How energy can scale advanced tech safely

The energy sector is benefiting from its early investments in emerging technologies, but can it securely scale up digitalization to generate value and enhance resilience?

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Foreword

Across the energy sector, we're seeing optimism and experimentation around emerging technologies. But in many cases, there isn't innovation at the scale required to deliver business results."

— Brad Stansberry
Consulting sector leader for energy and chemicals
KPMG LLP

Energy companies aren't waiting for the future: They're already deploying technologies that cut costs, reduce risk, and improve reliability. New KPMG LLP research finds that they're moving quickly: more than 9 in 10 see themselves as early adopters of new tech or fast followers.

The scale of this ambition is revealed in the **KPMG Global Tech Report 2026**.

The survey of

2,500 executives from

27 countries

including **100** from energy businesses in the US,

shows that these organizations are among the leaders in terms of how much of their technology budgets they're allocating to transformation initiatives.

At the C-suite level, there's now clear acknowledgment that they need to be fast adopters in order to achieve their ambitious capital deployment goals and meet expected demand growth."

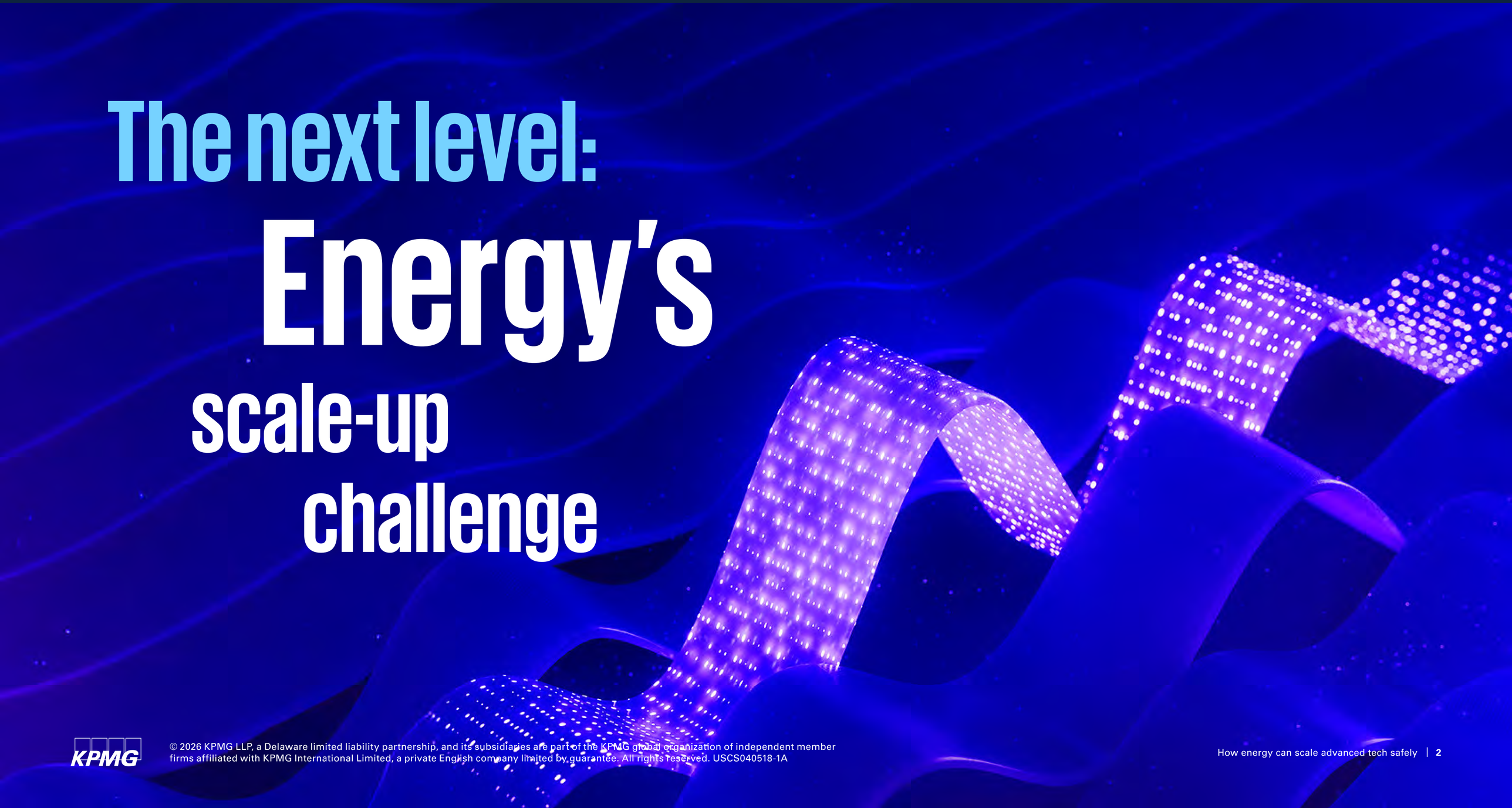
— Todd Fowler
US sector leader for energy, natural resources, and chemicals
KPMG LLP

