

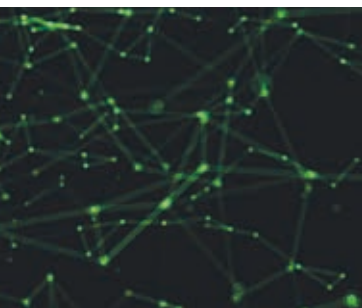
Digital grid: powering the future of utilities

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Foreword

Current energy systems were designed more than 100 years ago and have been only incrementally modified since. They worked well in the time of vertically integrated, centrally supplied generation models, but this was when efficiency and resilience were less important. As the state of New York put it in its white paper *Reforming the Energy Vision*:¹

“... the electricity system today would be familiar to Thomas Edison himself.”

Far-reaching and disruptive change is transforming the power and utilities (P&U) sector, in the form of:

- ▶ Government and regulatory action to address climate change concerns
- ▶ Increasingly empowered and demanding customers
- ▶ Proliferation of distributed generation, including solar and wind
- ▶ Digitization of the grid and information technology (IT) and operational technology (OT) integration
- ▶ Increased risk of cyber attacks on grid systems and infrastructure
- ▶ Energy reform as markets open to new forms of competition

Meeting the demands of the energy trilemma

If the industry does not address these disruptive forces, it risks failing to meet the challenges of the trilemma of a sustainable, affordable and reliable energy system.

“Today’s power-hungry world demands more resilience and flexibility from the grid.”

We need energy systems that can offer reliability and withstand external threats such as superstorms and cyber threats, as well as respond in real time to fluctuations in supply.

Affordability remains a key issue for consumers, who face rising energy bills. Electricity grids were scaled to meet peak demand: the fact that they lay idle quite a lot of the time was – until now – considered unavoidable. New grid optimization technology offers utilities the opportunity to improve efficiency and reduce costs.

Environmental targets reflect more reliance on renewable and green energy, as regulators and governments pursue a low carbon agenda in response to climate change concerns. Without the means to integrate renewables successfully into the grid, these targets are unlikely to be met.

The future of energy

How should energy systems be redesigned to balance these often conflicting needs?

The answer lies in digital grid.

“Utilities need to act now to unlock the true potential of digital grid: to serve as the backbone of the future energy systems.”

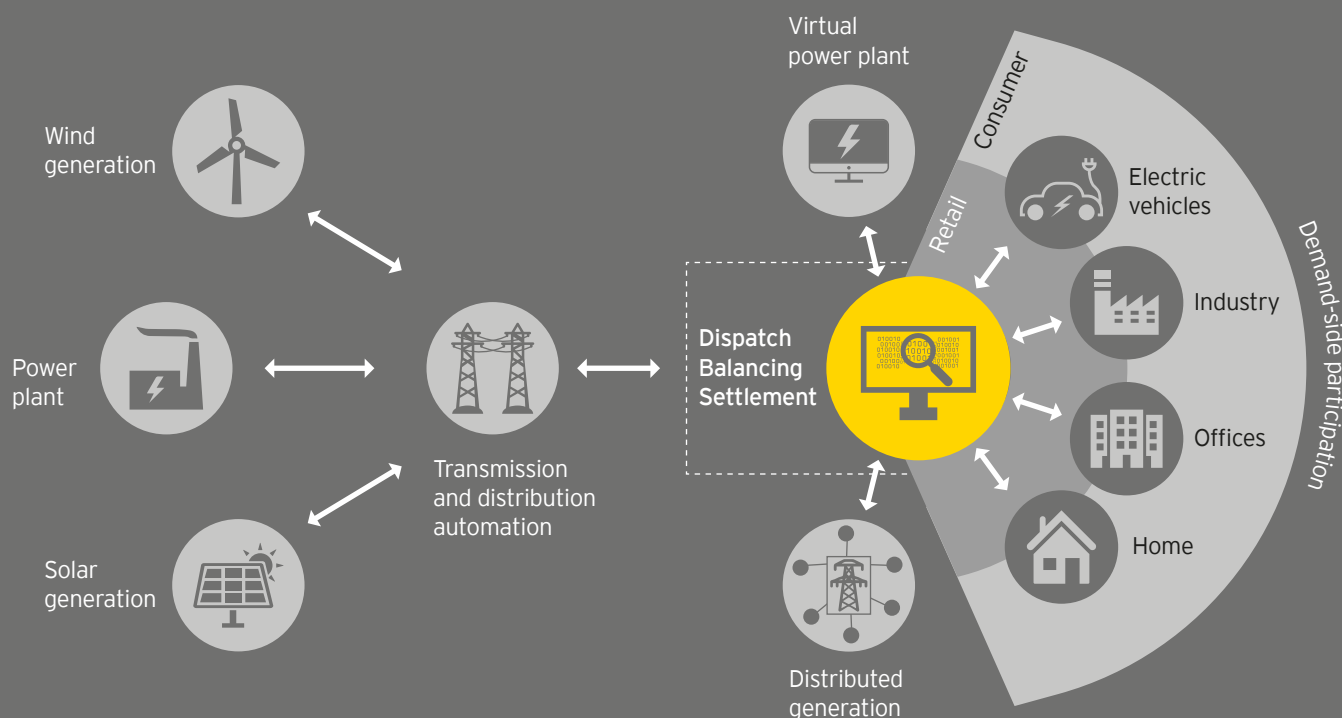
Digital grid is the digitization of electricity, gas and water networks using advanced technology. It allows two-way communication between the utility and the network, including its customers, and enables insight, automation and control across the utilities’ operations, empowering utilities to improve reliability, availability and efficiency of the grid.

