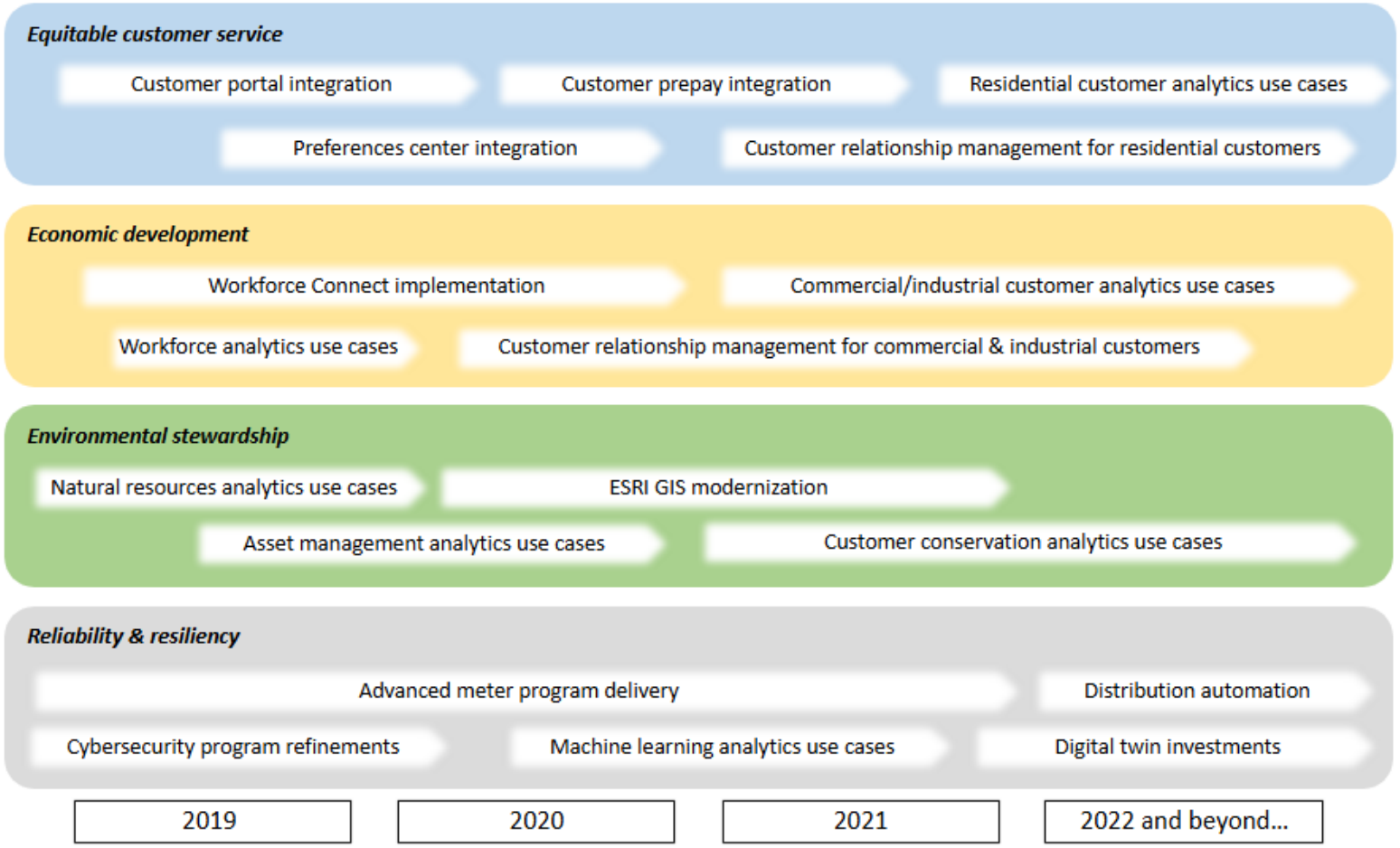
Cybersecurity program refinements

Energy Imbalance Market

Distribution automation

Where we started

Technology roadmap – utility modernization



What we have accomplished

Equitable Access for All Customers

- ✓ mytpu.org redesign
- ✓ Enhanced customer portal
- ✓ Customer analytics use cases
- ⚠ Customer outage & leak notifications
- ✓ Digital signage at TPU campus

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

- ✓ Natural resources analytics
- ✓ Geospatial technology
- ✓ 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

