Capitalizing on the digital revolution

How distribution utilities are leveraging new technologies to create business opportunity.

We surveyed 150 distribution utilities; most believed they understood how to leverage new technologies for an enterprise-wide view of asset health and maintenance, yet only about 35% felt prepared to do so.
How do you compare? What can you do to be ready?

A Zpryme research report.

Digital technology is driving change across every industry.

From the way we purchase groceries to how we are entertained, the digital transformation is in full force across all industries.

While we see the advantages so clearly in the consumer world, what about the commercial world?

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The question we posed to distribution utilities across the globe:

As digitalization takes hold within asset-intensive organizations, what do they see as the best way to leverage available technology to create new opportunities and transform business models?

What we heard is that **connected asset lifecycle management, or CALM, is steadily gaining interest and is taking a lead role in the digitalization efforts of utilities**. CALM is an approach that integrates enterprise asset management (EAM) with workforce management (WFM) and asset performance management (APM) systems to enable comprehensive, efficient management of assets, asset health and maintenance across the organization.

APM
Asset Performance Management

Connected asset lifecycle management

WFM
Workforce Management

EAM
Enterprise Asset Management
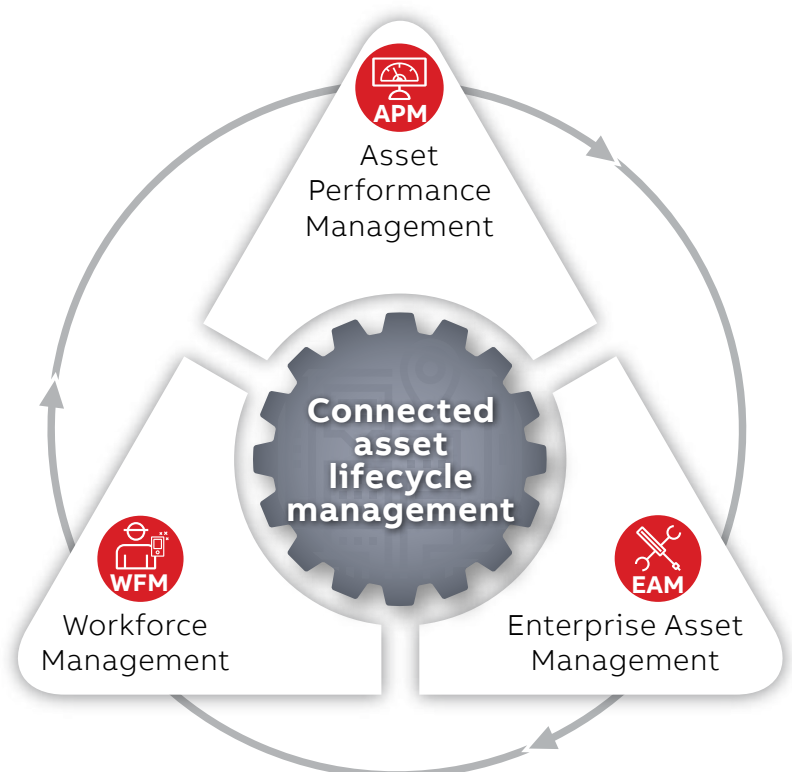
Key research findings.

To learn more about the significance of the growing interest in CALM, **Zpryme surveyed more than 150 respondents** who work for distribution utilities.

Zpryme's survey sought to better understand:

- CALM and its role in the digitalization of distribution utilities
- How well distribution utilities understand CALM and its potential uses
- The evolution of software and services in asset management
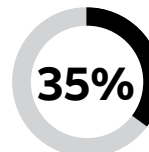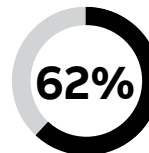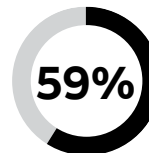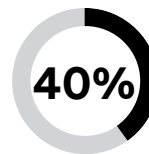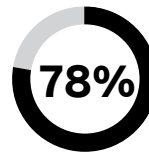
Key research findings include:

An overwhelming 78% of distribution utilities **expect CALM to increase in importance** for asset health and maintenance in the next 3 to 5 years.

78%

The **ability to integrate with other systems** (e.g., ERP, CRM) out of the box is the most important solution capability for organizations evaluating potential CALM applications (40%).

40%

Respondents report the **Internet of Things** (59%) and **Cloud technologies** (62%) are very important technologies for their organization's asset management efforts.

59%   **62%**

Only about one third of organizations (35%) **feel prepared** to take on an enterprise-wide view of asset health and maintenance.

Most organizations realize they need to step up their planning efforts.

35%

Respondent demographics.

