



hypothesis

# IoT Signals

## Power & Utilities Spotlight

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SUMMARY OF RESEARCH LEARNINGS  
MARCH 2020

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## BACKGROUND

The Internet of Things (IoT) is transforming the way people live and work. Beyond just the smart devices you use every day, IoT is revolutionizing the way companies do business – allowing them to become faster, smarter, safer, and more efficient.

Microsoft has been at the forefront of IoT, innovating and investing as IoT continues to gain traction worldwide. The IoT Signals report was created to give the industry a holistic view of the IoT ecosystem – providing insight into adoption rates as well as benefits and challenges.

The goal of the IoT Signals report is to better serve our partners and customers, as well as help business leaders develop their own IoT strategies.

This report focuses on two pieces of research – an initial round conducted in February 2019, which focused on IoT across industries and a follow-up in October 2019 that takes a deeper look into the power and utilities industry.

## METHODOLOGY

Microsoft commissioned Hypothesis Group, an insights, design, and strategy agency, to execute the IoT Signals research.

In February 2019, a 20-minute online survey was conducted with over 3,000 decision makers at enterprise companies across the US, UK, Germany, France, China, and Japan who were currently involved in IoT. The research included business decision makers (BDMs), IT decision makers (ITDMs), and developers from a range of industries such as manufacturing, retail/wholesale, government, transportation, healthcare, and more.

Following in October 2019, a 10-minute deep dive wave was conducted with 100 decision-makers specifically at enterprise power & utilities companies in the US, UK, France, and Japan. Similar to the initial wave, survey participants included business decision makers (BDMs), IT decision makers (ITDMs), and developers.

## 01 \_\_\_\_\_ **IoT IS DRIVING BOTH OPPORTUNITY AND OVERALL SUCCESS**

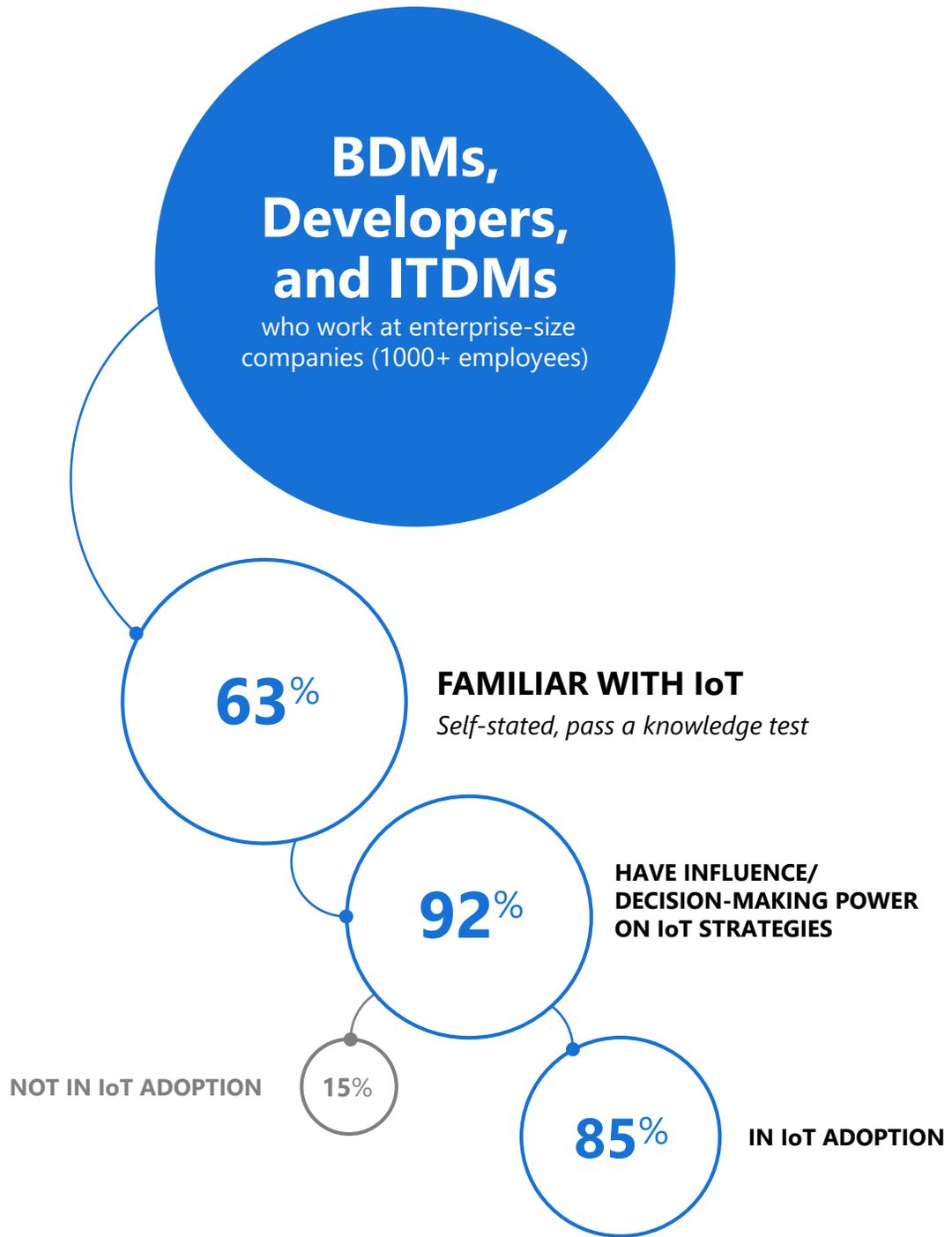
Among the IoT decision-makers we spoke to, 85% have adopted IoT. The most commonly mentioned reasons to adopt IoT include efficiency of operations and employee productivity. Once organizations adopt IoT, the top benefits align with the reasons they adopted – companies experience increased efficiency, yield, and quality. Due to these benefits, 88% of IoT decision-makers believe IoT is critical to their company's continued success.