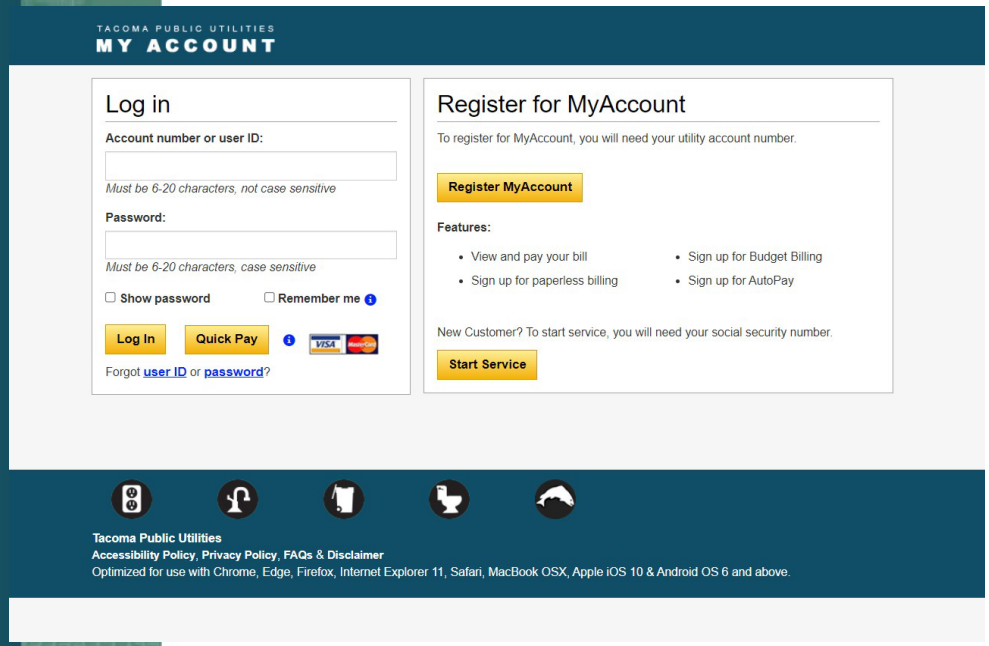
Automated Metering Infrastructure (AMI)

- **Scope: Deploy Advanced Meter Infrastructure and Capabilities**
  - Installation of ~ 290,000 advance meters
  - AMI communications network installation
  - Meter Data Management System (MDMS) implementation
  - AMI to SAP integration
  - Monthly billing transition
  - Customer engagement portal enablement
- **Schedule:**
- **2017 – 2025 (Revised)** | 201
  2022 (Original)
- **Budget:**
- **$82M - $84M (Re-baseline 2023)** | $81.7M (Original 2020)

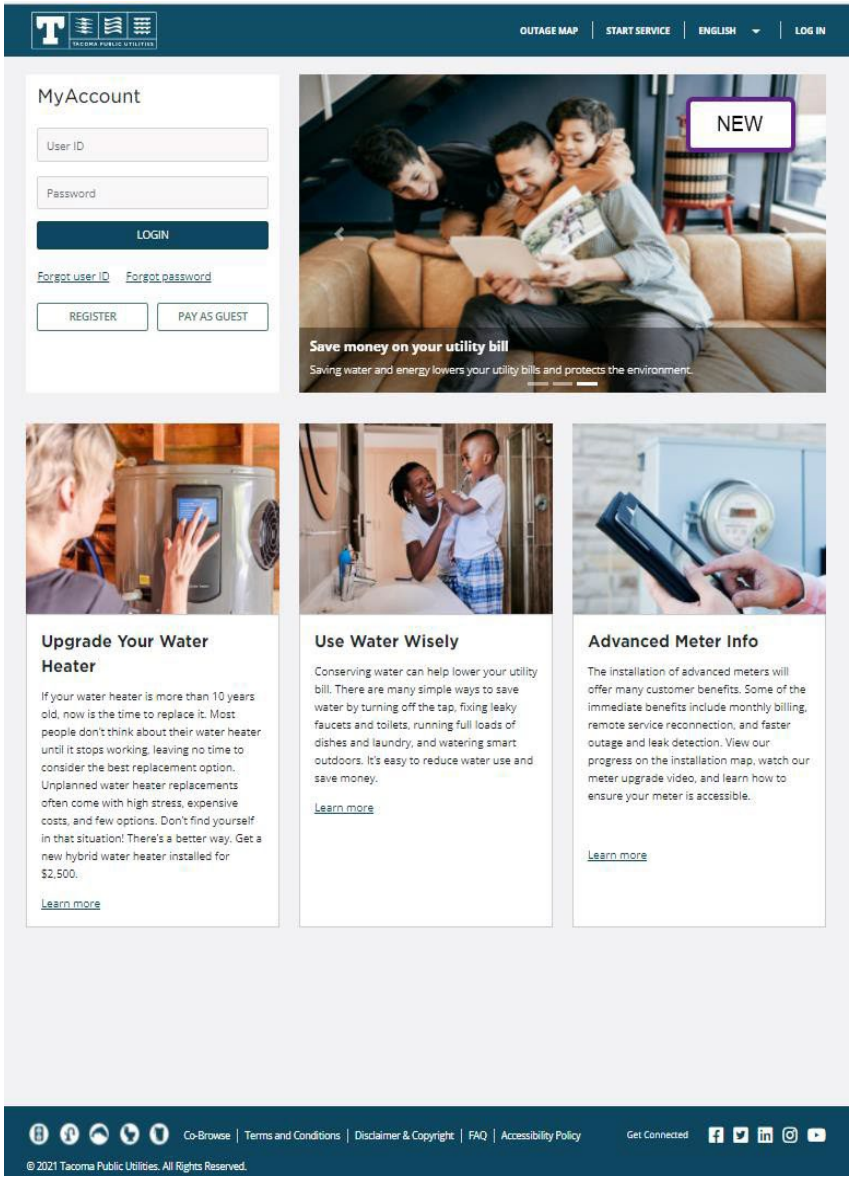
Final electric installed by vendor (03/20/25)

