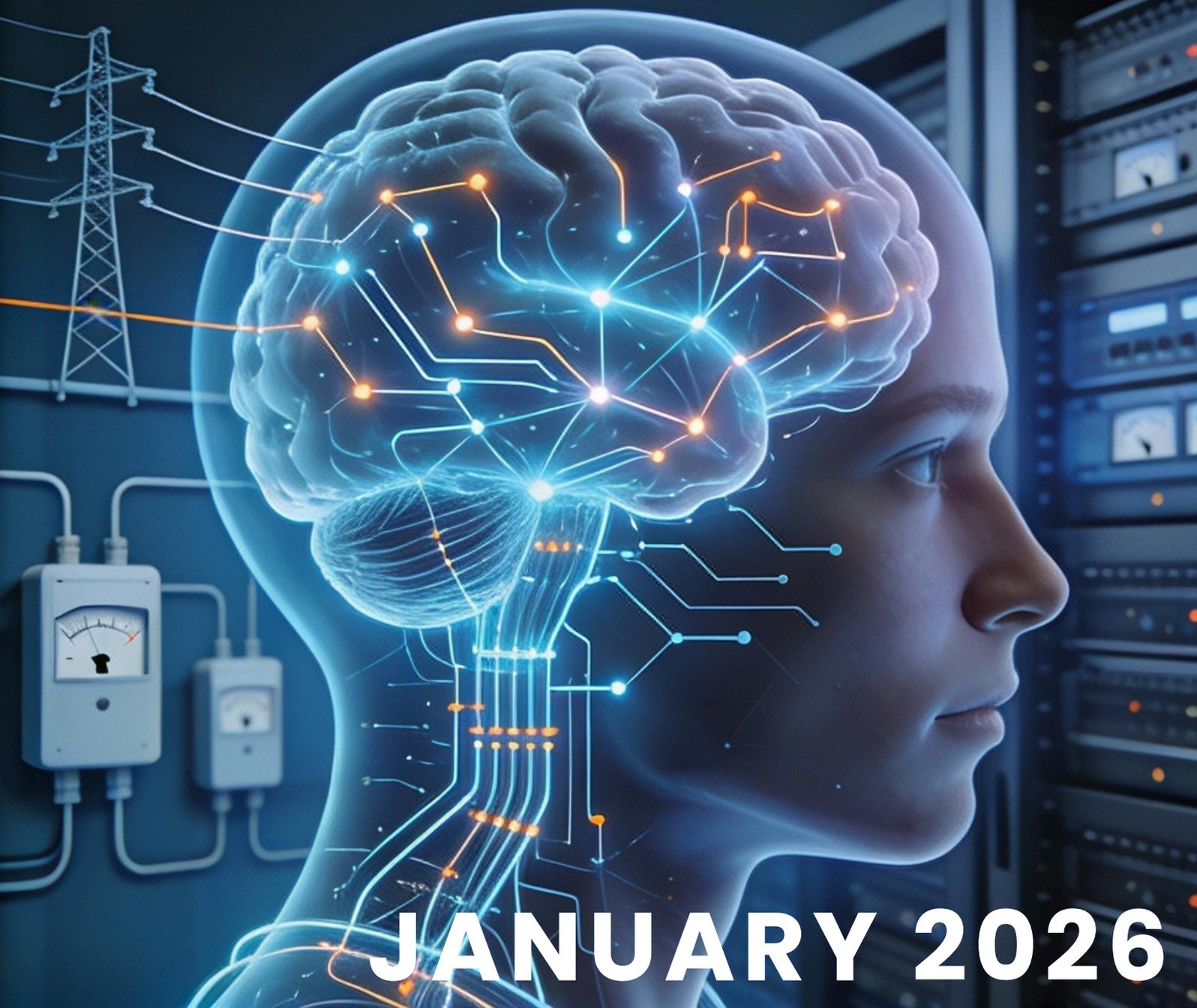


How AI Eats Electricity: The Hidden Energy Cost of Intelligence



JANUARY 2026

DEPARTMENT MISSION AND VISSION

Department Vision

To embrace students towards becoming computer professionals having problem solving skills, leadership qualities, foster research & innovative ideas inculcating moral values and social concerns.

Department Mission

- 1: To provide state of art facilities for high quality academic practices.
- 2: To focus advancement of quality & impact of research for the betterment of society.
- 3: To nurture extra-curricular skills and ethical values in students to meet the challenges of building a strong nation

PROGRAM OUTCOMES

PO 1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

PO 5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

PO 9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

PSO 1: To prepare students to excel in the areas of computer engineering techniques & tools through quality education as per industry demands.

PSO 2: To inculcate students a multidisciplinary approach to analyze, design, apply and create innovative products and research solutions for real life problems.

PSO 3: To develop professional ethics & skills in students and ability to relate computer engineering problems with social issues.

PROGRAM EDUCATIONAL OBJECTIVES

PEO 1: All the graduates will become high class software professionals who could be absorbed in the software industry on the basis of sound academic knowledge gained by them on account of adopting state of the art academic practices.