Headquarters location

Europe 5%
Asia Pacific 8%
Latin America 10%
North America 77%

Annual revenue

US$500M to US$1B 15%
Less than US$1B 33%
More than US$1B 25%
US$100M to US$500M 26%
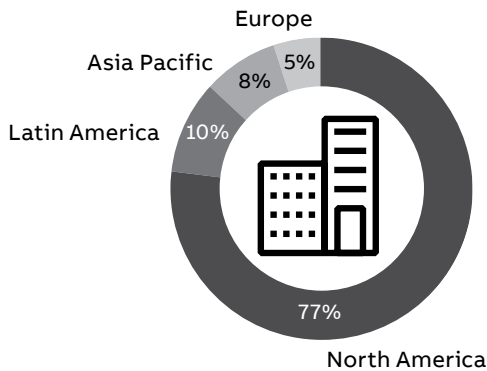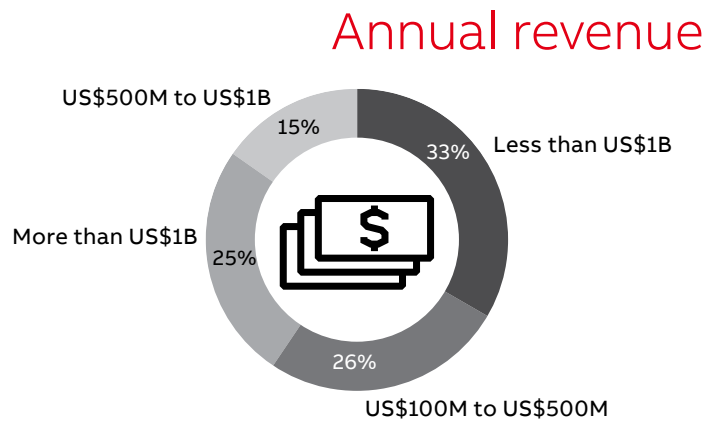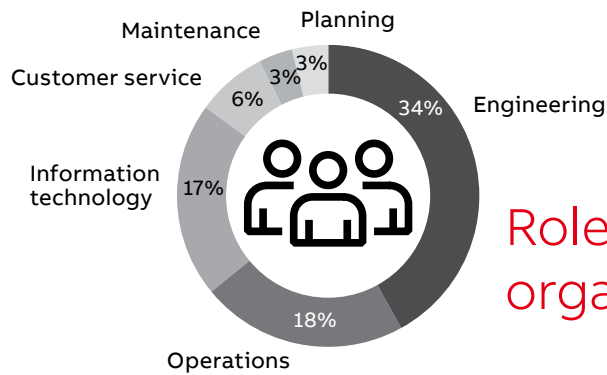
Role within organization

Planning 3%
Maintenance 3%
Customer service 6%
Information technology 17%
Engineering 34%
Operations 18%

Job responsibility

Administrative 8%
Executive 10%
Director 14%
Manager 35%
Professional staff 30%
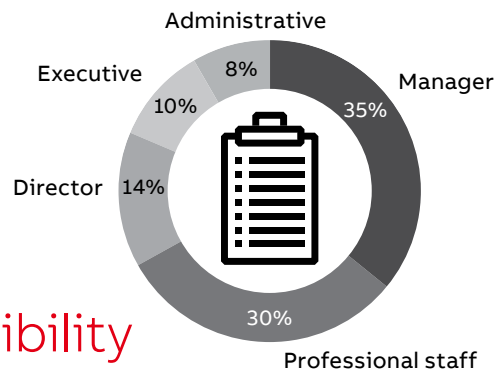
CALM is the way to carry on
for distribution utilities.

The digitalization of distribution networks is introducing an increasingly connected network of smart assets for the energy industry. This increasingly digital world, with more sensors, more data and more analytical capability, is bringing distribution utilities into a new era of asset management: one of incredible connection and automation.

But how do distribution utilities best harness these new opportunities? How can they best integrate their asset management efforts, while building stronger visibility and better communication across the enterprise?

Connected asset lifecycle management (CALM) integrates enterprise asset management (EAM), workforce management (WFM) and asset performance management (APM) systems to provide a unified view of assets, their health, and the work associated with them. CALM is the next step for distribution utilities to maximize the benefits of digitalization.

Many distribution utilities see CALM as a significant opportunity in the digitalization of energy. More than 85% of respondents agree that CALM is an important trend for the industry overall, and 75% agree that CALM will have a significant impact on their organizations (Figure 1).

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Figure 1
Agreement on CALM.

