

2025

POWERING POSSIBLE

Unleashing AI for Energy and Energy for AI



Microsoft



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At ADNOC, we believe that Artificial Intelligence (AI) lies at the heart of a new industrial revolution that will deliver unprecedented gains in productivity, transform entire industries and reshape societies.

The energy sector is essential to this transformation, because AI's growth depends on gigawatts. Collaboration between energy and technology leaders is no longer a nice to have. It is a must-do, if we are to unlock the full potential of AI.

Today, the energy sector is no longer exploring the potential of AI, it is delivering on it. Across the value chain, we are seeing real-world deployments that are improving reliability, unlocking new efficiencies and driving sustainability. From predictive maintenance in operations to AI-optimized grids integrating renewables at scale, the transformation is underway.

This progress is the result of deliberate action. Energy and technology leaders have moved beyond pilots to production, forging partnerships that are reshaping infrastructure, accelerating decarbonization, and building the workforce of the future. At ADNOC, we are embedding AI into every layer of our operations, not as a concept, but as a core capability driving measurable impact.

Yet the pace of change must increase. As AI becomes a major energy consumer, and as energy systems become more technology dependent, our strategies must evolve together. That means investing in talent, scaling proven solutions, and aligning policy with innovation.

This report reflects a sector in motion. It captures the lessons learned, the value created, and the urgency to go further. The next step is accelerated execution, together.

Dr. Sultan Al Jaber

Managing Director and Group CEO, ADNOC
and Chairman, Masdar



At Microsoft, we are deeply committed to being both a responsible consumer of energy and a trusted partner in the global energy transition.

That means investing in carbon-free power for our data centers, co-innovating with energy providers to develop scalable solutions, and responsibly applying AI to drive efficiency, resilience, and emissions reduction across the energy value chain.

We also recognize that technology alone is not enough. That's why we're investing in workforce programs and digital platforms that equip people with the AI capabilities needed to thrive in this new era—ensuring human ingenuity remains at the center of progress.

No single company or industry can meet this moment alone. Accelerating the transition to a more sustainable, secure, and inclusive energy future requires deep collaboration—between governments, energy providers, technology companies, and innovators everywhere. Together, we can shape the policies, partnerships, and skills that define the next generation of energy leadership.

Brad Smith

Vice Chair & President, Microsoft





Executive Summary

Over the last year, the convergence of Artificial Intelligence (AI) and energy has begun to shift from theory into practice. What was surfaced as ambition in the inaugural 2024 report is now moving to execution as projects scale, partnerships deepen, and early results point toward the transformative potential of this pairing.

This shift is reflected in the findings of the 2025 study by ADNOC, which shows that AI and digital infrastructure investment continues to climb with nearly nine in ten respondents reporting increased spending over the past year. The goal is no longer about proving concepts but how to move from pilot to enterprise-scale production while ensuring that AI and energy advance in parallel in ways that are sustainable, reliable, and inclusive.

Adoption patterns vary by seniority and region: Decision makers closer to implementation report broader functional use than their executive counterparts. Optimism is strongest in China and India. At the same time, barriers to AI deployment in the energy sector are shifting, with cybersecurity now seen as the top concern, closely followed by data quality. This suggests that energy leaders aren't questioning AI's value anymore— they're wrestling with how to make it work.

Last year's inaugural Powering Possible report outlined seven priorities to help the industry to overcome these barriers and accelerate AI deployments at scale. This year's edition tracks progress against each, highlighting where value is already being realized, where blockers remain, and what actions can deliver impact at scale. The result is a practical playbook for industry leaders navigating the AI-energy nexus—showing what works, where urgency is greatest, and how collaboration can unlock both commercial and climate benefits.

Strategic partnerships—such as those between ADNOC and Microsoft—show how collaboratively developed solutions can simultaneously meet AI's growing energy needs and apply AI to

optimize energy operations. These alliances are no longer experiments; they are being scaled across enterprises and sectors, setting a blueprint for broader adoption. Investment is following suit, flowing into renewable expansion, grid resilience, methane reduction, and carbon capture, utilization and storage. Pilot projects are giving way to full-scale deployments with measurable operational savings and emissions reductions. Yet financing still lags the scale of demand, particularly as next-generation AI data centers emerge as energy-intensive complexes requiring up to 5 GW of continuous power. Meeting this challenge requires not just more capital but smarter, faster infrastructure planning and permitting.

“Under the UAE's leadership, Artificial Intelligence stands today as a defining force of national progress and a cornerstone of our future readiness. The UAE recognizes that those who lead in AI will shape the future of economies, societies, and humanity itself. AI is already transforming how we work, make decisions, and address complex challenges, faster, smarter, and at scale. Yet, the true measure of leadership lies not only in technological advancement, but in preparing talents to harness its full potential. The UAE is deeply committed to developing human capital, empowering people with AI skills, knowledge, and mindset to innovate and lead in the age of AI.”

H.E. Omar Sultan Al Olama
Minister of State for Artificial Intelligence, Digital Economy, and Remote Work Applications UAE



The 2024 report identified seven priority areas where AI can unlock value across the energy sector while supporting the transformation to a more sustainable future. The 2025 report makes the case for increased collaboration between the energy and technology sectors to accelerate AI adoption at scale:

02



Invest in AI for the energy transformation, with a focus on four key areas: scaling renewable energy, building resilient grids, reducing methane emissions, and utilizing carbon capture and storage.

03



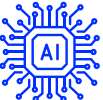
Expand and enhance grid capacity, increase availability of carbon-free electricity, especially in locally stressed grids or regions— while continuing to innovate to increase energy efficiency.

05



Develop AI with and for emerging economies, to meet their unique needs.

06



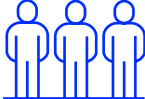
Establish data standards and protocols for AI to better support the energy sector.

01



Increase collaboration between technology and energy companies to deploy more carbon-free energy while making it more available and more affordable for all.

04



Build capacity in the workforce to leverage AI for energy transformation.

07

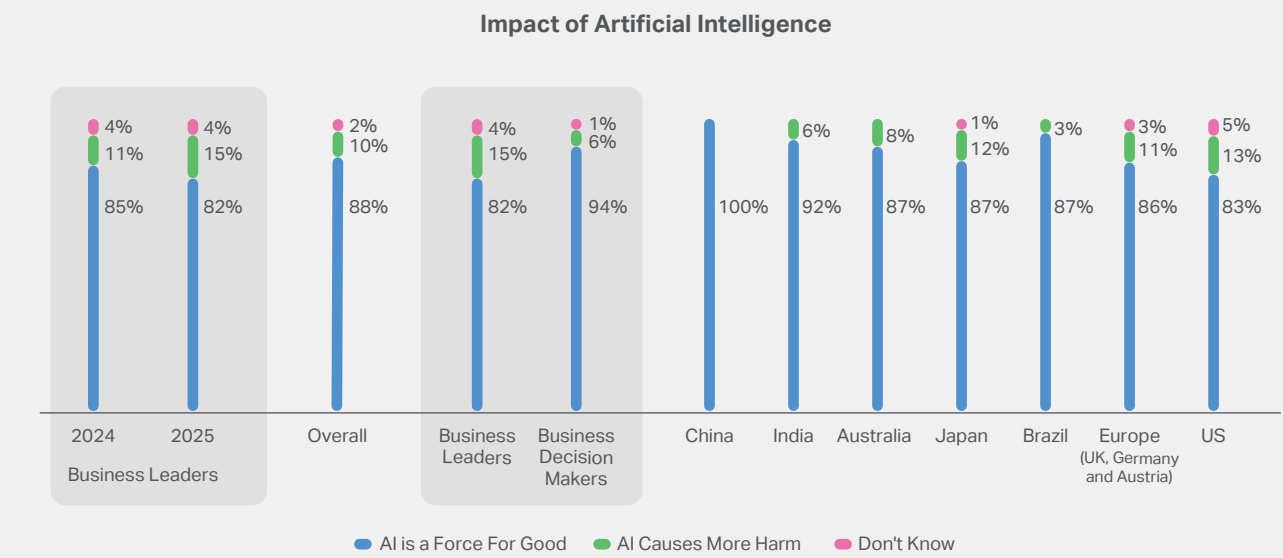


Advance policy and governance for responsible, sustainable AI and a secure and inclusive transformation to a more sustainable energy system.

Figure 1

AI is seen as a force for good

Business Decision Makers tend to be more optimistic than Business Leaders, with optimism highest in China and India.



The interplay of AI for Energy and Energy for AI is now symbiotic. AI-driven workloads are reshaping electricity demand and supply, while AI itself is optimizing forecasting, asset use, and maintenance across the energy system. The two reinforce each other: powering AI growth requires more sustainable, more reliable energy, and deploying AI across energy ensures that outcome is achieved affordably and at speed.

However, qualitative insights from this year’s ADNOC survey data suggest that business leaders expect population growth, technological advancements and AI usage, will increase energy usage. This increasing demand for energy is seen as a challenge for the sector and there is an interest in better understanding the role of AI in both contributing to and helping to efficiently manage this increase as well as the impact of demand growth on the energy grid.

