



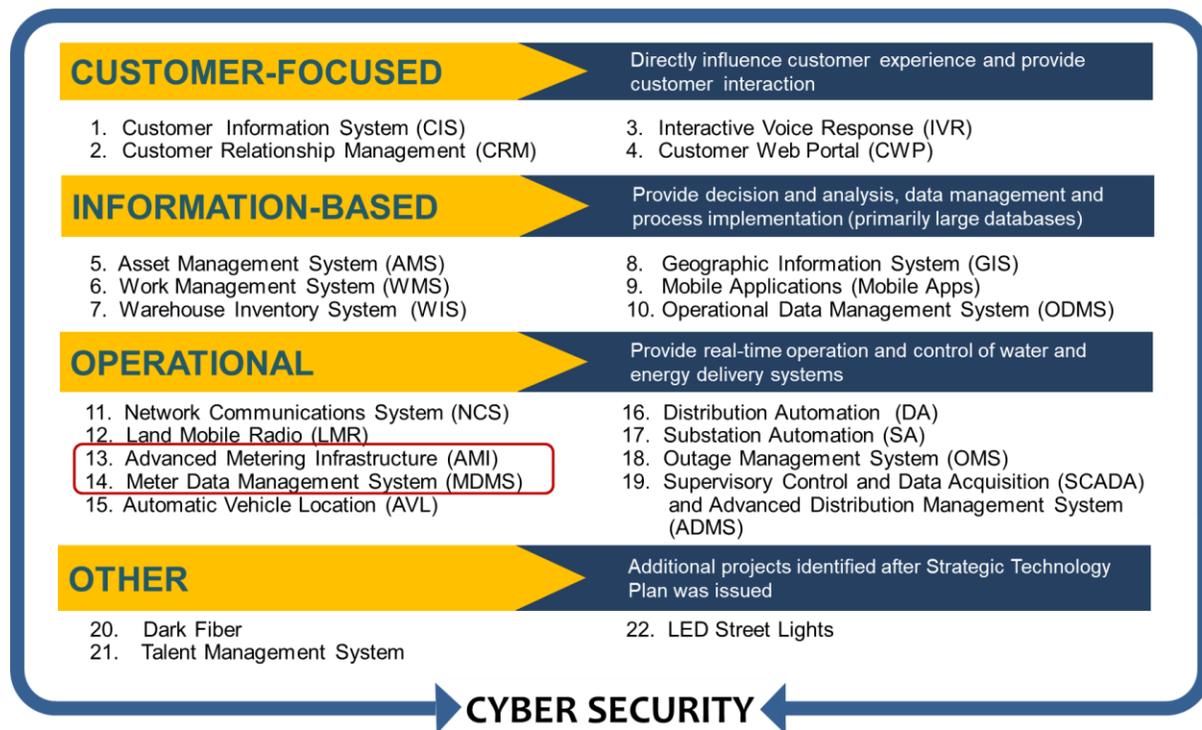
ADVANCED METERING INFRASTRUCTURE (AMI) BUSINESS CASE SUMMARY

Power Resources Division
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Business Case Summary

In early 2015, Riverside Public Utilities (RPU) issued a Strategic Technology Plan (Plan) that outlined strategic investments in new operational technologies (OT) as shown in Figure 1 below. Twenty-two OT projects were identified, with the intent of implementing the projects over the next 10 years. The Strategic Technology Plan facilitates a multi-year Utility 2.0 Strategic Plan, which incorporates RPU's mission and vision with broader goals and aspirations from the City-wide Riverside 2.0 planning framework. The key focus areas of Utility 2.0 are Customer Experience, Reliability & Resiliency, Affordability, Sustainability, Operational Excellence, and Strong Workforce.

FIGURE 1 – Strategic Technology Plan.



One of the most critical and foundational projects outlined in the Plan is an Advanced Metering Infrastructure (AMI) System, coupled with a Meter Data Management System (MDMS). AMI, an integrated system of smart meters, communications networks, and data management, is foundational for advancing the Utility 2.0 Strategic Plan. The system provides a number of important functions that were not previously possible or had to be performed manually, such as the ability to automatically and remotely measure electricity use, connect and disconnect service, detect tampering, identify and isolate outages, and monitor voltage. AMI provides RPU near real-time and actionable information about system performance, power quality, and outages, which increases reliability and efficiencies, and lowers overall operating costs.

AMI gives RPU customers expanded control, increased flexibility and additional choices in how they manage energy usage and energy efficiency. Customers will have access to energy usage through an online customer portal, which means they will not have to wait for a monthly bill to know how much

energy they are using each month. They will be able to set up usage threshold alerts so that they can be notified if their bill is reaching their pre-determined budgeted amount. AMI will also open the door for other cost-saving programs, time-of-use rates, and customer pre-payment plans.

In early 2017, RPU began exploring options for an AMI System. Due to the significant complexity of the project and the associated risks, on June 12, 2017 RPU obtained approval from the Board of Public Utilities (Board) to execute a Professional Services Agreement with UtiliWorks Consulting, LLC (UWC), a professional consulting firm with 13 years of experience successfully planning and implementing Advanced Meter Programs, to support the project from planning through execution.

Upon approval of the UWC agreement, staff worked diligently with the consultant to assess the feasibility and options of deploying AMI systems across both the electric and water utilities. The first step in this process was to identify goals for the project, assess readiness, develop a detailed business case, and identify potential operational gaps that could pose a challenge during implementation and beyond. UWC examined RPU's current utility operations, meter hardware and equipment, systems and software, operating costs and staffing across all divisions of RPU through a series of data requests and onsite stakeholder interviews and workshops.