## 02 \_\_\_\_\_ **SECURITY THREATS ARE NOT HINDERING ADOPTION**

Nearly all companies are concerned about security threats as they adopt IoT. However only 19% perceive security as a top challenge, falling below other challenges including complexity, budget, knowledge, and finding the right solution. Even for adopters who consider security a top concern, 93% are satisfied with IoT and most intend to keep using IoT in the future as they believe IoT will continue to be critical to the success of their company.

## 03 \_\_\_\_\_ **A LACK OF SKILLED WORKERS CAN HOLD BACK THE POTENTIAL OF IoT**

Despite its rapid adoption, 47% of current adopters feel that their companies don't have adequate workers and 44% don't have enough resources to see their projects through to realization. Companies with enough skilled workers are able to propel more IoT projects into the 'use' stage and reach it in less time, due in part to less failures during proof of concept.



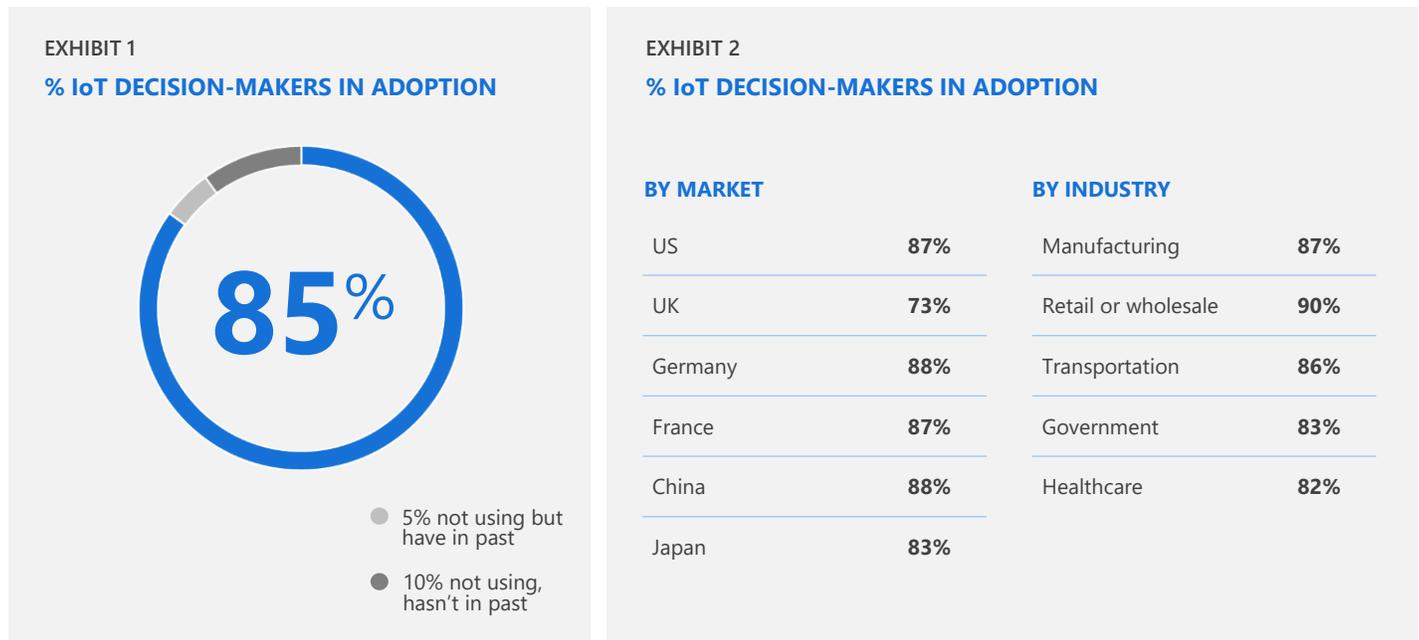
# IoT SIGNALS OVERALL RESEARCH LEARNINGS

## IoT: THE BIG PICTURE

In the commercial arena, the Internet of Things continues to grow in popularity. Business decision makers, IT decision makers, and developers at enterprise-size commercial organizations are incorporating IoT into their businesses at high rates, and the overwhelming majority is satisfied with the business results. As an outcome, companies are increasingly eager to adopt IoT.

The enthusiasm for IoT adoption is global, and it also crosses industries. Among the enterprise IoT decision makers we surveyed, 85% say they have at least one IoT project in either the learning, proof of concept, purchase, or use phase, with many reporting they have one or more projects currently in 'use'. **(See Exhibit 1)**

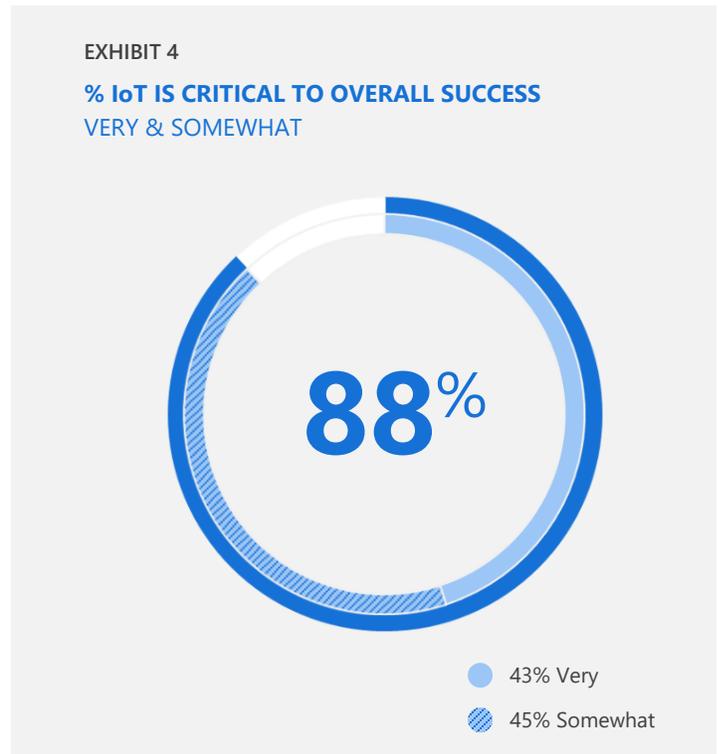
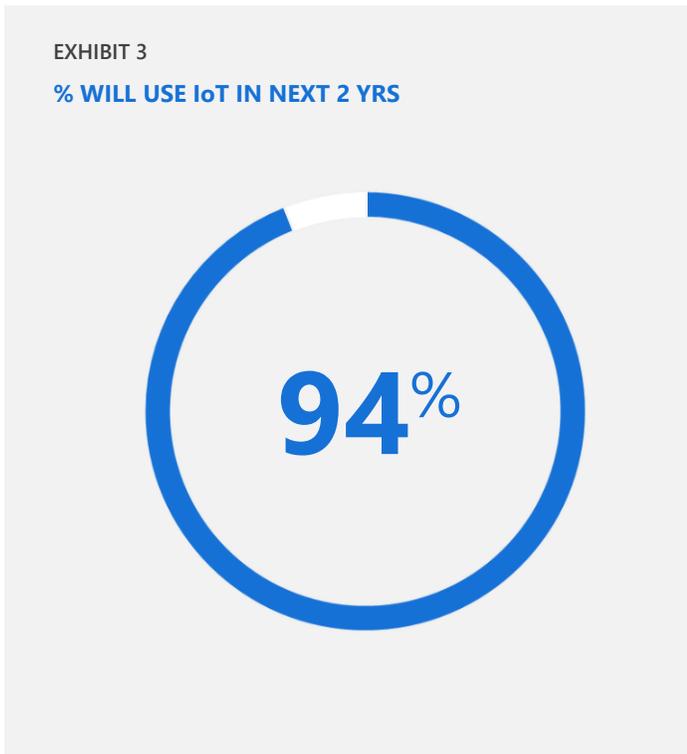
Adoption rates are similar across surveyed countries (US, UK, Germany, France, China, and Japan) and core industries (manufacturing, retail/wholesale, transportation, government, and healthcare). **(See Exhibit 2)**



