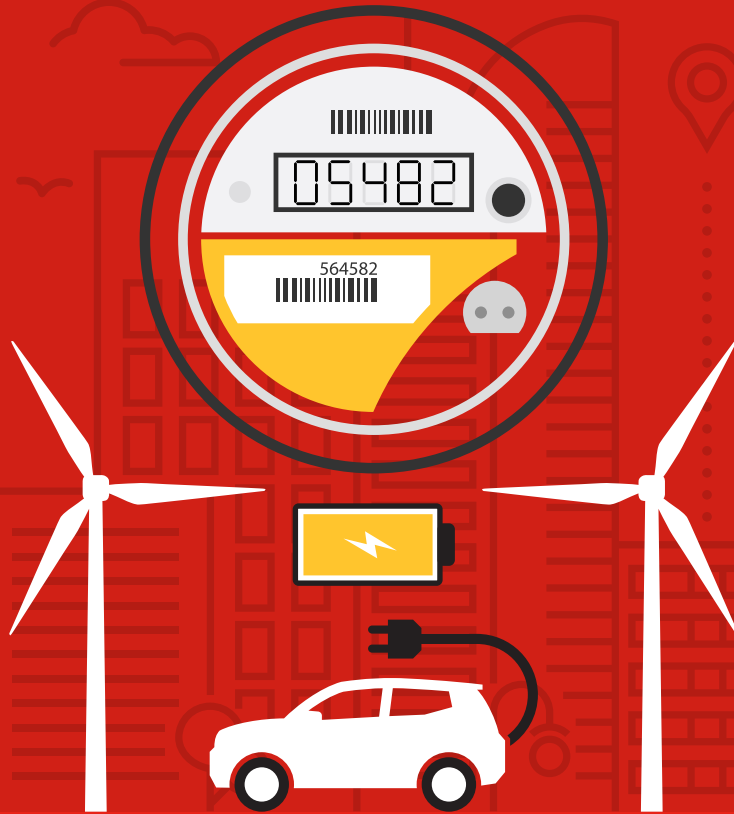


# Leveraging AMI for the Low Voltage Landscape



# *Itron*

## Setting the Stage

Multi-applications networks which include AMI capabilities have been heavily pursued by utilities over the past decade because of the ascendant power of data. As a result, utilities now have the chance to unlock opportunities with low voltage applications like never before.

AMI tools are foundational to supporting smart utilities by maintaining grid efficiency and distribution energy resource management, supporting billing processes, and enabling member service engagement programs. Utilities now have more insight into their customers' behavior and how the grid is utilized by accessing more granular data points collected with low voltage applications. Yet challenges still exist that can prevent utilities from maximizing ROI on grid modernization efforts. This will be even more critical as low voltage applications continue to be adopted across the grid.

To better understand the status of AMI applications in utilities, Zpryme surveyed more than 100 utilities across the globe. This paper explores:

- **Best practices for leveraging multi-purpose networks that support AMI to manage low voltage applications**
- **Plans for managing grid-edge devices as they are deployed at scale**
- **Ways in which utilities are prioritizing grid management use cases**
- **Challenges utilities face in capturing the full value of AMI data**

## KEY FINDINGS

- 60% of utilities are currently using or will use AMI data for low-voltage (LV) management
- Technology sourcing and vetting, along with data and security management, were top challenges for LV management
- 43% of utilities' current AMI strategies are very ready to extremely ready to support and scale smart utility applications in the next five years



# Low Voltage Management

The adoption of distributed energy resources (DERs) and number of devices being added makes for bi-directional management solutions for utilities to more accurately measure and balance the grid. Low voltage (LV) management solutions can help bridge the gap between existing meter infrastructure and new applications to stabilize and ensure improved power quality.

More than half of utilities are either already implementing or plan to leverage AMI data for LV management applications (60%). (Fig. 1). 40%, however, have no plans to implement in the near future. One reason could be that the utilities are too early in their journey of implementing more traditional AMI capabilities into their organizations and are not yet ready to take them further.

## Top Drivers & Services for LV Management

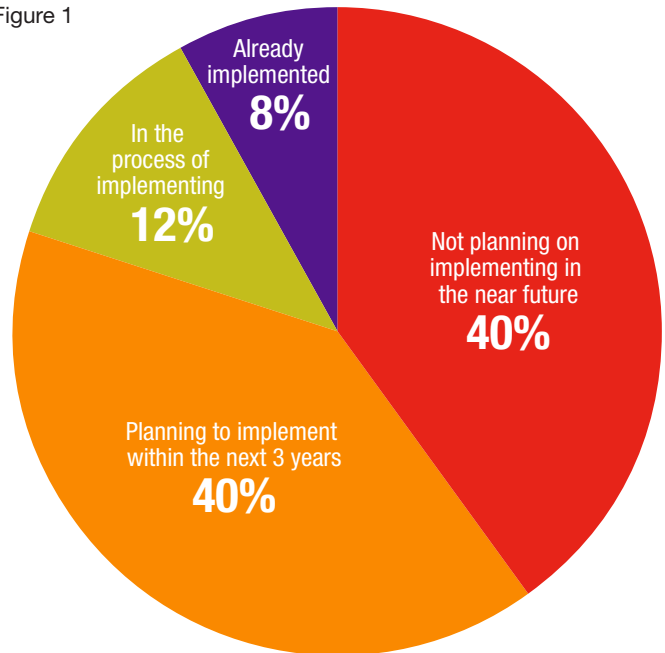
Customer relationships are changing as more renewables are added onto the grid, shifting the nature of engagement with utilities and raising expectations across the board. Customers also demand a greater variety of programs and services from their utilities. Nearly three quarters of utilities said that maintaining service quality for end-customers was one of the main drivers for adopting LV management applications. (Fig. 2) Yet, only 26% of respondents said that driving down customer costs was a priority.