PEO 2: All the graduates will demonstrate their talent in research and development activities involving themselves in such researches which could alleviate the existing problem of the society.

PEO 3: All the graduates shall be committed for high moral and ethical standards in solving the societal problems by means of their exposure to various co-curricular and extra-curricular activities.

From the Desk of the Head of the Department

It gives me immense pleasure to present this edition of our Technical Magazine. In today's rapidly evolving technological landscape, innovation, critical thinking, and continuous learning are the cornerstones of success in the field of Computer Science and Engineering.

This magazine stands as a platform for our students and faculty to showcase their technical knowledge, creativity, and research-oriented mindset. The articles, projects, and insights compiled here reflect not only academic excellence but also a deep curiosity to explore emerging technologies and real-world problem-solving approaches.

I sincerely appreciate the efforts of the editorial team, contributors, and faculty members who have worked tirelessly to bring out this magazine. Their dedication and teamwork are truly commendable. Such initiatives play a vital role in bridging the gap between theoretical concepts and practical applications.

I encourage our students to continue exploring, innovating, and contributing to the ever-growing domain of technology with confidence and responsibility. I am confident that this magazine will inspire readers and serve as a valuable source of technical knowledge.

I wish the entire team great success in their future endeavors.

Best Wishes.



Mr. Alok Mishra

Mr. Alok Mishra
Head of the Department
Computer Science & Engineering

From the Desk of the Deputy Head

It gives me great pleasure to be a part of this technical magazine, which serves as a valuable platform for showcasing the intellectual capabilities, creativity, and technical proficiency of our students and faculty members. In an era where technology is evolving at an unprecedented pace, such initiatives play a crucial role in nurturing curiosity, innovation, and a research-oriented mindset among budding engineers.

The Department of Computer Science & Engineering continuously strives to provide an environment that encourages learning beyond textbooks. This magazine is a reflection of those efforts, presenting diverse perspectives, emerging trends, and innovative ideas that resonate with the current demands of the industry and academia. The articles and technical contributions featured here demonstrate the enthusiasm and dedication of our students toward understanding and applying modern technological concepts.

I sincerely appreciate the efforts of the editorial team for their commitment, teamwork, and perseverance in bringing out this magazine. Compiling technical content requires not only subject knowledge but also discipline, coordination, and a vision to inspire readers. I also extend my gratitude to the faculty members who have guided and mentored students throughout this process, ensuring academic quality and relevance.

I encourage our students to actively participate in such technical and creative activities, as they significantly contribute to personal growth, confidence building, and professional development. Exploring new ideas, conducting research, and sharing knowledge are essential qualities of a successful engineer and responsible technologist.

I am confident that this technical magazine will motivate readers, ignite innovative thinking, and serve as a source of knowledge and inspiration for the academic community. I wish the entire team continued success and look forward to many more such commendable initiatives in the future.

Best Wishes,

Mr. Vipin Rawat

Deputy Head

Department of Computer Science & Engineering



Mr. Vipin Rawat

FACULTY CORDINATORS

We are pleased to present this edition of the Technical Magazine, which stands as a collective effort of creativity, knowledge, and technical enthusiasm from our students and faculty members. This magazine serves as a platform for students to express their ideas, showcase their technical skills, and explore emerging trends in the field of Computer Science and Engineering.

As faculty coordinators, it has been a rewarding experience to guide and support students throughout the development of this magazine. Their dedication, curiosity, and commitment to excellence have been truly commendable. From conceptualizing ideas to compiling technical articles, the students have demonstrated teamwork, responsibility, and a strong passion for learning beyond the classroom.

We extend our sincere appreciation to all contributors for their valuable inputs and to the editorial team for their hard work, coordination, and perseverance. Such initiatives not only enhance technical knowledge but also help students develop critical thinking, communication skills, and confidence—qualities essential for future professionals.

We are also grateful to the Head of the Department and departmental faculty members for their constant encouragement and guidance, which made this endeavor successful. Their support has been instrumental in maintaining the academic quality and relevance of the content presented in this magazine. We hope that this technical magazine will inspire readers to explore new technologies, innovate, and remain curious in their academic journey. We wish all students continued success and look forward to witnessing many more such creative and technical achievements in the future.

Best Wishes,

Faculty Coordinators

Department of Computer Science & Engineering



Miss. Km Divya
Assistant Professor



Mr. Atebar Haider
Assistant Professor

PREMIER'S ANALYSIS OF AI IMPACT



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WEEKEND AI DISCOVERIES

Power consumption in AI explained

Are you aware of AI's electricity demand? It's crucial to understand how AI operates, especially regarding its energy consumption. As we explore the world of artificial intelligence, its operational mechanics provide insight into electricity usage and sustainability measures waiting to be embraced.