Digital grid is needed to connect decentralized power from renewables, microgrids and virtual power plants, as well as energy storage, alongside traditional bulk generation. It’s needed to harness the potential of connected homes and devices and the internet of things. It’s also needed to improve the reliability of current grids by making them smarter, more able to self-detect and self-heal outages, and to reroute power as needed.

The utility of the future will operate in a new value chain, augmented and interconnected by digital technologies, where both power and information flow in both directions.

1. *Reforming the Energy Vision*, New York State. March 2016.
<https://www.ny.gov/sites/ny.gov/files/atoms/files/WhitePaperREVMarch2016.pdf>

What will the future P&U world look like?



At EY, we believe that the acceleration of renewables, connected devices, competition and other disruptive forces have compelled utilities to act and to prioritize digital grid in their capital programs.

To identify the current state of digital grid, EY commissioned research with 50 utilities around the world that have large distribution networks. These 50 were either stand-alone distribution system operators or part of a vertically integrated utility, and came from 22 countries. As such, respondents provide a representative view of developments across the distribution value chain.

We have outlined our key findings in the pages that follow. Our conclusion from the research is that the future is already here, and in order to move forward, utilities must:

- ▶ Define a digital grid strategy and define it consistently within their own organizations
- ▶ Clarify the purpose and objective for their digital grid, taking into account the short- and longer-term changes in their

ecosystem, as well as charting their road map and portfolio of initiatives

- ▶ Identify the scope of IT and organizational change across the business – from operations to regulatory models to customers – and its risks
- ▶ Build a strong business case and investment plan
- ▶ Override departmental silos and drive central coordination for the portfolio of initiatives

Only then will utilities be able to unlock the true potential of digital grid, which will serve as the backbone of future energy systems.

We've written this report to shed light on how digital grid is developing, and the questions that need to be addressed to move forward. We hope you find it useful as you develop your own digital grid strategies.

Paul Micallef, Digital Grid Leader

01

Has the industry reached a turning point for digital grid?

To gain an understanding of how utilities are currently approaching digital grid, from investments to risks and barriers to how initiatives are structured, EY commissioned research with 50 utilities with large distribution networks across Europe, the Americas, Asia Pacific, the Middle East and Africa (see methodology on page 17).

What we found was a story of “now,” a story of investment and optimism. As we outlined in the foreword, across the P&U sector, there is an understanding that the business landscape has transformed because of disruption and changes in the wider business environment.

What role will digital grid play in enabling the utilities of the future? Our results point to a resounding consensus that how the grid is managed and operated is at a turning point:

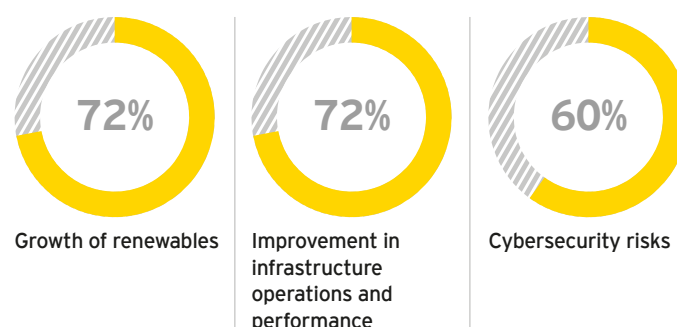
- ▶ Increasing investment in digital grid technologies and prominence as a strategic program
- ▶ Understanding that the scope of digital grid covers more than a technology or infrastructure upgrade to business-as-usual
- ▶ Recognition that competition will transform the industry

Utilities are embracing and investing in digital grid

It's encouraging to see the extent to which utilities are embracing digital grid technologies. When asked to describe their investment plans, almost half (46%) said that digital grid is either one of their top three strategic programs or has been earmarked for investment in the next 12 months. Only 8% said they had no plans to invest in digital grid.

The reason for investment varied by utility. However, top drivers behind the adoption include growth of renewables, infrastructure or performance improvements, and cybersecurity.

What are the main drivers for the increased adoption of digital grid in your organization?

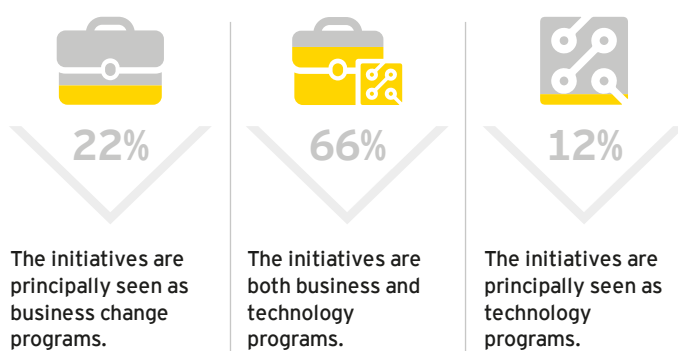


Investment in digital grid over the next five to seven years is expected to be in the region of US\$500b.