But the sector has work to do. Digitalization could unlock significantly more value from a much wider range of energy use cases. To access that value, organizations will need to expand their small-scale initiatives by creating a culture of innovation that manages risk and reward.

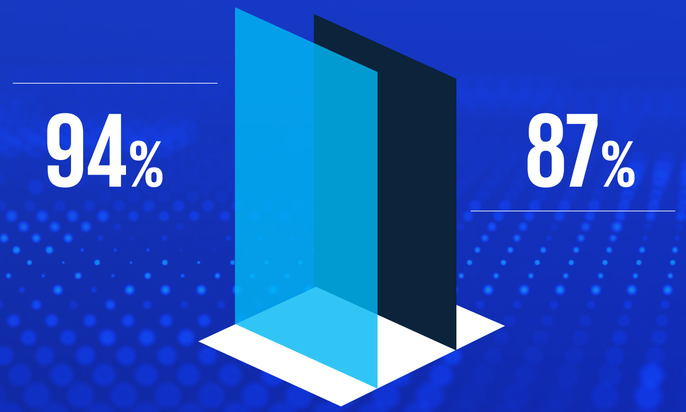
Examples of best practice highlight what's possible. One global energy company found that multiple teams were pursuing innovation independently, leading to inconsistency and limited scalability. As part of a US$500 million enterprise transformation, the company introduced a new target operating model, a robust change management process, and a suite of new technology solutions.

The result was a cultural shift that enabled faster decision-making, more effective scaling of new ideas, and a reduction in low-value activity—delivering measurable business returns while keeping the transformation on time and within budget.

The next level: Energy's scale-up challenge



When it comes to emerging tech, energy businesses recognize what's at stake. More than 9 in 10 (94 percent) say investing in advanced technologies will be their primary driver of competitive advantage over the next three years. Almost as many (87 percent) accept that the potential long-term returns from emerging technologies such as quantum computing, neuromorphic computing, and agentic AI justify investment today.



And energy companies are pressing ahead with their adoption of emerging technologies—in some cases, more convincingly than other industries. For example,

99% of energy organizations

have started to implement virtual-, augmented- and extended-reality technologies. In other industries, the average is 90 percent.

90% Other industries

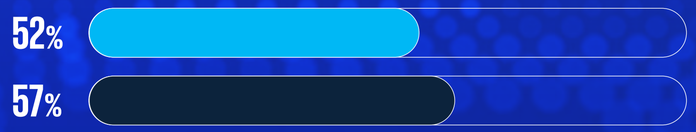
The next challenge for the energy sector is to scale up its technology and innovation activity. In some important areas, other industries are doing better at this:

Data and analytics

In data and analytics, only 45 percent of executives say they're already at the most advanced stages of implementation, compared with 60 percent of executives in other industries.

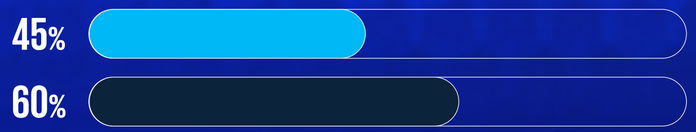
AI and automation

In AI and automation, 52 percent of executives say they're already at the most advanced stages of implementation, compared with 57 percent elsewhere.



Cybersecurity

In cybersecurity, 44 percent say they're already at the most advanced stages of implementation, compared with 61 percent elsewhere.



The sector is also investing less in digitalization. The average energy organization is currently investing about US$153 million a year in emerging technologies; the average across other industries in our research is about US$198 million.