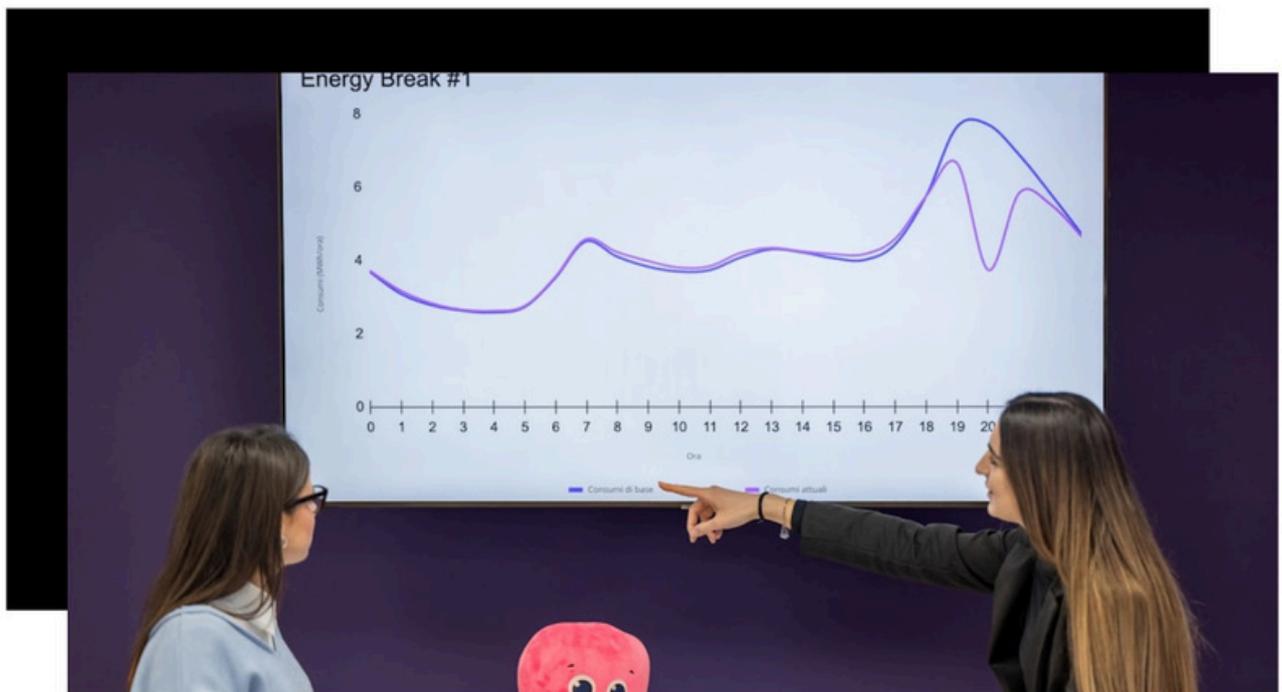
Being informed is vital. We will dissect the entire AI framework, covering everything from data processing to actual execution, allowing you to make educated decisions based on the needs of a rapidly evolving industry.



AI and Energy Dynamics

When you think of AI technologies deployed in numerous sectors today, the energy that powers them often gets overshadowed by their groundbreaking capabilities. Understanding how much energy generative models, including deep learning systems, consume is essential for businesses on a growth path.