Additional insights from industry leaders revealed, that confidence in the ability of existing infrastructure to support AI-driven energy demands through 2030 is higher in APAC than other regions. In the near term, new technologies, which include energy storage, dynamic line rating, high performance transmission

reconducting, etc., are widely seen as effective tools for enhancing grid resilience, lowering long-term costs, and supporting economic growth. Meanwhile, energy companies and digital infrastructure providers recognize the need to collaborate to balance power system affordability, reliability, and sustainability in a manner that positions AI to advance all three of these guiding principles in electricity governance.

Grid capacity remains a potential bottleneck to expanding the digital infrastructure supporting AI. Global data centers account for around 1.5% of the world’s electricity consumption and could double by 2030 to 945 TWh¹. This represents approximately 10% of total global electricity demand growth, requiring both new generation and better use of existing assets. In addition to more efficient use of existing grid assets, new generation, and grid upgrades, behind-the-meter storage and generation may emerge as niche, often temporary solutions, but equally may introduce new considerations in power system regulation and sustainability goals. Policymakers must consider reliability and reasonable cost, while balancing speed and innovation with fairness, safety, and alignment to climate goals.

“Unlocking the potential of AI requires advances in efficient and sustainable computing. Improving performance-per-watt is key to meeting future energy needs and the surging demand for compute. By applying AI to optimize the energy ecosystem itself, we can make systems more reliable and ensure that progress in AI also drives progress in powering the world.”

Dr. Lisa Su
Chair and CEO, AMD



1 IEA Energy and AI report, April 2025, <https://www.iea.org/reports/energy-and-ai>



On emissions, 2025 survey data underscores that senior leaders remain confident in AI's long-term environmental benefits, even as the pace of progress might be tempered by the realities of implementation at scale. Notably, AI is now being deployed in critical areas such as methane detection and carbon capture—two cost-effective and scalable levers for decarbonization. Methane, while less abundant than CO₂, is much more potent as a greenhouse gas over a 100-year period, making rapid detection and mitigation a top priority for the sector. AI-powered systems enable real-time monitoring and swift response to

leaks, helping organizations like ADNOC and its partners prevent emissions, optimize energy use, and monitor carbon storage with enhanced accuracy.

At the same time, carbon capture, utilization, and storage (CCS/CCUS) is increasingly recognized as essential for decarbonizing hard-to-abate sectors such as cement, steel, and chemical industries where direct emissions reductions are challenging. Here, AI is accelerating progress by optimizing capture processes, improving site selection, and enhancing monitoring and verification. ADNOC and partners are deploying machine learning to prevent leaks,

“AI can be a powerful driver for an equitable energy transition in Africa. By optimizing renewable energy generation and grid management, it will help countries leapfrog directly to cleaner, more efficient systems, reducing waste and reliance on fossil fuels. This must be done alongside investment in people and infrastructure – prioritizing digital skills, expanding broadband and reliable power grids, and building the data centers required to run these systems. The ambition and intent is in place; we must now focus on building the partnerships required to deliver the promise of energy for AI.”

Carlos Lopes
Professor at Nelson Mandela School of Public Governance, University of Cape Town



optimize energy use, and monitor carbon storage, proving how digital tools can accelerate decarbonization.

While these solutions are not yet deployed at full scale globally, the momentum is clear: digital tools are already delivering measurable results, and the challenge now is to extend these benefits rapidly and equitably across the sector. The focus is shifting from questioning AI's value to scaling its impact—demonstrating that AI is not just a promise for the future, but a practical driver of emissions reduction today.

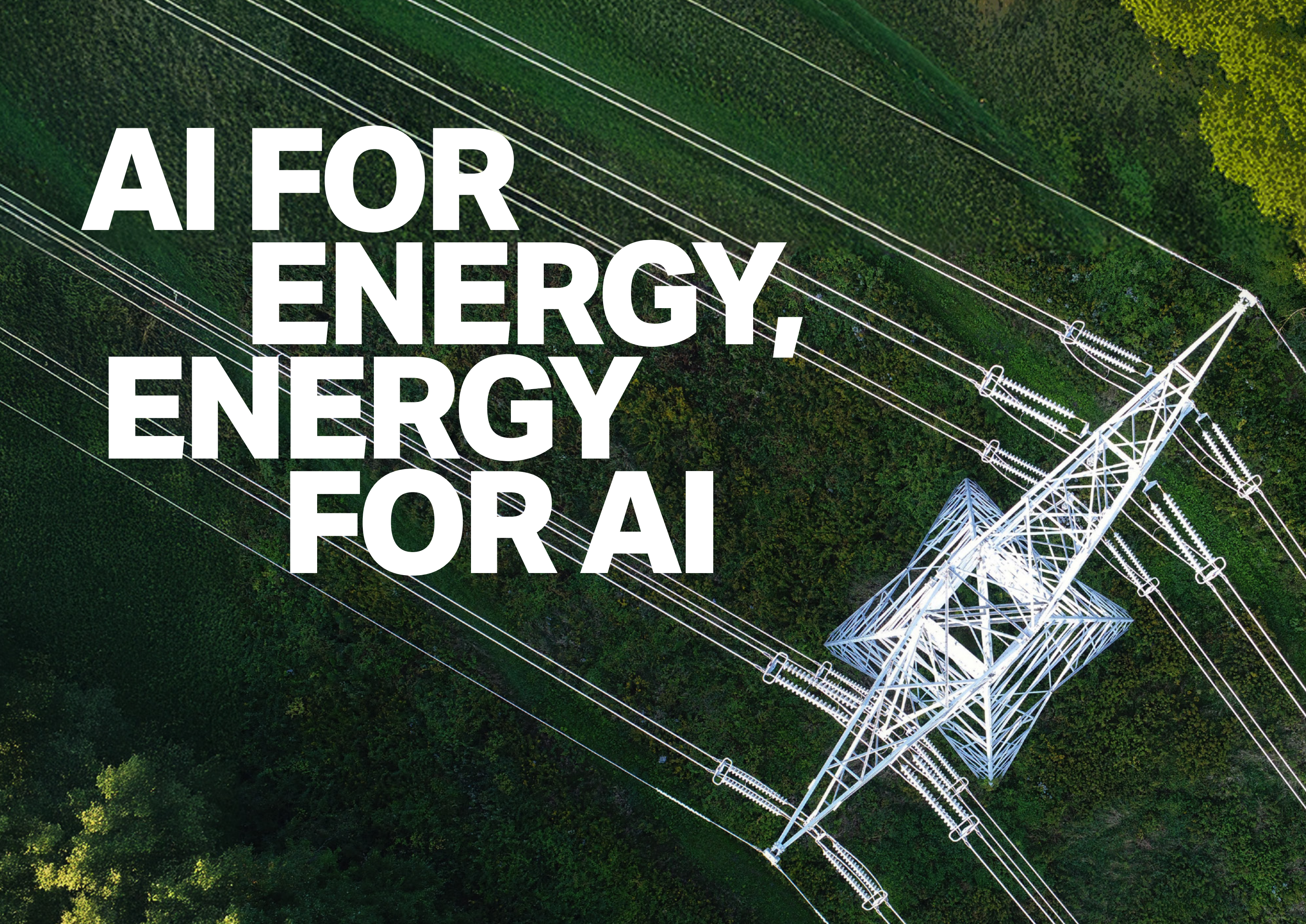
The talent gap identified in 2024 persists with 39% of respondents

from this year's survey citing it as a major barrier to AI adoption along with an urgent need to upskill energy professionals. Institutions like MBZUAI (Mohamed bin Zayed University of AI) are producing hybrid expertise in AI and energy, but the workforce gap remains wide. Without rapid investment in skills, both AI adoption and energy transition goals risk delay. Emerging economies, meanwhile, are beginning to benefit from AI-enabled solutions for distributed systems and grid planning. Ensuring equitable access to technology, capital, and talent is essential to avoid a new digital divide.

“As we enter the intelligence age, we see a future where AI and energy systems evolve together. AI will become more efficient through advances in training and greater use of clean power. In return, it can help transform the way energy is produced, distributed and consumed. From optimising grids to scientific breakthroughs, AI can help advance the shift to reliable, affordable renewable energy - unlocking the full potential of AI to benefit everyone. Success requires deep collaboration between technology companies, the energy industry and governments. At OpenAI, we're committed to making intelligence work for people and for the planet. If we align energy and AI with care and ambition, abundant intelligence can drive a cleaner, and more equitable future.”

Nate Harbacek
VP of Global Business, OpenAI





AI FOR ENERGY, ENERGY FOR AI

A Shared Transformation

AI and energy are no longer parallel conversations. In 2025, their convergence is shaping a single transformation: powering AI's exponential growth while using AI to deliver a cleaner, smarter, and more reliable energy system. Each accelerates the other, and both must evolve together if the world is to meet rising demand and achieve net zero goals.