Lower investment has created less value. Energy organizations estimate that they have gained an average of US$223 million from technology investment over the past year; in other industries, that average rises to US$306 million.

> **"There's plenty of optimism and experimentation. But we're not necessarily seeing enterprise—wide results."**
>
> **— Brad Stansberry**
> Consulting sector leader for energy and chemicals
> KPMG LLP

Why is energy slow to scale?

There are good explanations for the slower scale-up in the energy sector, from the volatility of the market landscape to the burden of regulation and compliance.

> **Energy companies are also dealing with constant cost pressures. This creates an environment in which the priority for IT is keeping the lights on rather than exploring new ways of working."**
>
> **— Tim Williams**
> Technology leader
> KPMG LLP

An associated problem is that energy organizations' extended investment and planning cycles—major projects can span several years—clash with the idea of rapidly adopting new technologies at scale.

Stansberry suggests that if energy companies think about innovation and digitalization in the context of their traditional business models, they will find it easier to move faster. "These are asset-based businesses," he says. "So deploying AI to help them operate assets more efficiently will drive value."

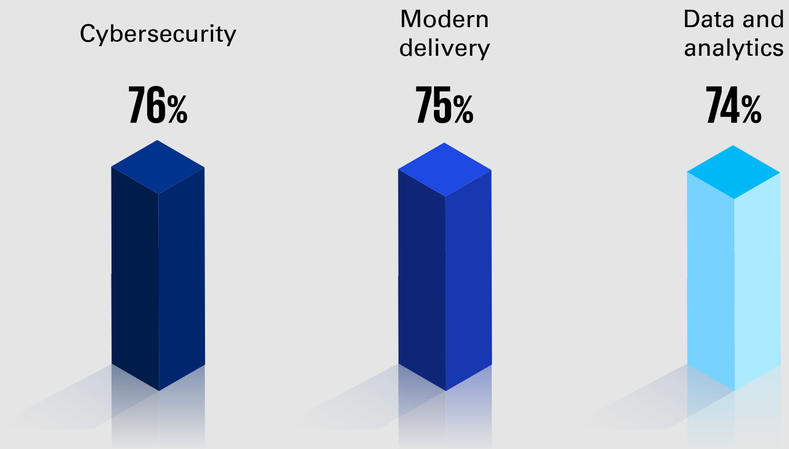
Williams, meanwhile, points out that this industry, which has often struggled to recruit technology specialists, will need to bring in new talent. "The availability of skills has been an issue," he says. "But that's now starting to change, not least because many organizations now accept that skills and knowledge around technology and innovation are often transferable from one industry to another."

The energy blueprint for tech

Security, resilience and efficiency

The technology priorities and ambitions of energy organizations today reflect their slightly slower scale-up of digitalization. They're more likely than organizations in other sectors to focus on goals such as increased efficiency and greater resilience. And they're less likely to target value creation benefits such as accelerated time to market and business growth.

Energy organizations' biggest priorities for technology investment over the next 12 months are:



AI and automation, which is the biggest focus for organizations in a number of other industries, isn't in the top three.

Executives expect the top benefits of investing in these priorities to be improved operational efficiency and better cyber risk management—which in turn builds resilience. While other industries also list improved operational efficiency as the top benefit, they are more likely than energy executives to look forward to new revenue growth and more rapid innovation.

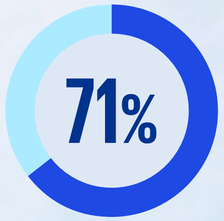
Energy organizations aren't wrong to focus on goals such as improved security, resilience, and efficiency. But they shouldn't overlook valuable opportunities to use technology to grow the business, according to Fowler. He gives the example of surging demand from the technology sector for energy to power data centers and other AI infrastructure.

"Utilities are very judicious in every dollar they spend on capital assets, as it ultimately flows to customer bills. So they're moving slowly and waiting to see how the market develops," he says. "It's actually the technology companies themselves that are accelerating deployment, as they are also the ones that are driving the acceleration in demand for energy."

For Williams, it's important to make the business case for more up-front value-generative investment activity. This calls for a less conservative approach.