IoT growth shows no signs of slowing: adoption is projected to increase by 9 points over the next two years, meaning 94% of businesses will be using IoT by the end of 2021. **(See Exhibit 3)**

Companies who incorporate IoT into their businesses are happy with the results: 88% of adopters say IoT is critical to the success of their company **(See Exhibit 4)**. Nearly all decision makers are satisfied with IoT, most likely because they believe it has a strong return on investment (ROI).

As IoT influencers and decision makers look to the future, even more expect to adopt IoT and find new ways to use the technology. We heard from those in IoT adoption that, two years from now, they believe they will see a 30% ROI, inclusive of cost savings and efficiencies. The continued success of IoT will also rely on other innovations: decision makers believe that in the next two years, AI, edge computing, and 5G will be critical technological drivers for IoT success.



## WHY ADOPT IoT?

On average, companies cite three to four major reasons that led them to adopt IoT. Efficiency and productivity are key motivators; the top two reasons that companies implement IoT are operations optimization (56%) and improvement of employee productivity (47%). The next most common use cases are safety and security, which 44% of companies view as top reasons to utilize IoT. 30% to 40% of enterprise companies also adopt IoT to manage supply chain, assure quality, track assets, and enable sales. On the whole, BDMs and developers view IoT as a way to streamline processes and work more efficiently. **(See Exhibit 5)**

EXHIBIT 5

### REASONS FOR IoT ADOPTION



While IoT has beneficial applications across industries, each industry prioritizes different use cases, according to its specific needs. In manufacturing, the top use cases for IoT are: automation (48%), quality and compliance (45%), production planning (43%), supply chain logistics (43%), and plant safety and security (33%). **(See Exhibit 6)**

For retail/wholesale companies, IoT is highly relevant for supply chain (64%) and inventory optimization (59%), while for transportation and government organizations equipment management and safety/surveillance are particularly important (~40%-55%). Within healthcare, IoT helps companies track patients, staff, and inventory (66%), as well as assists with remote device monitoring and service (57%). **(See Exhibit 7)**

EXHIBIT 6



**MANUFACTURING  
TOP 5 USE CASES**

Industrial automation	<b>48%</b>
Quality and compliance	<b>45%</b>
Production planning and scheduling	<b>43%</b>
Supply chain and logistics	<b>43%</b>
Plant safety and security	<b>33%</b>

EXHIBIT 7

**ADDITIONAL TOP USE CASES BY INDUSTRY**



**RETAIL/  
WHOLESALE**

Supply chain optimization	<b>64%</b>
Inventory optimization	<b>59%</b>
Surveillance and security	<b>48%</b>
Loss prevention	<b>44%</b>
Energy optimization	<b>40%</b>



**TRANSPORTATION**

Fleet management	<b>56%</b>
Security, surveillance, and safety	<b>51%</b>
Manufacturing operations efficiency	<b>40%</b>
Vehicle telematics and infotainment	<b>38%</b>
Predictive maintenance	<b>33%</b>



**GOVERNMENT**

Public Safety	<b>48%</b>
Infrastructure and facilities management	<b>40%</b>
Regulations and compliance management	<b>38%</b>
Fleet and asset management	<b>37%</b>
Incident response	<b>29%</b>



**HEALTHCARE**

Tracking patient, staff, and inventory	<b>66%</b>
Remote device monitoring and service	<b>57%</b>
Remote health monitoring and assistance	<b>55%</b>
Safety, security, and compliance	<b>53%</b>
Facilities management	<b>42%</b>

Once organizations adopt IoT, the top benefits align with the reasons they adopted – companies experience increased efficiency (91%), yield (91%), and quality (85%). Enterprise companies are quickly starting to see how IoT can deliver a return on investment by increasing productivity and production capacity, reducing business expenses, and lowering the chances of human error. IoT can also improve customer satisfaction and increase opportunities for companies to make better and more informed decisions. **(See Exhibit 8)**

Once organizations adopt IoT, they experience increased efficiency, yield, and quality.