Today, AI is providing demonstrated operational and financial advantages to energy companies:

- **Across the value chain**, ADNOC, in partnership with AIQ and AVEVA, are predicting a 50% reduction in unplanned shutdowns and a 20% extension in planned maintenance intervals based on the results of pilot projects for its AI-driven Neuron 5 tool.
- **In carbon management**, Chevron's AI-enabled methane monitoring has halved emissions in key assets.²
- **In power generation**, AI-enhanced forecasting enables better integration of renewables while maintaining grid stability.

- **In midstream**, Shell's predictive maintenance AI reduces pipeline downtime, delivering energy more reliably.³
- **In upstream**, ADNOC is using AI algorithms to analyze vast geological datasets to improve the accuracy of subsurface mapping, predict reservoir behavior, assess capacity, and reduce uncertainty in site selection.

Meanwhile, AIQ, a joint venture between ADNOC and Presight, and Microsoft are deploying AI solutions to ADNOC's upstream operations to help drive efficiency and cut emissions. These include machine-learning algorithms for

predictive maintenance on equipment to prevent leaks and AI analytics to optimize energy use in real time at production sites. ADNOC, through AI solutions provided by AIQ and Microsoft, has identified operational efficiencies expected to reduce its energy consumption by 5–10% in pilot sites – contributing to both emissions reductions and cost savings.

AI is also allowing energy businesses to tap into new revenue streams – including AI-optimized LNG and power trading, co-investment in dispatchable generation for data centers, and licensing proprietary AI analytics tools to industrial clients.

Opportunities

- **Operational improvements:** AI can achieve 10–30% cost reductions in operations and maintenance, contributing billions in annual savings, while improving safety and reliability.
- **New revenue avenues:** Collaborating on energy infrastructure (gas, SMRs, storage) with tech firms; monetizing AI platforms and data analytics services.
- **ESG benefits:** AI-enabled methane detection, flare reduction, and energy optimization enhance sustainability, compliance and investor confidence.

Considerations

- **Regulatory requirements:** Regional carbon and methane regulations may necessitate AI adoption for compliance.
- **Competitive disadvantage:** Not adopting AI internally could lead to higher costs compared to peers and reduced access to capital as investors favor digitally enabled operators.
- **AI initiatives that yield little tangible benefit:** Many organizations embark on AI projects without a clear strategy for integration, measurable outcomes, or alignment with operational needs. This disconnect not only delays progress but also risks eroding confidence in AI's transformative potential.

“Artificial Intelligence is becoming a strategic tool in our operations, enhancing efficiency, helping us shrink our environmental footprint, in particular enabling optimization of the electricity value chain between renewable assets, batteries, gas fired power plants and grids. But technology alone isn't enough, that's why we continue to invest in reskilling, empowering our teams with the capabilities to harness AI effectively. Ultimately, it's the synergy between cutting-edge technology and skilled talent that will truly drive the shift toward a more sustainable energy future”

Patrick Pouyanne
Chairman & CEO, TotalEnergies



² Chevron methane management, <https://www.chevron.com/newsroom/2022/q3/methane-management>

³ Artificial Intelligence in Oil and Gas: Applications, Benefits, and the Future, Blackridge Research 2025, <https://www.blackridgeresearch.com/blog/artificial-intelligence-machine-learning-generative-ai-oil-and-gas-industry>

At the same time, AI is emerging as a large-scale energy consumer, with next-generation campuses requiring considerable power capacity. Data centers, while currently accounting for a small share of global electricity use (about 1.5% in 2024)⁴, are seeing their local and global impact rise rapidly due to surging investment and the growth of AI – where certain types of AI-focused data centers can consume as much electricity as some heavy industry segments. According to the IEA, electricity use by data centers is projected to more than double to around 945 terawatt hours (TWh) by 2030, driven largely by AI workloads.⁵

This shift is changing collaboration among energy companies and digital infrastructure providers. Data centers are no longer niche IT loads; they are an emerging, innovative class of infrastructure that must be planned hand-in-hand with energy company partners and in the local communities in which datacenters operate. Electricity grids are already under strain in some areas, and unless addressed, planned data center projects in certain Tier 1 infrastructure markets could face delays due to delays in grid upgrades. Moreover, certain types of grid bottlenecks may constrain clean energy coming online to

support data center builds. Siting decisions can also determine whether growth reinforces resilience or deepens stress on aging grids, especially in markets where key infrastructure, such as transformers, begin to reach in-service retirement. Data center operators and electric utilities are becoming aware of the speed and scale of system changes required to meet cross-industry growth, necessitating a broad spectrum of scalable and sustainable approaches. As part of this transformation, companies such as Microsoft are helping accelerate the deployment of carbon-free

electricity to the grid through innovative procurement strategies and policy engagements. These efforts include power purchase agreements (PPAs) that enable the addition of net-new, reliable, carbon-free electricity to regional grids, while also supporting a diverse zero-carbon energy mix—spanning wind, solar, geothermal, clean hydrogen, sustainable biomass, energy storage, nuclear, and fusion technologies. Such approaches are essential to building a resilient and flexible grid capable of supporting region-specific data center expansion and broader electrification goals.

The dual transformation of AI and energy presents both opportunity and risk. For energy companies, AI offers operational efficiencies, emissions reduction, and potential new revenue streams. For AI providers, reliable and low-carbon power supply is now a strategic differentiator. But the risks of unclear investment pathways, regulatory barriers, and workforce shortages are real. Without purposeful action, the AI era could face obstacles to realizing its transformational potential on a rapid timeline..

The path forward is clear: accelerate cross-sector collaboration, invest in flexible and resilient infrastructure, build the workforce of the future, and establish governance frameworks that ensure AI and energy scale responsibly. AI for Energy and Energy for AI are no longer separate agendas; they are mutually reinforcing imperatives. The challenge, and the opportunity, is to harness synergies to deliver a sustainable and secure energy future.

AI-powered infrastructure for industrial growth

AI-augmented reinsurance (RIQ partnership)

ADNOC’s \$500 million partnership with RIQ, an AI-native reinsurance platform, marks a significant step toward modernizing risk management in the energy sector. This collaboration is focused on developing capital-efficient insurance solutions that leverage AI to assess, structure, and price coverage for both climate and operational risks – interwoven challenges that are especially acute in emerging markets.⁶

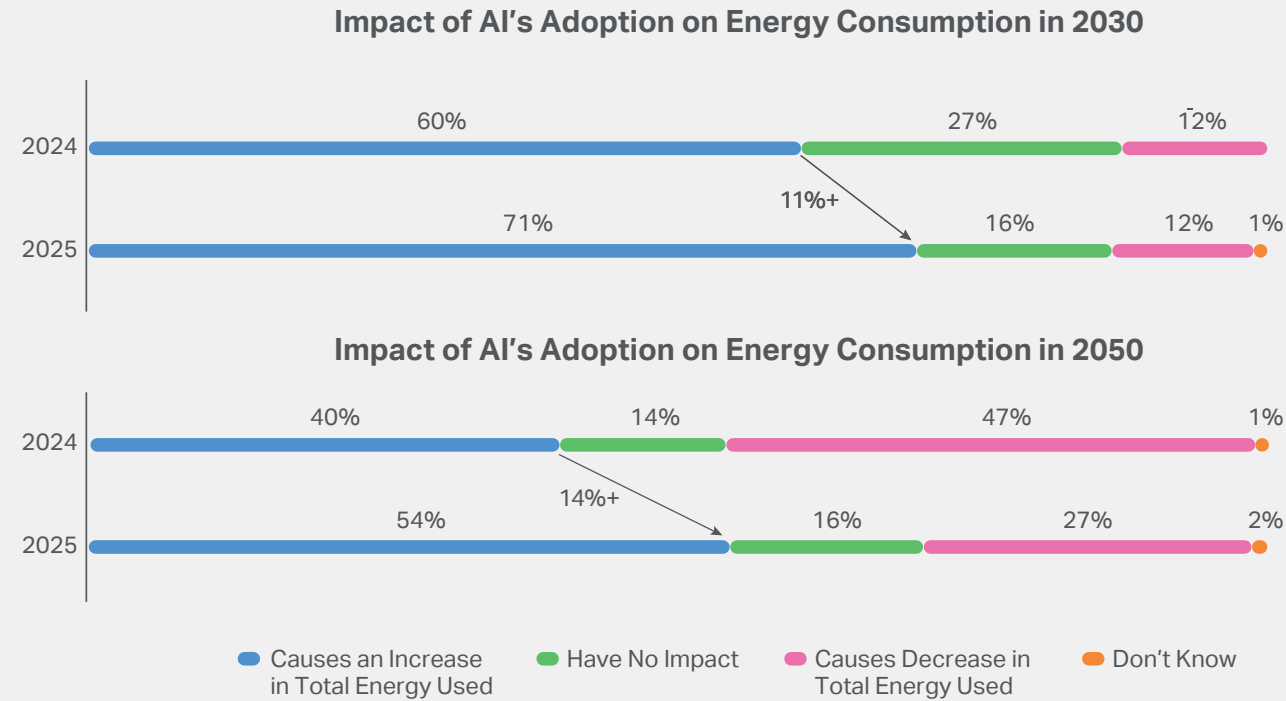
ENERGY^{ai}

A collaboration between ADNOC, AIQ, G42, and Microsoft, ENERGY^{ai} is designed to harness the power of agentic AI for the energy sector. At its core, ENERGY^{ai} leverages autonomous AI agents to manage complex and data-intensive tasks such as seismic analysis, reservoir modeling, and emissions forecasting. By automating these traditional labor-intensive processes, the platform accelerates decision-making and improves the accuracy of subsurface and operational insights. This supports more precise emissions tracking and reporting as well as enhancing the efficiency of exploration and production activities. By providing advanced AI-driven tools, ENERGY^{ai} is helping to democratize access to cutting-edge technology, enabling a broader range of stakeholders to participate in the global energy transition.⁷