As low-voltage networks expand, the need to accurately monitor and track what is happening at the grid edge becomes more critical for utilities. Because of this, real-time visibility of LV network operations (51%), tracking consumption pattern changes (44%), and the connection assessment of new loads (37%) are other top drivers for utilities (Fig. 2).

Power quality issues, particularly backfeed, can be incredibly dangerous for field crews to manage and can result in serious injury or even death. Being able to more accurately monitor the backfeed from renewables and other DERs allows for field crews to be more informed and safe while on the job.

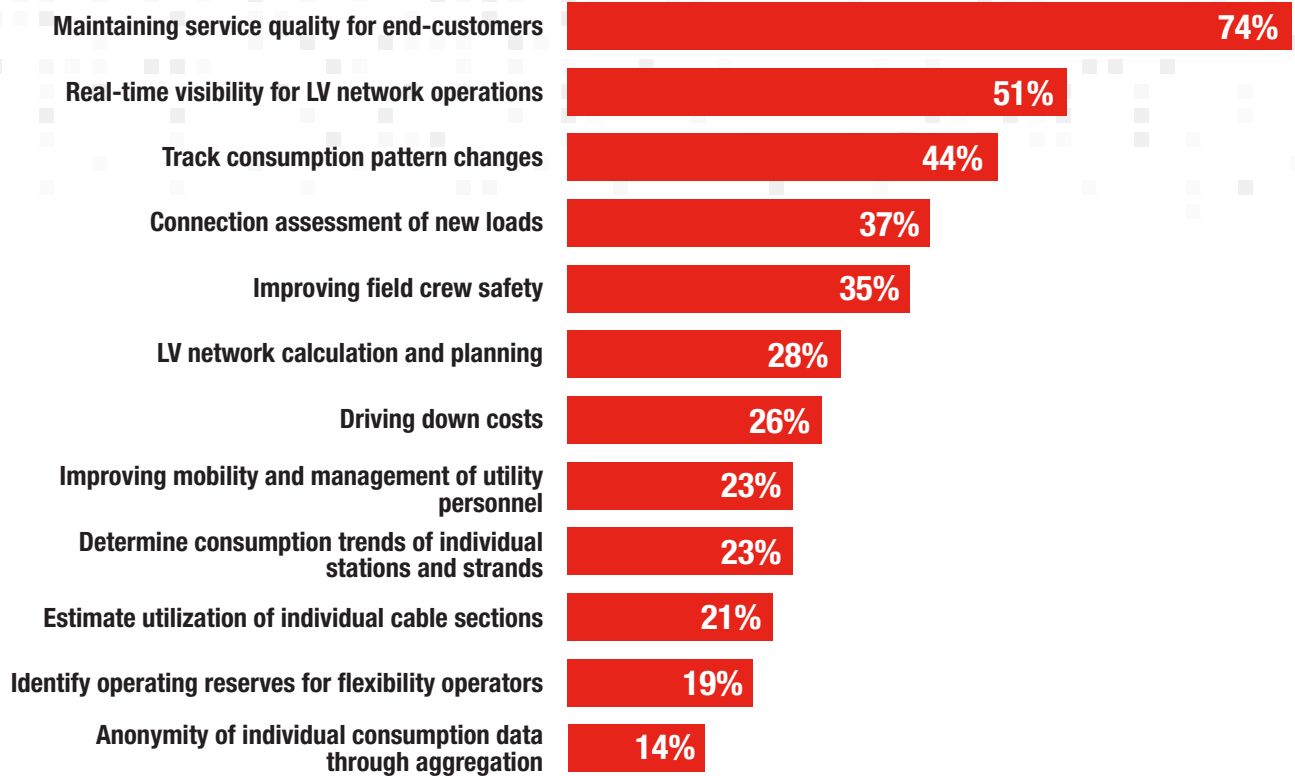
## Does your utility plan on leveraging AMI data for low voltage (LV) management applications in the future?