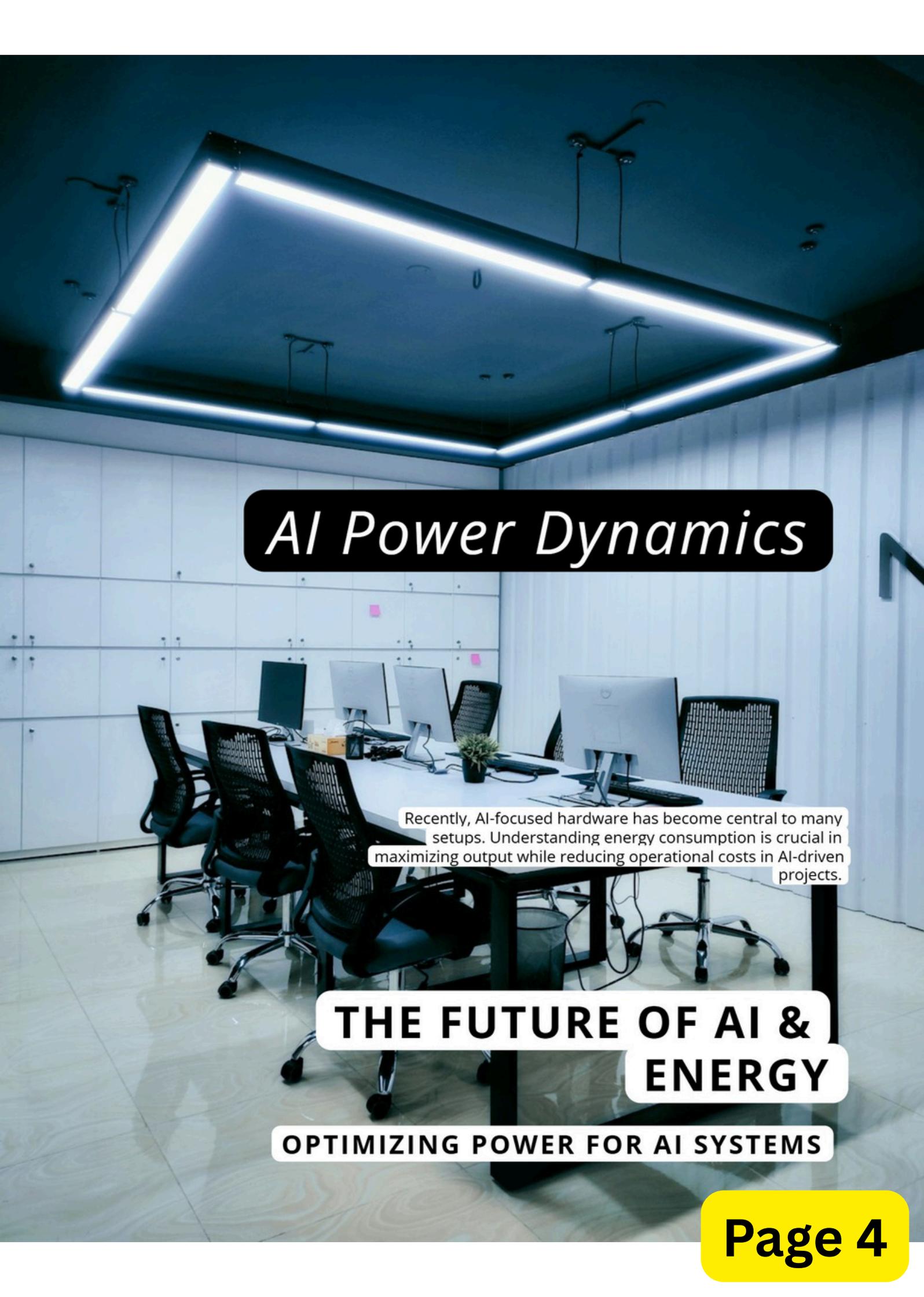
The growth trajectory for AI applications, while promising innovation, raises eyebrows concerning energy consumption. Companies need to strategize effectively in managing energy use as they scale, particularly with the integration of hardware optimized for AI workloads.





The AI professional landscape reveals many facets. It is imperative for developers and organizations to consider energy as a resource and not an afterthought. Energy management tactics must be part of AI operational strategies.

From large-scale data-driven services to small AI implementations, the future hinges on energy-efficient practices. Education can help pave the way for a sustainable AI future.



AI Power Dynamics

Recently, AI-focused hardware has become central to many setups. Understanding energy consumption is crucial in maximizing output while reducing operational costs in AI-driven projects.

THE FUTURE OF AI & ENERGY

OPTIMIZING POWER FOR AI SYSTEMS

ANALYSIS OF USAGE

Informed energy decisions can enhance AI deployment, productivity, and sustainability, signifying a critical shift for the industry.

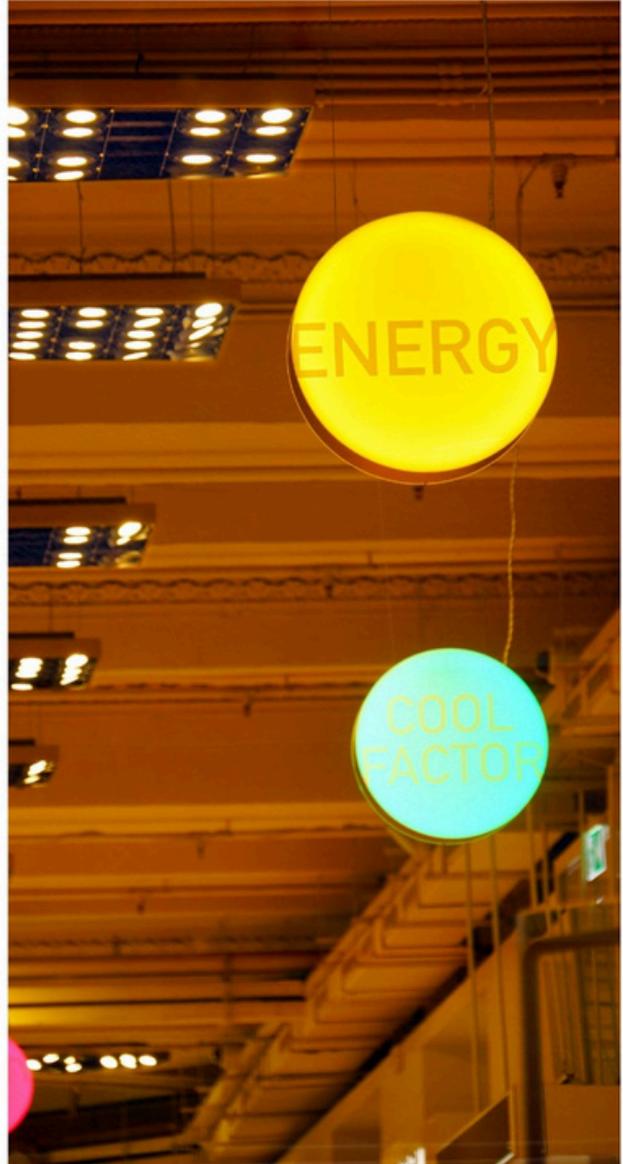
Sustainable practices in AI not only save costs but also assure compliance with new regulations, making them suitable for future roles.