2025 SURVEY INSIGHT

Figure 3 Expectations for AI's energy consumption

Business Leaders believe more strongly than Business Decision Makers that AI will increase energy consumption in both the near and distant future



⁴ IEA Energy and AI report, April 2025, <https://www.iea.org/reports/energy-and-ai>
⁵ IEA Energy and AI report, April 2025, <https://www.iea.org/reports/energy-and-ai>

⁶ ADNOC, RIQ Strike \$500M AI-Driven Reinsurance Deal To Boost Abu Dhabi's Role In Global Risk Finance, September 2025, <https://www.forbesmiddleeast.com/money/banking-finance/adnoc-riq-strike-%24500m-ai-driven-reinsurance-deal-to-boost-abu-dhabis-role-in-global-risk-finance>
⁷ ADNOC and AIQ Developing First-of-a-Kind Agentic AI Solution for Global Energy Transformation, November 2024, <https://www.adnoc.ae/en/news-and-media/press-releases/2024/adnoc-and-aiq-developing-first-of-a-kind-agentic-ai-solution-for-global-energy-transformation>



POWERING POSSIBLE TO PROGRESS IN PRACTICE

– 2025 report key findings

1 Cross-sector collaboration remains essential

Energy and digital technology have historically operated in silos, and respondents from both groups feel that partnership is crucial now.

Although some cross-sector forums and consortiums have formed in the past year, many described current collaboration as “early-stage”. There is still no standard playbook for utilities and cloud providers to co-develop AI solutions, or for regulators and AI firms to engage more proactively to help shape and support investments.

One policy leader noted the dramatic shift in tone from “exploration” to “execution” and stressed that 2025 would be a make-or-break year for aligning AI ambitions with infrastructure reality. They highlighted many CEOs now see grid capacity and workforce readiness as integral to their digital strategy. This is a positive development indicating the right cross-sector conversations are happening. The clear implication is that awareness must now translate into concrete action.

Co-innovating to drive efficiency and reduce emissions

ADNOC, together with its co-investors and technology partners, is advancing a comprehensive program to reduce methane emissions and achieve zero routine flaring across its operations by 2030. ADNOC’s efforts are part of a broader coalition of energy companies and technology partners - including G42 and Microsoft - who are investing in digital innovation to accelerate emissions reduction. These collaborations focus on deploying advanced analytics, IoT sensors, and AI-driven platforms to optimize methane management and flare reduction, as well as to support the scaling of carbon capture, utilization and storage (CCUS).

Initiatives such as Microsoft’s investment in Twelve and commercial partnership with Alaska Airlines—using E-Jet Fuel (SAF) produced from captured CO₂—underscore how innovation and cross-industry collaboration are central to accelerating climate progress⁸. Additional investments in low-carbon cement, including Fortera⁹, and agreements with near-zero emission steel producer Stegra¹⁰, further demonstrate how digital infrastructure investments can signal demand for sustainable materials and catalyze low-carbon innovation across sectors.

⁸ Twelve and Alaska Airlines to collaborate with Microsoft to advance sustainable aviation fuel derived from recaptured CO₂ and renewable energy, Decarbonization Technology, July 2022, <https://www.esgtoday.com/alaska-airlines-twelve-microsoft-collaborate-to-use-sustainable-aviation-fuel-produced-from-captured-co2/>

⁹ Microsoft invests in Fortera to scale low-carbon cement production, Global Construction Review, Feb 2025, <https://www.globalconstructionreview.com/microsoft-invests-in-fortera-to-scale-low-carbon-cement-production/>

¹⁰ Microsoft Partners with Stegra to Accelerate Market for Near-Zero Emission Steel, ESG News, Sept 2025, <https://stegra.com/news-and-stories/stegra-announces-agreement-with-microsoft>

Cross-sector collaboration for scalable energy transformation

More than 125 leaders across energy, technology, and academia are collaborating through OpenMinds to accelerate progress on the Dual Challenge of delivering more energy with less emissions, fast. United by a non-partisan mission, this network brings together current and future global leaders to address affordable energy access while rapidly reducing emissions. Microsoft is among OpenMinds’ contributors, working alongside peers to advance practical solutions and key initiatives that remove bottlenecks across the energy system. The group leverages collective expertise to communicate targeted actions, align existing leaders, develop future leaders, design and act on solution pathways, and lead impact projects. OpenMinds’ current flagship impact project, Grid Vision, aims to strengthen and expand the grid to deliver low-cost, abundant, reliable power. OpenMinds is driving impact projects on other key Dual Challenge solutions including methane abatement, CCUS, nuclear, and more.¹¹

Key Shifts from 2024 to 2025

- Momentum is building behind cross-sector working groups and initiatives such as ENERGYai with ADNOC, AIQ, G42 and Microsoft. In addition, EPRI’s Open Power AI Consortium has engaged over 300 key players in electric utility, technologies, hyperscalers, and national labs. The consortium is actively sharing real-world solutions and proven practices with this global community.

Watch For in 2026

- Formation of national or regional Energy-AI councils with utilities, tech firms, regulators, and financiers at the same table.
- Scaling pilots into multi-stakeholder, multi-year programs with shared platforms and protocols.

Transforming grid reliability through AI collaboration

Microsoft’s collaboration with EPRI exemplifies how cross-sector collaboration is accelerating the energy transition through practical AI innovation. The Open Power AI Consortium brings together utilities, technology leaders, and researchers to co-develop scalable AI solutions that address the industry’s most pressing challenges.

An early result is the joint development of an AI-powered transformer health monitoring model, which has doubled the accuracy in identifying high-risk transformers while achieving a 20% reduction in false positives compared to traditional rule-based systems. These solutions will empower utilities to proactively manage aging grid assets, prevent

“AI Transformation is accelerating scientific discovery, expanding access to knowledge, and empowering people and organizations in ways we are only beginning to imagine. With that promise comes responsibility. Microsoft is focused on meeting AI’s compute demands sustainably by optimizing every layer of our infrastructure—from silicon to software—to reduce energy use, minimize water consumption, and improve efficiency. That means optimizing every watt, procuring more clean energy, and using AI itself to drive smarter, more sustainable operations.”

Judson Althoff
CEO, Microsoft Commercial



outages, and improve reliability—showcasing how collaborative, AI-driven approaches are moving the industry from pilot projects to real-world impact.¹²

¹¹ OpenMinds, <https://openminds203x.org/>

¹² EPRI Launches Consortium to Drive Development of AI Applications in Power Sector, March 2025, <https://www.epri.com/about/media-resources/press-release/yglqo5dymdh2nonjvdgqmmgplyy826>

2 Rising AI investment tempered by pragmatism

More companies are allocating budget to AI projects, and more investors are inquiring about “AI in energy” opportunities.

However, there is also a recognition that without parallel investment in grids, clean energy, and storage, some AI initiatives (like electrified transport or smart cities) could hit

energy constraints. Essentially, investment is rising but so is awareness of physical limits and competing priorities, a nuance that wasn't as pronounced a year ago.

AI for grid optimization

Itron, Schneider Electric, and Microsoft have joined forces to deliver a comprehensive Grid Edge Intelligence solution that enhances utility visibility and control from the edge to the control center. By integrating distributed intelligence, advanced analytics, and AI-powered data platforms, the collaboration

enables real-time insights, improved load and voltage management, and seamless DER integration. This non-wires solution can boost grid capacity without new infrastructure, helping utilities address growing demand and long equipment lead times while maintaining reliability and efficiency.¹³

Accelerating energy infrastructure permitting

Permitting has long been a critical bottleneck for the rollout of energy infrastructure worldwide. The time intensive, complex, and cost intensive permitting and licensing processes can introduce unpredictability and risk to the development and deployment of energy projects. The Microsoft Generative AI for Energy Permitting Solution Accelerator empowers environmental planners and regulatory engineers to navigate these challenges with advanced speed and precision. For example, the Idaho National Laboratory (INL) recently announced a collaboration to use Microsoft's Azure cloud and AI technologies to streamline the nuclear permitting and licensing application process.¹⁴

Traditionally, permit applications span thousands of pages, may take years to finalize, and result in substantial

costs, sometimes millions of dollars, delaying critical clean energy projects. By harnessing generative AI and intelligent agents, the Accelerator automates data compilation, formatting, and review, facilitating comprehensive, consistent, and compliant applications. It can enable instant detection of errors and omissions, dramatically reducing review times and boosting confidence in regulatory alignment. Applicable across a range of energy sectors including nuclear, renewables and mining, the Accelerator supports diverse permitting needs with scalable AI-powered capabilities. This innovation not only saves thousands of hours but also accelerates the launch of vital infrastructure, unlocking clean energy deployment at scale.