Figure 1



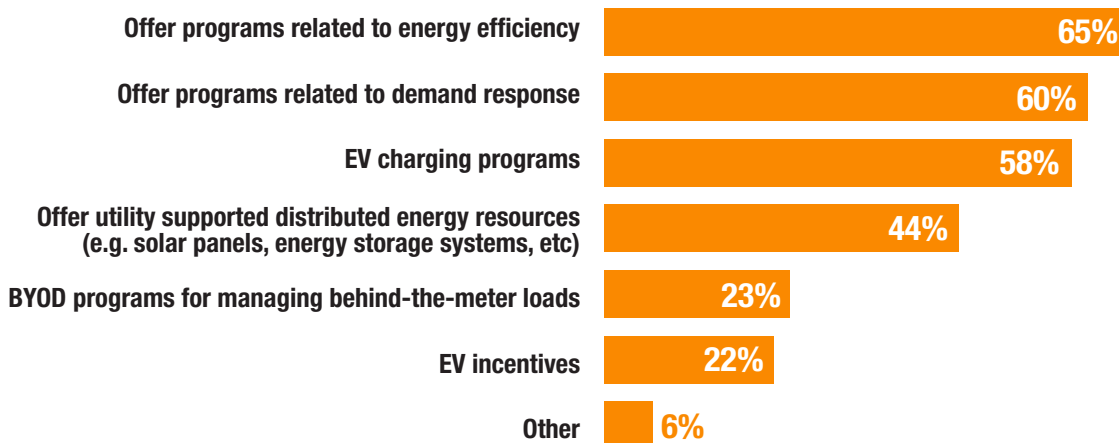
## What are the top drivers for implementing LV management application for your utility?

Figure 2



## Which services are you planning to offer to consumers as grid-edge energy management technologies?

Figure 3



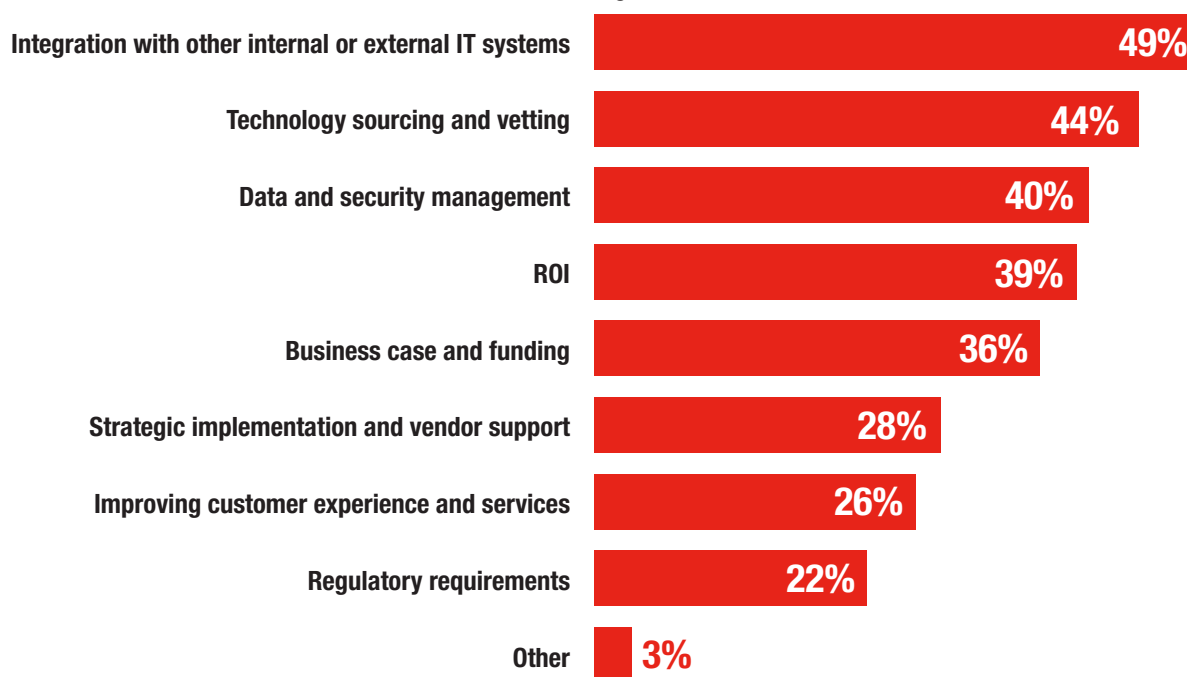
Energy efficiency programs are top of mind when utilities are looking at offering grid-management programs at scale (65%), closely followed by demand response programs (60%), and EV charging programs (58%). Interestingly, too, some utilities are looking to offer EV purchase incentives as well (21%). (Fig. 3).

### Challenges to Implementing LV Applications

While 44% of respondents were interested in offering utility supported DERs (e.g., solar panels, energy storage systems, etc.), the likelihood that the majority of utilities can take advantage of such programs is really dependent upon regulatory compliance and structure of the utility (Fig. 4). Similarly, some utilities also have BYOD programs in mind for managing behind-the-meter loads (23%).

## What are the top challenges your utility faces as it implements LV management applications?

Figure 4



Beyond integration challenges, technology sourcing and vetting (44%), in addition to data and security management (40%) were the top challenges when implementing LV management solutions. Finding experienced vendors to assist utilities in implementing LV management solutions is key to overcoming these challenges. Unified solutions that can leverage multiple data sources exist, and having managed security services can help utilities mitigate risk and increase security.