The true scope of digital grid begins to emerge

In this survey, 66% of participants viewed digital grid initiatives as both business and technology programs. Only 12% saw digital grid as primarily a technology program.

To what extent is your digital grid program a business change or technology program?



In our experience, there has been a tendency to view digital grid programs as primarily a technology or infrastructure implementation, with some change management tacked on as an afterthought.

"The true scope of digital grid programs can be overwhelming, as they involve a complete overhaul of organizational and operational structures, as well as security, commercial and regulatory models," says John Bayard, Senior Manager, Digital Grid at EY.

This recognition of the broader organizational impact of digital grid, above and beyond the implementation of technology, reflects that utilities are beginning to see its value. What remains is for these intentions to be incorporated into their operations in a meaningful way.

Recognition that new competitive threats will transform P&U

Non-traditional utility entrants are perceived to be changing the dynamics of the P&U industry, with 56% of utilities saying these new entrants will completely transform the sector. These new competitors include telecommunication companies, energy aggregators and energy service companies, along with strong technology or retail brands seeking to get a foot in the door with connected home and smart energy products.

This change is particularly disruptive to the utilities, which are inherently averse to risk and encumbered by regulation. Our survey results indicate that digital grid may be falling victim to this disruption, with 24% of utilities citing competition from

The true scope of digital grid programs can be overwhelming, as they involve a complete overhaul of organizational and operational structures, as well as security, commercial and regulatory models."

John Bayard, EY

non-utility entrants as a top three risk of digital grid. Essentially, utilities are concerned that competitors investing in offerings such as connected home products, home energy management solutions, off-grid solutions and other products will erode their ability to make adequate returns from digital grid investment, in both regulated and unregulated portfolios.

It's clear that utilities are feeling the pressure. Some are grabbing the bull by the horns and investing in innovation in digital grid to diversify, meet changing customer expectations and drive growth. Examples of "traditional" utilities employing disruptive strategies include:

- ▶ Developing the world's largest virtual power plant based on battery storage using a cloud-connected intelligent control system
- ▶ Promoting a hybrid "bring your own battery" business model in which up-front and operations and maintenance (O&M) costs are often shared between customer and utility
- ▶ Testing blockchain for electric vehicle (EV) charging, and on a platform that enables consumers to trade green energy independently of utilities

Summary

Our view is that the P&U sector has reached a definite turning point. There is greater investment in digital grid, recognition of it being an enterprise-wide problem, and competitive pressures that are acting as a catalyst to drive innovation. Digital grid is no longer on the horizon – it has arrived and is on the agenda.

Utilities must overcome caution to embrace investment and innovation

We asked utilities how they're funding digital grid, which capabilities they have already invested in and what they're planning to invest in next.

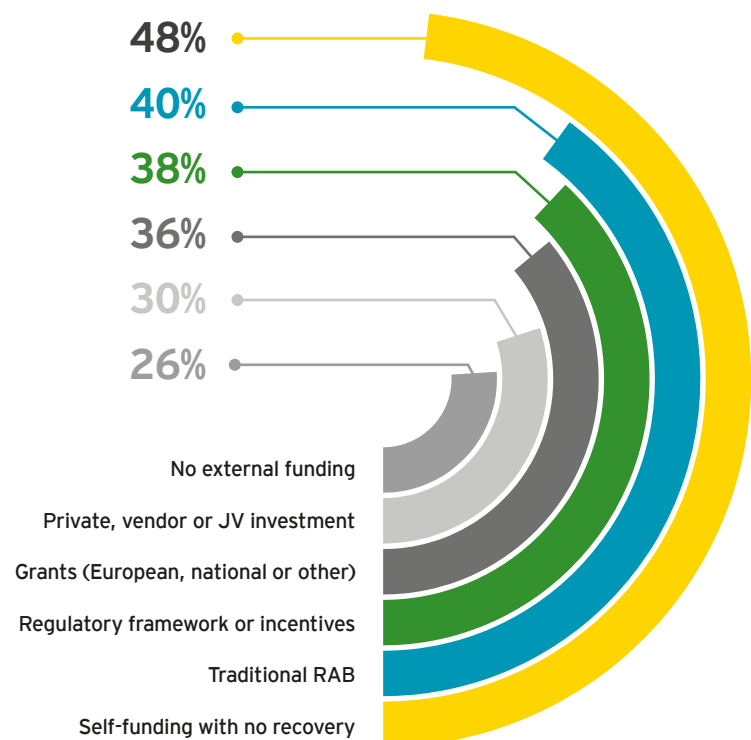
We found that while investment in digital grid is taking place, it has been primarily focused on addressing the concerns of today, rather than the step-change potential for future operations. The reasons for this include:

- ▶ Need to self-fund digital grid projects
- ▶ Natural caution on the part of utilities, driven by a need to keep the lights on
- ▶ Lack of clarity on digital grid or cohesive investment strategy
- ▶ Departmental silos preventing enterprise-wide view of digital grid

Self-funding is the top funding model for digital grid

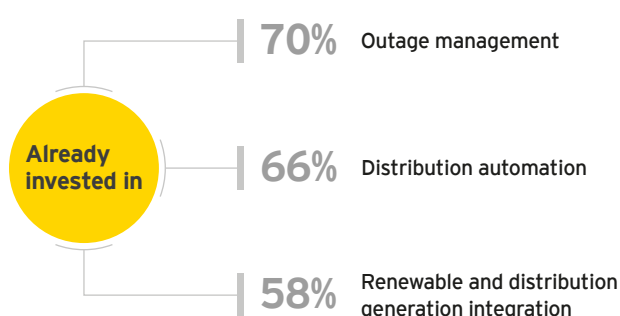
Nearly half (48%) of utilities told us they are most likely to self-fund digital grid programs compared with those receiving regulatory incentives – a mere 38%.