CALM is an important trend for the utility industry overall **86%**

CALM will have a significant impact on our organization **75%**

0   20   40   60   80   100
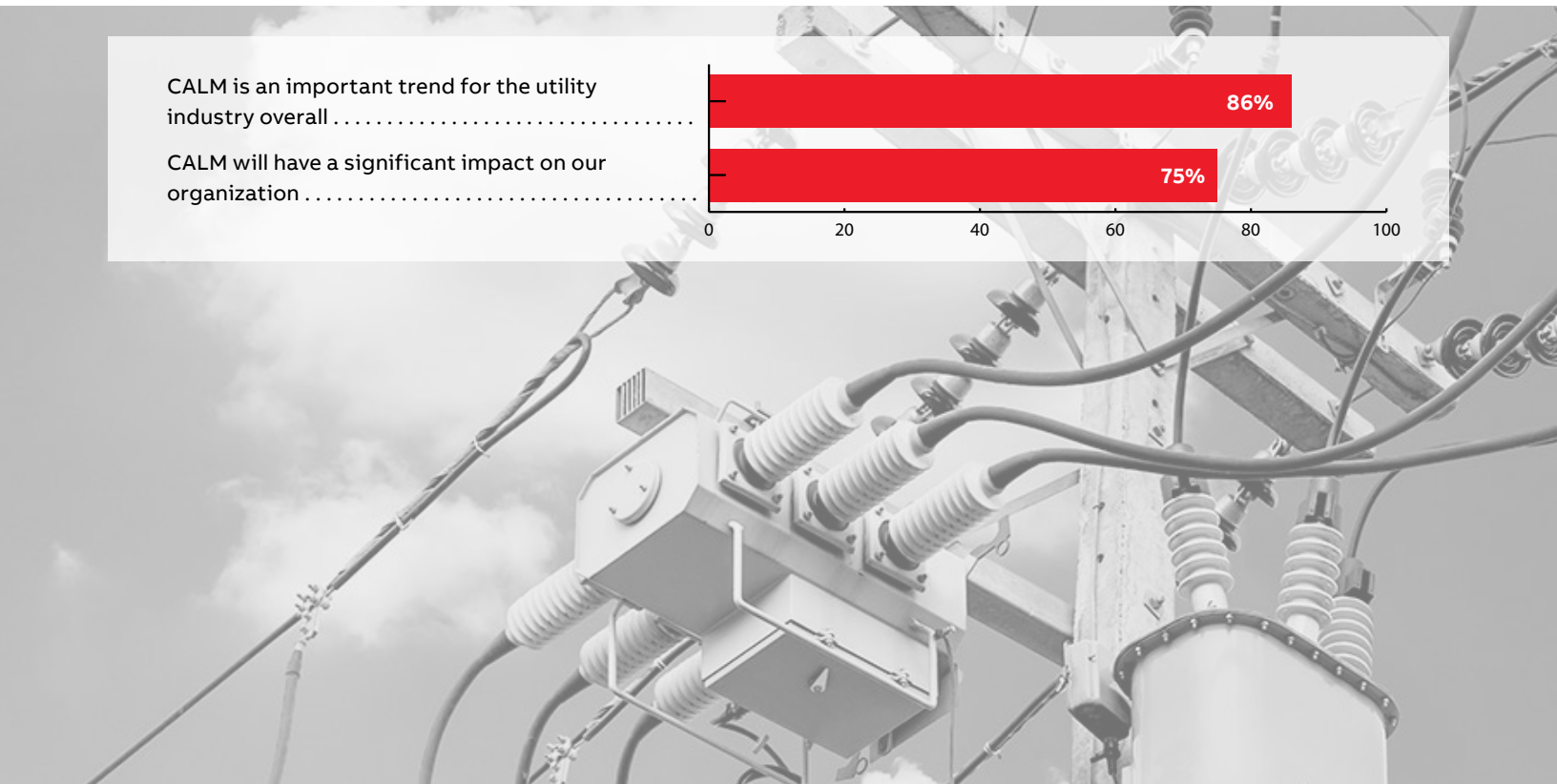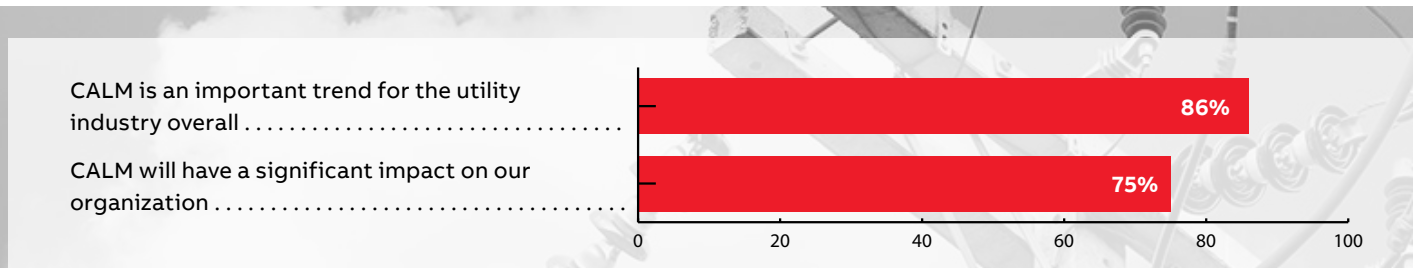
Over three-quarters of respondents expect the importance of CALM to increase in the next 3 to 5 years, with 28% expecting the importance to increase significantly (Figure 2).

Even with all the changes in digitalization and new assets on the grid, distribution utilities are turning to CALM for the same reasons they've been driven by all along: operational efficiency and reliability. When asked what they see as top CALM benefits, 61% of distribution utilities list improved operation efficiency in their top three, followed by improved system resilience and reliability (51%), and reduced unplanned outages/failures (44%) (Figure 3).

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Figure 2
CALM change in importance for asset health maintenance over the next 3 to 5 years.
Percent of respondents who selected "Somewhat agree" or "Strongly agree."

No change

It will increase somewhat

51%

22%

28%

It will increase significantly
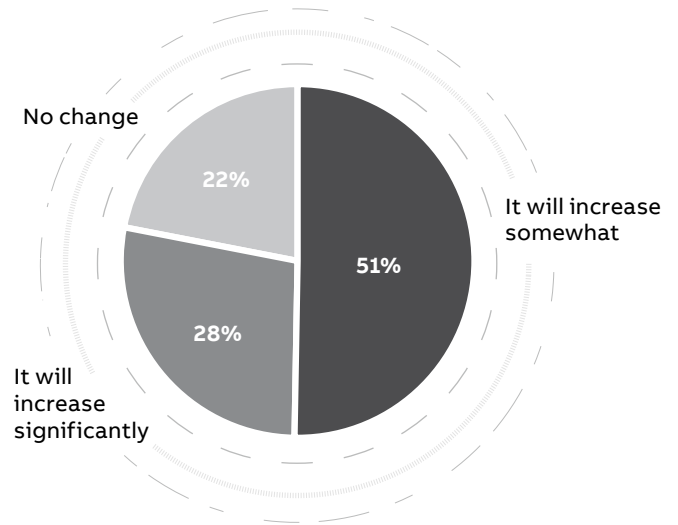
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Figure 3
Top CALM benefits.
Percent of respondents who selected an answer option as one of his/her "Top three."