Customer Experience Portal – MyTPU.org

Before



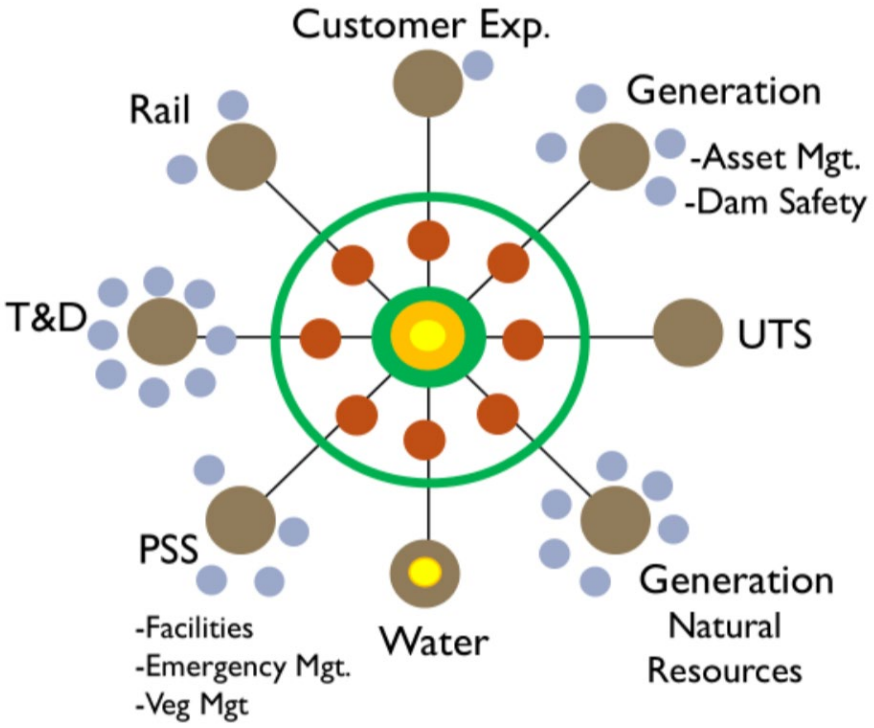
After



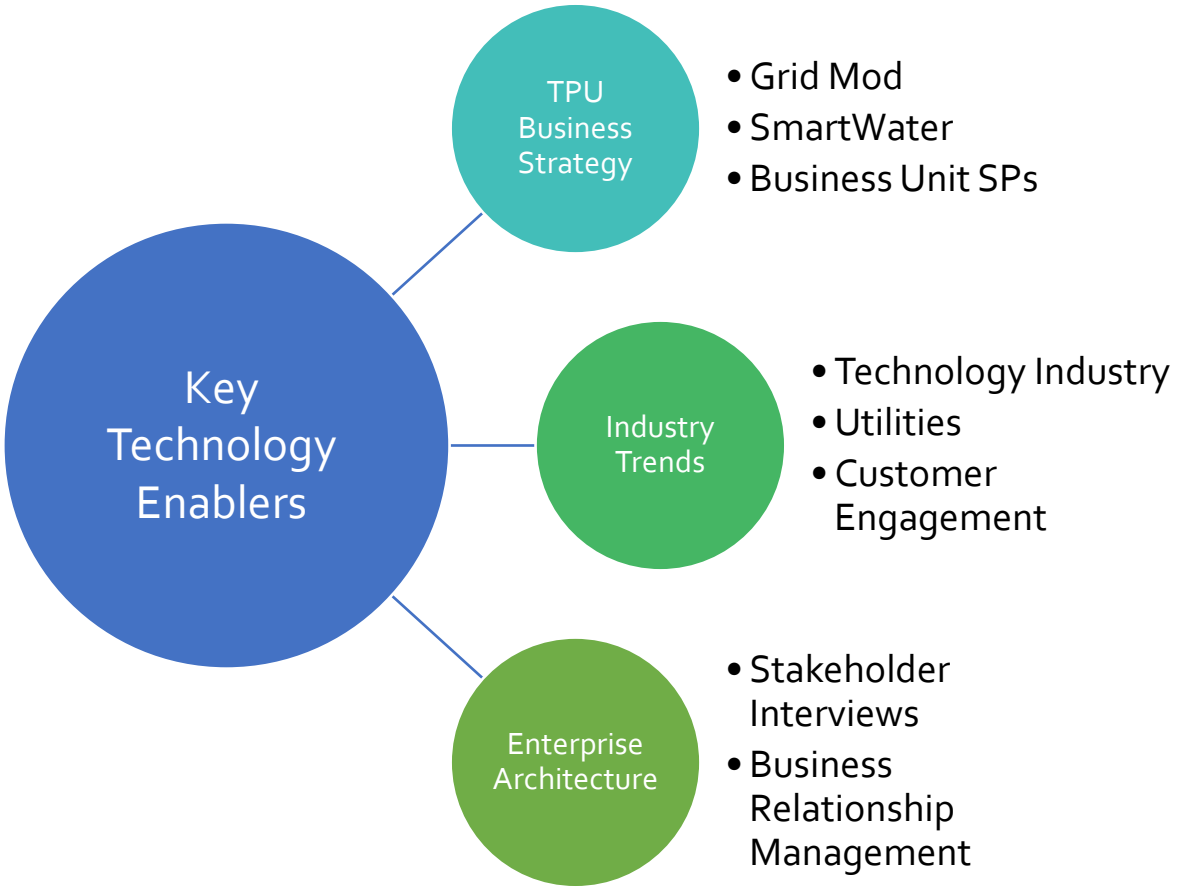
Geographic Information System (GIS)

- **T&D** Steel Pole Inventory, Wood Pole field maps, Joint use Pole Permit integration, outage point GIS data creation
- **Emergency Management** Situational a wareness for wind, weather earthquakes and active fires, fire modeling and analysis
- **Generation** Septic System mapping, Critical Infrastructure Document linking, Flood inundation modeling for Dam failures, Noxious weed quick capture, and Rife Lake Elevation Analysis
- **Customer Services** Meter locations
- **Power Shared Services** vegetation m anagement, campus indoor map, conference room booking app, Parking Lot assignments
- **Water** Hydraulic Model, Meter mapping