Analysis of usage plays a crucial role in understanding how energy is consumed across AI systems and infrastructure. By closely examining where, when, and how power is used, organizations can make informed energy decisions that enhance AI deployment, improve productivity, and support long-term sustainability. Efficient usage analysis helps identify energy-intensive processes, optimize workloads, and reduce unnecessary consumption without compromising performance. Adopting sustainable practices not only lowers operational costs but also ensures compliance with emerging environmental regulations, positioning AI systems to remain effective, responsible, and future-ready in an evolving technological landscape.



To optimize AI systems, categorize energy consumption mathematically in relation to performance metrics, timeliness, and accuracy.

To optimize AI systems, energy consumption must be analyzed and categorized in relation to key performance metrics such as accuracy, speed, and reliability. As AI models grow more complex, higher performance often demands greater computational power, which directly increases energy usage. By mathematically evaluating the trade-offs between energy consumption and model performance, developers can design systems that deliver acceptable accuracy and responsiveness without unnecessary power waste. This approach encourages smarter algorithm design, efficient hardware utilization, and better cooling strategies, ensuring that energy efficiency remains a priority during AI deployment while maintaining the effectiveness and scalability of intelligent systems.



Energy efficiency remains a priority in AI deployment.

AI Infrastructure Impact

The balance of technology and energy consumption is key when leveraging AI advancements for business growth.

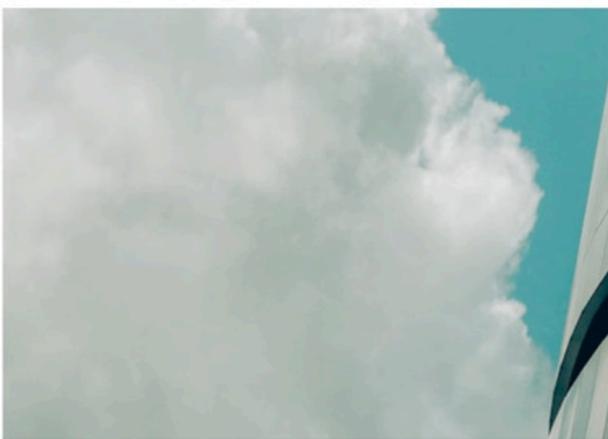
SINCE 2023

EVOLUTION THROUGH DATA

The journey toward sustainable AI demands radical reform in energy management strategies.

2023 indicates a pivotal moment in AI history, balancing performance with sustainability needs.

Leading AI industries are creating standardized protocols aimed at reducing energy displacement across operations through innovative techniques, setting a benchmark for followers.



AI has evolved from rule-based systems in the 1950s to data-driven deep learning models today, where vast datasets fuel advancements in machine learning, neural networks, and generative AI.

Leaders in technology aim for transformative energy conservation strategies while managing consumption with comprehensive oversight.

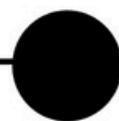


Through efficient design, AI companies are discovering various avenues to lower carbon footprints tied to power usage. The synergy of energy-informed design is where cost and environmental health can harmonize.



The shift toward a balanced AI brings about discussions into energy conservation that resonate with principles of environmental stewardship.