“Over the past year, we’ve seen unprecedented investment flow into AI infrastructure, clean energy, and grid capacity. Yet the scale of demand ahead will require trillions more in long-term capital. The investment community must evolve to meet this challenge, financing not only technology and infrastructure, but also the skills needed for a sustainable, AI-enabled energy future.”

Douglas Kimmelman
Executive Chairman, ECP



Key Shifts from 2024 to 2025

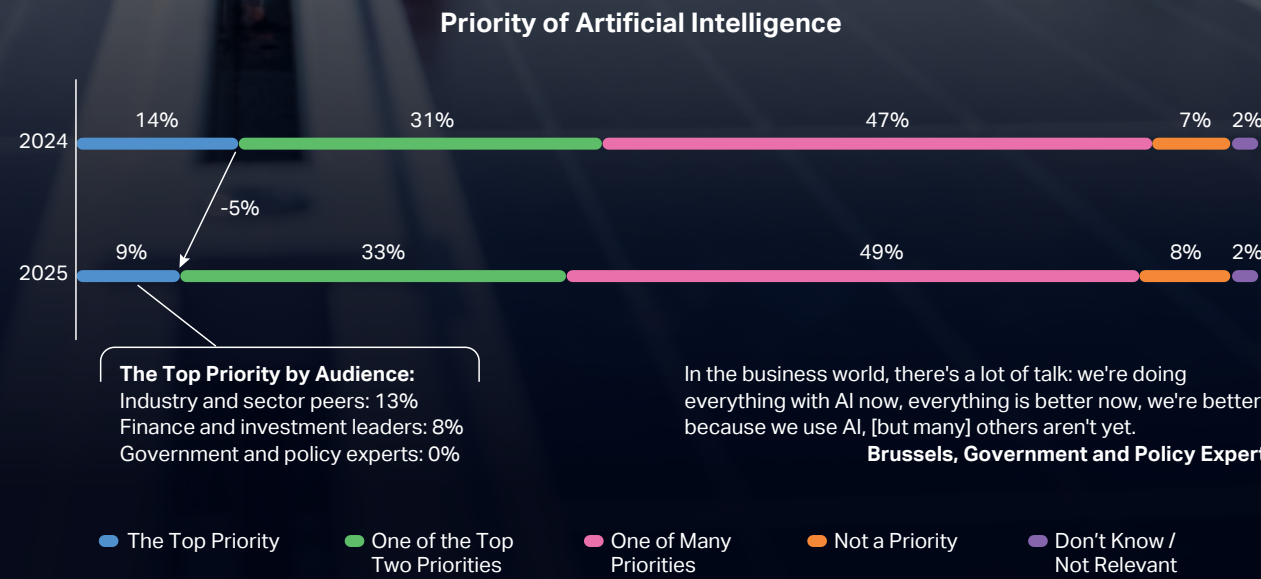
- Investment keeps rising, priority cools slightly. 87% of organizations report higher AI and digital infrastructure spend in the past 12 months, but “AI as the top organizational priority” dipped among senior leaders reflecting a maturing view as deployments move from hype to integration.
- Energy and digital infrastructure leaders are moving from siloed operations to strategic collaboration—driven by the urgent need to jointly tackle electricity affordability, sustainability, and reliability while unlocking innovation at scale.

Watch For in 2026

- Integrated AI–energy investment announcements (e.g., the new digital infrastructure announced alongside new clean energy and other forms of grid-enhancing resources).
- A focus on time-to-market for AI products, which will necessitate unique, forward-leaning use of energy technologies at or near data center locations to balance scale and sustainability.

Figure 4

AI still seen as a priority investment



13 Collaboration to Extend Grid Edge Intelligence to the Utility Control Center, March 24, 2025, <https://www.globenewswire.com/news-release/2025/03/24/3047874/0/en/Itron-and-Schneider-Electric-Collaborate-to-Tackle-Grid-Complexity-Enable-Visibility-and-Control-at-the-Grid-Edge-Integrating-Microsoft-Solutions.html>

14 Idaho National Laboratory collaborates with Microsoft to streamline nuclear licensing, July 16, 2025, <https://inl.gov/news-release/idaho-national-laboratory-collaborates-with-microsoft-to-streamline-nuclear-licensing/>

3 AI's efficiency gains are scaling

Optimization and automation are seen as the areas where AI will have the greatest impact on the energy transition. While many of these expectations align to last year, understanding and expectations have sharpened as knowledge around AI has increased.

There are expectations that AI will be able to effectively analyze big data to support supply and demand predictions to make a more efficient and robust system. Similarly, with the integration of smart sensors, there is belief that AI will have impact through predictive maintenance as well as reducing human error through automation.

AI is viewed as a key enabler for sustainability initiatives, decarbonization, and the development of innovative energy technologies. At the same time there is a widespread view among survey respondents that investments in grid modernization (55%) are key to keeping up with AI's growing demands, followed by energy storage (38%) and advanced materials like high-efficiency conductors (33%).

Key Shifts from 2024 to 2025

- AI is driving efficiency by optimizing complex systems (like power flow), automating processes (such as predictive maintenance), and enabling better forecasting for renewables.
- Senior leaders expect the greatest impact from AI in optimization and automation, with additional benefits in unlocking scientific discoveries and supporting new business models.

Watch For in 2026

- Efficiency AI (HVAC, predictive maintenance, process optimization) moving from pilots to standard operating procedure.
- New "energy productivity" KPIs (e.g. energy per AI task) entering corporate reporting.
- Watch for companies reporting tangible energy-efficiency improvements attributed to AI, indicating this trend's payoff.



“AI is not only transforming global demand for renewable energy, but increasingly, it’s redefining what is possible for clean power. Masdar’s game-changing ‘Round the Clock’ project in Abu Dhabi uses advanced AI forecasting to optimize storage and release, making dispatchable, 24/7 clean power a reality. The priority now must be to replicate its success globally as we accelerate innovation and integration, ensuring that AI and clean energy evolve together to power the next industrial era.”

Mohamed Al Ramahi
CEO, MASDAR



Smarter renewable power: Masdar’s AI-optimized clean energy

Masdar, one of the world’s largest renewable energy investors, has embedded AI across its global wind and solar portfolio and within Masdar City to maximize efficiency, reliability, and scalability

AI-driven climate control in Masdar City’s newest buildings has achieved an average energy reduction of 38% compared to international baselines., proving AI’s tangible benefits. Across its renewables, Masdar and AI specialist Presight deployed predictive maintenance tools analyzing data from turbines,

solar panels, and storage. These models reduce downtime, extend uptime by 3–5%, and allow maintenance to be scheduled during low-demand periods.

In Masdar City, AI functions as the central energy control system, forecasting generation and demand, charging storage ahead of low-solar days, pre-cooling buildings during peak hours, and lowering reliance on grid power. AI also optimizes autonomous electric transport, further reducing demand and emissions.

The results are significant: predictive systems have increased annual energy yields across assets, and the AI-managed city microgrid has lowered peak electricity demand, reducing grid stress and fossil backup needs. Masdar’s experience highlights how digital infrastructure amplifies returns from renewable assets, with stakeholder engagement proving critical for adoption. For policymakers and developers, Masdar City offers a replicable blueprint for AI-enabled clean energy and sustainable urban design.¹⁵

15 Fast Facts Masdar City, November 2023
https://masdarcity.ae/docs/default-source/pdf-to-download/mc--net-zero-fact-sheet-nov-1-2023.pdf?sfvrsn=3ca9260a_2

4 AI for emissions management becomes mainstream

Energy companies are increasingly turning to Artificial Intelligence to enhance their emissions management strategies. AI enables organizations to move beyond traditional, manual monitoring by providing real-time, high-accuracy detection and rapid response capabilities.

Companies have deployed AI-powered systems that combine advanced sensors, computer vision, and deep learning to monitor large operational areas for methane and other greenhouse gas emissions. These systems can identify leaks and emission sources quickly, supporting both regulatory compliance and proactive environmental stewardship.

