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Using AI To Enable and Enhance Enterprise Sustainability Initiatives

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Abstract: Sustainability is a major strategic initiative for nearly all organizations, representing major financial, operational, regulatory, and brand-related efforts. Achieving those sustainability goals is a tricky task, requiring a balance of business processes, corporate culture, and technology tools to achieve many enterprise sustainability-related objectives. Organizations should consider how AI can and should play a key role in driving these sustainability efforts.

Overview: Are AI and Sustainability Compatible?

In a very short time, AI has rapidly changed society and economies. As of late, much of the public imagination has been focused on generative AI—chats, vaguely creepy images, college students using it to write papers, etc. What is less understood and appreciated is how AI is transforming IT and, in particular, IT infrastructure. Even less understood is how emerging AI will affect corporate sustainability efforts. Sustainability has traditionally been a secondary priority, after shareholder value, profitability, market share, and strategic advantage. But today—as a key component of the more comprehensive strategic initiative known as *environmental, social, and governance* (ESG)—sustainability efforts are a driving topic in boardrooms and executive suites.

Sustainability is also increasingly being built into regulatory compliance, particularly in Europe, the Middle East, and Africa (EMEA). Organizations are demanding their vendors and suppliers share their sustainability policies before they commit to business partnerships.

> **Market Insight**
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Research from TechTarget's Enterprise Strategy Group points out that 97% of organizations with established ESG programs agree that ESG affects their strategic planning, and most of those respondents agree it does so at a "significant" level.[1]

There is little wavering from organizations' commitments to do everything from reducing carbon footprints and creating a system of circularity to improving component sourcing practices and managing power, cooling, and real estate requirements. In order to accelerate those efforts—and, in many cases, jump-start new programs—organizations are looking for an efficient force multiplier that can give their sustainability efforts real traction. Increasingly, that force multiplier is AI.

Using AI To Address Sustainability Goals at the Infrastructure Level

At first glance, the use of AI to enhance corporate goals for sustainability might seem like a disconnect. Even putting aside concerns about how the vast amount and diversity of data generated by AI will be used, the indisputable fact is that AI demands huge amounts of computing power. This doesn't even account for the substantial amount of electricity and cooling required to run the systems that support massive data sets extending into multiple gigabytes (if not more) of memory. This is particularly true as enterprises purchase, deploy, and optimize powerful IT infrastructure for AI workloads. Those workloads—from relatively simple AI chatbots to simulation of intergalactic travel—demand extensive networking throughput and connection speed, vast storage capacity and extremely low latency, and compute performance at levels rarely seen other than in cutting-edge, high-performance supercomputing.

But AI clearly has the potential to be a force for good. Applying AI and machine learning algorithms can more efficiently manage AI infrastructure and create transformative user experiences, enabling organizations to achieve a wide range of sustainability goals, including:

- Monitoring, measuring, and maintaining environmental issues, including energy usage
- Contributing to a "circular economy" marked by waste reduction, recycling, and reuse
- Improved resource use that reduces and eliminates waste in packaging, shipping, and transportation
- Reduced downtime due to cybersecurity attacks, human error, and other issues

Market Insight

89% view an AI vendor's stance on sustainability and environmental responsibility as very, if not extremely, important.

Not only do AI tools help monitor and manage energy use to respond in real time to demand, but AI also can be used to control other costs, such as the high price of real estate to house sprawling IT infrastructure and the attendant energy use. In fact, sustainability concerns are now a key factor in how organizations evaluate and select suppliers of IT infrastructure (such as networking and compute). Our research shows that 89% view an AI vendor's stance on sustainability and environmental responsibility as very, if not extremely, important.[2]

The issue isn't just about having sustainability-aware AI infrastructure (although that is very important); it's also about how AI tools help drive the success of an organization's overall sustainability programs. Keeping in mind how to develop, implement, and interpret proper metrics to evaluate the efficacy of sustainability practices for AI infrastructure is important as well, but 40% of organizations acknowledge they do not have specific metrics, according to Enterprise Strategy Group.[3]

Finally, organizations need to keep in mind the challenges in developing and deploying AI use cases in order to plan their sustainability initiatives accordingly. For instance, the following research identifies several important speed bumps organizations often run into when navigating the gauntlet of challenges related to AI:

- 31% of organizations say they have encountered issues related to suitable availability of quality data for AI models
- 30% say their organizations have paid high costs for AI solution implementation
- 28% have concerns with data privacy and cybersecurity

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[2] Source: Enterprise Strategy Group Research Report, *Navigating the Evolving AI Infrastructure Landscape*, September 2023.
[3] Ibid.

- 27% ran into difficulty in scaling systems across the enterprise[4]

When addressing these and other AI-related challenges, it would not be unusual to run into such sustainability issues in the form of energy usage spikes, AI infrastructure sprawl, and an expanding carbon footprint. Organizations should use AI systems to closely monitor and manage those areas, while also thinking about how AI-enabled technologies can help organizations achieve sustainability goals at multiple levels.