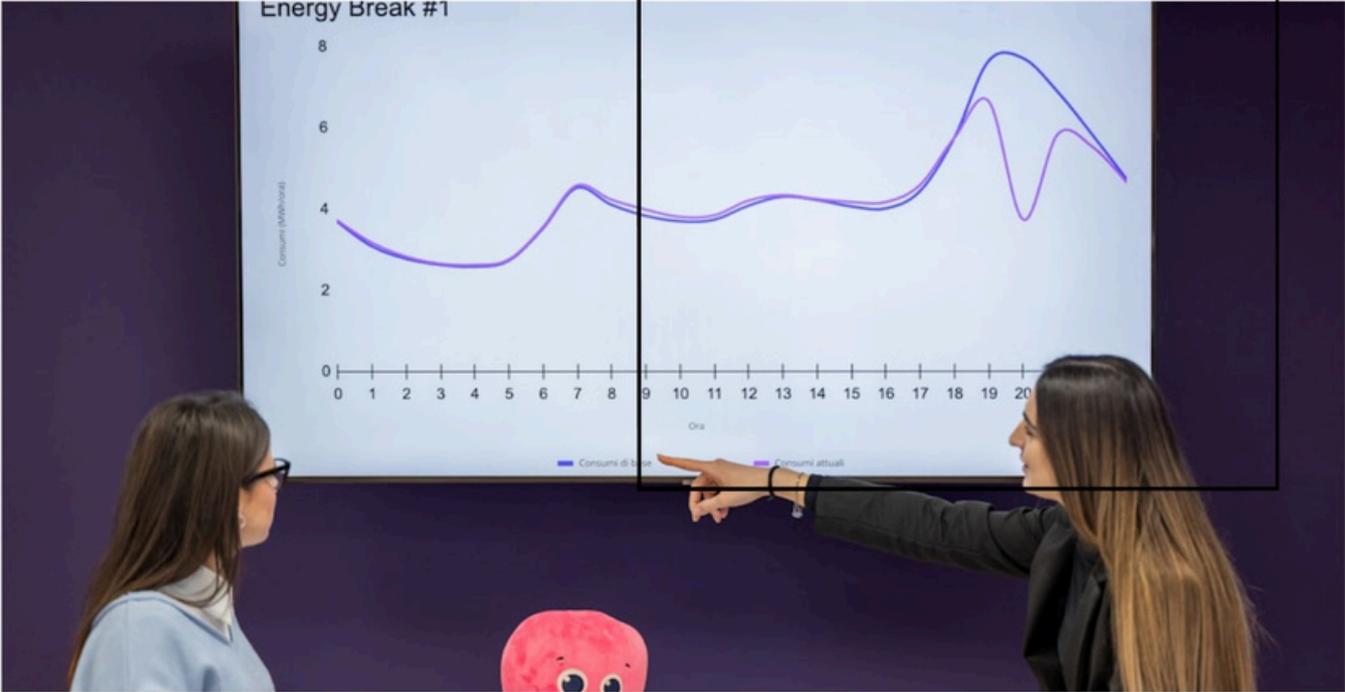
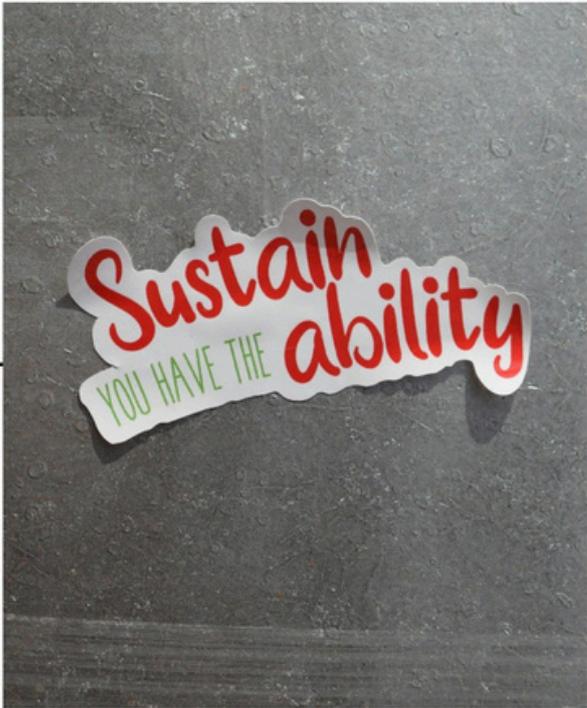
The shift toward a balanced approach to artificial intelligence brings energy conservation into the center of technological discussion, aligning AI development with the principles of environmental stewardship. As AI systems become more deeply integrated into everyday life, their energy requirements can no longer be treated as a secondary concern. This balance encourages researchers, industries, and policymakers to design AI models that are not only accurate and powerful but also energy-efficient and sustainable. By focusing on responsible energy use, optimized computation, and cleaner power sources, AI can support innovation while minimizing its environmental footprint. Such an approach ensures that progress in intelligence does not come at the cost of ecological health, fostering a future where technology and sustainability evolve together in harmony.



AI Green Initiatives

Preparedness for upcoming green standards requires adapting to frameworks that support AI's energy-efficient future.

This includes understanding recent trends and preparing businesses for energy responsibilities linked with upcoming regulatory demands.