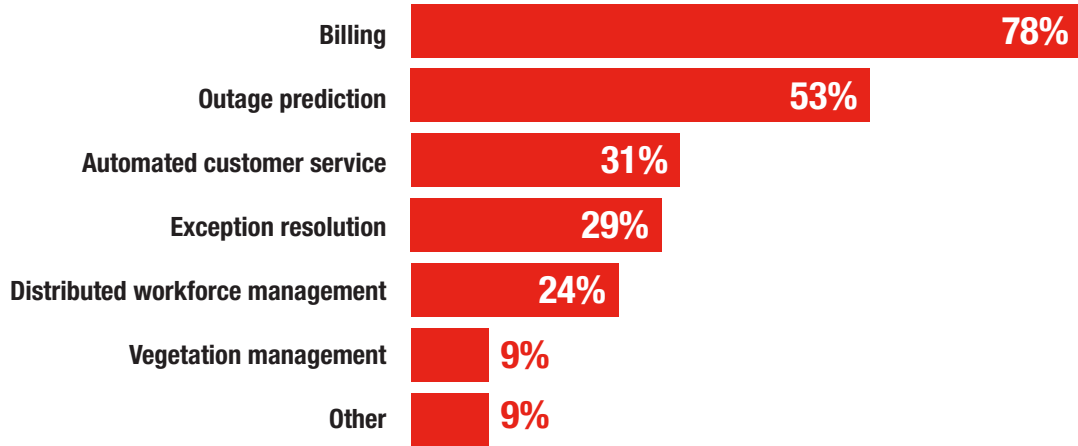
But none of that matters if the ROI and business cases aren't clear. Investing in technologies is an important role for the utility of the future, but identifying a clear strategy for how to implement and then scale the applications for overall ROI relies on a solid business case. Further, connecting with trusted partners that offer access to a broad ecosystem of application providers and systems integrators can help steer utilities away from known ROI traps while maximizing their opportunities.

# AMI Snapshot

Grid modernization, coupled with decarbonization and the addition of distributed energy resources, has completely changed how the grid is managed. Utilities need access to real-time quality data to better understand how to balance the grid and to better serve their customers. By implementing AMI tools across the organization, utilities can tap into those data streams and create additional value for both their customers and the utility.

## Does your utility use AMI tools for the following purposes?

Figure 5



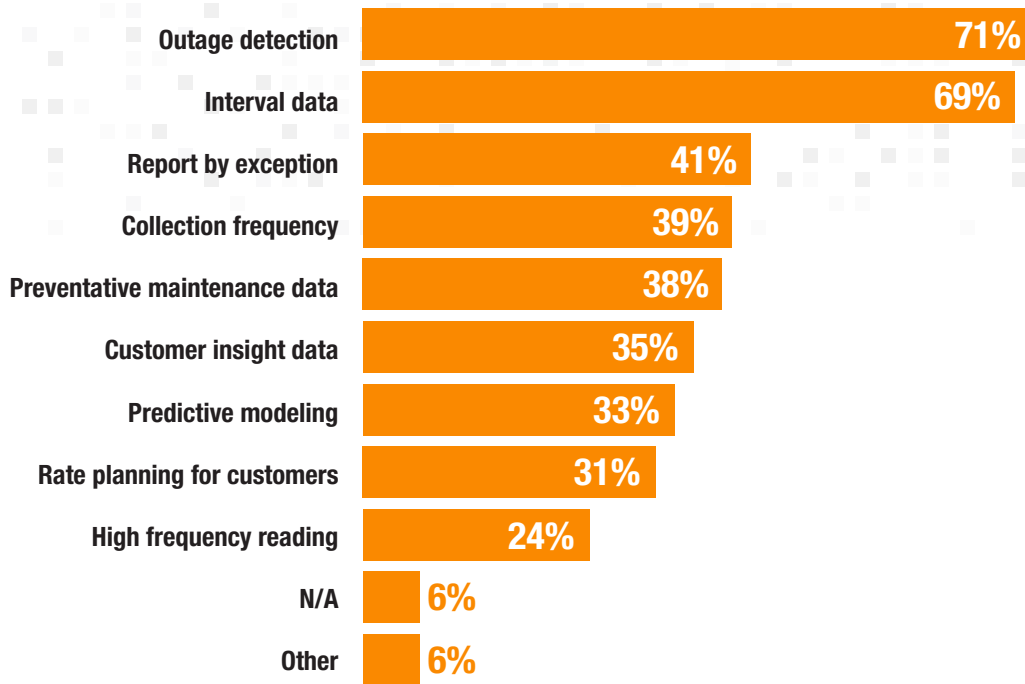
By and large, we found that utilities use AMI data for billing purposes and outage prediction (78% and 53% respectively, Fig. 5). Behind-the-meter capabilities tap into customer behavior data, as well as provide more accurate usage data so that utilities can avoid billing errors and improve customer satisfaction. From a grid management perspective, outage prediction modeling is crucial to reducing downtime during outages and can assist with predictive maintenance of equipment, too.

Building towards a more customer-centric utility, AMI data can also be leveraged for automated customer service (31%) and exception resolution (29%). Automated customer service benefits include notifications about high usage, as well as access to a self-service customer portal. Exception resolution tools are incredibly helpful in addressing customer experience and expectations, too. **Despite benefits, less than half of respondents are utilizing their data in this way. Managing exceptions can be hard to track, time consuming, and may result in unnecessary disconnections for customers.** By leveraging AMI data, utilities can help reduce exceptions and resolve them more efficiently and improve overall customer experience.



