

Case study: Burbank Water and Power

Meter data management system provides platform for Smart Grid

Burbank, California, is a forward-thinking media and entertainment-oriented city that requires 21st century infrastructure and technology. Home to three major movie production studios, Burbank is a high-tech city by nature and very dependent on consistent, high-quality electric and water delivery.

Burbank Water and Power (BWP) provides 45,000 residences and 6,000 businesses with water and electricity. Since 1913 it has been entrusted to deliver safe, reliable and affordable public services to Burbank's citizens and business owners. In 2008, the mid-sized, community-owned utility embarked on a comprehensive Smart Grid initiative. The grid's foundation, a meter data management system (MDMS) with robust meter-to-cash capabilities, was chosen and implemented with expertise from Siemens Energy, Inc.

Multi-dimensional business drivers

The variety of forces behind BWP's move to establish a Smart Grid and MDMS coincided with the City's own sustainability initiative. In January 2008, the Burbank City Council approved a sustainability action plan to improve efficiency city-wide, and the project conceived by BWP facilitates several of the action plan's objectives.

Increase efficiency: Burbank's energy demands were rising at a rate of nearly 1.5 percent per year. Having more accurate and timely meter data to better manage demand would alleviate the need to invest in new and expensive generating resources.

"We are in a transformational position at BWP. After almost 100 years of operating the same way, we are embarking on a technological evolution."

Joanne Fletcher, Assistant GM for Customer Service/Marketing, Burbank Water and Power

Improve reliability: Power availability is a concern in California when temperatures are particularly high. Monitoring and controlling demand to reduce peak load would help maintain power to customers and hasten communication and recovery should an interruption occur.

Reduce losses: California's water crisis caused by drought conditions and judicial decisions requires BWP to be proactive in monitoring and preventing unaccounted water due to leaks and other losses.

Foster conservation: Integrating smart meter data with an MDMS and billing system would empower BWP's customers to monitor their energy and water usage patterns in order to reduce or reschedule consumption and lower their utility bills.

Promote renewables: In order to increase the use of renewable energy sources such as solar, wind and geothermal power, and integrate the customers' own electric generation and storage into the energy grid, different infrastructure and control systems were required.

Ensure competitiveness: BWP needed to keep up with private utility technology and process trends in order to remain competitive should California again embark on deregulation.

Technology mandates

Security was BWP's number one concern. The MDMS needed to tightly secure both the utility's and customers' privacy, and provide a clean audit trail. It needed to be easily configured to BWP's business rules without assistance from a programmer. It had to be scalable to accommodate a growing user base, more intelligent and diverse technologies, and BWP's evolving vision without sacrificing service speed or efficiency. It also required an open architecture with the ability to support digital smart meters from multiple manufacturers to allow flexibility in the Smart Grid infrastructure.

Defining the vision

The meter-to-cash implementation was the crucial first step in BWP's overall Smart Grid vision. It consisted of implementing and integrating an advanced metering infrastructure (AMI) and MDMS, and tying it to BWP's existing customer information system (CIS).

The AMI, including smart electric and water meters and wireless mesh network communications, will allow for bi-directional communications with the meters at more timely intervals—scheduled or on demand. The meter reads will be validated, estimated and edited (VEE) within the MDMS to ensure they are accurate and complete before being converted into billing determinants. Because the billing data will be more precise, BWP will be able to provide faster and more efficient customer service.

This implementation also lays the foundation for additional meters and increasingly sophisticated Smart Grid and MDMS capabilities, such as remote connect and reconnect, demand response, thermal energy storage, voltage diagnostics, time-of-use pricing and a customer portal. Also targeted are integrations with BWP's outage management system and a future energy demand management system, and possible electric vehicle integration.



In November 2009, BWP received a financial boost from the U.S. Department of Energy. A \$20 million stimulus grant was awarded through the American Recovery and Reinvestment Act (ARRA) to help BWP deploy its Smart Grid initiative, including the meter-to-cash phase.

Product search and selection

BWP conducted an extensive search before choosing its Smart Grid software solution provider. Partners Siemens Energy, Inc. (Siemens) and eMeter Corporation rose to the top for several reasons. Siemens has a long track record of success leading transmission and distribution technology projects, and BWP was sold on the Siemens team's solid software, partnership, expertise and commitment to supporting the utility's Smart Grid vision.