From where do you source funding for your digital grid programs?



The nature of self-funding is that any money spent must deliver tangible value. To this end, we believe utilities have been investing their money in problems they feel comfortable with. This view is borne out by our survey results, which show that for past investments, outage management is first at 70%, followed closely by distribution automation (66%) and renewable and distribution generation integration (58%).

Top three digital grid capabilities invested in



Historically, utilities have relied on the regulator to provide funding for investing in programs. When it comes to digital

grid, however, this model has changed. In these times of capital scarcity, utilities are having to find new models to underwrite their investment.

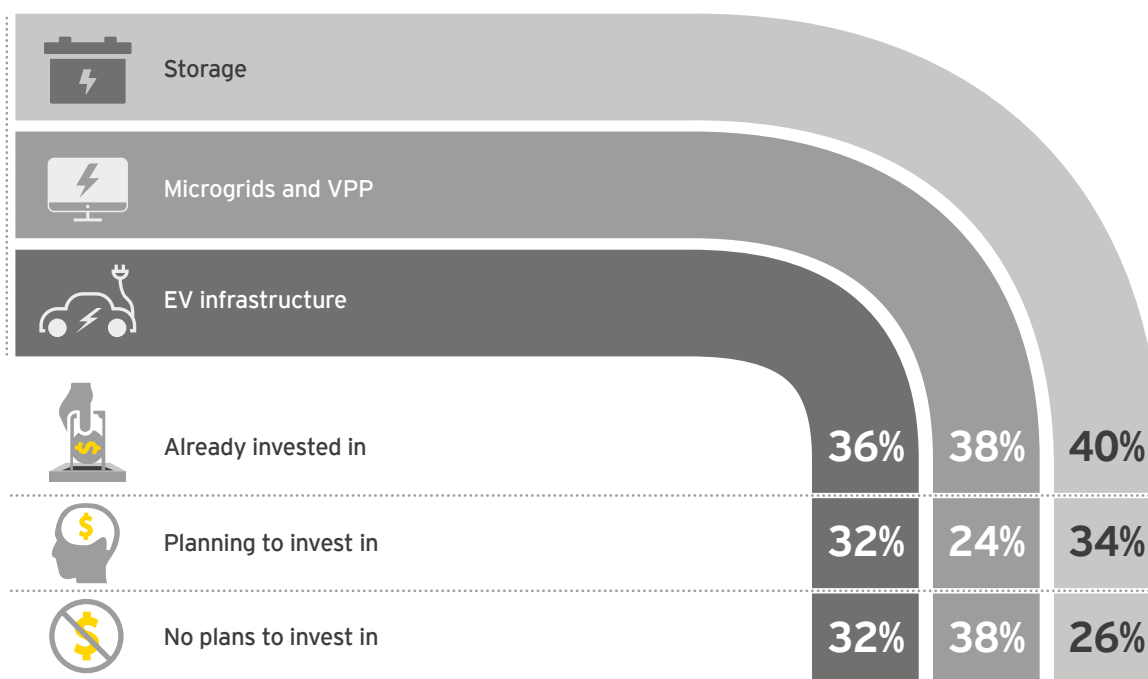
Utilities will benefit from a bolder approach to emerging technologies

The cautious nature of the industry – driven by the need to keep the lights on – is also playing a role, suggests Paul Micallef, Digital Grid Leader at EY. “The P&U industry is not disruptive or innovative by nature; in the past, it has had no reason to be, as regulators have dictated the modus operandi.” This is illustrated by the fact that in 2015, only 9 out of the top 200 utilities by revenue globally had executives in the senior management team or C-suite with a job title including “innovation.”²

Utilities have been hesitant about investing in emerging technologies. In our research, the areas attracting the least investment to date were storage, microgrids and virtual power plants (VPP), and EV infrastructure.

There is an element of timing here; though storage currently ranks in the bottom three for investment to date, it's the clear leader at 34% for planned investment.

Which digital grid capabilities have you invested in, or are planning to invest in? (least investment to date)



2. EY research for *Women in Power and Utilities Index 2015*, accessed 13 October 2016 at <http://www.ey.com/Publication/vwLUAssets/EY-women-in-power-and-utilities-index-2015.pdf>

In terms of current investment, however, these newer technologies are outside the comfort zone of many utilities, as they require greater innovation and represent higher levels of risk. We believe utilities will benefit most when they integrate these emerging technologies into their digital grid portfolio.