## Which capabilities are you using to get the most out of your AMI meter data?

Figure 6



In operations, the top two capabilities that utilities are using AMI tools for is outage detection and interval data (71% and 69% respectively), followed by preventative maintenance (38%). (Figure 6). Which isn't surprising as leveraging AMI for grid management isn't a new concept and its value is clearly recognized. This shows that leveraging AMI data for grid operational purposes has become equally important with billing functions in today's modern grids.

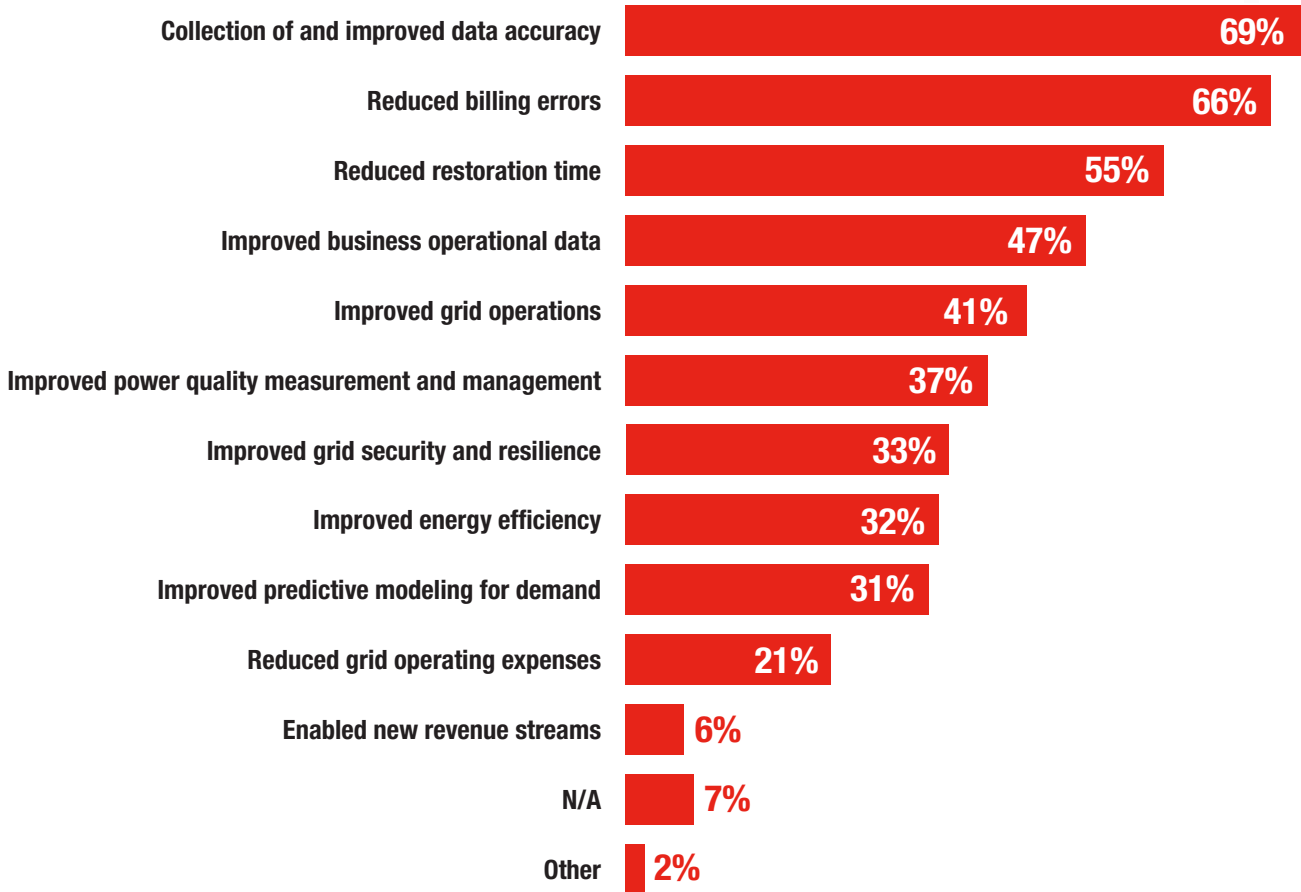
In customer service, reports by exception lead the way, followed by collection frequency data (41% and 39% respectively). More than a third of utilities are leveraging AMI tools for accessing customer insight data, as well as rate planning for customers (31%).



The collection of and improved data accuracy (69%) and reduced billing errors (66%) were the top two benefits when leveraging AMI data (Fig. 7), supporting data from Figure 5. More than half of utilities said reduced restoration times (55%) was another key benefit to leveraging AMI tools across the utility. By accessing real-time data leading up to and during outages, utilities can decrease the amount of time their grid is down and better maintain services for customers.