A key application of AI is in flare management. By integrating AI with real-time video feeds and sensor data, companies can continuously assess combustion efficiency and detect

flare events as they happen. This allows for immediate adjustments to minimize emissions and optimize operational performance. ADNOC, for example, uses AI-driven flare monitoring to provide reliable, real-time data that supports emission control strategies and aligns with environmental regulations, ultimately reducing emissions in a cost-effective manner.¹⁶

Beyond detection and operational optimization, AI is playing a growing role in supporting carbon capture and storage (CCS) initiatives. AI algorithms

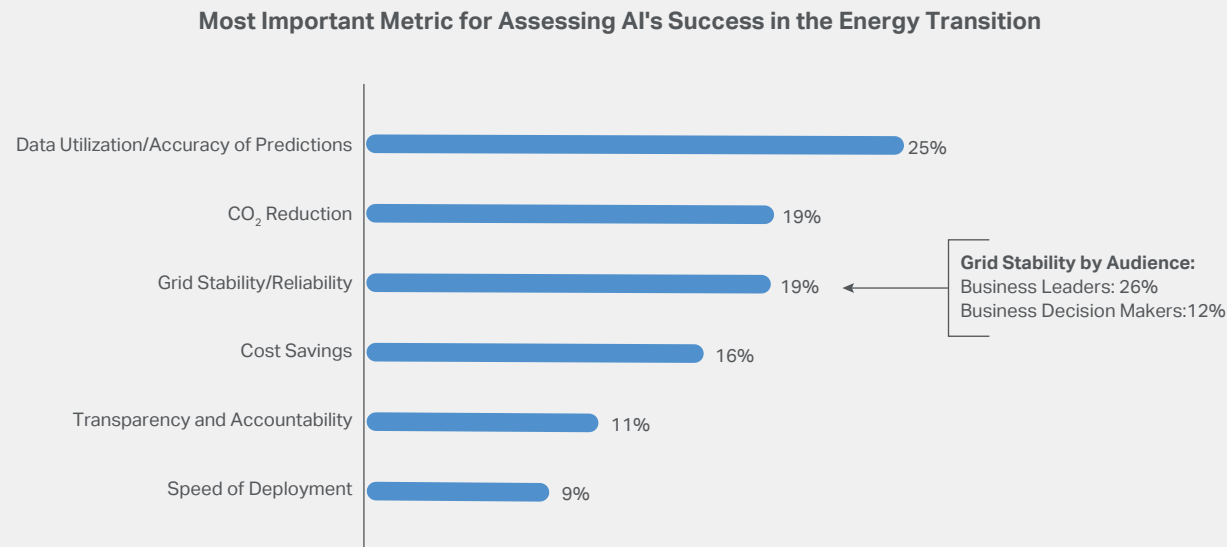
can help identify new materials for more efficient CO₂ capture, simulate storage conditions, and optimize injection rates and site selection. These capabilities are essential for scaling CCS projects and decarbonizing hard-to-abate sectors, such as heavy industry and hydrogen production.

By integrating AI across emissions detection, monitoring, and operational optimization, energy companies are setting new benchmarks for digital innovation in sustainability.

2025 SURVEY INSIGHT

Figure 5

Data and CO₂ reduction are key success metrics for AI within the energy transition



16 ADNOC, <https://adnocgas.ae/en/sustainability/environment>

“Our industry has been using AI techniques to model the physical world for many years. From resolving the structure of the subsurface through seismic and well log data to the behavior of artificial lift systems, AI continues to provide new insights that unlock greater operational efficiencies and lower costs that translate into tangible business value. Oxy is expanding our use of AI to address emissions and ensure we can deliver lower carbon intensity oil and gas the world needs through direct air capture and enhanced oil recovery.”

Vicki Hollub
CEO, Occidental Petroleum



Key Shifts from 2024 to 2025

- Greater emphasis on AI for emissions control: more companies (and regulators) prioritized AI-based emissions monitoring – especially methane – whereas in 2024 it was an emerging topic.
- New tools launched in the past year (e.g. AI-enabled satellite methane trackers) and stronger industry commitments have made emissions-focused AI solutions mainstream rather than experimental.

Watch For in 2026

- Regulatory mandates for AI-based methane monitoring. Keep an eye on government or industry standards that require AI in leak detection and reporting.
- AI applications expanding into carbon capture optimization and real-time corporate carbon accounting.

“AI is a tremendous enabler for sustainability. It helps customers use less energy, shift to greener sources, and optimize operations. The time to scale AI for energy transition is now – the technology is ready, and the impact is real.”

Philippe Rambach
Chief AI Officer, Schneider Electric



5 Supportive policies can help AI buildout

Regulation can be both an enabler of, and barrier to, AI implementation across the sector.

Respondents noted that while a loose regulatory landscape encourages rapid AI development, the lack of comprehensive policy could hinder long-term progress. This emphasizes the need for a regulatory environment that integrates policy and regulation across the value chain to ensure sustainable AI usage in the long term. This aligns with the survey participants' call for policy modernization and responsible AI governance frameworks to ensure AI use in critical energy systems is safe, transparent, and ethical.

Looking at the survey data, 34% of respondents consider AI-energy regulation the most important policy action, followed by grid investment (27%), incentives for clean energy (25%), and digital skills programs (14%). This highlights how regulatory mismatches can stall AI projects and explains why some governments are taking steps to address these gaps through initiatives like regulatory sandboxes and data-transparency rules. The emphasis on grid investment and clean energy incentives also aligns with the broader need for a balanced regulatory approach that supports innovation while ensuring long-term sustainability.

Together, these findings tell a compelling story about the necessity of a well-rounded regulatory framework to foster the growth of AI in the energy sector. They emphasize the need for a harmonious approach to AI ethics, responsible use policy, and environmental policy to create a environment conducive for AI development and energy transformation.

“AI now offers pathways to smarter, more resilient infrastructure. This should act as a rallying call for conversations around AI for Energy that are anchored in collaboration and pragmatism – even as we continue to prioritise energy security, reliability, and affordability not only for AI, but for communities across the globe.”

Tengku Muhammad Taufik
President & Group CEO, Petronas



Key Shifts from 2024 to 2025

- Feedback highlights stalled AI projects due to regulatory mismatches - e.g., market rules ignoring AI-enabled demand response.
- Some governments are piloting “regulatory sandboxes” and data-transparency rules to better accommodate AI, signaling early steps to address these gaps.

Watch For in 2026

- First “AI-ready” regulatory frameworks integrating data access, cyber resilience, and AI market participation.
- The emergence of “AI-ready” regulatory frameworks covering security, data, and integration.

“AI is redefining what’s possible for the energy sector by unlocking new efficiencies and optimisations. But its promise can only be realised through informed policy, smart investment, and deep collaboration across the energy and technology industries. Done right, AI can be an enabler of a more secure, innovative and sustainable energy future.”

Dr. Fatih Birol
Executive Director, IEA



6 AI talent and skills gap remains a barrier

The 2024 Powering Possible report identified building workforce capacity to leverage AI as a critical priority area for action.

At the time, survey data revealed that a significant majority of leaders (78%) viewed talent and training as a major challenge to AI adoption and use. The report called for a dual approach: training energy sector staff in AI to foster innovation and retain talent and educating technology companies on the energy sector's unique operational environment. It also highlighted the untapped potential of an optimistic and ambitious talent pool in the Global South, where workers were shown to be frequent and enthusiastic users of AI.

One year on, the landscape has evolved. While the initial excitement around AI may have calmed as organizations focus on the practicalities of integration, the talent and skills gap remains a persistent and top-tier concern. 2025 data shows that a lack of skilled talent is still considered one of the biggest barriers to AI adoption, cited by 39% of respondents and ranking fourth behind cybersecurity, data quality, and cost.

This shift reflects a broader trend: as knowledge of AI grows, expectations have sharpened. The challenge is no longer just a lack of technical proficiency, but also perhaps a cultural one. We see evidence of a trust deficit, where experienced employees are hesitant to defer to the recommendations of an algorithm over their decades of experience. Despite these hurdles, organizations are taking action; training is being offered to develop AI usage skills, with one executive noting their company is sending employees on additional AI courses as part of wider technology investments.

Microsoft's 2025 Work Trend Index Annual Report¹⁷ reveals that the AI talent and skills gap remains one of the most significant barriers to digital transformation across every industry and segment, with demand for AI talent outpacing supply by a factor of three. For 82% of global leaders, this year marks a pivotal moment for rethinking strategy and operations in response to

the rise of AI. Adoption is accelerating: 24% of organizations have already deployed AI at scale, while only 12% remain in pilot phase. Looking ahead, 81% of leaders anticipate that agents will be moderately or extensively integrated into their company's AI strategy in the next 12 to 18 months. As intelligence on tap—instant, organization-wide access to AI-powered insights and automation—becomes a strategic enabler, companies are rapidly reimagining their workforce strategies, moving beyond pilots to broad deployment of AI-powered solutions and human-agent teams. Nearly half of executives now rank AI-specific skilling as their top workforce priority, recognizing that future-ready organizations will thrive by pairing deep AI capabilities with uniquely human strengths such as adaptability, innovative thinking, and strategic oversight.

ADNOC: An AI-enabled energy company underpinned by its people

- **Applied Intelligence Philosophy:** ADNOC's AI strategy focuses on real-world deployment of intelligent systems to enhance efficiency, reduce emissions, and unlock operational value.
- **ENERGY^{ai}:** Developed by AIQ, this AI solution spans predictive maintenance, emissions management, seismic analysis, and subsurface modeling—ingesting decades of operational data to deliver real-time insights.
- **Hybrid Talent Pools:** ADNOC has retrained petro-technical professionals in data science, forming cross-functional teams that collaborate with AI systems to drive innovation and performance.
- **AI Fluency for All:** Through internal campaigns and platforms like Microsoft's "AI Fluency" modules, ADNOC promotes continuous learning in AI across all levels—from engineers to executives.
- **Upskilling Labs and Thought Leadership:** ADNOC's immersive AI zones and learning labs, showcased at ADIPEC and other forums, address the AI skill gap and foster dialogue on energy-AI convergence.

