



Extracting Untapped Value From Your AMI System

By Jeff Buxton and Kevin Cornish | Black & Veatch Management Consulting, LLC

Recognizing the benefits afforded by advanced metering infrastructure (AMI) technology and the data it generates, electric utilities have been increasingly implementing AMI systems throughout the grid as they work to transform and enhance utility operations and customer service. But as the pace of AMI innovation accelerates, utilities are faced with new challenges regarding how to expand their ability to leverage new AMI investments.

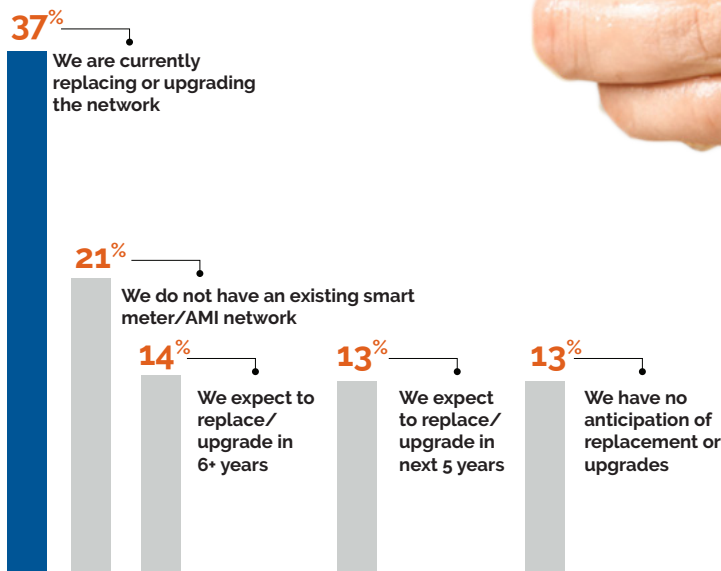
Historically, utilities would install a new AMR or early generation AMI system, operate it for 15 years, and then replace it in a wholesale manner. But today, we're seeing some utilities replace this approach with a "continuous investment" paradigm. As a result, wholesale replacement is no longer the only path to consider and often may not be the appropriate strategy to employ.

Squeezing the Lemon

Extracting Full Value from Your AMI

According to Black & Veatch's 2019 *Strategic Directions: Electric Report* survey, which polled nearly 900 qualified stakeholders in the North American power utility industry, 79 percent of respondents currently rely on an AMI system. According to that 79 percent, here are the findings.

Do you have an existing smart meter/AMI network? If so, when do you think upgrades or replacement of the network will be necessary due to end of life or equipment obsolescence?



Experience has shown us that early investments in AMI technologies often focus on achieving the most obvious benefits – the low-hanging fruit if you will – typically including the easily accessible operational opportunities. As a result, those benefits that require deeper process change, more complex analytics, work automation or extended leverage of granular AMI data are often left on the drawing board. Furthermore, extending opportunities to provide customers or societal benefits were often secondary on the list of priorities.

As regulatory pressure mounts for utilities to demonstrate the benefits expected from AMI systems, and the potential for functional obsolescence becomes an increasing consideration for investment priorities, utilities are being driven to consider the options to reinvest, vs replace. Granted, this is not a simple decision and is often based on the current state of the underlying technology, the depth of integration in place, the amount of change management already accomplished, and the potential impact of stranded assets.

Utilities should answer four key questions to help ensure that they are extracting all possible value from their AMI systems:

- 1 Are there any originally planned **AMI investment** benefits that have gone **unfulfilled**? Why? Is this due to technological limitations, organizational change hurdles, or lack of management support?
- 2 Are there **additional functional capabilities** that you have not leveraged yet, or enhancements that you have not implemented yet, from your AMI solution?
 - Is there system functionality that is not being used, such as alerts and alarms (e.g., voltage drops, temperature thresholds, tamper/theft); outage and restoration reporting or nested outage detection; and customer program support?
 - Are you using the latest capabilities from your AMI Technology? Have you reviewed what is available from system upgrades?
- 3 Are you **leveraging your AMI system** to incorporate new business opportunities and technologies, e.g., demand response and distributed energy resources (DER)?
- 4 Are you exposed to **functional or technological obsolescence** of your current AMI system?