Benefit	Percent
Improved operational efficiency	61%
Improved system resilience and reliability	51%
Reduce unplanned outages/failures	44%
Reduction in restoration/repair time	31%
Improved worker safety	23%
Automation of manual processes	21%
Access to/analysis of real-time information	19%
Reduce errors	12%
Capturing/sharing institutional knowledge	8%
Reduce IT costs	8%
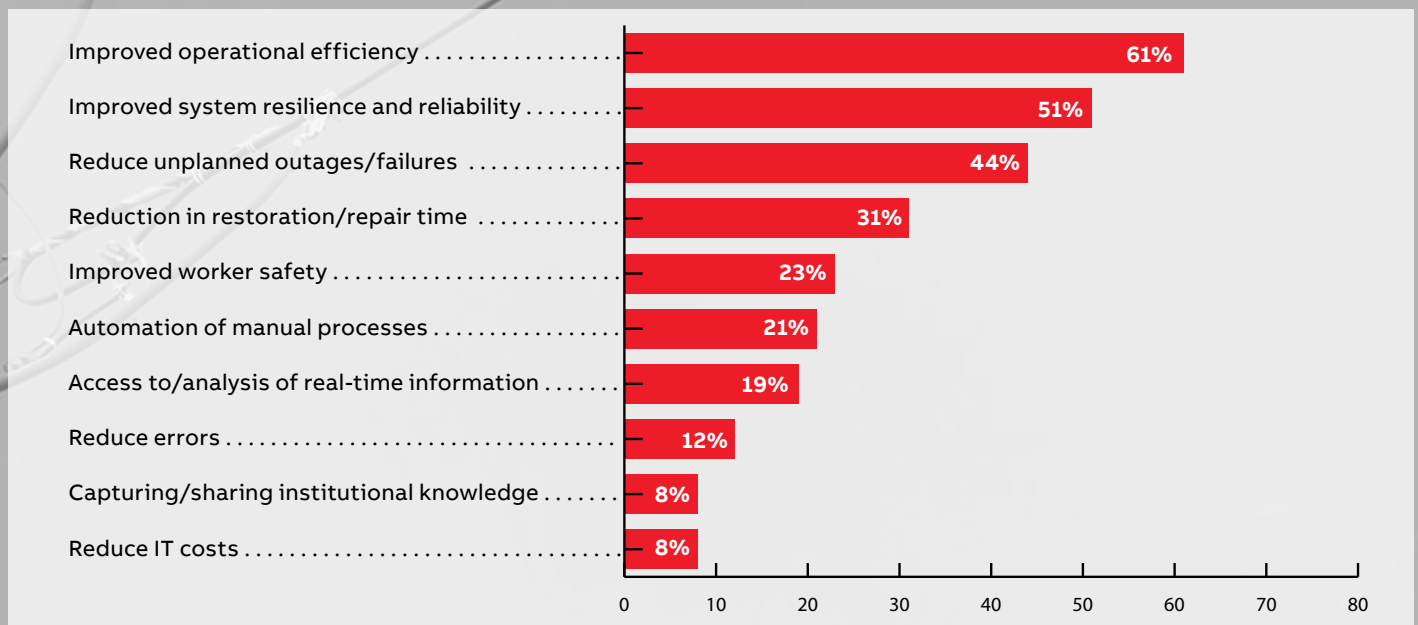
CALM considerations.

What does CALM look like within distribution utilities in terms of applications? And what matters most for applications?

Respondents are seeking opportunities to invest in key CALM applications, and many organizations are looking to replace these systems in the next few years. In fact, the top two applications for replacement in the next five years are workforce/field service management and enterprise asset management (Figure 4).

As respondents look to select and deploy new applications, most are looking to take advantage of new capabilities provided by them. Up to 63% of respondents say that the availability of new capabilities was a main factor in switching to a new EAM, WFM or APM system.

