nagarro

Powering digital innovation in E&U

How Generative AI is shaping a sustainable future in Energy & Utilities

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In summary

Generative AI (GenAI) has the potential of revolutionizing the Energy & Utilities industry, **accelerating their Energy 4.0 journey.**

Effective integration of GenAI across **Energy & Utilities value chain** requires a strategic approach, focusing on organizational goals & readiness, aligning with existing processes, and navigating industry-specific challenges.

Nagarro's playbook-led approach offers a structured roadmap for E&U providers to strategically and responsibly adopt AI/ML technologies, ensuring sustainable innovation and operational excellence.

A new era in the E&U industry

Imagine a future where our power systems self-optimize, utility outages are predicted and pre-empted, and customer interactions are personalized at an unprecedented level. This future is not on the distant horizon – it's the transformative impact of AI on the Energy & Utilities (E&U) sector today.

With the E&U industry rapidly transitioning towards **Energy 4.0***, embracing AI is not merely an option but a strategic enabler for achieving the industry's goals of decarbonization, decentralization, and digitalization. While AI is reshaping our daily experiences, GenAI stands at the forefront, serving as the interface for this transformation, built on the solid foundation of an enterprise's technology and data maturity.

* Strategic driving forces of Energy 4.0

Decentralization

Simplifying complex energy networks to unlock new opportunities.

Decarbonization

Strategic shift towards Net Zero for a sustainable future.

Digitalization

Redefining the energy landscape via cutting-edge digital technologies.

Accelerated by:

Innovation Breakthrough accelerating the energy shift.

| Battery storage tech | PVs | Green hydrogen | EVs | + | AI/ML | Iot | LCNC | Edge computing |

Adopting Generative AI

In this dynamically evolving landscape of generative technologies, especially for the Utility industry, it is crucial to approach its adoption as a well-thought-out strategy.

We recommend industry leaders to move beyond just exploring GenAI's capabilities and deliberate on essential aspects like – evaluating enterprise data maturity, identifying viable business use cases, considering RoI and risks, organizational culture, and more.

Drawing from our experience in digital innovation, we offer our insights on the strategic adoption of GenAI, translating its potential into sustainable value.

How?

Key phases of GenAI adoption
Adopting GenAI is a continuous forward journey – **How do you want to leverage GenAI?**

What?

Revolutionizing E&U operations
There are 100s of use cases across the Energy & Utilities value chain – **What are your priorities?**

Why?

Key business outcomes
When done right, GenAI can help you achieve your goals – **Why do you want to adopt GenAI?**

Key phases of Generative AI adoption

Harnessing the true potential of GenAI for any enterprise is a continuous forward journey. We at Nagarro, recommend organizations to evaluate opportunities across these three broad phases:

Generative AI tech maturity

Business use cases maturity

Autonomous

Nearly independent management of critical tasks by GenAI tool(s), with minimal human oversight.

For e.g., GenAI bot acts as an operator to automate customer self-service and helps in decision making like initiating relocation of power and gas services or recommending consumption-based demand response programs.

Augmentative

A collaborative synergy between humans and GenAI model, enhancing complex task management.

For e.g., GenAI bot acts as a partner and pro-actively nudges an outage manager on the developing meteorological situation so the manager can respond to this emergency suitably.

Assistive

On-demand task execution, requiring high human intervention for not-so-complex business use cases

For e.g., GenAI bot acts as an assistant to a utility field technician with on-demand Information extraction & summarization to provide maintenance tips, service routines, etc.

Note: Selecting the adoption phase requires understanding of its unique challenges, including adoption & implementation complexities, time-to-value, risk levels, and impact on business value. To adopt strategically, enterprises must clearly define these factors beforehand.

Revolutionizing E&U operations

As a technology, GenAI has the potential to act as a transformative catalyst within the E&U industry. Beyond generating innovative content for communications and training, it enhances customer and employee interactions, and augments the effort of streamlining business operations.

GENAI AS CORE TECHNOLOGY:

Business operations			Back-office operations				Tech-operations
Generation	T&D	Retail & Cust. Service	Human Capital	Marketing & Sales	Legal & Procurement	Finance	Digital + IT
Field service co-agent	Co-agent for customer service		Co-agent for customer service	Marketing collateral	Contracts generation, review & analysis	Financial statement summarization	Code generation, review & optimization / Product feature recommendation
Operational data analytics & insights	Self-service interactions		Training & upskill	Co-agent for sales personnel	Tender evaluation & bid response creation	Expense & Budget Analysis	Test case and mock test data generation / Synthetic data generation
Emergency response							Wireframes and visual design
Image based defect detection	Personalized customer communication		Hiring	Social media sentiment analysis	Legal compliance and risks insights	Co-agent for investor relations team	Co-agent for IT support / Business & technical documentation

GENAI AS CORE TECHNOLOGY:

Plant performance optimization	Long term capacity planning	Predictive asset maintenance	Outage Prediction and Management	Grid Planning and Expansion	Other AI applications

Note: 'GenAI as core' refers to usage of out of the box capabilities of Generative AI, while 'GenAI as complementing technology' means the Generative AI is augmenting the existing/traditional AI models for better accuracy.)

Key benefits of embracing GenAI in E&U sector

Utilizing GenAI-based tools and systems across variety of use cases enables E&U providers achieve some of their most critical business objectives, like:

⚙️ Operational Efficiency

Picture an enterprise that leverages GenAI to intelligently streamline tasks, eliminate inefficiencies, and accelerate operations – precisely aligning every action with operational goals to maximize performance.