Key Shifts from 2024 to 2025

- Focus has moved from skills and training being a general hurdle to a specific barrier. This demonstrates a shift from a widespread concern to a well-defined business impediment which reinforces the view of a growing AI maturity within organizations where broad issues are now being put into sharper focus.
- Cultural concerns have been brought to fore. While the 2024 report focused on the need for training across technical and non-technical roles, 2025 findings reveal a deeper cultural barrier.
- Greater investment in specialized skills, with energy companies providing AI training to build a culture of innovation.

Watch For in 2026

- Demand for highly specialized AI talent could outpace supply, driving companies to build internal academies and long-term development pathways over standalone courses.
- Training will focus on overcoming the human-algorithm trust gap, emphasizing data literacy, model transparency, and AI ethics so staff can confidently validate and use AI-driven insights.
- Organizations will increasingly tap into ambitious talent from the Global South, expanding global exchange programs, remote development hubs, and direct investment in emerging markets.

“Preparing for what’s next is no longer optional. Employees must build AI skills and companies must support them with the right tools and training.”

Jared Spataro
CMO, AI at Work, Microsoft



17 Microsoft Work Trend Index 2025, <https://www.microsoft.com/en-us/worklab/work-trend-index>

7 Data quality is now a primary barrier to AI adoption

In 2024, establishing data standards was framed primarily as a foundational requirement for unlocking AI's potential in the energy sector.

The focus was on creating unified data formats and protocols to enable the efficient flow of information across an increasingly complex energy system. This presented data as a critical enabler with the implicit understanding that high-quality, standardized data was a prerequisite for success.

Today, the perspective has shifted significantly. The foundational need for good data has now become a critical, top-tier operational barrier. "Data quality and consistency" is now perceived as the second biggest

barrier to AI adoption, cited by 45% of leaders, placing it ahead of cost and the lack of skilled talent, and only slightly behind the primary concern of cybersecurity risks. This elevation from a priority action item to a major real-world blocker suggests companies are directly encountering the challenges of working with inadequate data as they look to scale AI deployments.

This issue reflects the industry's deepening engagement with AI. As organizations have begun to pilot and integrate, the initial focus on

strategic frameworks has given way to a sharp awareness of practical, on-the-ground challenges. Insights from the 2025 survey show that leaders now see "Data utilization/ Accuracy of predictions" as the single most important metric for assessing AI's success in the energy transition, selected by 25% of respondents. The focus has moved from how to get the data to an acute awareness that the quality of that data directly determines the value of their AI investments.

Key Shifts from 2024 to 2025

- The call to "Establish data standards and protocols" has transformed into a present-day obstacle, with "Data quality and consistency" now ranked as the second biggest barrier to AI adoption by 45% of leaders, surpassing even the cost of implementation.
- The conversation has moved beyond data infrastructure to business outcomes. "Data utilization/Accuracy of predictions" is now the most important metric for assessing the success of AI in the energy transition.
- The energy system of the future will be far more complex, with a dramatic increase in smart meters, sensors, and connected devices.

Watch For in 2026

- Increased investment in data governance with organizations launching comprehensive data cleansing and governance initiatives as a prerequisite for major AI projects.
- The emergence of specialized roles focused on "data curation for AI" will likely appear within energy companies, tasked with ensuring data is clean, consistent, and fit-for-purpose.
- A renewed push for industry standards with the earlier call for pre-competitive data standards gaining urgent momentum.

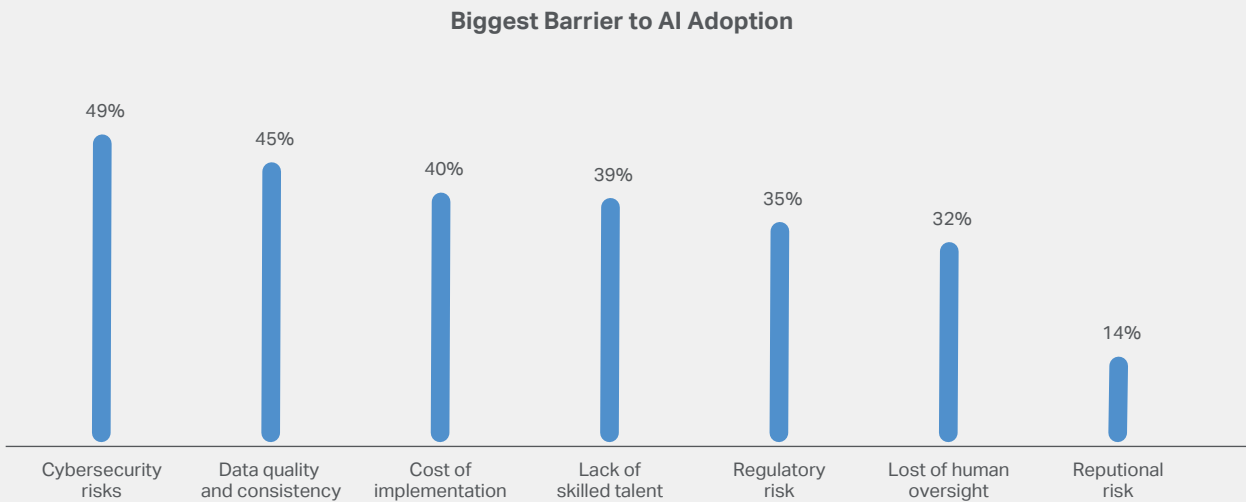
"AI's potential hinges on data- its quality, accessibility, and scale. As energy systems become more intelligent and interconnected, the ability to unify and analyze vast datasets in real time will define success. The convergence of AI and energy isn't just about automation; it's about unlocking insights that drive sustainability, resilience, and innovation at scale."

Jake Loosarian
CEO, Gecko Robotics



Figure 6

Cybersecurity and data quality rank higher than cost as greatest barriers to AI adoption



Building a trusted foundation for energy innovation and resilience

As energy companies embrace AI and digital transformation, cybersecurity is essential to protecting critical physical and IT systems. Microsoft's Secure Future Initiative (SFI) embeds secure-by-design, secure-by-default, and secure-operations principles across product development, deployment, and operations—mobilizing thousands of engineers to strengthen identity protections and accelerate vulnerability remediation at scale. Complementing these efforts, AI-powered tools like Microsoft Sentinel and Security Copilot analyze trillions of threat signals, deliver contextual insights, and automate remediation to counter sophisticated attacks, including those using generative AI. Together, SFI and AI-driven security capabilities provide the resilience energy companies need to innovate confidently without compromising critical infrastructure.

Unlocking real-time value with a unified data platform

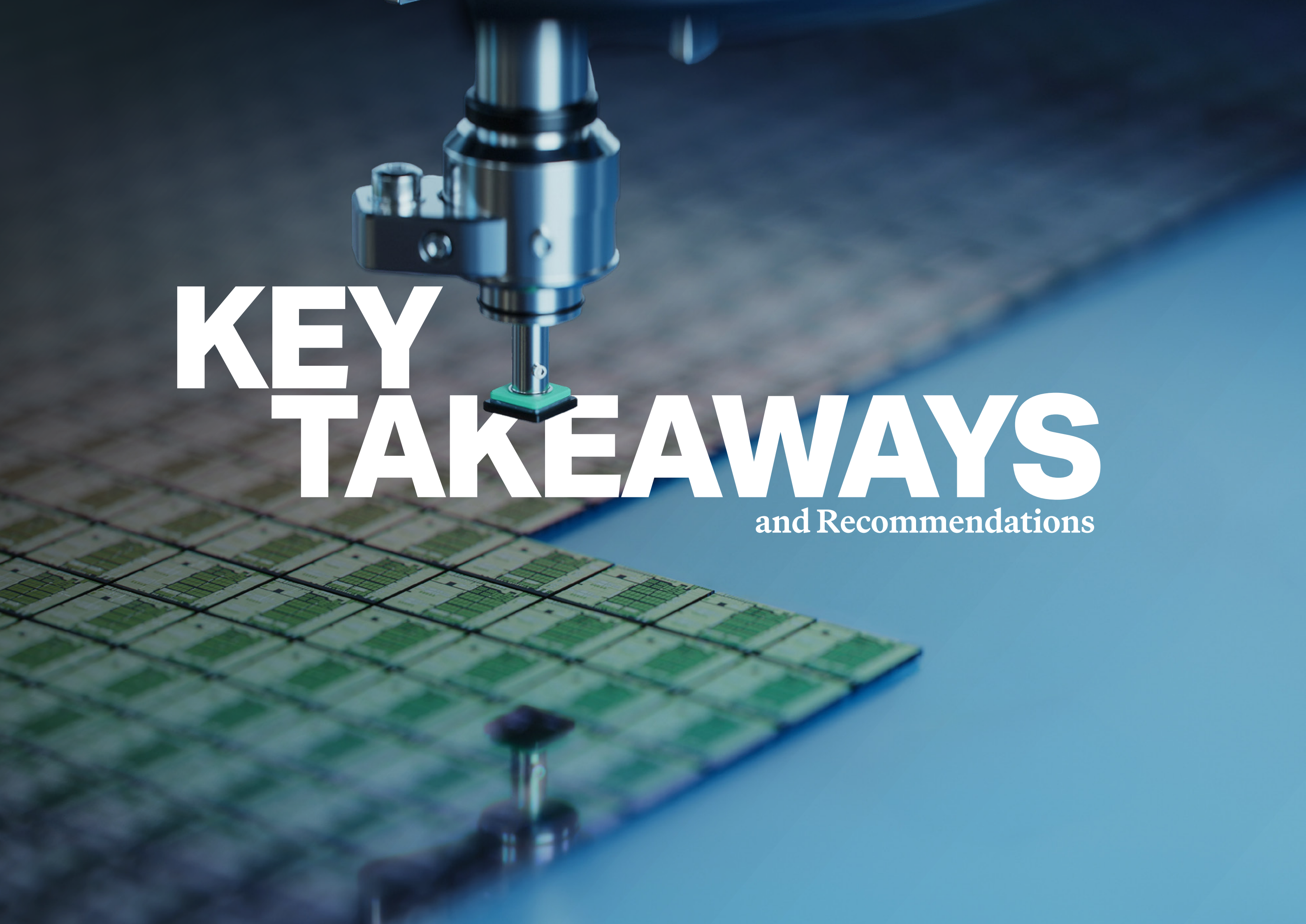
Microsoft Fabric and Azure Arc create a unified enterprise data foundation that simplifies the integration and scaling of AI across cloud, edge, and on-prem environments. Fabric consolidates data into an open lake for analytics and AI readiness, while Azure Arc extends governance, security and policy wherever data resides. Together, they unlock real-time edge-to-cloud intelligence for faster, smarter decisions. Chevron's Facilities of the Future initiative demonstrates this—using Azure IoT Operations to enable remote operations, streamline performance monitoring, anomaly detection, and proactive response to changing conditions.¹⁸