Overarching need for clarity on digital grid and cohesive investment strategy

In order for this to happen, utilities need a common understanding of digital grid and a cohesive investment strategy. However, our research confirmed something we have seen in practice: the market is still struggling to define digital grid. In anticipation of this, we presented respondents with a definition of digital grid (see inset box).

Defining digital grid

A fundamental challenge for the P&U sector is the lack of a clear, consistent definition of digital grid. Not only are there different definitions of digital grid across the industry, there are often different definitions within the same organization.

To overcome this challenge, EY proposed the following definition of digital grid for the research:

“A digital grid represents the digitization of the electricity grid, making use of digital technology to remotely monitor, control and automate the network. The digital grid is an unprecedented opportunity to deal with changes across the energy landscape (e.g., distributed generation) as well as improve reliability, availability and efficiency of the grid.

54%

of respondents don't have a common definition for digital grid

Just over half (54%) said they used multiple definitions of digital grid or had no definition. Only 42% of utilities used the definition provided consistently within their organization. This is about much more than semantics. Developing a common understanding of what digital grid is, and its purpose in meeting organizational goals, is an essential foundation for all digital grid initiatives.

As you layer on multiple digital grid technologies within an organization, the benefits are often far greater than the component parts.”

John Bayard, EY

This lack of clarity is causing larger problems with investments: utilities don't know what they're spending on digital grid. In our research, more than 92% were unable to confirm the value of their investment in digital grid, suggesting they don't have their arms around their investment portfolio. Utilities need a cohesive investment strategy built upon an understanding of what digital grid is and how it supports corporate goals. Left unaddressed, this ambiguity will erode not only the value of digital grid investments, but its potential to serve as the backbone of future energy systems.

92%

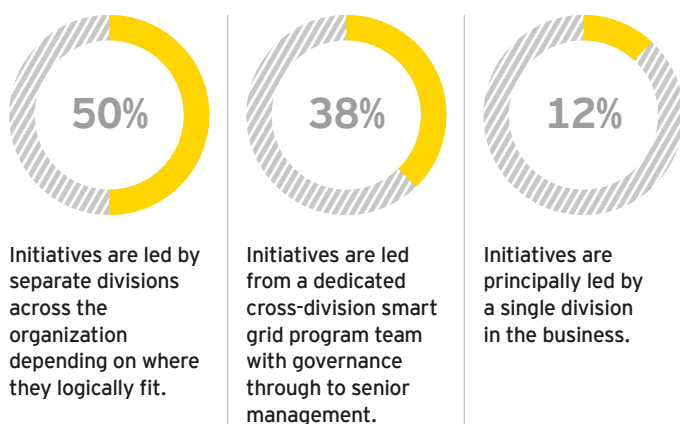
of respondents don't know the exact amount of investment they've made in digital grid



Departmental silos preventing enterprise-wide view of digital grid

Half of respondents are leading digital grid initiatives across separate divisions, further perpetuating a “silo” approach, where one division doesn’t know what the other is doing or spending.

Which of the following options best describes the organizational setup of your suite of digital grid initiatives?



We frequently see these departmental silos frustrate digital grid initiatives, resulting in duplicated investment in IT, infrastructure and capabilities. “Without a coordinated, enterprise-wide approach, utilities will overspend and overcomplicate solutions, diluting returns. Furthermore, they leave themselves open to gaps in cybersecurity and risk coverage.” says Graham Skinner, Digital Grid at EY

There is also a layering aspect to digital grid technologies that utilities will miss if they implement them in isolation. “As you layer on multiple digital grid technologies within an organization, the benefits are often far greater than the component parts,” says Bayard.

Without a coordinated, enterprise-wide approach, utilities will overspend and overcomplicate solutions, diluting returns.”

Graham Skinner, EY

Consider the value of being able to isolate where an outage has occurred using autoreclosers and sectionalizers; that’s a start. Layer on workforce management technologies that allocate the fleet to the impacted feeder segment; that’s even better. Go one step further, and layer on an outage management system that allows your call center – perhaps supported by an interactive voice response (IVR) system – to provide customers with updates about the problem and you have a powerful system with amplified benefits.

This is where digital grid can go. But our results show how far the sector is from this in practice.

Summary

The nature of self-funding digital grid projects has colored investments in digital grid to date. While the historical model has been for regulators to provide financial incentives, utilities need to accept that this may change. The most urgent priority is for utilities to define what digital grid means for their organization, and to structure themselves in a way that enables them to realize this vision. Breaking down departmental silos is key to avoid eroding value, and will be instrumental in creating an enterprise-wide view of digital grid.

We believe that the wide-ranging nature of digital grid projects requires a central role at C-suite level or immediately below, to oversee every facet of the investment and implementation. Success depends on a common taxonomy, strategy, organizational structure and approach to investment.

What are the risks and barriers associated with digital grid?