The Right Approach: How Juniper Supports Sustainability Through AI

Market-leading IT infrastructure companies are making the enablement of sustainability in both IT and in overall business processes a key capability. Juniper Networks, a leading networking infrastructure company, has prioritized sustainability in both their internal activities and the AI-enabled products and services they deliver to their client. Juniper's approach to sustainability through AI plays out in two ways: through its internal sustainability efforts as a very large, Fortune-class global organization, and by helping its customers reach their own sustainability goals via responsible and strategic use of AI-driven technology.

Juniper's Internal Sustainability Initiatives

Juniper's multifaceted approach to sustainability encompasses the following internal strategic uses of AI:

- AI tools are used to monitor, evaluate, measure, and adjust the carbon footprint throughout Juniper's numerous global manufacturing plants
- Renewable energy sources are an essential component in energy usage reduction and decarbonization achieved through power purchasing agreements and the use of renewable sources, such as solar and wind
- Significant reduction in the use of packaging materials is achieved, in part, through the use of virgin plastics
- Juniper "try and buy" and preowned programs encourage circularity of technology solutions

Juniper's Customer-Facing Sustainability Initiatives

Led by Juniper's AI-Native Networking Platform, sustainability is promoted and facilitated in the following ways:

- Driving more efficient use of power and performance, while providing real-time monitoring and management
- Optimizing how silicon, systems, and AI operations (AIOps) are leveraged to drive results at scale
- Enabling organizations using the Juniper AI-infused platform to monitor energy usage and reduce their overall carbon footprint, while improving operational efficiency and extending the effective life of AI infrastructure products and components

Specifically, the platform's silicon is optimized for sustainability initiatives, providing superior energy efficiency—even at very high-performance levels required for AI workloads—and enabling multigenerational chipset longevity. At the systems level, the Juniper platform is engineered with an energy-efficient chassis; uses a modular design that facilitates deployment, service, and upgrades; utilizes converged infrastructure for a smaller form factor and improved system resource efficiency; and comes with integrated resource management software to drive efficiency and lower energy usage. Juniper's operations approach to sustainability leverages substantial improvements in AIOps and the use of active assurance to reduce on-site visits and to reduce or replace truck rolls. Cloud-based automation and proactive power management also reduce operating costs.

An interesting real-life example can be seen in Juniper's work with major retailer Gap when it was in the midst of transforming the consumer experience. Recognizing the power of delivering a predictable, reliable, and high-performant network, Gap turned to Juniper's AI-driven Mist platform. Not only did its IT team gain unprecedented visibility into users' Wi-Fi experience, but it also consistently delivered expected service levels. And because Gap's

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[4] Ibid.

IT team was able to identify problems remotely and proactively, as well as easily collect and analyze root-case data, on-site visits dropped. In fact, the Gap reduced on-site visits by more than 85%, leading to a dramatic reduction in carbon footprint by cutting truck rolls to the stores.

Finally, Juniper's solutions are enhanced by numerous sustainability innovations with Juniper Beyond Labs, the company's innovation hub for experience-first networking. Those innovations include advances such as thermal profiling, which delivers enhanced observability into energy distribution, power steering for routing traffic through optimized paths, and liquid-cooling techniques, such as immersion cooling.

So, what is the result for both Juniper and its customers? OpEx savings, demonstrable compliance performance, a wide range of cost reductions, support for customer initiatives to drive down their own electronic waste, and Scope 3 improvements for customers.

Conclusion

Sustainability efforts are already shaping how, when, and why organizations use technology for the good of the business and the good of their customers, business partners, and communities. But sustainability isn't some buzzword, the "next new thing," or something to build public relations campaigns around. Organizations should treat it as a strategic initiative.

All organizations need a sustainability strategy integral to their overall business strategy, including such fundamental pillars as decarbonization, sustainable technology, and circularity. This is critical as expectations increase for organizations to meet and exceed a wide and broadening array of requirements on such diverse issues as smart sourcing, energy monitoring and management, responsible use of product packaging, and environmentally sound disposal policies.

Being a sustainability leader is challenging for technology companies—or any organization that invests heavily in AI infrastructure—because of the massive amount of compute power, energy, real estate, and cooling required for AI optimization. Industry leaders, such as Juniper Networks, have made it a priority to both leverage the benefits of AI and to do so in a responsible, environmentally sustainable manner.

Juniper's AI-Native Networking Platform represents an industry breakthrough in development of purpose-built infrastructure to take advantage of AI in a way that ensures an excellent experience for both network operations and their end users. The AI-Native Networking Platform represents a key component of Juniper's AI-directed corporate strategy for sustainability, both in how it operates its own business and how it meets its customers' sustainability expectations.