

CASE STUDY

# Harriman Utility Board

PROJECT

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Investing in  
Advanced Metering  
Infrastructure



## ABOUT

A municipally owned local power company



YEAR INCORPORATED

1939



MILES OF DISTRIBUTION

700

## CUSTOMERS

TOTAL

12,136+



ELECTRIC

11,1787



GAS

3,173



WATER/SEWER

5,104 / 2,300



## Background

Harriman Utility Board (HUB) had previously relied on drive-by meter readings for electric and gas meters and manual readings for water meters, which proved inefficient and costly. These monthly readings did not provide customers nor HUB with clarity on their daily or hourly usage patterns. This left customers often questioning, “why is my bill so high?”

Collecting all customer readings would take HUB approximately two weeks due to the mixed manual and drive-by reading system. Also, customers with multiple services often received different reading dates on their bills. For example, electric and gas readings would be done on one day, while water readings would be done on another day. Recognizing the need to modernize, HUB set out to replace these outdated methods with advanced metering infrastructure (AMI).



**Advanced metering infrastructure (AMI) improves a utility’s ability to collect frequent and accurate usage data.**

# Goals

THROUGH ITS PLANNED ADOPTION OF AMI TECHNOLOGY, HUB AIMED TO:

1

## Streamline operational efficiency

Bolstering their outage management by providing real-time insights into outages helps the utility diagnose issues and pinpoint outage locations faster, speeding up response and restoration times.

4

## Improve customer service

HUB sought to harness AMI data to create personalized interactions with customers by helping them understand their energy usage and encouraging energy-saving behavior.

2

## Lower the cost of meter reading

Replacing outdated methods with AMI will save time and reduce costs.

5

## Save staff time

Eliminating the need for manual meter readings frees up staff to focus on other critical work.

3

## Improve its customer payment model

Customers can take advantage of “pre-pay billing” - a payment model that allows those with poor credit to sign up for services without a deposit. It spreads overdue balances across multiple pre-payments, empowering customers to control their energy usage and save on their utility bills.



## Advanced Metering Infrastructure Supports TVA’s Regional Grid Transformation Objectives

HUB’s investment in advanced metering infrastructure is in line with TVA’s Regional Grid Transformation (RGT) objective of upgrading our electric system to meet the changing needs of customers and the world. As part of the RGT initiative, TVA and LPCs worked together to identify the capabilities needed to advance the electric system Valley-wide, known as the “Capability Progression Model.” One of the identified capabilities is advanced metering infrastructure, which helps to provide an exceptional end-user experience.

HUB’s success in identifying an improvement opportunity, overcoming funding challenges, and implementing modernized technology demonstrates the potential benefits that all LPCs, their communities and the Valley can realize through grid transformation efforts.

## APPROACH

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# Securing Internal Approval

To garner support from their board of directors, HUB engaged a consulting firm to assess the costs and benefits of upgrading to AMI.

Despite the estimated upfront cost of \$4,375,000 (of which nearly \$2.2 million was attributed to the Electric Department), the analysis forecasted substantial annual cost savings. HUB compiled and presented the findings to the board.

### BOARD APPROVED:

<b>November</b>	<b>Total cost</b>
<b>2020</b>	<b>\$4,375,000</b>

### BOARD PRESENTATION TOPICS

#### The Need for Change

- HUB was starting to fall behind neighboring utilities who had already invested in AMI.

#### Positive Features of AMI

- Remote disconnects and reconnects are safer and more convenient.
- Prepaid metering is an attractive option for customers with fluctuating income.

## APPROACH

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# Securing City Council Approval

HUB also needed to secure City Council approval to borrow funds for the project. This proved more complex than anticipated due to initial skepticism about investing substantial funds across three departments of HUB.

Over the past two decades, HUB has consistently demonstrated their commitment to infrastructure improvement by undertaking significant projects, such as multiple major substation upgrades. These efforts, though capital-intensive, were essential for providing reliable service to the community.

Given fiscal pressures resulting from these earlier investments, combined with stale to declining sales growth over the previous decade, Harriman implemented measured rate adjustments in 2018, 2019 and 2021 to ensure financial stability and continued reliability across all of their services. HUB also made the prudent decision to forego a rate increase in 2020 due to COVID-19 impacts on their customers.

HUB was committed to providing its City Council with transparent and comprehensive

communication. Amidst the financial considerations, HUB approached the City Council with meticulous care, organizing workshops to educate City Council members about HUB's operations and the reasoning behind the necessary investments.

Six months after discussions began, the City Council approved Harriman Utility Board's request to borrow the \$4.375 million for AMI. This open dialogue showcases HUB's dedication to serving both their community and the broader public.

Furthermore, amidst economic uncertainty, HUB was proactive in seizing the opportunity presented by declining interest rates in 2021. They secured historically low (1.4-1.6%) rates for refinancing existing debt and the new AMI debt — a strategic move that is already helping HUB secure a faster return on investment for their customers.