### What are the top benefits your utility has noticed from leveraging AMI data?

Figure 7



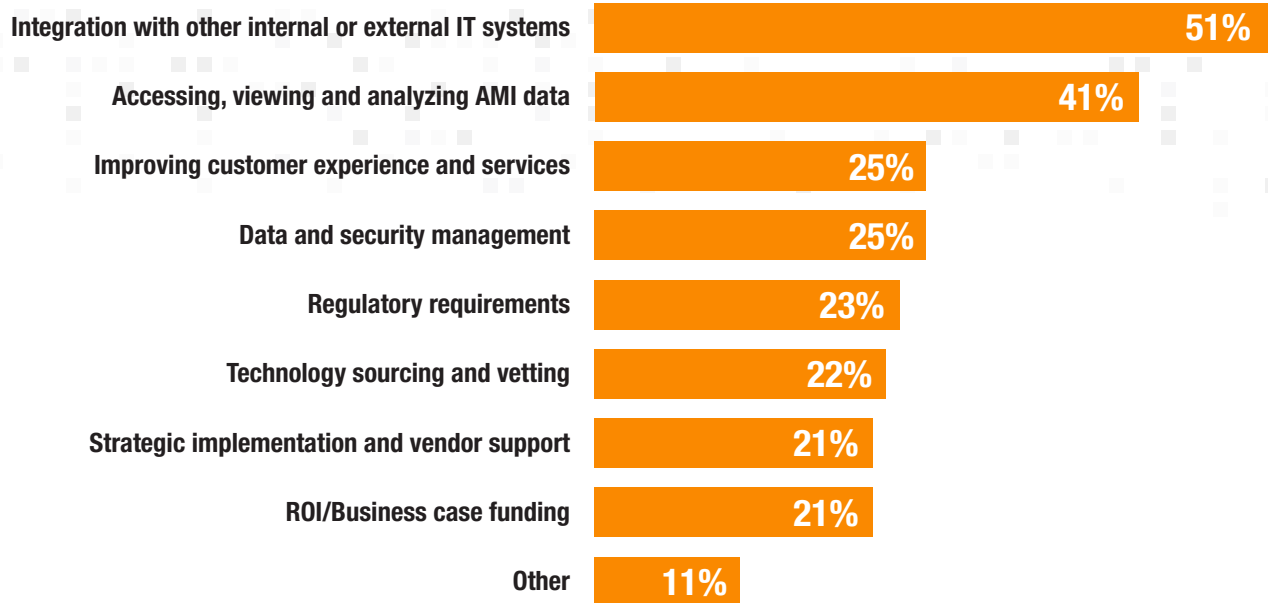
Interestingly, however, 37% of respondents indicated that they saw improved power quality measurement and management. This becomes increasingly important as distributed energy resources are added onto the grid and backfeed occurs.





## Which areas have been the most challenging for your utility when leveraging AMI data?

Figure 8



### AMI Data Challenges

Unsurprisingly utilities said that integrating with other internal or external IT systems was the biggest challenge (51%). However, accessing, viewing, and analyzing AMI data was second (41%). (Fig. 8).

Nearly a quarter of utilities responded that both improving customer experience and services and data and security management ranked within the top four challenges they face.

Regulatory requirements remain a challenge for utilities wanting to implement/leverage AMI data and solutions (23%). The need to consistently and securely gather and report data, particularly customer data, continues to be a stumbling block in the way of adopting AMI for some utilities.

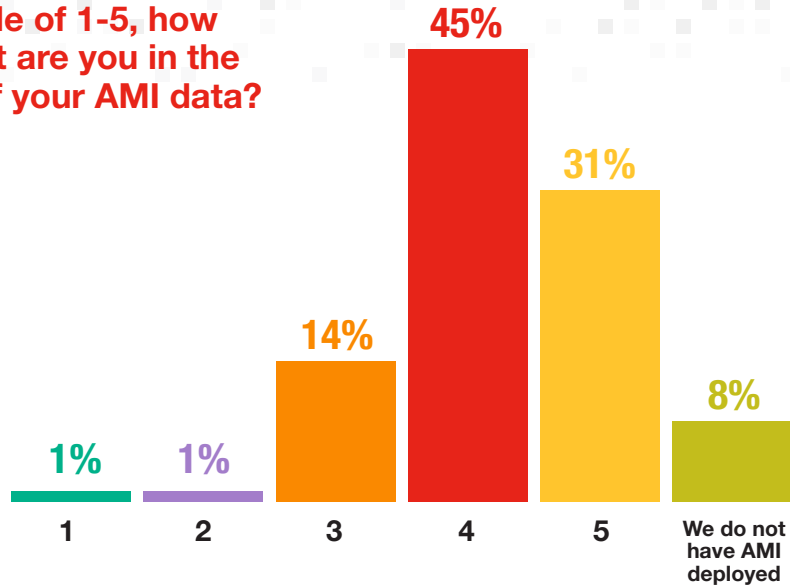
Interestingly, the other challenges were mostly equally distributed across the responses, including technology sourcing and vetting and strategic implementation and vendor support (22% and 21% respectively).



Despite the challenges associated with implementing and scaling AMI solutions, utilities are largely confident in the quality of data they provide (76%). (Fig. 9). This doesn't speak to whether or not they are ultimately satisfied with the level of accessibility or interoperability of data streams once various AMI tools are deployed. The need for cross-functional solutions that tap into a variety of data streams easily is critical for a utility's success with AMI.