Furthermore, 40% of respondents think a key ability for these systems is integrating with one another right out of the box.
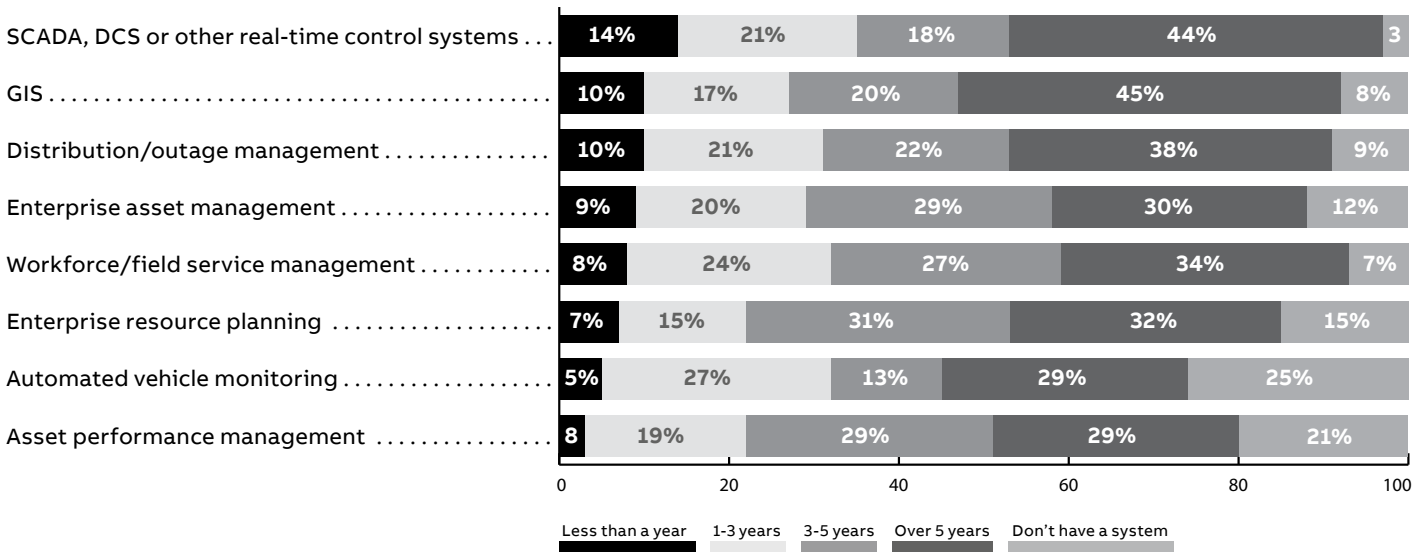
"I think at this point in time you have a lot of utilities moving at the forefront of these technologies," says a respondent. "However, you've currently got a lot of non-standardized data packages, so interoperability is crucial as utilities move to an enterprise view."

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Figure 4
Timeline to replace systems

|	Less than a year	1–3 years	3–5 years	Over 5 years	Don't have a system
SCADA, DCS or other real-time control systems	14%	21%	18%	44%	3
GIS	10%	17%	20%	45%	8%
Distribution/outage management	10%	21%	22%	38%	9%
Enterprise asset management	9%	20%	29%	30%	12%
Workforce/field service management	8%	24%	27%	34%	7%
Enterprise resource planning	7%	15%	31%	32%	15%
Automated vehicle monitoring	5%	27%	13%	29%	25%
Asset performance management	8	19%	29%	29%	21%

Building out the CALM ecosystem.

Upgrading and integrating essential CALM applications is critical, but organizations can also leverage newer technologies and resources to strengthen CALM initiatives.

The Internet of Things (IoT) and Cloud applications present the most influential opportunities. Over half of respondents believe IoT will be very important for their asset management efforts, and over 60% believe the same for Cloud technologies. Machine learning and augmented reality (AR)/wearable technologies are coming along, too, but are still in the early stages of understanding (Figure 5).

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Figure 5
Importance of technologies for asset management efforts.
Percent of respondents who selected a 4 or 5 on a scale of 1 to 5 (1 = not important and 5 = extremely important)

	Very important (4)	Extremely important (5)
Cloud technologies	39%	23%
Internet of Things	36%	23%
Machine learning	29%	15%
Wearable technologies/AR	22%	12%
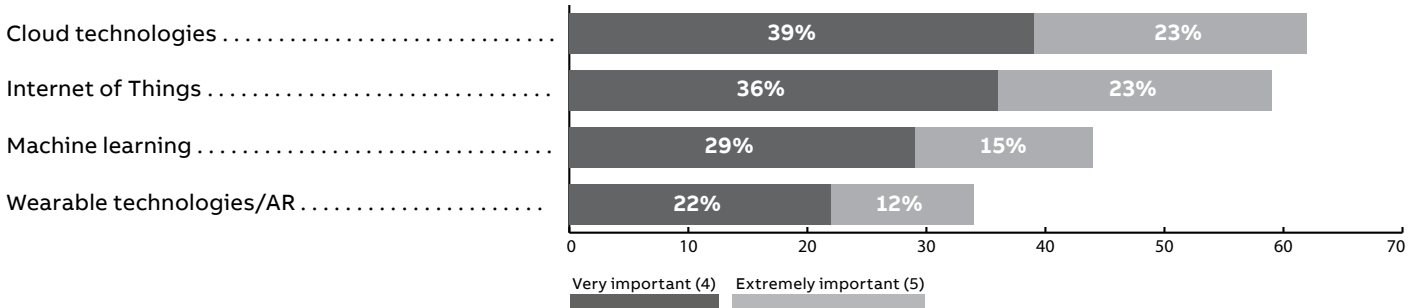
Cloud technologies are also leading the way in terms of strategies for asset management efforts. Nearly 50% of respondents have a Cloud strategy underway and another 30% are planning to put a strategy in place (Figure 6).

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Looking to the Cloud

"The truth be known, the movement is in that direction," says a respondent. "Utilities historically have been protective of their equipment. With NERC standards it's hard, but I see people moving towards the Cloud."

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Figure 6
Strategy status of technologies for asset management efforts.