EXHIBIT 8

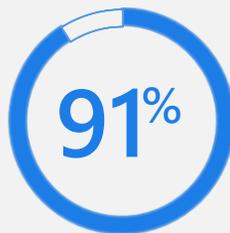
TOP IoT BENEFITS

①  
INCREASE EFFICIENCY



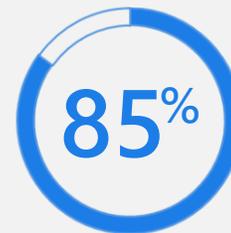
Improves overall efficiency	55%
Allows team to be more productive	42%
Saves time for team to focus efforts elsewhere	35%
Helps me be better informed and make better business decisions	33%
Enables new types of business models	26%

②  
INCREASE YIELD



Increases production capacity	43%
Provides my business with cost savings	39%
Increases revenue	36%
Reduces business expenses	35%
Enables new types of customer offerings	27%
Enables new revenue streams	26%

③  
IMPROVE QUALITY



Reduces chance for human error	45%
Increases customer satisfaction	44%
Increases company's competitive advantage	41%

## WHAT ARE THE CHALLENGES OF IoT ADOPTION?

Despite its success, IoT is not without challenges. Both for companies striving to get IoT projects off the ground and for companies looking to use IoT more, the roadblocks are often the same: complexity and technical challenges, security concerns, and lack of talent and training.

Companies who want to utilize IoT more find that complexity and technical challenges are their biggest barriers: 38% of companies say these are the reasons they aren't using IoT more. Lack of budget and staff resources (29%), lack of knowledge (29%), and difficulty finding the right solution (28%) are the next most common roadblocks. Security is also a challenge (19%). **(See Exhibit 9)**

### EXHIBIT 9

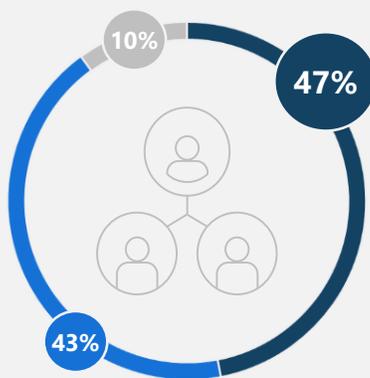
#### TOP IoT CHALLENGES



Lack of talent and training present challenges for almost half of IoT adopters. In this relatively new field, it's hard to find workers with the right skills and experience. 47% of companies that have adopted IoT report that they don't have enough skilled workers (See Exhibit 10), and 44% don't have enough available resources to train employees. (See Exhibit 11)

EXHIBIT 10

**TECHNICAL TALENT ASSESSMENT**



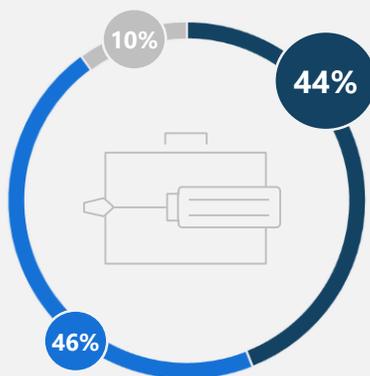
**Not enough available skilled workers**

Enough available skilled workers

No need for talent

EXHIBIT 11

**INDUSTRY TRAINING ASSESSMENT**



**Not enough available resources to train workers**

Enough available resources to train workers

No need for training resources

Security concerns around IoT adoption are universal: 97% of companies are concerned about security when implementing IoT (though this is not hindering adoption). Collectively, the top security priority is software/firmware management (e.g. encryption protocols – 34%, hardware/software testing – 32%, and updating software and firmware - 31%). **(See Exhibit 12)**

IoT device management is another hot-button security issue. 38% of organizations are concerned about tracking and managing each IoT device as well as creating security endpoints for devices (i.e. the hardware device to which IoT information is communicated). Additionally, securing and authenticating accounts plays a factor – 43% of companies cite ensuring network-level security with strong user authentications for network-level data as their main concern. **(See also Exhibit 12)**

EXHIBIT 12

**TYPES OF IoT SECURITY CONSIDERATIONS**



Our findings show that IoT adopters believe around one-third of IoT projects fail in proof of concept (POC), often because implementation is expensive or the bottom-line benefits are unclear. Among those who have had IoT projects stall in the trial stage, the top reason is the high cost of scaling—32% of businesses cited this as the main issue with getting their projects off the ground. In other cases, it’s difficult to justify moving forward on a project when the business benefits are not well enough defined: 28% of organizations reported that their projects failed because their pilots demonstrated unclear business value or ROI, and 26% of companies found it hard to justify a business case without short-term impact. **(See Exhibit 13)**

Additionally, lack of resources, IoT experience, and leadership buy-in can contribute to lower IoT success – companies who fall short in these areas have higher rates of POC failure and fewer projects in use versus those that don’t.

EXHIBIT 13

**REASONS FOR IoT FAILURE IN POC**



## WHO DRIVES IoT ADOPTION?

Because of IoT's complexity, an IoT strategy requires leaders to bridge organizational boundaries, communicate the strategic vision for IoT, and achieve broad alignment across all participating teams. Having a technology leader with end-to-end accountability can be critical to achieving success with IoT.

While C-suite buy-in is essential to get projects off the ground (and they are often the champions of IoT projects), IT and operations leaders as well as developers are important to facilitating and executing IoT use. As a business decision maker mentioned, "IT plays a large role in generating business stories for IoT and developing it."

## FINAL THOUGHTS

Globally and across industries, IoT adoption enables companies to become more efficient, productive, and safe. However, there are also complexity, security, and talent challenges to overcome. Businesses with sufficient IoT knowledge, workers, resources, and leadership buy-in are more likely to get their projects past proof of concept, but even those with lower success rates are still committed to using IoT now and in the future, especially since ROI is projected to increase in the coming years. IoT is becoming indispensable to commercial organizations and, considering these findings as a whole, it's safe to say that the future looks bright for IoT.



# Power & Utilities Spotlight

## 01 \_\_\_\_\_ **IoT IS HIGHLY USED IN THE POWER & UTILITIES ENERGY FIELD, BUT COMES WITH COMPLEXITY**

Many uses for IoT in energy are large-scale, spanning across homes, businesses, and geographic areas. Adoption rates are strong, and adopters say IoT is critical to their business success. There is a desire to implement IoT even further, but issues around timing/deployment, knowledge/resources and privacy/data security can hold organizations back.