GIS is a Foundational Technology

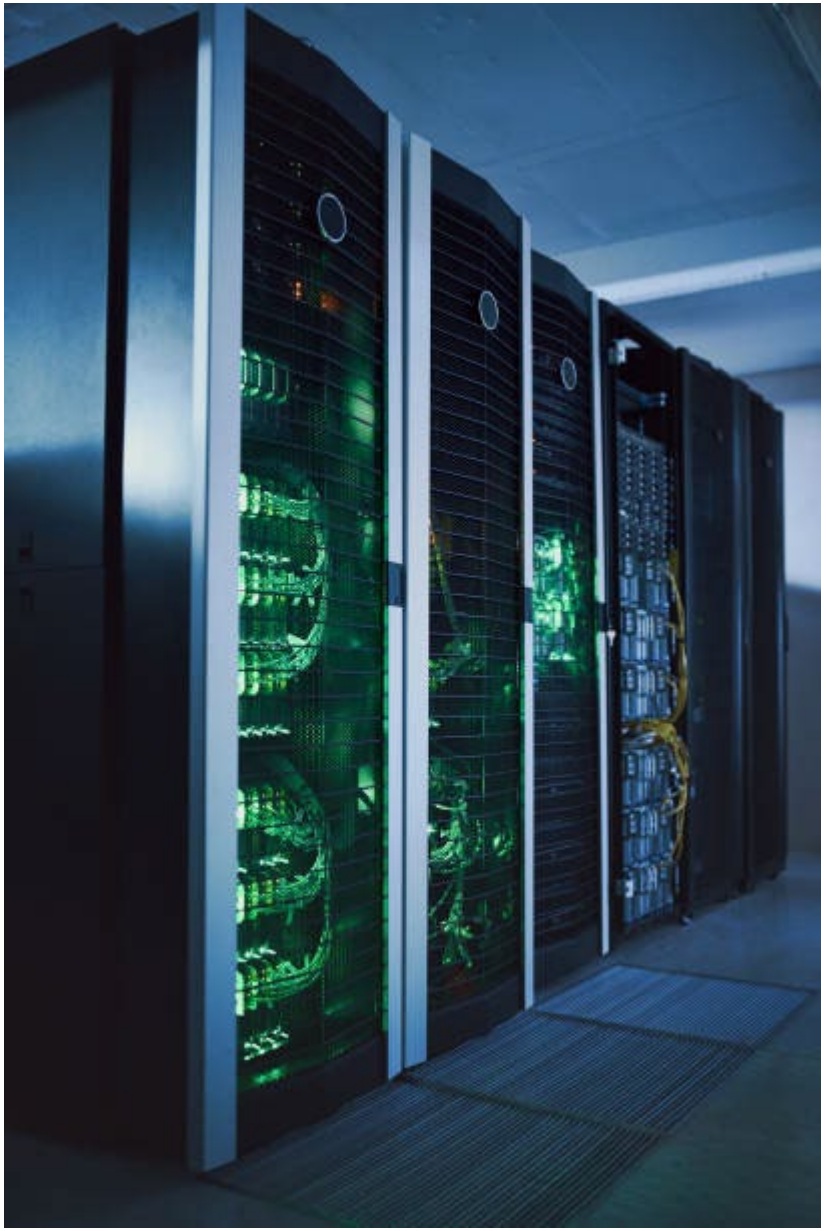


Key Technology Enablers by Domain



Enterprise/Cross Domain Platforms

- ***ERP Modernization (Finance, HR, Supply Chain, Projects)** Modernize to a cloud hosted SAP ERP implementation and map out business processes to update across TPU.
- ***Enterprise Asset Management (EAM) Convergence** Deploy a single EAM system across domains for assets, work management, and maintenance planning.
- **Cybersecurity & Resilience Program** Implement Internal Network Security Monitoring, OT/IT segmentation, and Supply Chain risk management monitoring across domains.
- **Field Mobility Enablement** Expand field service applications for work orders, safety alerts, and GIS integration.
- ***Enabling the workforce with AI Tools -** Developing use cases and introduce training for AI Use machine learning to predict outages and extend asset life, reducing O&M costs.
- **Cloud Right!** – Adjust how TPU has viewed cloud offerings and move to a Cloud Right! Approach.



Grid Modernization

- ***Advanced Distribution Management System (ADMS)** Deployment Integrate OMS and DMS, with DERMS capability to handle distributed resources, EVs, and microgrids.
- **Grid-edge Intelligence & Sensor Deployment** Expand IoT sensors, FLISR (fault location, isolation, service restoration), and substation automation to create a self-healing grid.
- ***Digital Twin of Electric System** Build a real-time grid simulation model for predictive reliability, planning, and DER integration.
- ***Predictive Asset Performance Management (APM)** Leverage AI to forecast equipment failures across substations, lines, and transformers.
- **Telecommunication system and strategy** Strategic plan considering the future migration of different types of communication systems to ensure line and substations projects are future proof and facilitates more holistic communication system improvement planning defining ownership, redundancy, security, bandwidth, and changing contractual relationships with third party providers.

Generation and Power Management

- **Hydro Plant Digital Twins** Simulate hydraulic, electrical, and mechanical conditions to optimize output and forecast maintenance streamlining asset management.
- **SCADA + Asset Performance Management Integration** Couple hydro Supervisory Control and Data Acquisition (SCADA) System with enterprise APM for lifecycle asset management and predictive analytics.
- **Digitization of Generation Asset Data** procure a digital maintenance management system and being mapping assets in preparation of EAM.
- **Energy Market Integration** Transition to new Southwest Power Pool Markets+ and enable data driven market decisions through AI/ML capabilities within Data Services.
- **Hydro Relicensing** Prepare for the relicensing of Tacoma Power's Cowlitz and Nisqually Hydro projects and ensure technology plays an enabler role.