For example:
LLM-powered front-desk co-pilot that analyzes enterprise-wide documents (like contracts, MSAs, reports, etc.) to provide contact center agents with real-time on-the-call recommendations.

Interactive experience

Imagine every user interaction is personalized and intuitive, enhancing engagement, deepening connections, and transforming all touchpoints into an opportunity for delight and loyalty.

For example:
Generative model for interactive business analysis that provides market specific business insights to energy traders, to optimize electricity trade operations, leveraging internal reports and public data sources.

Data-driven decision making

An ecosystem where data is transformed into actionable intelligence, enhancing decision accuracy and enabling confident, strategic execution for impactful results.

For example:
LLM based conversational platform that provides your customers, like Energy managers, with insights into historical consumption data and forecasts future trends to enable optimal power purchase planning.

Balancing opportunities with Responsibility

Despite enthusiasm for the potential opportunities, practical application of GenAI within the E&U sector comes with its set of challenges. From ensuring the accuracy and reliability of AI-generated outcomes to safeguarding data privacy and adhering to regulatory standards, navigating these complexities is crucial for realizing GenAI's true potential in the industry.

Additionally, seamlessly integrating GenAI into existing operational structures requires careful planning and digital engineering expertise. Addressing these risks is crucial for unlocking the true potential of the technology in any sector.

Thus, it is important to address these implications with responsibility.

Expanding the spectrum of Responsible Generative AI

At Nagarro, our approach to Responsible GenAI transcends operational excellence and governance, focusing on business viability and collaborative innovation.

Our Responsible GenAI Framework ensures that our approach and solutions are technically robust and strategically aligned with business vision & KPIs - a balanced adoption, meeting both short-term and long-term objectives.

Industry focus

Operational Excellence

- Engineering excellence
- Explainability
- Transparency

Technology & Data

Compliance & Governance

- Privacy and Security
- Data & AI governance
- Safety and Fairness

+

Nagarro's values add

Business Viability

- Use case alignment
- Technology analysis
- Financial considerations

Business & People

Collaborative Innovation

- Inclusive collaboration
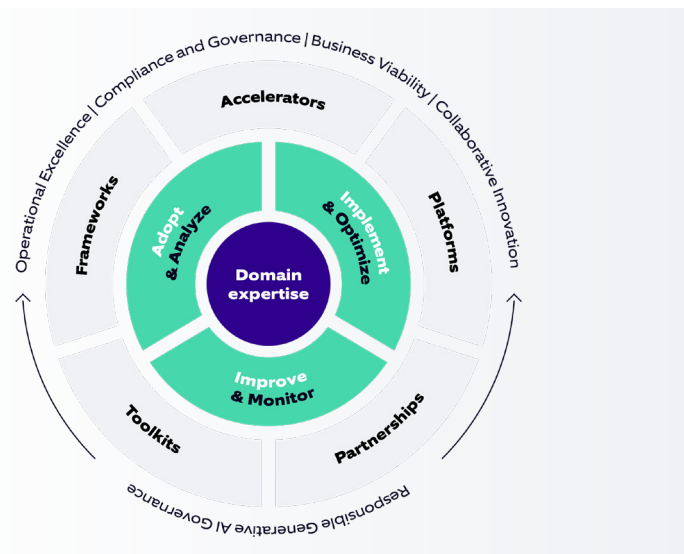- Knowledge sharing
- Breakthrough approaches

Being Responsible (R) is integral to Nagarro's *caring* principles

AIM for Responsible Generative AI

In a world where technology evolves at breakneck speed, GenAI (if implemented responsibly) is set to be a cornerstone of innovation in the E&U industry.

Nagarro's AIM framework provides a comprehensive roadmap to jump- start your GenAI journey, from initial assessment and analysis to full-scale implementation and continuous enhancement.

The AIM is the key to Nagarro's playbook-led approach for GenAI adoption and implementation, which essentially enables businesses with:

- Identifying the business use cases that align with organizations' strategic vision and KPIs.

- Exploring, experimenting, and selecting the appropriate GenAI model based on use case viability (ROI, TCO, etc.), risk assessment (like bias, hallucinations, privacy & security, etc.) and data & infra maturity.

- Building, scaling & monitoring the model based on product backlog and technology roadmap.

- Commitment to Responsible AI by prioritizing business viability, collaborative innovation, operational excellence, and compliance & governance.

Further, Nagarro can support with proprietary tools, frameworks, and expertise in foundational models and platforms to ensure a responsible, strategic, and successful adoption of GenAI across your enterprise.

Embarking on a Transformative Journey Together

The journey to harnessing the transformative power of Generative AI in the Energy & Utilities sector is both exciting and complex. With Nagarro's structured approach and commitment to responsible innovation, we are well-positioned to navigate this journey together, unlocking new opportunities for efficiency, innovation, and sustainability.

We invite you to connect with us, so together we could help in shaping a future where GenAI not only powers your business operations but also drives us towards a more sustainable, energy efficient, and innovative world.

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About Nagarro

At Nagarro, we have been partnering with multiple customers in the Energy & Utilities domain for the last two decades across the globe to add value to their digital transformation and innovation journey.

Our experience involves providing the most impactful solutions that cater to the Energy and Utilities industry. We help our customers achieve their goals for operational efficiency, sustainability, grid resilience, safety, and security while increasing customer satisfaction and retention.

Get in touch with our industry experts: **energyutilities@nagarro.com** to kickstart a conversation.