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## HUB's AMI implementation journey continues as they work toward installing 11,000+ electric meters by Fall 2024.

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Meter readers are utilizing non-reading days to expedite installations. Meters are placed strategically, with approximately 15 collectors gathering data from multiple meters and transmitting it to HUB's office for efficient data management. The goal is to streamline operations by placing electric, water and gas meters on the same route. In September 2023, HUB began remote reading along some water-only routes in rural areas.

As installations progress, manual reading will decrease, allowing staff to prioritize other activities. The forthcoming prepay setup and optimized routes will further increase efficiency.

## Challenges

### Supply Chain Issues

As of August 2023, HUB had received around 4,200 electric meters out of 10,909 ordered in October 2021. The delay prompted HUB to create criteria for prioritizing customers for available meters, emphasizing areas with high move-in and move-out rates to streamline routes.



### Overlapping Meter Reading and Distribution Routes

HUB's outage management system, which provides notifications ahead of customer calls, is not fully optimized due to overlapping meter readings and distribution routes. Once all AMI electric meters are operational, HUB will be able to quickly identify power outages down to the individual home before the customer even calls to report it — which will enable faster outage response and restoration.

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# Benefits of HUB's AMI Investment



## Enhanced Storm Response

The implementation of AMI is already producing game-changing advantages in HUB's storm response. With real-time insights into outage occurrences, HUB is gaining the ability to swiftly identify affected customers and pinpoint the root causes of issues. In the past, HUB's outage management system relied on information gleaned directly from customer calls. Ultimately, this will lead to faster and more accurate responses to power outages in HUB's service territory.



## Meter Tampering and Theft Detection

Once fully deployed, AMI will allow HUB to detect meter tampering and electricity theft faster and more accurately, potentially saving lives in the process. Previously, these incidents often went unnoticed, as older meters are limited in their monitoring ability. HUB's newer alarms alert in real-time when a meter is tampered with and/or functioning improperly. This technology helps eliminate unsafe conditions created by anyone attempting to interfere with meters.



## Improved Cost of Service Analysis

HUB and other LPCs engaged with TVA's Customer Analytics Program can better assess the service cost for distinct rate classes (e.g., residential, commercial, industrial), helping them understand their costs and allocate rates more precisely.



## Outage Detection

With AMI, HUB will be able to quickly detect "blinks," or brief interruptions in service, as they occur — enabling quicker action to prevent these isolated instances from cascading into full-scale outages.



## Notification of High Utility Usage

AMI data and TVA's Customer Analytics Program will give HUB real-time visibility into usage patterns for faster alerts and identification of energy fluctuations. This will benefit low-income renters with less control over their home's energy efficiency. HUB supports vulnerable customers by connecting them with auditors and programs like TVA Home Uplift, which offers free home energy efficiency upgrades to reduce usage and costs.



## Tailored Customer Interaction

AMI's data-driven potential allows utilities to revolutionize their customer engagement. As more HUB AMI meters come online, and with plans to offer a prepay program, HUB envisions a future in which they can deliver focused alerts to customers — giving them a clear understanding of their energy usage, how different behaviors impact their monthly bill and insights on how to save energy.

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# Recommendations for Other LPCs

Harriman Utility Board believes implementing AMI technology is an essential first step toward modernizing their service. Other LPCs seeking to garner support for AMI or a similar project should:

## Communicate Consistently

As you begin engaging with your city council or other entities about the project, ensure your messaging is clear and consistent. HUB continued to update the Harriman city council after receiving approval to borrow funds for the project, which has helped build trust.

## Build Trust

Years ago, HUB had promised to reduce costs by implementing “drive-by meter reading.” However, manual readings continued (likely due to budget constraints), resulting in no reduction in staffing levels. HUB worked to address this concern and build rapport with the city council. LPCs should prioritize trust-building, especially during the early stages of discussions.

## Employ Evidence-Based Messaging

Base all communication on solid evidence and facts. Highlight the proven benefits of AMI systems, such as increased accuracy, reduced operational costs and improved customer service.

## Emphasize Cost Reduction

Present the expected cost of the project transparently and accurately while also emphasizing how the operational efficiencies resulting from the project will reduce costs.



**“The AMI project is our largest effort to date toward modernization... Once completed, our customers and customer service representatives will have access to data they’ve never seen before. We will use this data to become a smarter utility.”**

CANDACE VANNASDALE, HUB GENERAL MANAGER

### LEARN MORE

The Regional Grid Transformation (RGT) initiative is a collaboration between local power companies and TVA to transform the power grid into a more resilient, flexible and integrated system to meet customer expectations and changing world conditions.

Visit [tva.com](http://tva.com) for details.



TENNESSEE  
VALLEY  
AUTHORITY