We asked utilities what their main concerns are, both as an organization and specifically around digital grid. Their responses showed that the top areas of concern are:

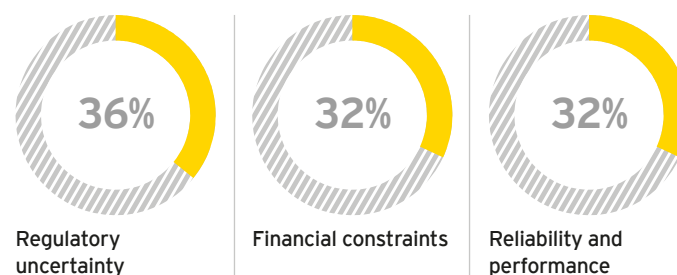
- Uncertainty about regulators, in terms of both their role and financial incentives
- Difficulty making a business case for digital grid
- The risks posed by cybersecurity breaches

Of these concerns, regulatory uncertainty emerged as the strongest theme. Despite different environments that require different treatments, utilities voiced the same concerns. They were clearly uneasy with the lack of regulatory incentives and support for digital grid, with over half saying the regulator should be doing more. For many, this contributed to another key concern: the difficulty in creating a business case for digital grid.

Regulatory uncertainty seen as key organizational risk

When we asked utilities what concerns or risks they are currently facing as an organization, regulatory uncertainty came top of the list, followed by financial constraints and reliability and performance issues.

Top three greatest concerns or risks you are facing as an organization



In a related question, almost half of the utilities we spoke with (48%) indicated that they do not feel regulators are doing enough to encourage the development of digital grid solutions.

In our view, this regulatory uncertainty stems from financial incentives and regulation based on current models rather than taking into account new market dynamics. As outlined in the previous section, self-funding is the most prevalent model for financing digital grid projects.

When asked which stakeholders are currently setting the digital grid agenda, 62% of participants said it was the regulator.

Which of the following stakeholders currently set the digital grid agenda in the market in which you operate, and which should set the agenda?

Currently set the agenda	Should set the agenda
1 — Regulators	1 — Customers
2 — Utilities	2 — Regulators
3 — Government	3 — Utilities

This points to a wider question, namely what is the role of the regulator in today's market? Utilities are in a position where they need to innovate more than ever in the face of disruption. Is it the regulator's job to set the agenda and provide leadership – and if so, what needs to change to enable this to happen?

There used to be a clear balance of power, with the regulator at the top, followed by the utility and the customer at the bottom. Regulators used to set the agenda, in particular by providing financial incentives. But the case is not clear for the digital grid.

"If the regulator is no longer 'able' to set the agenda for digital grid because of market dynamics, and the rules of the game have changed, then the relationships between regulators, utilities and customers need to be renegotiated," says Micallef.

Even if regulators no longer provide the main source of financial incentives and leadership, they have a duty to provide the proverbial handrails that protect the industry and consumers.



If the regulator is no longer 'able' to set the agenda for digital grid because of market dynamics, and the rules of the game have changed, then the relationships between regulators, utilities and customers need to be renegotiated."

Paul Micallef, EY

They also need to provide policy that promotes innovation and allows utilities to thrive financially amid the rebalance of the market place. For example, if consumers start to go off-grid but still rely on distribution network operators to be the provider of last resort, regulators need to decide how to intervene.

Regulatory uncertainty carries over to tactical concerns

Against the backdrop of concerns with the regulatory model, difficulty making a business case emerged as a key barrier to the adoption of digital grid:

Top three barriers to the adoption of digital grid within your organization		
		
Difficulty making business case	Immature technologies and supplier inexperience	Lack of understanding of implications on organizational, people and process change

The other top barriers were immature technologies and lack of understanding of implication, which will be addressed as more utilities embark on their digital grid journey as the market develops.

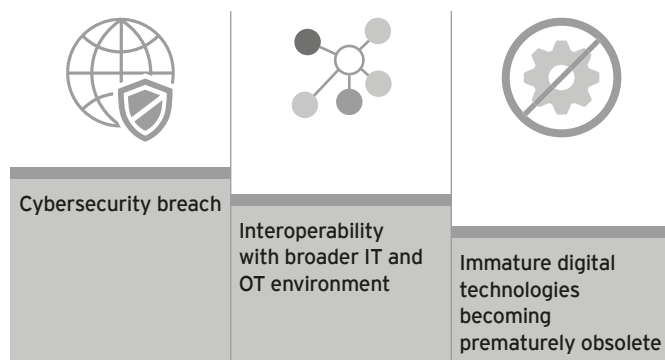
We are not surprised that utilities are finding it difficult to make a business case when regulatory models are uncertain. This is further complicated by the fact that many utilities are operating in divisional silos: at best, they are missing the synergies of investment in digital grid and, at worst, they are duplicating effort and investment.

To address this, utilities need to develop a clear understanding of the regulated and unregulated returns from digital grid. This can only be quantified when the organizational objectives of investing have been clarified and agreed.

Cybersecurity breach is seen as highest risk for digital grid

When it comes to risks associated with digital grid projects, a cybersecurity breach came top.

What are the top three risks associated with digital grid?



Utilities face increasingly sophisticated and frequent cyber threats, so awareness and vigilance are important first steps."

Matt Chambers, EY

This corresponds with what we are seeing in the market. Cyber attacks on utilities and critical infrastructure are no longer theoretical; they are a recognized threat. In the US, the National Cybersecurity and Communications Integration Center and the Industrial Control Systems Cyber Emergency Response Team (ICS-CERT) reported that the energy and water sectors accounted for nearly half of cybersecurity incidents in the first half of FY15.³ Of the total of 295 cyber incidents that ICS-CERT responded to in FY15, 46 were from the energy sector and 25 from the water and wastewater systems sector.⁴

In the Ukraine, in the first publicly acknowledged cyber attack to result in power outages, a quarter of a million people lost power when a control systems network was hacked in December 2015. Following the incident, many countries stepped up efforts on cybersecurity.