**On a scale of 1-5, how confident are you in the quality of your AMI data?**

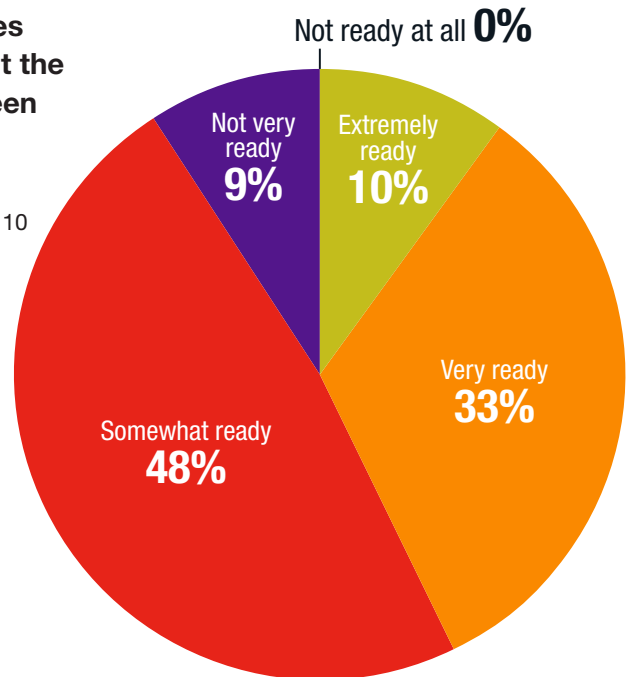
Figure 9



When asked if their current strategy was ready to support AMI integrations at scale within the next five years, more than half are somewhat or not very ready at all. (Fig. 10). **Despite the recognition that AMI is beneficial to customer and operational initiatives and the adoption of AMI into utilities throughout the industry, there seems to be a disconnect between adoption and true integration.**

**How ready is your current AMI strategy to support and scale the integration of future smart utility applications and services in the next 5 years?**