## 02 \_\_\_\_\_ **UTILIZING IoT TO IMPROVE VIRTUAL AND EMPLOYEE SAFETY IS A TOP PRIORITY**

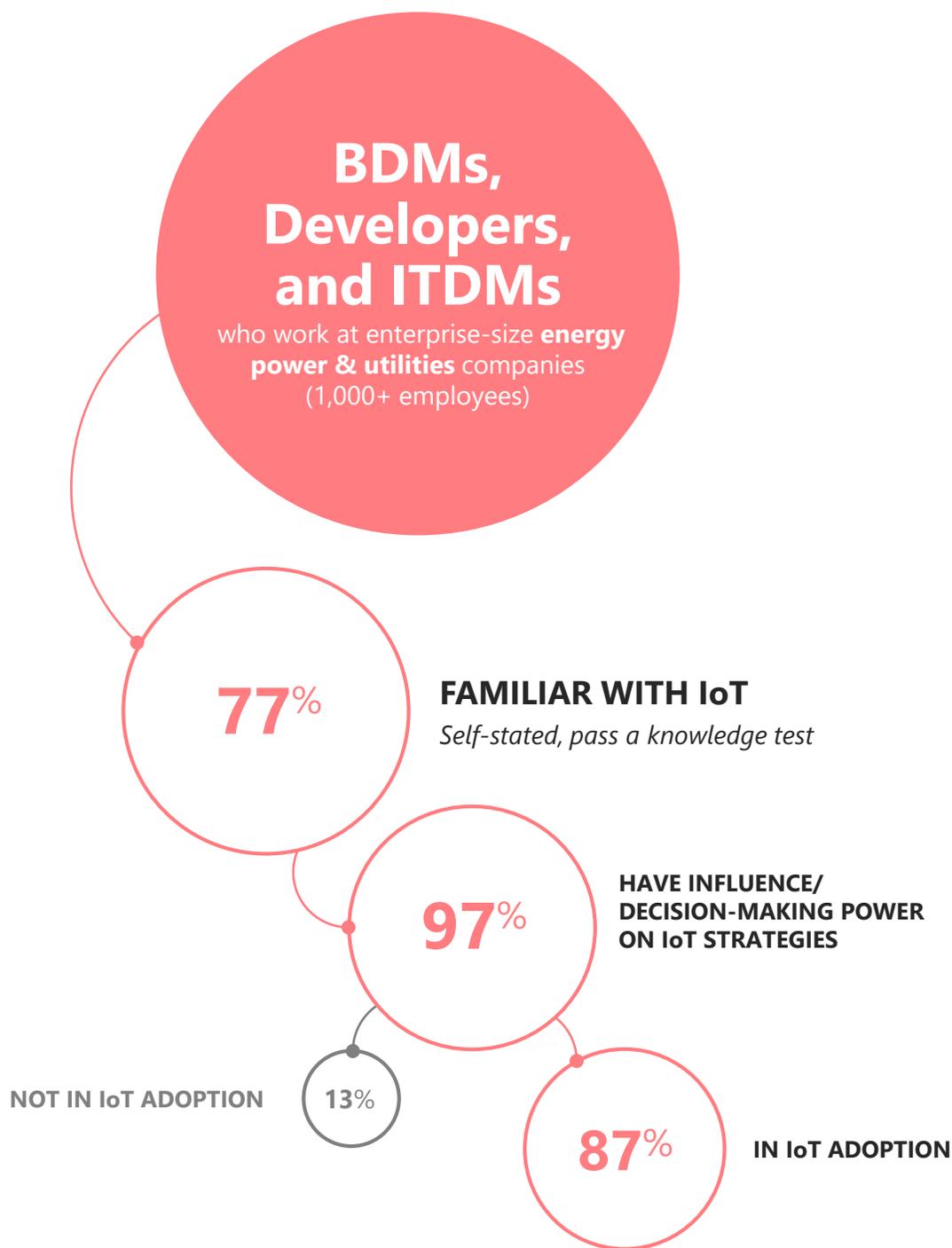
Almost half of decision-makers we talked to use IoT to make their IT practices more secure. Another third are implementing IoT to make their workplaces safer, as well as improve the safety of their employees. Decision-makers intend to utilize IoT even more in the future for employee safety as well.

## 03 \_\_\_\_\_ **OPTIMIZING PROCESSES THROUGH AUTOMATION IS CRITICAL FOR IoT USE**

Automation plays a key role in IoT – top IoT uses cases in P&U include automation-heavy processes such as smart grid automation, energy optimization and load balancing, smart metering, and predictive load forecasting. Future IoT adoption will continue to focus on automation, with growth in adoption for use cases related to optimizing energy and creating more efficient maintenance systems. Also in support of automation, AI is often a component of Energy IoT solutions. Almost all adopters have either already integrated AI or are considering integration.