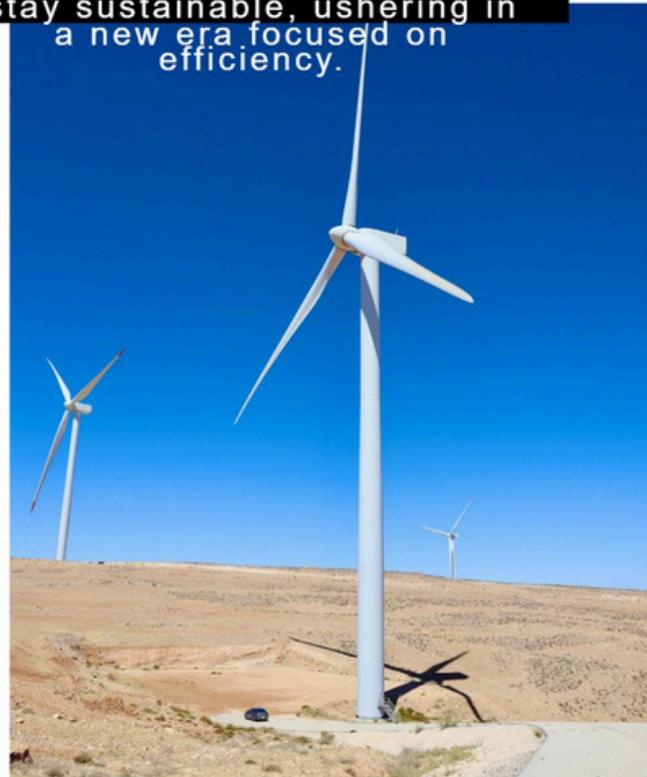


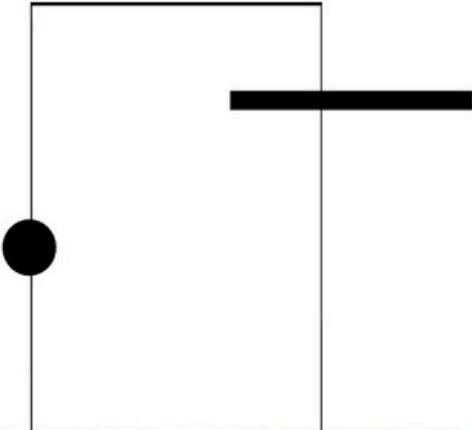
A new vision for AI's relationship with power sources may dictate its fate in a world ever more concerned with ecological balance.

As energy sources become increasingly scrutinized, a roadmap to a greener AI unveils opportunities for reducing not just consumption but the overall environmental impact.

AI infrastructure must evolve along with power sources to stay sustainable, ushering in a new era focused on efficiency.

- Agentic AI Agents: Autonomous "super agents" handle complex tasks across apps, environments, and devices, evolving from chatbots to proactive digital workers.
- Multimodal and Edge AI: Models process text, images, video, and actions seamlessly on devices, reducing cloud dependency for faster, greener computing.
- Efficient Small Models: Shift to smaller, domain-specific language models (SLMs) tuned for industries like healthcare, cutting energy use while matching large model performance.
- Physical and Robotic AI: AI bridges digital-physical worlds with dexterous robots for manufacturing, eldercare, and logistics, boosting productivity by 25%.
- Hyper-Personalization and Governance: Tailored AI experiences with strong ethical frameworks, open-source diversification, and security audits for trust.





To determine what needs to happen in fostering a sustainable AI future, examining energy metrics alongside industry practices offers valuable insights.



Critically assessing the sustainable practices that govern AI execution can yield enhanced productivity while confronting energy realities!

AI serves as a beacon of technology, illuminating the energy requirements that will shape future paradigms.

● Efforts to innovate energy consumption metrics are designed to yield sustainable operational conditions while fueling continual growth in AI.



A strategy based on successful frameworks highlights a path forward that enhances both functionality and ecological responsibility.

SINCE 2023

Navigating the tech landscape requires an awareness of how AI impacts energy logistics and driving innovation forward.

Understanding AI energy profiles can lead to proactive measures that propel transformative methods across sectors.



Evaluating the integration of sustainable practices within AI reveals how to align energy consumption with AI's operational goals.

AI initiatives are not just about advancements but also consideration of energy responsibilities they