The Reality Of Typical AMI System Deployments

In typical AMI system deployments, the project team is primarily focused on meeting the capital spending plan for the installation of network and metering devices. As the project deployment team focuses on successfully deploying the technology, achieving benefits through operational improvement, business processes or organizational change can sometimes become a secondary consideration.

Unfortunately, this laser focus on deployment may lead to certain capabilities being deferred, partially fulfilled or completely moved out of scope to meet the deployment schedule. As a result, the business operationalization of the originally planned opportunities is only partially realized. But that said, this situation provides for future benefit opportunities should the deferred capabilities ultimately become fully functional.

It is important to identify unfulfilled or partially fulfilled opportunities – and the incremental functional requirements needed to enable them – in this value extraction exercise.





In addition to the renewed achievement of planned benefits, AMI system owners are sometimes unaware of all the benefits that a fully utilized system may afford. AMI systems provide a plethora of data that can be amplified in value when extended deeper into utility operational, planning and engineering processes.

Typically, AMI opportunities are evaluated against ROI thresholds, where a significant portion of the projects identified are low-cost/high-return system enhancements.

It can be incredibly enlightening – and informative – to perform a thorough review of the capabilities of your current AMI system to identify additional opportunities to leverage AMI's "data mining" capabilities into more data-driven business processes. AMI optimization can help to expand existing functionality. For example, metering for distributed generation and EV charging can lead to new rate developments; summary billing can be expanded to improve labor costs and cash flow, and regular preventative maintenance can lead to improved loss allocation and proactive losses mitigation measures.

Remote Connect and Remote Disconnect (RCRD) capabilities can lead to a reduction in field orders and costs while improving safety.

This process of discovery may even unfold additional novel opportunities that are attainable through an incremental investment in network capacity, surgical endpoint replacement, head-end system upgrade or advanced analytics capabilities.

Incremental upgrades like embracing real-time customer data can lead to direct access to meter usage, helping to enhance the customer experience. Real time meter data, coupled with events/alarms/alerts can improve field maintenance efficiencies, distribution grid connectivity model improvements, and a reduction in unbilled energy. Remote Connect and Remote Disconnect (RCRD) capabilities can lead to a reduction in field orders and costs while improving safety. Lastly, an outage management system could help reduce the number of trouble calls, while improving customer communications and system reliability.

AMI optimization could even result in the ability to implement alternative technologies, such as EV charging and street light automation.

By arming themselves with a thorough understanding of the opportunities to extract more value from their existing AMI system – or by highlighting opportunities to make limited, incremental investment into the existing system – utilities will be well-positioned to evaluate their "invest vs. replace" options. Backed by this deeper understanding, a reliable investment and technology roadmap can be developed and confidently implemented.

AMI Performance Evaluation

Performing an AMI value extraction evaluation typically takes 3-4 months when thoroughly executed. The six-step evaluation process often includes:

- Strategy Workshop
- Current State Analysis of AMI, IT and Systems Architecture
- Identify and Catalog Potential Opportunities
- Benefits and Opportunity Discovery
- Key Functional Requirements Validation
- Technology Roadmap and Business Release Planning

At Black & Veatch we find most of these evaluation exercises focus on identifying and cataloging potential opportunities. To properly conduct the discovery of additional opportunities, it's important to start with a deep inventory of potential opportunities and use cases. Based on this type of inventory and benchmark use cases from other utilities, facilitated ideation sessions can be held with the various stakeholder groups to identify deeper opportunities. These sessions can yield a prioritized AMI opportunity catalog that can highlight those opportunities still available and the incremental level of effort/cost required to achieve them.

The AMI opportunity catalog provides a prioritized list of opportunities but also identifies the functional requirements necessary to enable the benefits identified. A gap analysis can then determine which opportunities cannot be satisfied by the AMI system in its current state, as well as the future requirements necessary to satisfy those opportunities.



Embracing Opportunity, Preparing for the **Future**

Experience has shown that this process always yields several new opportunities available via deeper utilization of what already exists or through small, incremental investments that can yield high returns. That said, some of the opportunities identified will be too high cost or require a nearly complete replacement of the existing system. These are still important as they provide the underlying basis for any future justification of a system replacement decision.

Looking beyond the traditional wholesale replacement mentality and considering a continuous investment strategy can extend the life of your current AMI system and provide important technology investment options. Through this analysis, it is likely that you will find hidden value in your current system and will be presented with several low-cost/high-return projects that can quickly be converted to realize tangible business benefits.