Customer Engagement & External Affairs

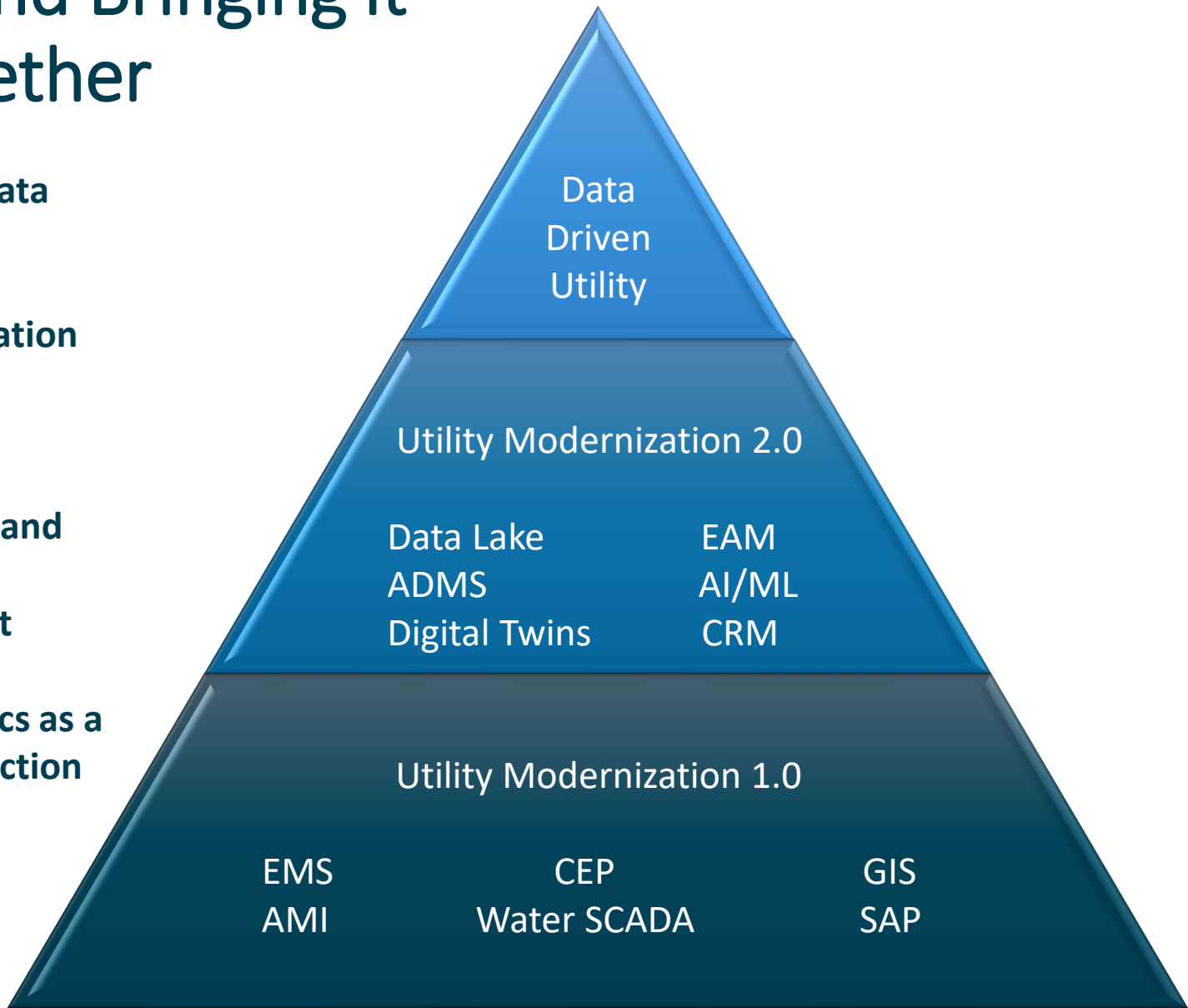
- **Omni-channel Engagement** Explore unified Customer experience capabilities through full integrations of current and future Technologies.
- **Personalized Customer Portals** Deliver a unified “one stop” view for electric, water, and Environmental Services customers across billing, usage, outages, and notifications.
- **Advanced Billing Modernization** Replace legacy billing systems with modular CIS capabilities that support flexible rates, distributed resources, and bundled services. Deploy pre-pay services within the Customer Portal.
- **Leak Detection** Provide Water customers advanced leak detection capabilities. More accurately gauge leakage in water distribution.
- **Telephony Modernization** Modernize the Call center and move to modern capabilities such as Unified Communications as a Service and Call Center as a Service.

Water “SmartWater” Transformation

- **SmartWater AMI Metering** Utilizing the meter to its full capabilities. Ensure end-to-end metering coverage for leak detection, water quality, demand forecasting, and customer transparency.
- **Water Unified Common Operating Picture (COP)** Create a system model of distribution and pumping networks to optimize water flows and predict failures.
- **Advanced SCADA** Upgrade for Water Treatment & Distribution Modernize automatio n, sensor integration, and cybersecurity protection in treatment plants and pump stations.
- **IoT-Enabled System Monitoring** Deploy sensors for pressure, water quality, and flow.