> **"It's uncomfortable moving rapidly on technology. Because there are so many unknowns with the promises of something like AI. But IT teams do now need to think a little differently, moving away from those very long-term planning processes."**
>
> **— Tim Williams**
> Technology leader | KPMG LLP

One factor that could help with a cultural shift to greater immediacy is the heightened focus on energy security and sustainability. To increase resilience and sustainability and prevent shortages over the next year, energy businesses rank carbon capture and storage, smart grid systems, and diversifying the energy mix with higher renewables as their three most pressing technology-led initiatives. Similar findings were observed in the KPMG US Emerging Energy Survey 2025:



of executives said their energy mix needed to expand to support increasing AI energy demands.

In the US in particular, these are now primarily economic challenges—as opposed to imperatives connected to the energy transition—argues Stansberry.

> **"The Energy sector has become a national priority that will enable or constrain future economic growth. Innovation is required to drive a more efficient profitable energy sector that is moving at pace with the broader US economy."**
>
> **— Brad Stansberry**
> Consulting sector leader for energy, natural resources, and chemicals
> KPMG LLP

More effective scenario planning

Emerging technologies could be particularly useful to energy organizations in increasing their agility and making them more proactive. Affected by unpredictable factors including geopolitics, market pricing, regulation and the weather, the energy sector is particularly vulnerable to volatility and uncertainty.

More than half of energy executives,

53%

say that ineffective forecasting or scenario planning frequently has negative consequences for how they respond to such shifts,

compared with only

39%

of executives in other industries.

Six in 10 energy executives

61%

say that market, regulatory and technology shifts have significant potential to affect them

compared with only

47%

of executives in other sectors.

But the sector's ability to consider likely shifts, their impact and how to respond isn't always good enough.

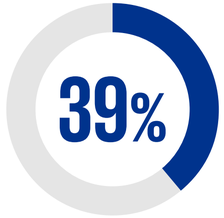
They also need better demand forecasting.

> **Many energy companies are struggling with how much load growth to expect in the near term. They need better visibility of the impact of AI and data centers on load, and need better scenario planning in order to understand where infrastructure is needed and upgrades are required, in order to meet the energy load demand from new large load customers like data centers."**

— Todd Fowler
US sector leader for energy, natural resources, and chemicals
KPMG LLP

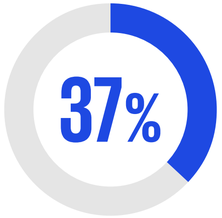
Many energy organizations now understand that digitalization could help them.

In the next 12 months

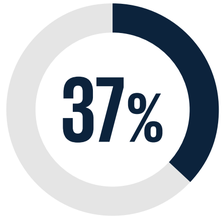


39% intend to improve their data flows and technology infrastructure to support scenario planning and enhance decision-making agility, and the same percentage plan to apply greater scrutiny to the geographic location of cybersecurity partners.

Almost 4 in 10 reveal that they are preparing their workforce for digitalization, with ambitions to hire more onshore technology talent,