THE FLOURISHING AI FUTURE

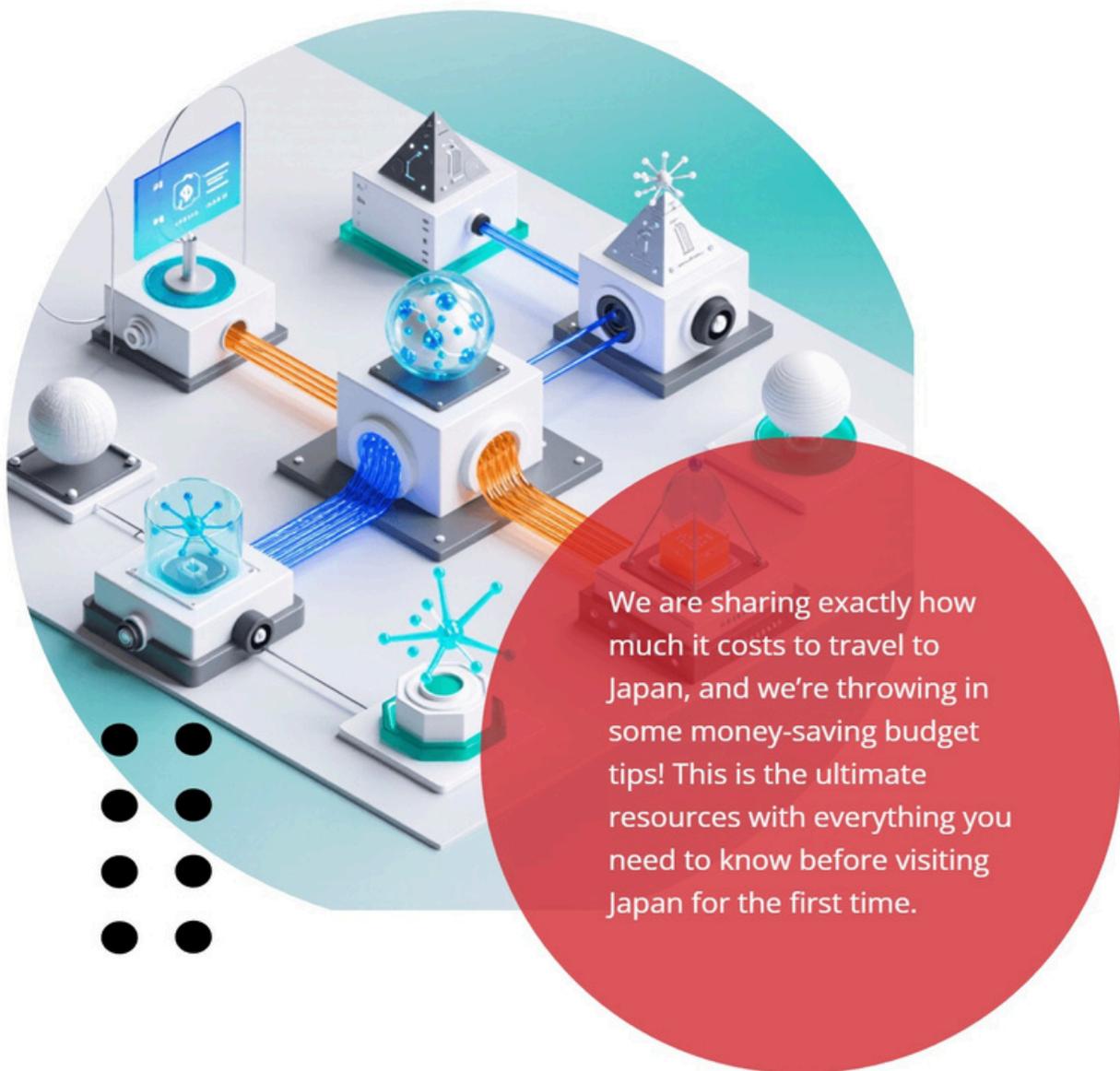
Emphasizing growth in responsible AI development suggests a need for frameworks that embrace energy considerations proactively.

As natural resource alignments shift, AI's future hinges on how it harmonizes with sustainable energy solutions.

LAND OF THE RISING AI



AI and Energy Dynamics



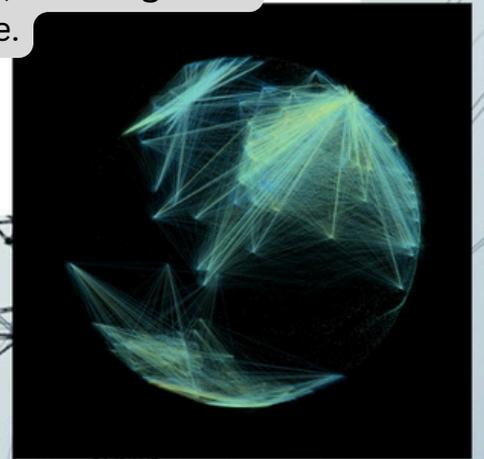
We are sharing exactly how much it costs to travel to Japan, and we're throwing in some money-saving budget tips! This is the ultimate resources with everything you need to know before visiting Japan for the first time.



Artificial intelligence affects energy consumption in electric cars by adding a small but constant power demand for computation while also helping the vehicle use energy more efficiently. AI manages the battery by monitoring temperature, charge levels, and health, which consumes little energy but improves performance and lifespan. Driver-assistance and autonomous features use cameras, sensors, and processors that require significant power and can slightly reduce driving range. At the same time, AI optimizes routes, driving behavior, and climate control, reducing unnecessary energy use. Overall, AI consumes electricity to make decisions, but the energy it saves through smarter vehicle management often outweighs the energy it uses.

SHIFTS IN ENERGY

Shifts in energy responsibility have the potential to improve the sophistication of artificial intelligence while also supporting a more sustainable future. As AI systems grow more powerful, their demand for electricity increases, making it essential to rethink how energy is produced, managed, and consumed. By prioritizing energy-efficient hardware, optimizing algorithms, and integrating renewable energy sources, AI development can continue without placing excessive strain on the environment. Responsible energy use encourages smarter system design, reduces carbon emissions, and ensures that technological progress aligns with ecological balance, allowing AI to evolve in a way that is both innovative and sustainable.



Student Editor



SPARSH MISHRA



VISHAL KUMAR



YOGESH PRAJAPATI

The Student Editor section is driven by a passionate team of students who bring creativity, responsibility, and fresh perspectives to every edition of the magazine. Working collaboratively, the student editorial team plays a key role in planning, reviewing, and refining content to ensure it is informative, engaging, and aligned with the vision of the publication.

As student editors, we actively coordinate with writers, designers, and contributors, encouraging innovative ideas and maintaining high standards of quality and originality. This platform allows students to express their thoughts, showcase talents, and highlight achievements across academics, technology, culture, and campus life.