Data and Bringing it all together

- **Enterprise Data Lake**
- **API & integration Middleware**
- **Metadata, Governance and Master Data management**
- **Data Analytics as a business function**



Technology Disrupters and Opportunities

Disruptive Technology:

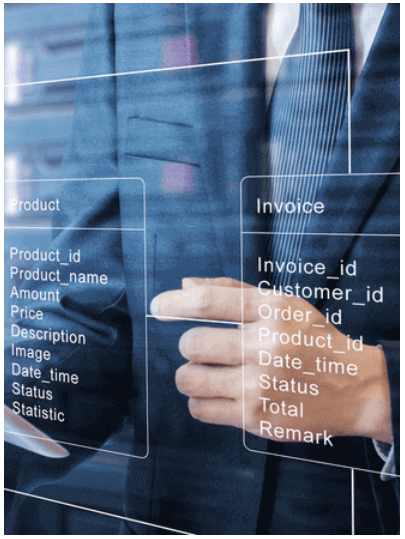
An innovation that significantly alters the way consumers, industries, or businesses operate

- Artificial Intelligence / Machine Learning
- AI/ML Industry specific use cases
- Cyber Threat Landscape

Artificial Intelligence / Machine Learning (AI/ML)

AI/ML Use Cases

- **Predictive Demand Forecasting**
- **Smart Grid Optimization**
- **Water Management**
- **Personalized Customer Engagement**



Emerging threats to Critical Infrastructure

'Cyberpartisans' hack Belarusian railway to disrupt Russian buildup

Activists claim they could paralyse trains moving Russian forces for potential attack on Ukraine

Businessweek | Technology

What Happens When Russian Hackers Come for the Electrical Grid

Emergency training at a restricted facility off Long Island has aimed to minimize the potentially catastrophic effects of a cyberattack on U.S. power infrastructure.