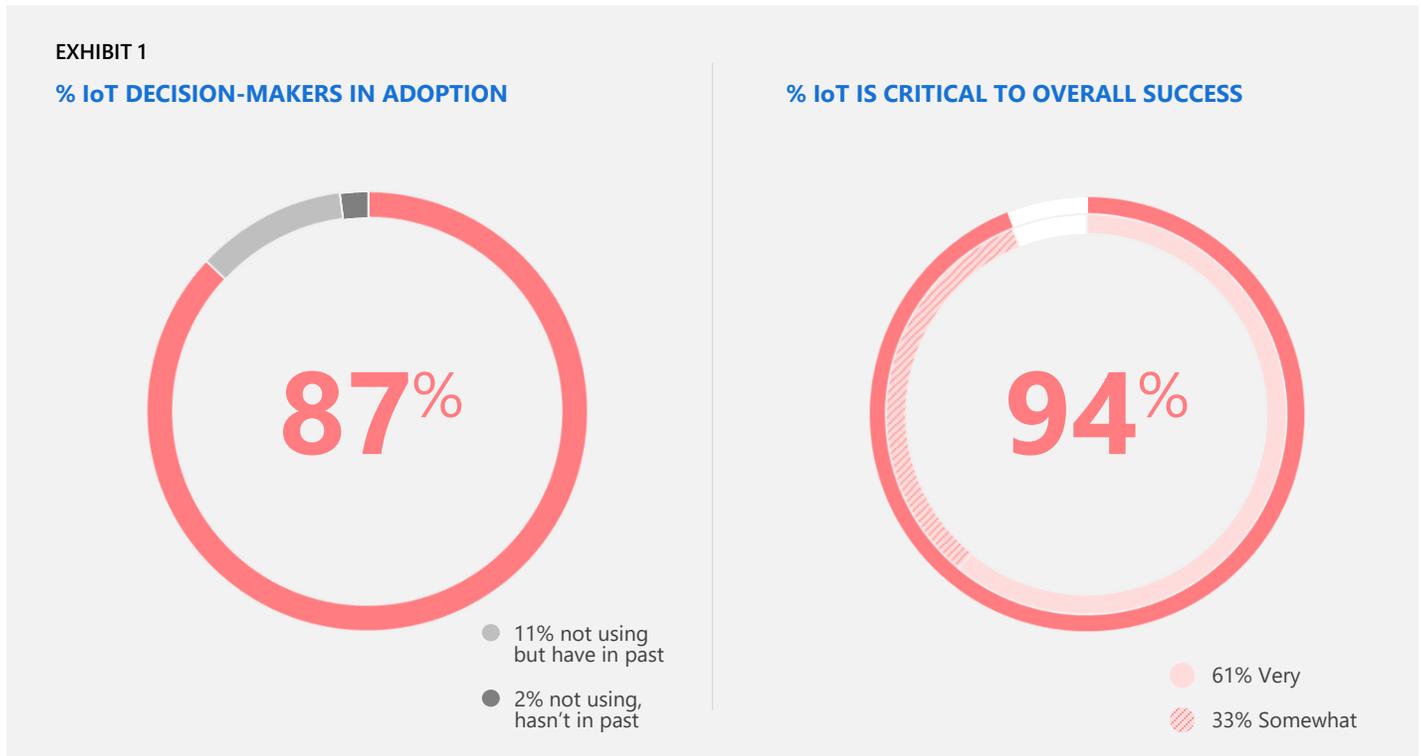
## 04 \_\_\_\_\_ **POWER & UTILITIES COMPANIES ALSO LEVERAGE IoT TO SECURE THEIR PHYSICAL ASSETS**

Many P&U companies are using IoT to secure various aspects of their operations through equipment management and infrastructure maintenance.

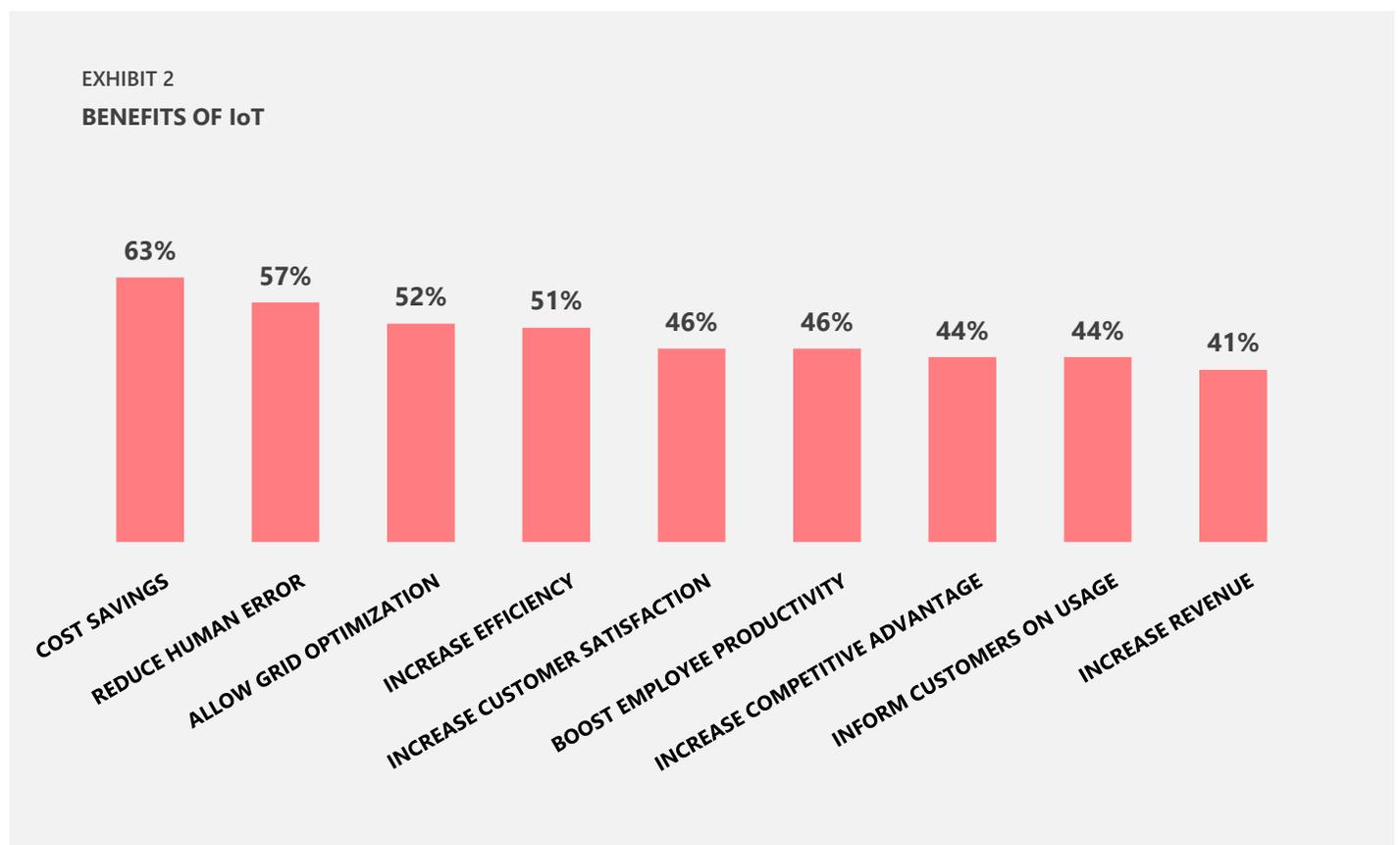


## IoT IS HIGHLY USED IN THE POWER & UTILITIES ENERGY FIELD, BUT COMES WITH COMPLEXITY

The power and utilities (P&U) industry is an enthusiastic adopter of IoT, and the majority of the companies we surveyed view IoT adoption as paramount to their success. 87% of survey participants report that they have at least one project in learning, proof of concept (POC), purchase, or use (i.e., fully implemented) phase. **(See Exhibit 1)** IoT plays a key role in company success, with 94% of adopters saying the technology is vital to the growth of their business. **(See Exhibit 1)** On average, it typically takes a project 14 months to get to the use phase, and 81% of those we spoke with have reached this phase on at least one project. In the next two years, IoT adoption will be nearly universal in the industry, with 97% of our decision-makers saying they will be using IoT.