	Yes	No, but planning to	No, and no plans to	Don't know
Cloud technologies	46%	30%	16%	8%
Internet of Things	26%	42%	22%	11%
Machine learning	21%	30%	32%	18%
Wearable technologies/AR	16%	22%	44%	18%
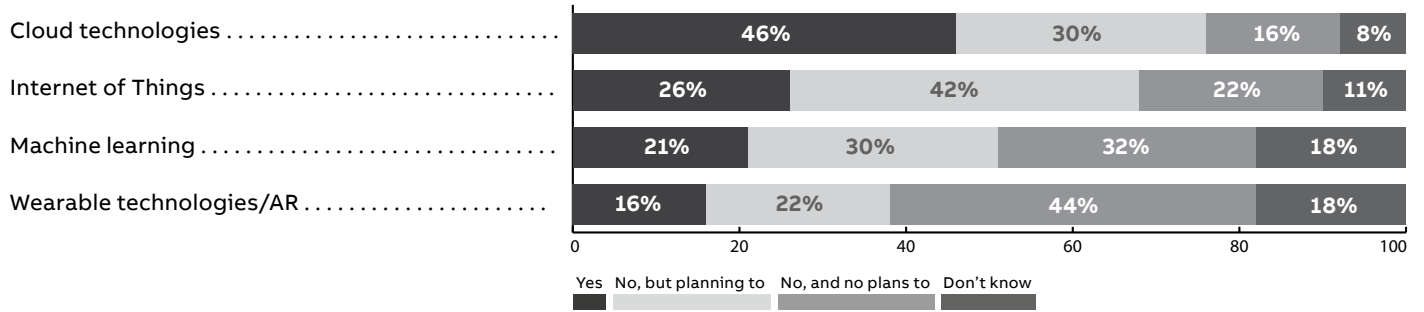
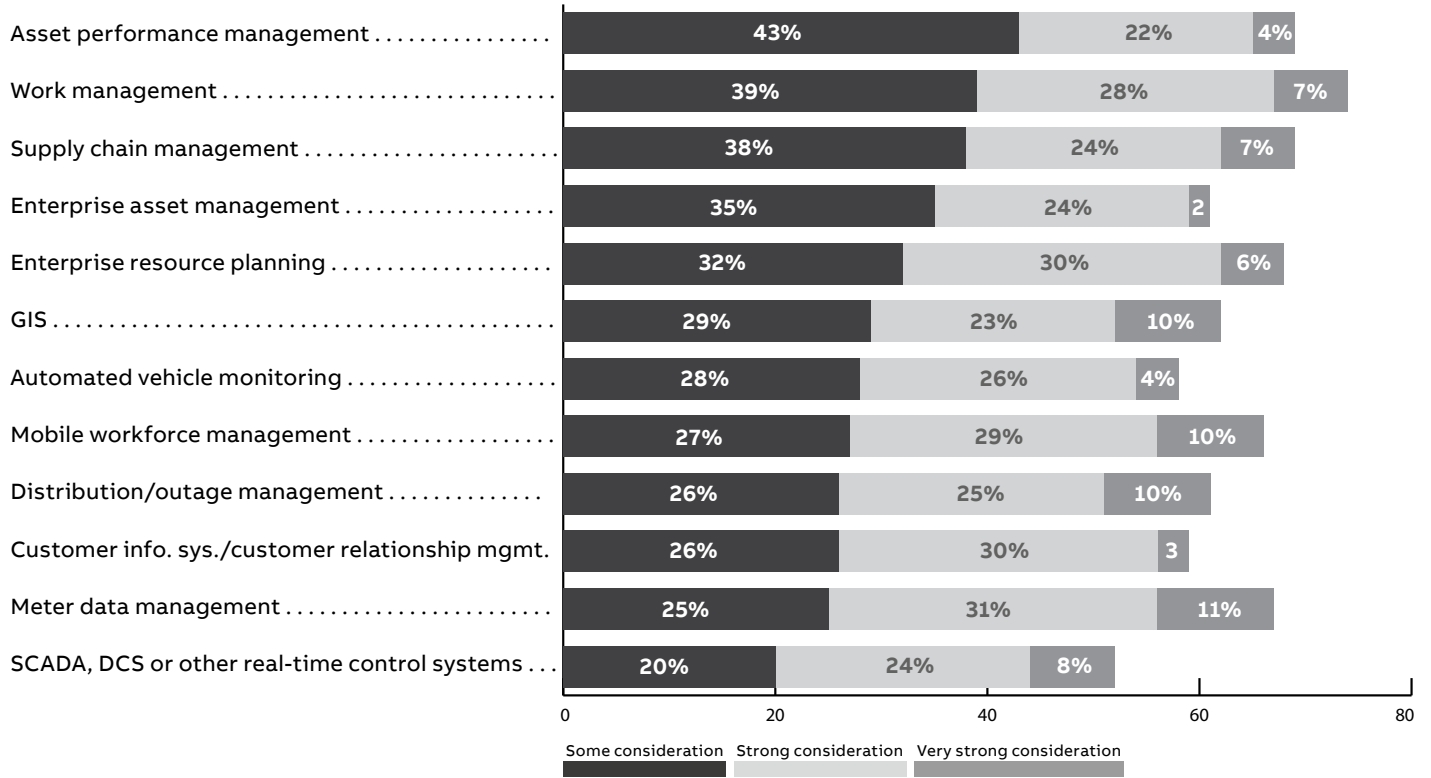The top areas for Cloud consideration (figure 7) include:

• Work management
• Supply chain management
• Asset performance management
• Meter data management

Over a quarter of respondents currently have an IoT strategy in place, and 42% are planning to put one into place in the near future. Another 50% of respondents have or are planning to put a strategy in place for machine learning (Figure 6).