The MDMS, eMeter EnergyIP®, met every one of BWP's business, technical and security requirements. It is not just a meter reading and data repository, but a scalable Smart Grid data platform designed to support future utility needs. It is also a reputable product with an established client base, posing little risk compared to other candidates that BWP was considering. eMeter EnergyIP is viewed by BWP as an integral building block for its Smart Grid.

On time, under budget

Siemens worked closely with BWP's dedicated, seven-member project team to complete the MDMS meter-to-cash implementation. Siemens provided the project management leadership and methodology, network and security consulting and technical expertise. During the requirements gathering phase of the project, Siemens presented options and consequences so that the project team could make informed decisions. The MDMS user and system administrator training was presented clearly, coherently and at just the right level for the audience.

Because a significant portion of the project was completed remotely, BWP benefited from active knowledge transfer at a significantly lower cost. The only tasks completed on site were requirements definition, MDMS training and go-live support. Siemens personnel connected using a virtual private network (VPN) to commission and configure the software, validate the connections, secure the system and perform acceptance testing. Weekly conference calls and prolific e-mail correspondence kept the project moving without incurring the usual travel and expense overhead of on-site personnel.

The high-caliber team members from both companies thrived in the virtual working environment, and the MDMS went live in August 2010 on time and within budget. Smart meters are now installed for approximately 18,000 water customers and 1,000 electric customers. Granular consumption data information is now being captured at each installed smart meter and more than 14,000 bills are being generated monthly by the MDMS. Every BWP customer will have advanced metering infrastructure (AMI) meters at the rollout's completion.

With the meter-to-cash phase now complete, Siemens has begun working with BWP to extend the MDMS benefits by installing, configuring and commissioning an adapter between the electricity communications system and utility enterprise applications. The two-way AMI adapter will enable remote service connections and reconnections and on-demand meter reads. A third and final phase, scheduled to begin in mid-2011, will complete BWP's Smart Grid vision by integrating the MDMS with other utility control systems and will also allow BWP customers daily access to their usage data.

This is the first project where we've had so much VPN communication with a vendor. We saw the Siemens team in the requirements phase and at the end for go-live, but we knew them. We communicated on e-mail constantly and they answered back immediately.

Teri Kaczmarek, Manager of Customer Service Operations, Burbank Water and Power

Meter-to-cash benefits

Several benefits are being realized from BWP's MDMS implementation, particularly for those customers with an AMI meter installed. As the meter rollout continues, and additional MDMS capabilities and integrations are enabled, the positive effects will become more pervasive and quantifiable.

- Customers receiving near real-time data on energy usage from AMI meters now have the ability to make better consumption and conservation decisions.
- BWP will provide significantly enhanced service to its AMI utility customers due to improved billing accuracy and faster, more efficient customer response.
- Access to granular interval data will ultimately allow for fewer billing exceptions and customer billing queries.
- With the gathering of granular data, BWP can proactively gauge each issue as the problem arises.
- Business rules, such as VEE, may be configured as BWP's business needs evolve, without requiring a programmer's involvement.
- Interval data will reveal evidence of leaks or other unaccountable water on a timelier basis.
- Any water meters recording data but not being billed will be identified as a result of the AMI replacement, allowing accounts to be properly established.
- Field force personnel dedicated to manual meter reads may be shifted to other tasks as the AMI rollout progresses.

We received an unparalleled level of support, service, flexibility and commitment from each person we worked with at Siemens. They were fantastic.

Joanne Fletcher, Assistant GM, Customer Service/Marketing, Burbank Water and Power

Snapshot: Burbank Water and Power

- Founded – 1913
- Region served – City of Burbank, California
- Service area – 17 square miles
- Electric customers – 51,000
- Water customers – 27,000
- Employees – 325
- 2009 revenue – \$288 Million
- Website – www.burbankwaterandpower.com

Smart Grid project timeline

- September 2008 – Siemens sales presentation to BWP
- December 2008 – RFP response due to BWP
- April 2009 – Burbank City Council authorizes BWP to seek federal funding for the Smart Grid network
- June 2009 – Siemens and eMeter commence phase one meter-to-cash implementation
- November 2009 – U.S. DOE awards a \$20 million ARRA stimulus grant to Burbank Water and Power, providing Smart Grid project funding through 2012
- August 2010 – Phase one goes live with AMI, EnergyIP and CIS integration
- November 2010 – First bills produced from EnergyIP following three months of parallel billing
- December 2010 – Phase two begins
- July 2011 – Phase three begins
- December 2012 – ARRA stimulus funding expires

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