

Advanced Metering Infrastructure: The need is now

Water supply and conservation

A common theme throughout the water industry is concern regarding water infrastructure and supply problems. Non-revenue water is an issue for water utilities around the country and around the world. This is especially true for those areas that have experienced or are currently experiencing drought, and the resultant diminishing supplies of potable water.

On average, non-revenue water in the U.S. is at 20 percent and globally at 28 percent. Water resource management and improvements in water infrastructure efficiency are issues that need to be addressed now. In addition, competition for limited capital budgets, aging equipment and infrastructure, and growing concerns regarding sustainability and diminishing water supplies further impact the water industry.

Fortunately, there are tools to address resource and infrastructure management concerns. This process, and many of the needed improvements, must begin with accurate and real-time measurement of water, how it is used and how to build an economically viable and sustainable future.

The solution: Advanced Metering Infrastructure

Advanced Metering Infrastructure, or AMI, systems with robust and expandable platforms provide real-time data on a community's water resource, giving consumers easy-to-understand information that allows them to proactively monitor and address their water usage. Customer service improvements allow the utility's customer service representatives ready access to real-time and historical views of a consumer's water usage and identify things like continuous consumption, which could indicate possible leaks, reverse flow and hourly consumption data. This information can be shared with the consumer in a positive and meaningful dialog. These customer service improvements create a positive partnership with the consumer, and reduces the need for unnecessary truck rolls to a customer's meter, which saves money for the utility.

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AMI systems also fall under the category of the “Smart City” Initiative, which has captured the attention of consumers and public officials alike across the country. The “Smart City” Initiative was announced in 2015, and is a federal program that will invest more than \$160 million in federal research and leverage more than 25 new technology collaborations to help local communities tackle key challenges such as fostering economic growth, managing the effects of a changing climate and improving the delivery of city services.

Additions to AMI systems, such as leak detection modules which communicate directly with the AMI system, discover leaks within the distribution system early when proactive repairs can be made before a bigger emergency occurs. Additionally, in combination with asset management systems and predictive analytics programs, today’s AMI systems allow for cost-effective management of the entire water system infrastructure. Intelligent metering systems and cloud-based analytics software programs provide unprecedented access to real-time information about consumption, demand and system efficiency which allows forward-thinking utilities to apply predictive programs and correct problems before they occur.

The following real-life examples represent the thought processes of utilities across the country facing a point at which they need to consider updating their metering infrastructure. These utility managers know they need to make changes now if they want the ability to act quickly when the next big event strikes.

System A

A suburban system with plus or minus 17,000 services with direct-read meters planned a small AMI pilot of approximately 1,600 AMI endpoints. With a shrinking economy in 2009, both grant and low interest loans became available to replace the entire system over a two-year period. Calculations assured payback of the investment in seven to 10 years, and City Council approved the project. The water resource management and sustainable nature of a system expected to last at least 20 years provided the qualification as a “green” project and funding was secured. The payback goal is well within reach even with added enhancements to the system with new analytics interfaces.

System B

A once rural or suburban water district, referred to as “District”, had grown to around 14,000 services with direct-read meters. The District was experiencing a growth in population and in need of a solution to sustainably grow and better manage their metering infrastructure and cash flow. Moving from bi-monthly to monthly billing and gaining hourly read-data pointed to AMI as the solution. State revolving loan funding was available at the time of the project.

The District’s consultant built a case for AMI by comparing the 20-year cost of doing nothing but maintaining the current direct-read meter system vs. the cost of having an AMI system installed over five years by District staff and for a one-year project having an outside contractor do the AMI install work.

They developed the following scenarios:

- Scenario 1: Do nothing but routine maintenance on the existing direct-read meters \$7,760,000
- Scenario 2: Add AMI with contractor installation over one year \$5,663,000
- Scenario 3: Add AMI with District staff installation over five years \$3,650,000

The District's board unanimously approved the contractor-installed solution in order to begin capturing the benefits of the system sooner and providing improved customer service in dispute resolution, customer leaks, etc. Benefits to the District included advanced system monitoring and resource management, reducing truck rolls and site visits, accuracy of new meters, and more advanced and automated reporting capabilities.

Since the installations of both System A and System B, public funding has become more difficult to secure, and the funding process takes an extended period of time, causing revenue delays and ultimately keeping utilities from reaping the overall benefits of the AMI system. A combination of public and private funding or private funding only may solve this issue.

Funding AMI/AMR projects with public sector experts

Many water agencies have turned to financing their capital projects to avoid costly government grant and loan program delays and funding shortfalls. Firms that specialize in water finance have the industry expertise, products and capital to assist with customizing the right solution for each utility.