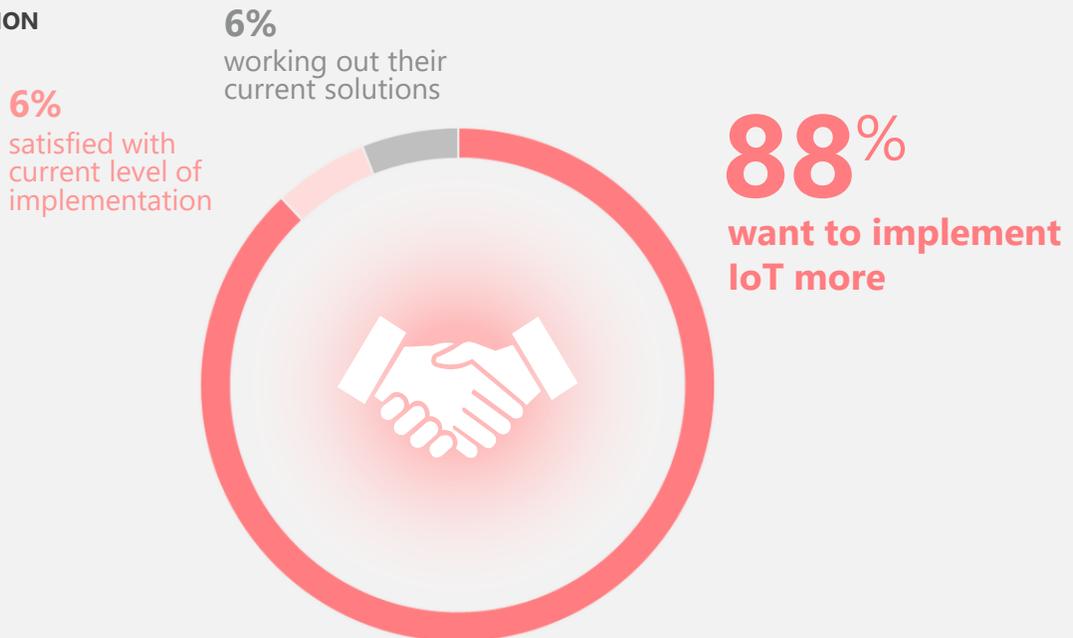


Decision-makers cite cost savings and reducing human error as the greatest benefits to IoT adoption: 63% and 57%, respectively, say these as the most valuable ways they use IoT in their businesses. Companies also state IoT is beneficial in grid optimization (52%), increasing efficiency (51%), increasing customer satisfaction (46%), and boosting employee productivity (46%). (See Exhibit 2)



While P&U companies' use of IoT is already widespread, 88% of businesses want to implement the technology even more; however, certain barriers must be overcome in order to have further IoT integration (**See Exhibit 3**). Adopters see challenges around lack of knowledge and security as the biggest barriers: for example, 37% say their organizations do not have sufficient technical knowledge, while 32% cite privacy concerns as a roadblock to further adoption. Complexity, timing, and insufficient resources are also barriers.

EXHIBIT 3  
**FURTHER IoT  
IMPLEMENTATION**



## UTILIZING IoT TO IMPROVE VIRTUAL AND EMPLOYEE SAFETY IS A TOP PRIORITY

Utilizing IoT for security and safety is a top priority for power and utilities companies, with the technology often being used for both virtual and employee safety. Almost half of adopters report leveraging IoT to bolster IT security and create protection against viruses and hacking. 30% of adopters currently use IoT to monitor workplace safety, tracking equipment vitals to ensure the work environment is safe. Currently over a quarter of companies use IoT to help keep employees safer, tracking factors such as health and vital signs, with the number expecting to grow to almost 40% in the next two years. **(See Exhibit 4)**

EXHIBIT 4  
SAFETY & SECURITY USE CASES



## OPTIMIZING PROCESSES THROUGH AUTOMATION IS CRITICAL FOR IoT USE

Additionally, power and utilities companies frequently look to IoT when optimizing energy distribution and usage, and when streamlining these processes through automation. For close to half of surveyed adopters, IoT allows automation of smart grids that communicate with energy suppliers. 41% of businesses use IoT to handle energy optimization and load balancing, with 39% also utilizing the technology for predictive load forecasting (to better forecast energy demand). In the future, IoT usage for these tasks is predicted to increase by 10 points or more. IoT also helps 39% of companies with smart metering, to monitor in-home energy usage. **(See Exhibit 5)** In support of automation, artificial intelligence (AI) is becoming a core component of many IoT solutions. The vast majority of IoT adopters are integrating or considering integrating AI into their IoT projects. **(See Exhibit 6)**