"It's encouraging to see that messages on the importance of cybersecurity are getting through. Utilities face increasingly sophisticated and frequent cyber threats, so awareness and vigilance are important first steps," says Matt Chambers, P&U Risk and Cybersecurity Leader at EY.

Summary

Our view is that utilities must become leaders rather than looking to the regulator to set the agenda and provide leadership. Digital grid will not only transform the business models of utilities, but the traditional utility-regulatory model as well. The fact that regulators are no longer the main source of funding can be viewed in a positive light, as it means that utilities are finding ways to innovate in order to generate their own revenue. To manage cybersecurity risks, utilities must continue to be vigilant and invest in cybersecurity skills.

3. *ICS-CERT Monitor*, Industrial Control Systems Cybersecurity Emergency Response Team, Department of Homeland Security. May/June 2015.

4. *Year in Review*, Industrial Control Systems Cybersecurity Emergency Response Team, Department of Homeland Security, FY 2015



How can utilities unlock the full value of digital grid?

Our research captured many encouraging signs, not least the rising investment in, piloting and rollout of digital grid. This represents a positive shift forward.

The vision for digital grid is a compelling one. However, our research revealed a level of overconfidence that could unravel digital grid's potential.

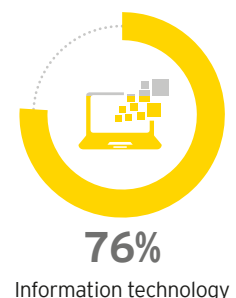
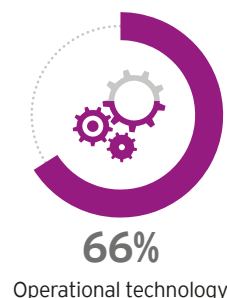
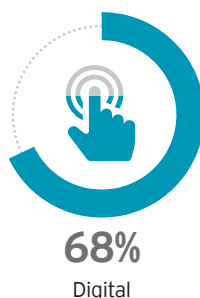
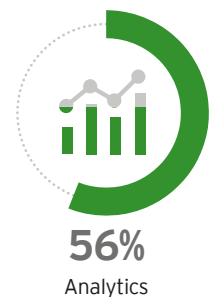
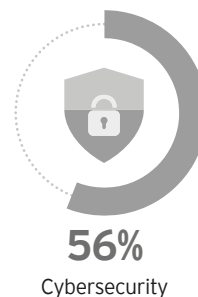
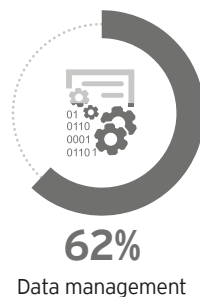
The truth is that there will be many different reasons utilities embark on digital grid initiatives, from balancing power to integrating renewables to sustainability. But in a sector that is still struggling to define exactly what a digital grid is, there is a long journey ahead to unlock its full value. We recommend that utilities:

- ▶ Rein in overconfidence on skills and project success
- ▶ Define clear objectives for digital grid
- ▶ Identify the true scope of the business change required to make this a reality

Rein in overconfidence on skills and project success

On average, more than half of respondents told us they were confident or very confident that they possessed all the skills needed to develop digital grid. Even on cybersecurity, which is an acknowledged area of risk, 56% of utilities we spoke with said they already possess the skills they need.

How confident are you in having the following skills within your organization for developing digital grid? (Confident or very confident)

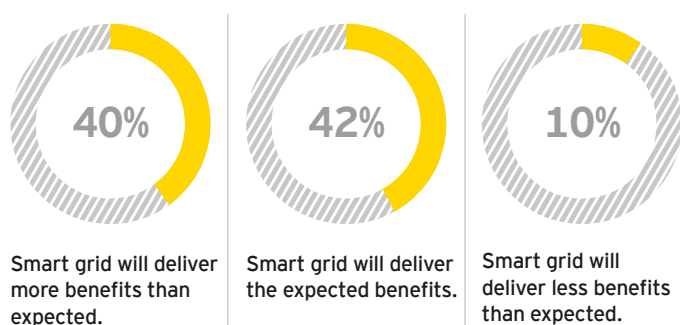


In our opinion, this raises a red flag. It is far too early to claim “all systems go” and to say that all the skills needed to deliver a successful digital grid project are in hand. It conflicts with both our experience and reported shortages of digital and cybersecurity skills in the market.

“The shortage of cybersecurity specialists is a global problem that cuts across industries. With sophisticated cyber attacks on the rise, protecting critical infrastructure and the grid will become increasingly important. Companies already face a ‘war for talent’ in competing for the best and most highly valued experts as the demand for cybersecurity skills continues to grow. Utilities need to be at the forefront in addressing these challenges by investing in cybersecurity education and training,” says Chambers.

Similarly, when it came to confidence in whether digital grid initiatives would prove successful, a whopping 82% said they would deliver or exceed expected benefits. We suspect this comes down to enthusiasm for digital grid and a strong sense of its potential. Nonetheless, there is a clear misunderstanding of the myriad challenges that lie ahead.