By Michael Riley

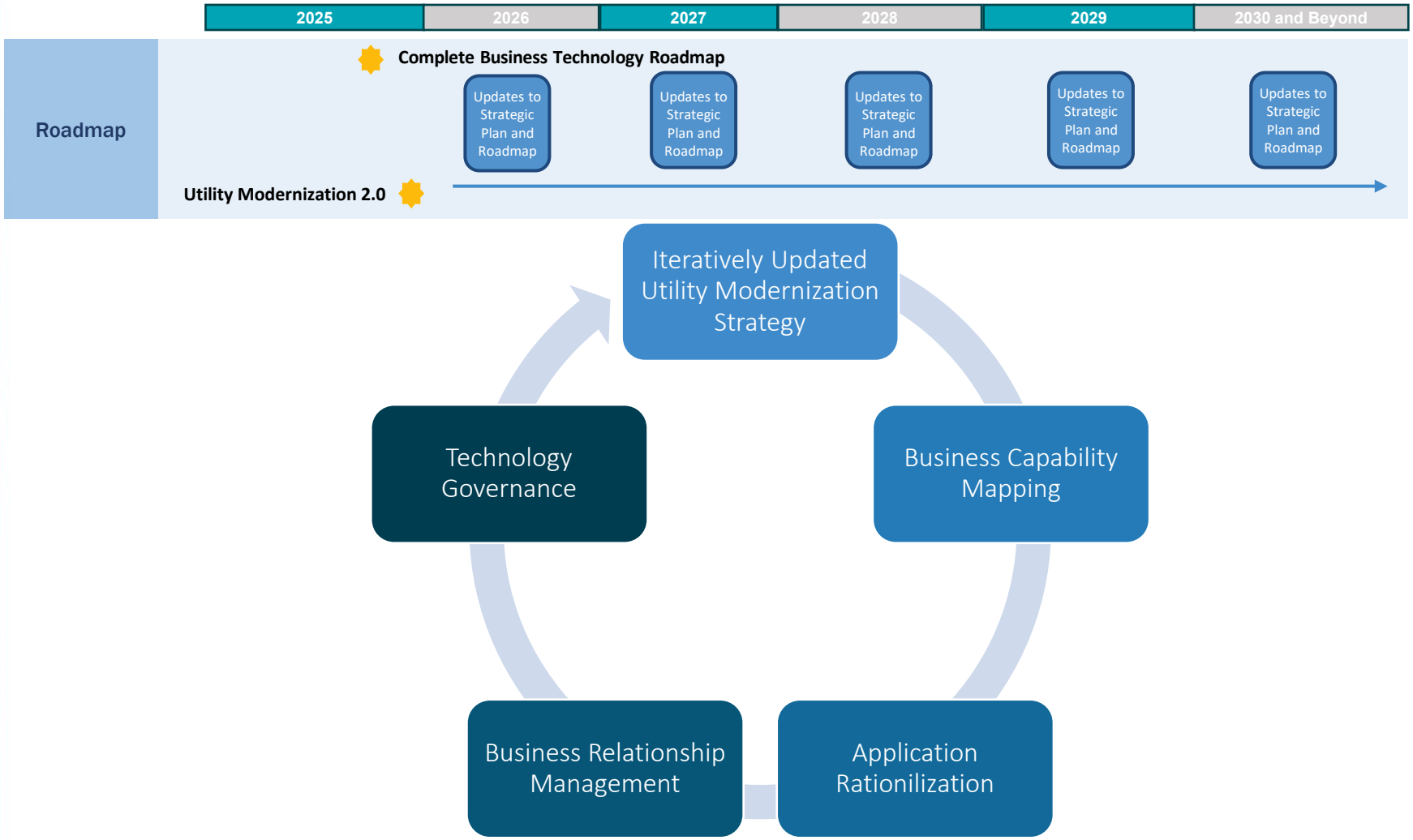
January 26, 2022, 1:00 AM PST

US government warns of new Iran-linked cyber threats on critical infrastructure

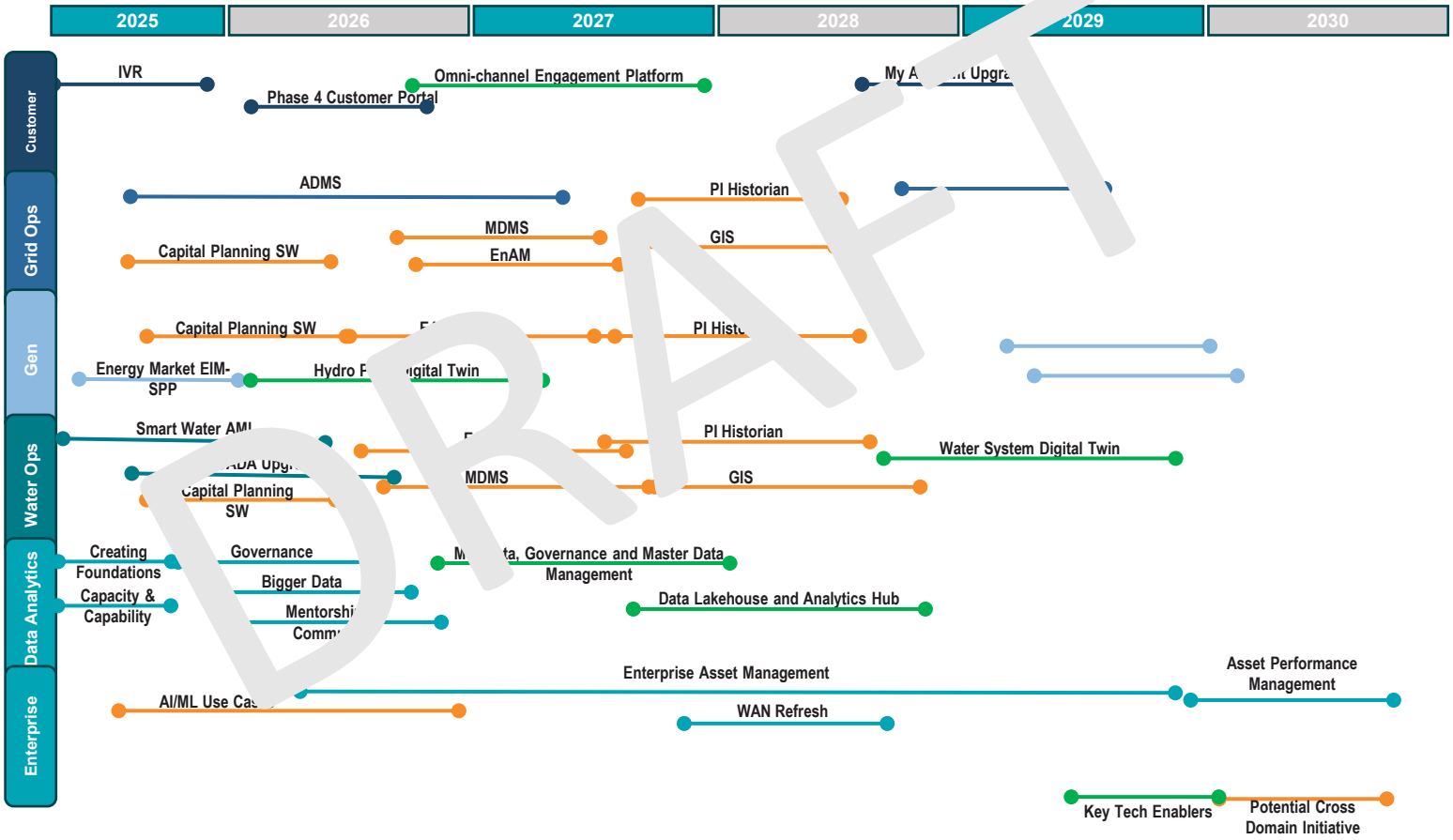
Companies should disconnect operational technology from the internet and enforce strong protections for user accounts, a joint alert from CISA, the FBI, NSA and DoD said.

Published June 30, 2025

Next Steps for Utility Modernization 2.0



Utility Modernization 2.0 Roadmap (2025-30)



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Questions & Feedback

Appendix Slides