EXHIBIT 5

### AUTOMATION EMPLOYMENT USE CASES

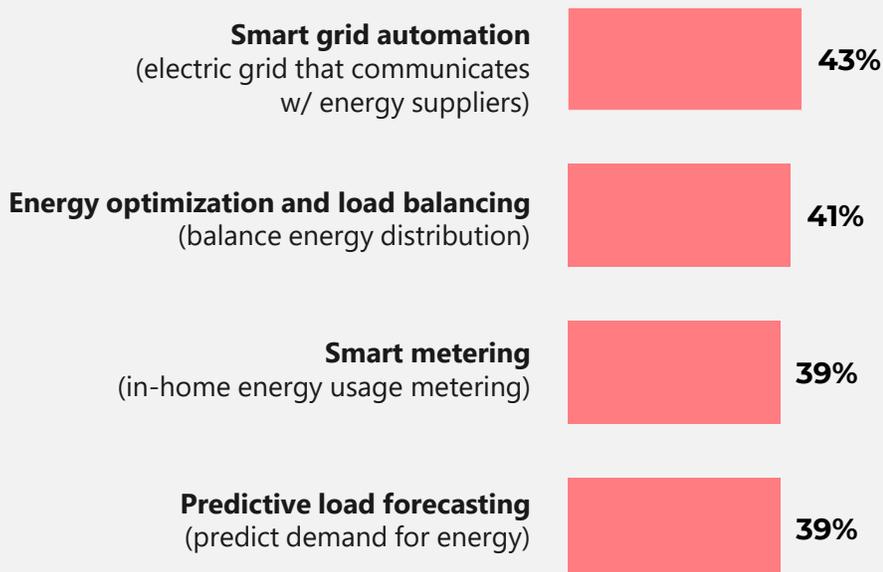
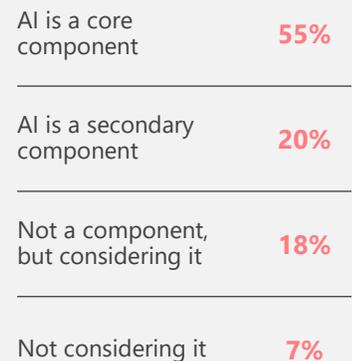


EXHIBIT 6

### AI INTEGRATION

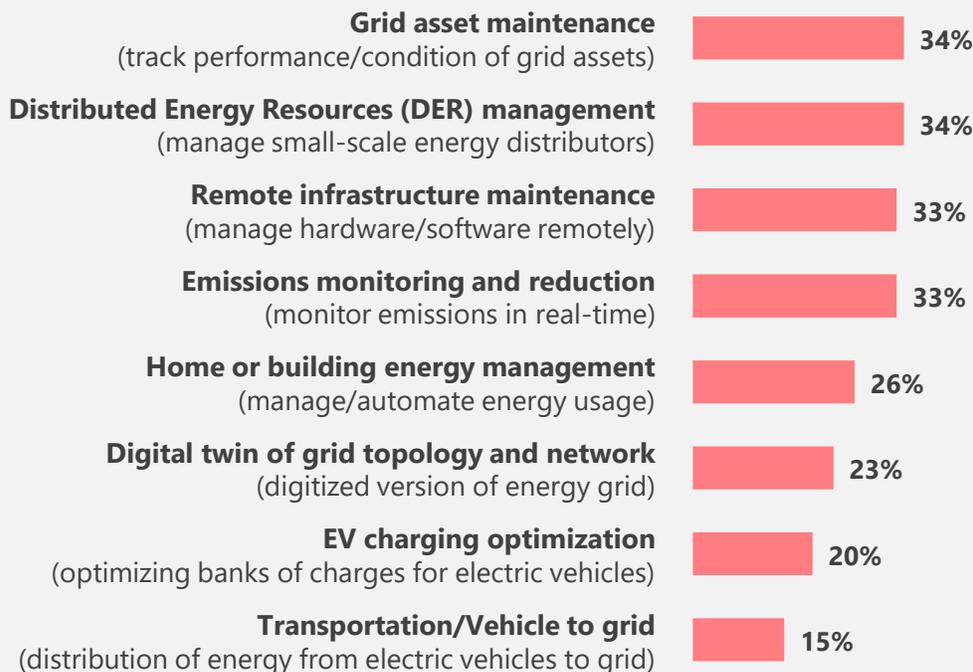


## POWER & UTILITIES COMPANIES ALSO LEVERAGE IoT TO SECURE THEIR PHYSICAL ASSETS

The energy industry has a wide variety of other uses for IoT, largely centering around securing operations through equipment management and infrastructure maintenance. Roughly a third of adopters use IoT for grid asset maintenance (tracking the performance and condition of grid assets), Distributed Energy Resources (DER) management (managing small-scale energy distributors), remote maintenance of hardware and software, and real-time monitoring and reduction of emissions. For close to a quarter of adopters, IoT plays an important role in management and automation of energy usage, as well as the creation of digital versions of energy grids. Businesses also use IoT to distribute energy from the grid to electric vehicles and vice versa. (See Exhibit 7)

### EXHIBIT 7

#### ADDITIONAL ENERGY USE CASES



## FINAL THOUGHTS

The power and utilities industry views IoT as an essential component of many processes, from safety and security to optimization and automation. In addition, businesses are working to seamlessly integrate AI into their IoT solutions. Most power and utilities organizations want to adopt IoT more widely in the next two years but must overcome barriers including lack of knowledge and security issues. Deployment and timing issues can also prevent IoT projects from getting off the ground. When we examine the research in its entirety, though, it's clear that the P&U industry considers IoT vital to its success, and that in the coming years, use of IoT will grow to a near-universal level.

## THE OBJECTIVES OF THE RESEARCH INCLUDED

- 1 Explore the benefits and the challenges of IoT adoption
- 2 Understand the revenue impact of adopting vs not adopting IoT
- 3 Project future adoption and uses of IoT

## TO MEET THE SCREENING CRITERIA, IoT PROFESSIONALS NEEDED TO BE:

A business decision maker, IT decision maker, or developer at their company

Employed full-time at an enterprise-level company (1,000 employees or more)

Ages 18-66

Familiar with IoT

Involved in decision making for IoT

Within the Power & Utilities Spotlight, respondents also needed to work in the power and utilities industry

## OF THE MORE THAN 3,000 IoT PROFESSIONALS INTERVIEWED FOR THE INITIAL RESEARCH WAVE IN FEBRUARY 2019

In the US, approximately 1,000 Decision Makers and 200 Developers were interviewed

In Germany, Japan, China, France, and the UK: approximately 300 Decision Makers and 100 Developers were interviewed in each country

## OF THE 100 POWER AND UTILITIES IoT PROFESSIONALS INTERVIEWED IN OCTOBER 2019, ACROSS BDMS, ITDMS, AND DEVELOPERS

33 were interviewed in the US

27 were interviewed in the UK

23 were interviewed in France

17 were interviewed in Japan