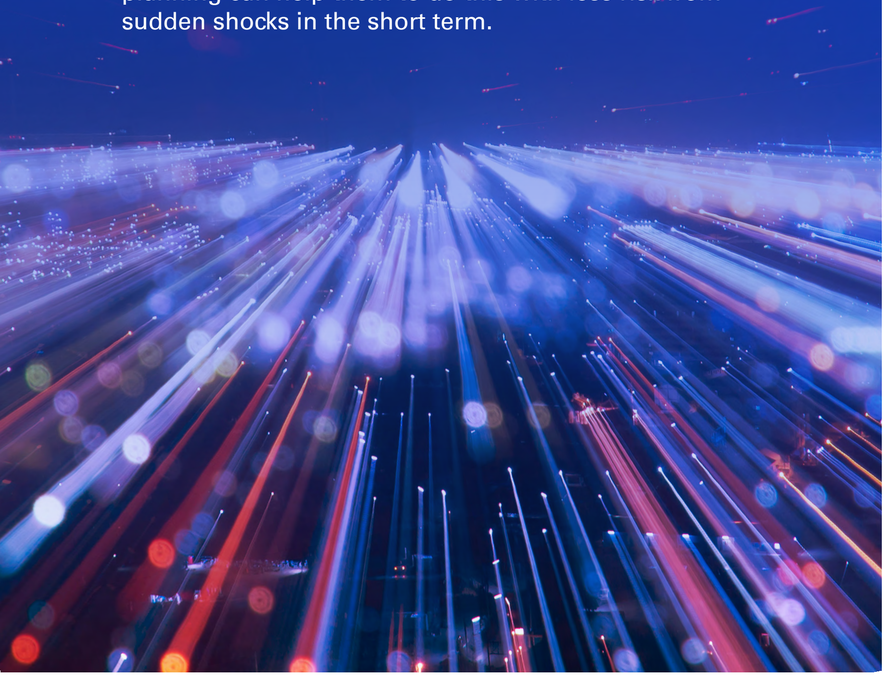
37%



37% and to invest in centers of excellence for innovation.

Following its acquisition of Chesapeake Energy, Encino Energy invested in a multilayer cloud-based architecture and self-service analytics platform, integrating previously fragmented datasets and giving employees access to trusted, on-demand insights. As a result, Encino improved decision-making: forecast accuracy increased, field deployment became more efficient, and capital allocation was optimized.

Energy companies will still need to look beyond short-term volatility and consider their longer-term strategies. That's especially true in oil and gas, where investment decisions play out over decades. Better scenario planning can help them to do this with less risk from sudden shocks in the short term.

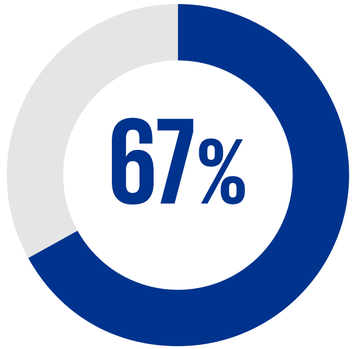


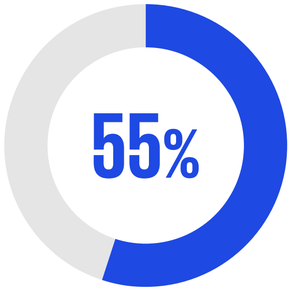
Safety and security first

Energy companies are under pressure to innovate rapidly and at scale. But many are responsible for critical infrastructure, so safety and security have to remain paramount.

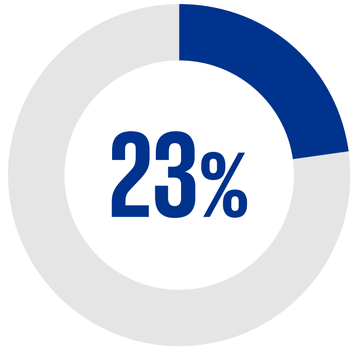
Some in the sector are concerned that they aren't,

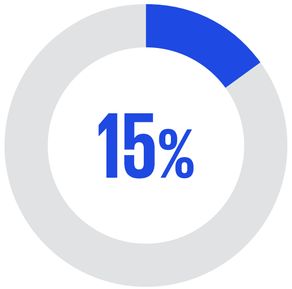
and 23 percent say they're investing rapidly in AI but not implementing risk-focused policies and guardrails at the same pace. Only 15 percent of organizations in other industries say the same.



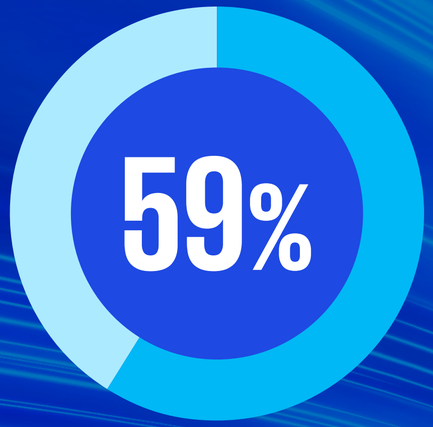


67 percent of energy organizations say they make speed to market a priority, even if it means being more flexible with security, compared with only 55 percent of other organizations.





Speed is important, but haste is a mistake—and not just because of security. More than half of energy executives



are concerned that in trying to be as cost-effective and fast as possible, their tech programs have made trade-offs with negative impacts on imperatives such as scalability and data standardization, as well as on security.

Organizations building cultures of innovation can address these issues, says Stansberry.