To what extent do you believe the digital grid programs or initiatives will deliver their associated benefits?



These results may also reflect the early stage we are at in the digital grid journey. Not enough utilities have reached implementation stage, that “aha” moment in which they realize how different digital grid is from traditional technology and system implementations.

“Digital grid has such far-reaching implications that it absolutely requires a shared vision, shared terminology, shared organization structures and tight management across all the functions it touches. Starting without those foundations is a recipe for disaster,” says Micallef.

Define digital grid and your objectives

Obviously, initial objectives for the digital grid will vary depending on the operating and technical conditions in that country. For example, in Germany, the top objective is integration of renewables, while in the Middle East, it’s sustainability due to high population growth and the ability to deal with growth.

“Our clients are finding that investing in digital grid is far cheaper than building new power plants.”

John Bayard, EY

From these initial objectives, digital grid will evolve as utilities develop and implement strategies in response to disruption. In the future, the objective will no longer be solely to deliver kilowatts. The 25-year planning cycle will shorten and the objectives for digital grid will change.

Already we are working with clients that use demand response and other digital grid tools to remove the need for capital investment. “Our clients are finding that investing in digital grid is far cheaper than building new power plants,” says Bayard. “Successful projects have demonstrated that a reduction of 1-2GW is perfectly doable at a mid-sized utility with circa one million clients.”

“Those who can embrace the shift in mindset that disruption is causing are the ones who will be able to unlock the value of digital grid and reap the benefits.”

Serge Colle, EY

Identify the enterprise-wide scope of change

Done properly, digital grid will touch all sides of a utility's business. Although there is an increasing understanding that digital grid is as much business change as technology change, when the time comes for implementation, there is a tendency to stay inside comfort zones.

After identifying the scope of change across the business, from operations to regulatory models to customers – and related risks, comes the harder work of putting it into practice.

Breaking down departmental silos is the elephant in the room. It is easily said and not easily accomplished. But enterprise-wide thinking is critical to the success of digital grid projects. It is not business-as-usual with a bit of change tacked on.



Digital grid has such far-reaching implications that it absolutely requires a shared vision, shared terminology, shared organization structures and tight management across all the functions it touches. Starting without those foundations is a recipe for disaster."

Paul Micallef, EY

We strongly recommend a structure with one central body, which maintains oversight of investment and implementation across the enterprise. Its sole focus should be digital grid, to enable it to champion change, build consistency across the organization and push for layered technologies that make the most of a utility's hard-earned spend.

Conclusion

The tide of disruptive forces in the P&U sector is rising at an increasing rate. Utilities recognize that digital grid is a tool that can help them harness the positive force of this tide. While it does not come with watertight instructions on how to achieve it, or a clear common definition across the board, the digital grid can, with the right approach, transform P&U companies into resilient, responsive and innovative businesses.

It requires change that utilities will find difficult – a change in mindset and overcoming departmental silos. It requires a new set of skills and capabilities.

The comforting news is that utilities don't need to go it alone. In the new landscape that disruption has created, collaboration with innovators, disruptors and cybersecurity specialists can take many forms: partnerships, alliances and joint ventures, and so

on. These models offer new ways of working and opportunities to build knowledge and fill skills gaps.

Navigating this terrain will take knowledge and confidence. Utilities need to accept the different role that regulators might play, the active role the customer is now playing in decision-making and that their own role will require more leading and less following. "Those who can embrace the shift in mindset that disruption is causing are the ones who will be able to unlock the value of digital grid and reap the benefits," says Serge Colle, Global Advisory Power & Utilities Leader at EY.

Utilities that develop sound foundations for their digital grid strategy will be in a much better position to succeed in creating a flexible, resilient grid that meets the needs of future energy systems.



EY Contacts

Paul Micallef

Global Digital Grid Leader
pmicallef@uk.ey.com

Graham Skinner

Digital Grid
gskinner@uk.ey.com

John Bayard

Digital Grid
jbayard@uk.ey.com

Omar Al-Juburi

US Digital Grid
omar.aljuburi@ey.com

Benoit Laclau

Global Power & Utilities Leader
blaclau@uk.ey.com

Serge Colle

Global Advisory Power & Utilities Leader
serge.colle@be.ey.com

Gavin Rennie

Global Power & Utilities Emerging Markets Leader
gavin.ennie@qa.ey.com

Stuart Hartley

Asia Pacific and Digital Power & Utilities Advisory Leader
stuart.hartley@au.ey.com

Dana Hanson

Americas Power & Utilities Leader
dana.hanson@ey.com

Methodology

To identify the current state of digital grid, EY commissioned research based on telephone interviews in September 2016 with 50 utilities with large distribution networks. These 50 were either stand-alone distribution system operators or part of a vertically integrated utility.

Geographically, 52% of respondents were based in Europe, 20% in the Americas, 10% in the Asia Pacific region, and 18% in the Middle East and Africa. In terms of size, 66% of utilities surveyed had more than 500,000 customers.

Of those interviewed, 12% were from the C-suite; the remainder were digital grid leaders in operational or management positions.

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EYG no. 03744-164GBL

BMC Agency
GA 0531_08681

ED None.



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