Transforming energy workflows with open data standards

Azure Data Manager for Energy is a fully managed, enterprise-grade platform service aligned with the OSDU® Technical Standard—replacing custom integrations with standardized data products and protocols for secure, scalable, and interoperable data management and workflows. Combined with Microsoft Fabric and Microsoft OneLake, it makes data accessible and AI-ready, automating interpretation and insights. Energy companies are accelerating ingestion to insight, decision-making, and innovation in areas such as carbon capture and storage, reservoir modelling, and operational planning, driving faster time to value.¹⁹

¹⁸ Chevron plans facilities of the future with Azure IoT Operations, <https://www.microsoft.com/en/customers/story/22849-chevron-iot-operations>

¹⁹ Azure Data Manager for Energy, <https://azure.microsoft.com/en-us/products/data-manager-for-energy>

A background image showing a close-up of a microchip assembly process. A metal nozzle is positioned over a green circuit board with a grid of components. The scene is dimly lit with a blue tint.

KEY TAKEAWAYS

and Recommendations

The convergence of energy and AI is now a reality

The findings in this report confirm that AI’s exponential growth depends on timely energy investment, and energy’s modernization depends on AI’s capabilities. What began as seven priorities in 2024 has now become a roadmap in action: efficiency gains, deeper collaboration, expanded investment, and early breakthroughs across the value chain. The task ahead is to scale what works and close the gaps before they become constraints.



INSIGHTS	RECOMMENDATION
Hype gives way to pragmatism: The initial excitement around AI is maturing. While investment is still high, fewer businesses now call AI their "top priority". The focus has shifted from potential to the practical realities and challenges of integration, with many organizations looking to move from pilot to production	Prioritize scalable, operational AI deployments with clear business value. Energy companies should shift resources from exploratory pilots to full-scale, production-ready AI solutions that directly address operational pain points (e.g., predictive maintenance, grid optimization). Establish robust frameworks for evaluating ROI and lessons learned from pilots and invest in change management to accelerate adoption across business units.
Consider all perspectives to avoid misalignment on AI's Impact: While most respondents continue to see AI's impact on the energy sector as in line with other sectors – with numbers remaining relatively flat year on year, the gap between senior leaders and business decision makers is telling. 52% of BDMs see AI's disruption on energy as being greater than other industries while it's just 28% for the leaders.	Bridge the perception gap through cross-level engagement and shared goals. Facilitate regular forums and workshops where senior leaders and business decision makers jointly review AI progress, challenges, and opportunities. Align incentives and performance metrics to ensure both groups are invested in AI-driven transformation, fostering a unified vision and accelerating buy-in at all levels. When senior leaders are seen using AI and investing in their own digital literacy, it sends a powerful message: AI is everyone's business.

INSIGHTS	RECOMMENDATION
AI satisfaction follows a maturity curve: There is clear evidence to show that satisfaction in AI deployments drops as understanding of AI increases yet quickly rebounds once implementations mature. Cultural barriers to AI adoption have also become more prevalent.	Invest in AI literacy, upskilling and long-term development structures. Prepare teams for the "trough of disillusionment" by providing ongoing training, transparent communication about challenges, and celebrating incremental wins. Establish centers of excellence or AI "champions" to support teams through the complexity curve, ensuring sustained momentum and eventual satisfaction as solutions mature.
Cybersecurity awareness reinforces maturity narrative: Cybersecurity risk (49%) has overtaken cost as the biggest barrier to AI adoption in the energy sector. This reflects growing awareness of the vulnerabilities created by integrating vast amounts of data and energy security and again, the conversation moving from why to how.	Embed cybersecurity into every stage of AI deployment. Adopt a "security by design" approach for all AI initiatives. Conduct regular risk assessments, invest in workforce cyber training, and collaborate with industry partners to share threat intelligence. Make cybersecurity a board-level priority, ensuring that digital transformation does not outpace risk management
Leaders focused on sustainable AI growth: Leaders are increasingly aware of the energy AI consumes. The proportion of senior leaders who believe AI will increase long-term energy use has jumped by 17% since last year . Confidence in existing grid infrastructure is low, especially in the US and Europe.	Continue to integrate energy efficiency and sustainability into AI strategy. Prioritize AI workloads that optimize energy use and emissions reduction. Collaborate with utilities and technology partners to co-design solutions that balance AI growth with grid resilience and decarbonization. Advocate for policy incentives that support sustainable AI infrastructure and renewable integration.
Talent and trust are critical: Workforce gaps remain a top barrier, and embedding responsible AI into energy operations is essential for safety and confidence. Progressive energy companies and educational institutions are helping close the gap, but momentum must accelerate.	Accelerate workforce upskilling and embed responsible AI principles. Partner with educational institutions and technology providers to launch targeted training programs in AI and digital skills. Develop internal "AI fluency" campaigns and ensure responsible AI frameworks are integrated into all operations, building trust with employees, regulators, and the public.
Data quality is a critical consideration: As the second biggest barrier to AI adoption in energy, data quality should be an executive level priority. As AI deployments scale, the value of investments hinges on clean, reliable data—making data utilization and prediction accuracy the top metric for success.	Prioritize comprehensive data governance and cleansing initiatives as prerequisites for major AI projects. Invest in specialized data curation roles and push for industry-wide standards to ensure data is fit-for-purpose, unlocking AI's full potential and avoiding stalled initiatives.

Methodology

The research was commissioned solely by ADNOC. To arrive at the findings, we spoke to 850 global experts from across the energy ecosystem. The sample comprised of two different groups:

Quantitative survey: Via an online panel & recruited by individuals

N=850 interviews were conducted with professionals in 8 different countries, of those, N=650 of the interviews were with Business Decision Makers and the other N=200 were among a group of high-level

Business Leaders (similar to those in the IDIs). Interviews were conducted online in English, and the local language, from 3rd – 17th September 2025.

The margin of error for the total quantitative sample is +/- 3.4% and median LOI was 21 minutes.

Audience	Business Decision Makers	Business Leaders	Total Interviews	Margin of Error
All	650	200	850	+/- 3.4%
Business Decision Makers	650	-	650	+/- 3.8%
Business Leaders	-	200	200	+/- 6.9%
US	100	100	200	+/- 6.9%
Europe (UK, DE, and AT)	100	50	150	+/- 8.0%
Japan	100	-	100	+/- 9.8%
Australia	100	-	100	+/- 9.8%
India	75	25	100	+/- 9.8%
Brazil	75	25	100	+/- 9.8%
China	100	-	100	+/- 9.8%

Qualitative in-depth interviews (IDIs): One-on-one via online platform. N=15 interviews were conducted with professionals in Azerbaijan, Brussels, and the US. In Brussels, all professionals were policy makers. In Azerbaijan and the US professionals

were a mix of Industry leaders, Financial leaders, and Government & Policy experts.

Each interview lasted around 1 hour and was conducted in the local language, from 15th September - 3rd October 2025.

Audience	Industry Leader	Financial Leader	Government & Policy Expert	Total Interviews
All	3	3	9	15
Azerbaijan	2	1	2	5
Brussels	-	-	5	5
US	1	2	2	5



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