It is important to select a financing partner that understands the individual water agency's revenue streams, capital cost and financing terms. Financing partners should be able to quickly underwrite, approve and fund projects.

Advantages of financing

- Increases revenues
- Upgrade outdated infrastructure
- Reduce operating costs
- Increased productivity
- Create new jobs
- Eliminate grant funding delays
- Quick funding
- 100 percent project funding
- Competitive rates
- Early buyout options
- Match payments to budgets
- Spread payments over useful life
- Preserve cash
- Simplified documentation

Installment sale agreements

Most water agencies finance their AMI/AMR projects with an Installment Purchase Agreement. The Installment Purchase Agreement allows the water agency to finance 100 percent of the project cost over its useful life. The water agency retains ownership of the equipment, and the lender secures its interest with a pledge of the water revenues. The Installment Purchase Agreement provides the financing terms, payment schedule and source of repayment. It simplifies the process to fund projects of all sizes quickly and efficiently.

Financing example

A water agency wants to install an AMI/AMR project to track customer water usage, detect leaks, and eliminate labor intensive meter reading. The \$500,000 project will increase the agency’s cash flow by \$75,000 per year with a 3.3 percent finance rate with 10 annual payments equal to \$59,516.18. The project will generate \$15,483.52 in annual cash flow savings in years one to 10 and \$75,000 after the loan is paid off.

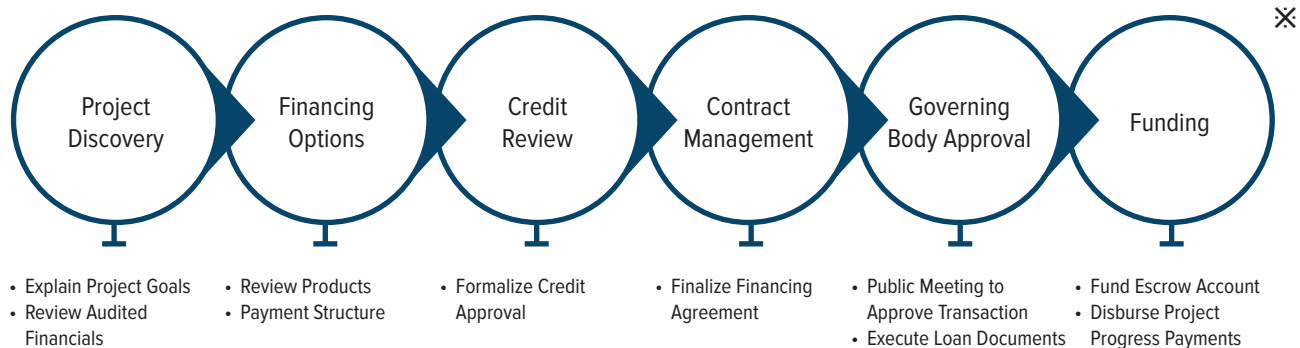
Loan Payment		AMI/AMR Cash Flow Analysis			
Project Cost	\$500,000.00				
Term	10				
Interest Rate	3.30%				
Payment	-\$59,516.18				
		Cash Flow with Loan	Savings Yrs. (1-10)	Savings Yrs. (11-20)	Total Savings
Annual Project Cash Flow		\$75,000.00	\$75,000.00	\$75,000.00	\$1,500,000.00
Loan Payment		-\$59,516.18	-\$595,161.77	\$0.00	-\$595,161.77
		Net Annual Savings	\$15,483.82	\$154,838.23	\$750,000.00
					\$904,838.23

Overall, the AMI or AMR project will produce approximately \$904,838.23 in cash flow for the water agency over a 20-year period.

Financing process

The financing process is designed to be quick and simple. The process provides the lender with a project overview explaining the purpose, timeline, source of repayment and cost. The lender then provides the water agency with a couple of financing options for consideration. Once the proposal is accepted, the lender seeks credit approval for the transaction and sends an installment purchase agreement for review. The agency’s governing body then approves the financing terms via a resolution, minutes or consent and authorizes the appropriate person to execute the installment agreement on behalf of the water agency. Finally, the funds are disbursed to an escrow account to pay vendors or reimburse project costs.

The transaction process is designed to jettison red tape and fund projects quickly. Utilities should select the right partner that understands their business to ensure the project is a success.



Conclusion

AMI/AMR projects track customer consumption, detect costly leaks, and reduce labor costs to improve operating performance and boost revenues. Waiting for government funding can delay or prevent projects from moving forward at all. Financing these projects, however, enables water agencies to start infrastructure upgrade projects immediately, create jobs, and generate positive cash flows. Merging project development and finance into a comprehensive solution enables water agencies to enhance their systems' performance and deliver clean and affordable water for generations to come.

※ Image provided by Holman Capital Corporation.