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Figure 7
Consideration of cloud-based solutions for systems.

System	Some consideration	Strong consideration	Very strong consideration
Asset performance management	43%	22%	4%
Work management	39%	28%	7%
Supply chain management	38%	24%	7%
Enterprise asset management	35%	24%	2
Enterprise resource planning	32%	30%	6%
GIS	29%	23%	10%
Automated vehicle monitoring	28%	26%	4%
Mobile workforce management	27%	29%	10%
Distribution/outage management	26%	25%	10%
Customer info. sys./customer relationship mgmt.	26%	30%	3
Meter data management	25%	31%	11%
SCADA, DCS or other real-time control systems	20%	24%	8%

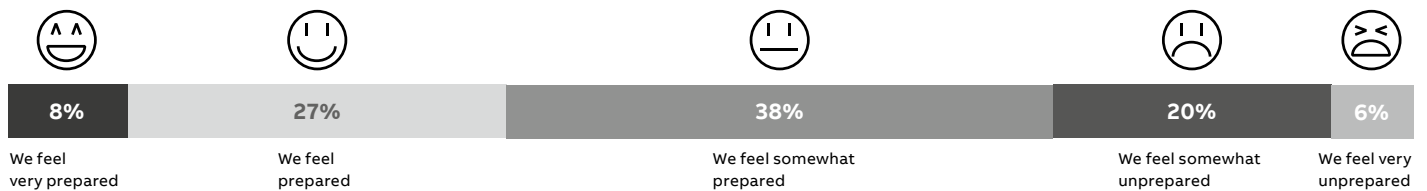Some consideration   Strong consideration   Very strong consideration

Other advanced technologies are working their way into asset management, and bringing new opportunities for data acquisition that will ultimately feed into CALM.

"We're looking at [augmented reality] headsets to facilitate data acquisition in the field. We're increasing drones and it's been about a year or so," notes a respondent. "Many organizations don't realize they need the infrastructure to get the data out of the drone. How do you integrate that into the rest of your systems? That's what we're trying to figure out."

Now is the time to start planning.

The evolution of digitalization is leading distribution utilities to CALM, but how prepared are they today? We're finding that just under one third of utilities feel prepared to take on an enterprise-wide view of asset health and maintenance (Figure 8). Most organizations realize they need to step up their planning and strategy efforts.

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Figure 8
Organization preparedness for enterprise-wide view of asset health and maintenance.

8%	27%	38%	20%	6%
We feel very prepared	We feel prepared	We feel somewhat prepared	We feel somewhat unprepared	We feel very unprepared

A key component of CALM is the integration of applications. Some respondents indicated they are on their way to achieving greater integration, but most suggested their systems still need work. Just 12% of distribution utilities feel that their applications are "very well" integrated today, and only 26% say they're integrated "well." Nearly two-thirds of respondents think their integration efforts are lacking (Figure 9).