> **Innovation should be a corporate asset, with encouragement, resourcing, celebration and reward that fosters participation. That process thrives when it is a governed and structured approach. Enterprise innovation can be federated or centralized, but good governance protects and enables the organization"**

— Brad Stansberry
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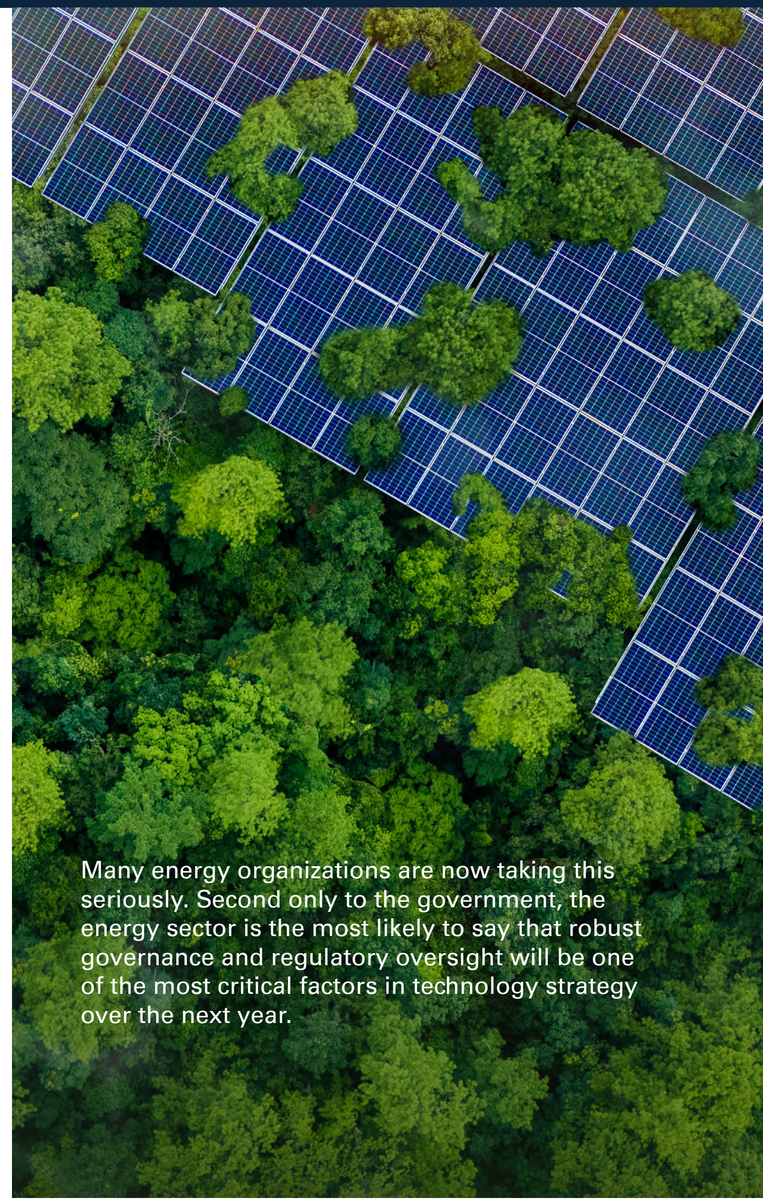

Many energy organizations are now taking this seriously. Second only to the government, the energy sector is the most likely to say that robust governance and regulatory oversight will be one of the most critical factors in technology strategy over the next year.

Three moves for energy leaders in the next 12 months

Three moves for energy leaders in the next 12 months

Our research shows that energy organizations understand the stakes. Emerging technologies could give them greater operational efficiency, better risk management, increased value, and faster growth.

But maximum advantage will come from innovating at scale without losing their grip on risk.

To do this, they need to:

Build the foundations for enterprise-level digital adoption

Energy firms have started to implement advanced technologies, but they often lack scale. Leaders should change their infrastructure, data readiness, and operating model to allow them to move from pilots to enterprise-wide solutions.

Strengthen resilience with better scenario planning and data-driven decision-making

Investing in stronger data flows, talent and forecasting capabilities will help organizations to get ahead of disruption instead of being forced to react to it.

Reinforce governance to balance speed with long-term stability

Rushing tech programs creates vulnerabilities and slows down transformation later. Energy leaders should embed governance earlier, adopt clearer AI guardrails, and ensure that speed doesn't compromise their security, scalability, or sustainability.

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