Figure 10

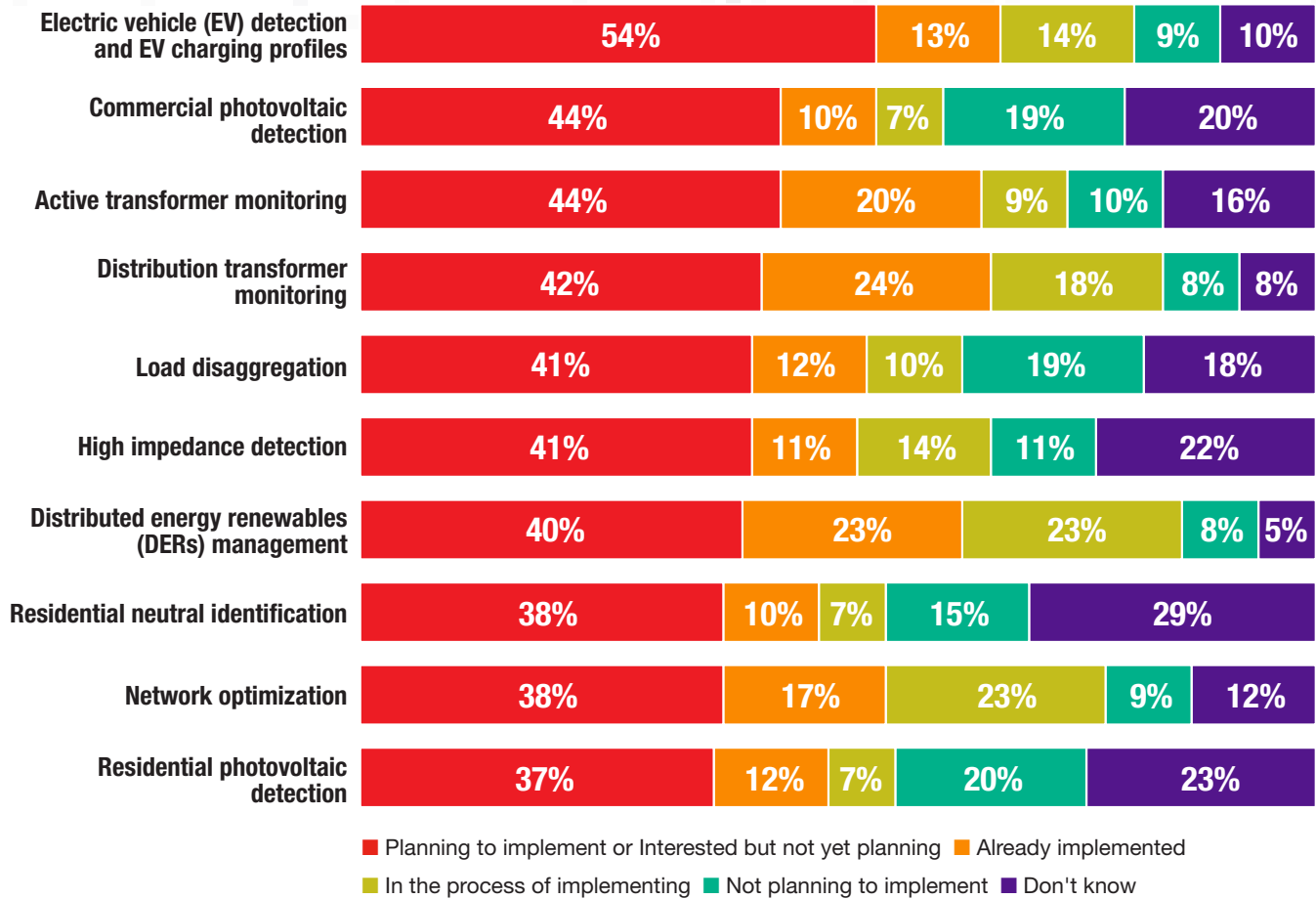


# What Applications Are Utilities Implementing Next?

Utilities have a variety of interests and plan on investing in both commercial and residential applications over the next few years.

## Plans for implementation in the next three years

Figure 11



The top three implementations utilities are looking at over the next three years are Electric Vehicle (EV) Detection and EV Charging Profiles (54%), along with Commercial Photovoltaic Detection and Active Transformer Load Management (44%, respectively). (Fig. 11). Distribution Transformer Monitoring is also highly relevant to utilities; while 42% plan to implement in the next three years, 42% of respondents have either already implemented or are currently in the process of implementing.

Interestingly, for Distributed Energy Renewables (DERs) Management, 40% of utilities are planning to implement and 46% of respondents have already implemented or are in the process of implementing. An indication that renewables are here to stay and that utilities are actively preparing for their integrations.

Residential Photovoltaic Detection, however, seems to offer the most uncertainty, 23% of utilities aren't sure if they will implement in the near future and 20% of utilities have no plans to implement and aren't interested in doing so.

# Conclusion

Billing, analytics, and process automation are at the forefront of AMI data application for utilities, though improved customer service is also becoming a priority. More than half of respondents have implemented or are planning to implement low voltage applications and are finding opportunities for real-time data in that space, such as EV charging programs at scale. Utilities are seeing traction in maintaining service quality for end-customers and the added visibility at the grid edge by leveraging LV solutions. Despite the benefits, the challenges present can affect cost-benefit analyses and make utility executives hesitant, which is likely why other ambitious ideas are being investigated and implemented at lower rates for the time being.

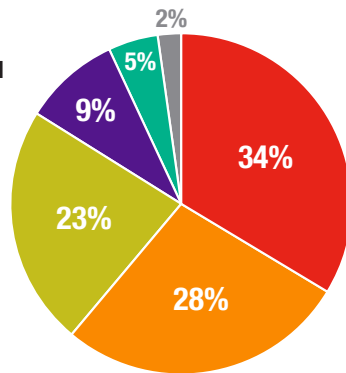
## Learn More

[How to Enable Low-Voltage Distribution Automation](#)  
[Leveraging Distributed Intelligence for Edge Analytics](#)

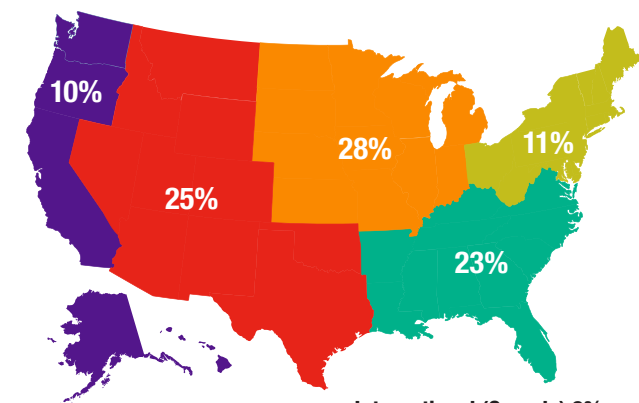
# Demographics

### Utility Type

- Investor-owned
- Municipal
- Cooperative
- Public-owned
- District/federal
- Other

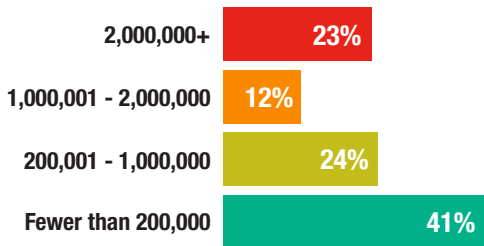


### Region



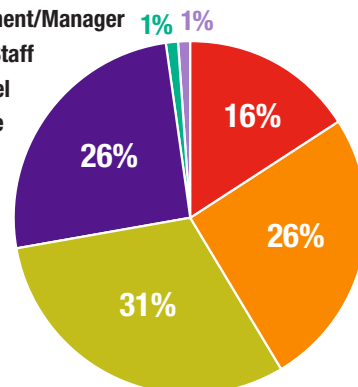
International (Canada) 9%  
 International (other) 8%

### Utility Size by Customer Accounts



### Job Responsibility

- Executive/C-level
- Senior Management/Director
- Mid-Management/Manager
- Professional Staff
- Field Personnel
- Administrative



### Primary Role

- Metering/AMI
- Distribution Operations
- Distribution Planning
- IT
- Customer operations
- Executive
- Finance
- Other