Even with the benefits of and a focus on a CALM model, distribution utilities still face challenges integrating CALM into their organizations. Network security (36%) and software maturity (29%) rise to the top of the list of challenges, but there is a mix of factors influencing utility efforts, including hardware maturity (25%) and sufficient budget (25%) (Figure 10).
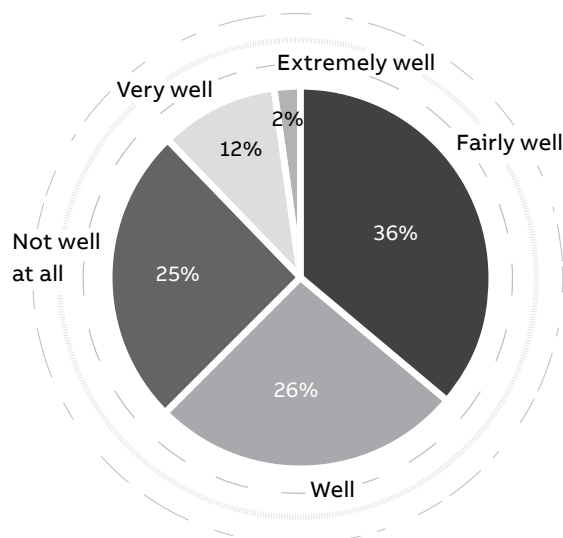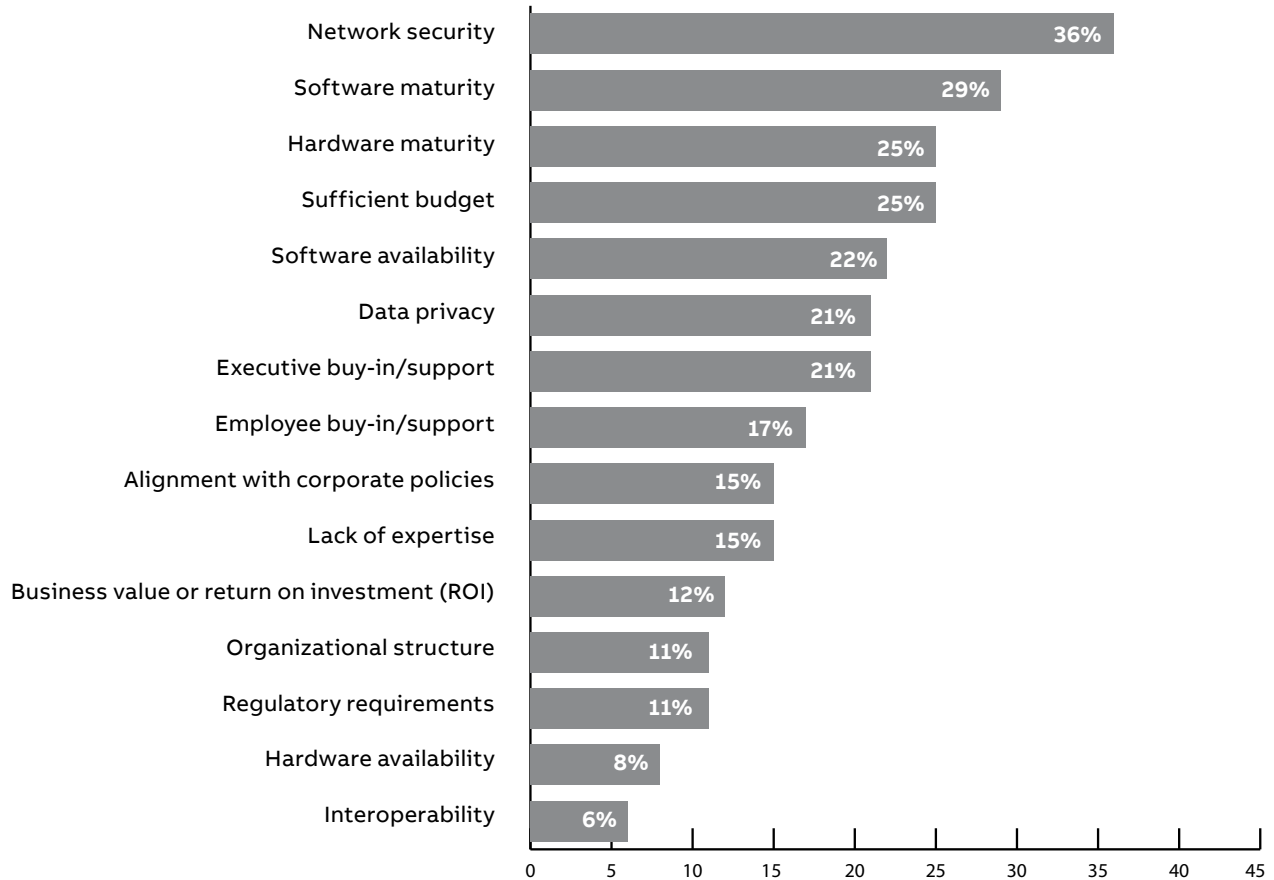

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Figure 9
Integration of applications today.

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Figure 10
Top three challenges of integrating CALM into your organization.
Percent of respondents who selected an answer option as one of his/her "Top three."

Challenge	Percent
Network security	36%
Software maturity	29%
Hardware maturity	25%
Sufficient budget	25%
Software availability	22%
Data privacy	21%
Executive buy-in/support	21%
Employee buy-in/support	17%
Alignment with corporate policies	15%
Lack of expertise	15%
Business value or return on investment (ROI)	12%
Organizational structure	11%
Regulatory requirements	11%
Hardware availability	8%
Interoperability	6%

"One of the biggest issues we're going to have is that we have so many systems for different assets," says a respondent. "Blending them together is going to be a challenge."

Recommendations.

Here are some steps you can take to embrace CALM and start reaping its benefits.

Build the vision

It is important to define what it means for your organization to effectively deliver CALM at an enterprise level. The individual digital technologies being deployed on electric distribution networks today provide a great opportunity for organizations to transform their approach to asset management. However, it's important for an enterprise-wide approach such as CALM to be driven by strong vision to ensure all these technologies work together effectively.

Consider who will make it happen

It is important to understand the technology changes that need to happen to realize this vision, but it's also important to consider the people and processes that will make it all happen. As with most technology investments, it's more than just a technology change – it is a process and organizational change.

Find the right partners

The opportunities and changes described in this paper are significant for nearly any organization. It is essential to understand your organization's capacity to handle these changes, and where it can benefit from partnerships that deliver additional capabilities and expertise.

Ready to step up your CALM integration efforts?

Explore ABB Ability Ellipse, as well as our extensive portfolio of proven enterprise software solutions by visiting:
http://new.abb.com/enterprise-software

Digitalization and the progression toward CALM are well underway, and distribution utilities must adjust their strategies. The time to act is now, so your organization doesn't get left behind during this industry transformation.

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abb.com/enterprise-software
info.pges@abb.com

About Zpryme

Residing in Austin, Texas, Zpryme is a research, media, and events agency with a focus on energy. Based on the creative direction of our associates Zpryme, produces influential research, Energy Thought Summit (ETS), and premium branding experiences that challenge the status quo. Combined, ETS and Zpryme represent digital and physical solutions that share stories of real people and engage ideas and products influencing the grand energy transition.

About ABB

ABB provides industry-leading software and deep domain expertise to help the world's most asset-intensive industries solve their biggest challenges, from plant level, to regional network scale, to global fleet-wide operations. ABB's enterprise software portfolio offers an unparalleled range of solutions for asset performance management, operations and workforce management, network control and energy portfolio management to help customers reach new levels of efficiency, reliability, safety and sustainability.

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