Utilizing the data and information gathered and analyzed from the tasks listed above, the team developed a detailed business case for an AMI program that reflected RPU's needs and expected benefits, with the greatest return on investment. The business case was documented in late 2017 and 2018, with assumptions based on operational and financial data for both water and electric from 2015 and 2016. It outlined the quantitative and qualitative benefits to be realized with an AMI program, as well as proposed an implementation roadmap.

Based on the recommendations made in the business case, the project team, in partnership with the Innovation and Technology Department (IT), developed a comprehensive set of business requirements (functional, technical and security) to develop and issue an Advanced Meter Program Request for Proposal (RFP). Based on the evaluation of proposals, the evaluation panel selected Tantalus as the preferred vendor for the electric AMI system (which includes meters) and SmartWorks as the preferred vendor for the MDMS (which includes a customer portal) based on best overall value. A vendor was selected for the Water AMI project as well, but due to budget constraints, the Water AMI project was postponed and will be addressed through a separate project at a later date. On January 28, 2019, the Board approved agreements with Tantalus and SmartWorks for Electric AMI, as well as the overall project budget.

Following the January 2019 approval, staff worked with the consultant to update the business case based on an electric-only project, actual project costs rather than assumptions, and updated financial and operational data from years 2017 and 2018. The total project cost is \$14,182,321, which includes consultant services, the Tantalus AMI system (2-year agreement), meters, equipment, the SmartWorks MDMS (5-year agreement), integration with the existing Customer Information System, IT labor, customer engagement, and a contingency. The business case also includes estimated operating expenses that will be incurred by the Electric Meter Shop to install the AMI meters.

The business case includes anticipated benefits in the form of operational savings, revenue enhancement, efficiency improvements, and recovery of losses. The following quantitative factors were calculated as specific cost savings in the business case:

Savings Category	Estimated Average Annual Savings (\$)
Reduced electric meter reading costs	\$ 868,802
Reduced electric meter re-read costs	\$ 29,503
Reduced electric meter move-in/move-out costs	\$ 482,332
Reduced electric meter turn-on/turn-off costs	\$ 107,596
Reduced electric meter investigations	\$ 25,747
Reduced electric billing inquiries	\$ 1,602
Reduced electric customer calls	\$ 297,104
Right-sizing of electric distribution transformers	\$ 5,517
Increased efficiency of electric outage response	\$ 50,121
Reduced customer minutes out	\$ 17,404
Elimination of legacy MV-90 system	\$ 25,000
Reduced bad debt write-off	\$ 36,240
Increased revenue capture for improved electric meter accuracy	\$ 64,049
Power quality improvements	\$ 697
Revenue from electric meter scrap (one-time savings)	\$ 14,375
Improved voltage control during shock events	\$ 140,505

All the costs and anticipated benefits outlined above were entered into a financial model to calculate the following metrics:

- Net Present Value (NPV)**
 NPV is the cumulative benefits minus the costs of a project, while accounting for the time value of money. Conceptually, it is similar to a profit and loss statement where the NPV tells you the magnitude of the gains or losses. A positive NPV means that the project is a worthwhile investment for the utility.
- Internal Rate of Return (IRR)**
 IRR equals the percentage rate by which the net benefits are discounted until the point in time that they equal the initial costs. IRR is related closely to NPV. The discount rate you would need to apply to your benefits to obtain a net present value of zero is the rate of return calculated by IRR.
- Payback Period**
 Payback period describes the length of time (in years) it takes for the investment to show a profit.
- Return on Investment (ROI)**
 ROI is calculated by looking at total profit (revenue - cost) divided by the total investment over a specified period.

The RPU AMI project business case resulted in a positive return as outlined in the following table:

Total Capital Expense for Deployment	\$15,772,000
Estimated Benefits	\$71,367,000
Net Present Value	\$55,595,000
Internal Rate of Return (IRR)	26.4%
Return on Investment (ROI)	352%
Payback Period	7 years

In addition to the benefits that can be quantified and were included in the business case analysis, RPU has the opportunity to realize numerous intangible/soft benefits. While many of these benefits are not easily measurable, they are real and achievable with the successful deployment of an AMI system. By leveraging the AMI system and interval read data for other value-added activities beyond typical meter reading, many of these intangible benefits have a large, direct, and positive impact on the customer experience.

Qualitative Benefit	Description
Improved Safety	With the introduction of automated meter reading, RPU will have the ability to remotely read meters. This will dramatically reduce exposure to risky conditions on the road and at a customer premise, such as weather conditions, unfriendly pets, physically hard to access meters, and theft.
Improved Customer Service	Customer service improvements because of: <ul style="list-style-type: none"> • Faster response times • More informed customer service representatives • Averted high bills • Near real-time event notifications
Environmental Sustainability	Greater operational efficiencies and fewer field visits will allow for better utilization of natural resources and a reduction in environmental impacts because of less wasted fuel and energy.
Timely and Accurate Meter Reading	AMI reads will deliver timely meter reads and bills and will reduce the need to estimate bills.
Improved System Reliability	The AMI system will enable RPU to model the overall system to facilitate proactive management and improve reliability.
Improved Emergency Protocol	The frequency and volume of AMI data will allow RPU to respond more swiftly and efficiently to emergencies, especially when paired with the analytic capabilities of the MDMS.
Compliance with Future Legislative Requirements	With the introduction of AMI, RPU will better prepare itself to address legislative and/or CA state requirements regarding conservation, time-based rates and other energy-related issues.
Use of Network	An RPU-owned network will provide new communications infrastructure that may be leveraged for other devices, such as new Internet of Things (IoT) or smart city devices.

Leveraging AMI technologies will significantly improve the measurement and management of utility resources and will bring direct benefit and value to customers. The overall benefits of the AMI system are significant and will continue to increase as additional AMI meters are installed beyond the 25,000 planned for the initial AMI project.