DELL Technologies

Achieving your goals sustainably with enterprise AI solutions from Dell Technologies

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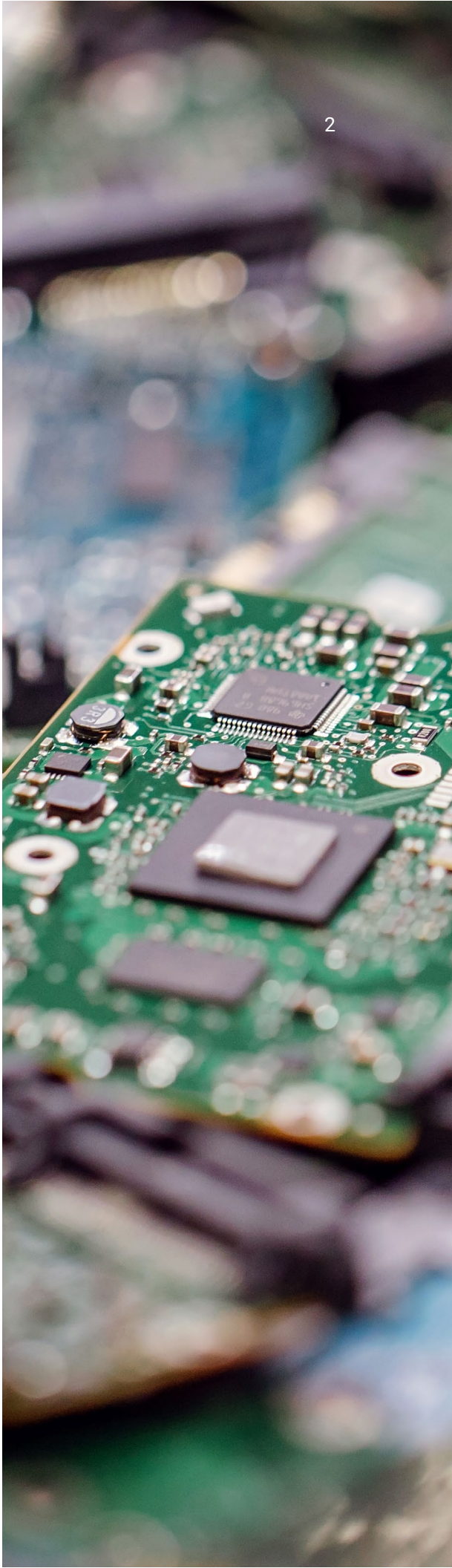
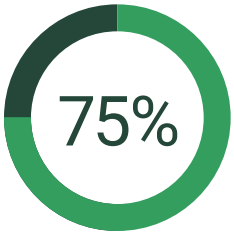


AI, sustainability and the future of business

Sustainable AI — not just an option but a necessity

Artificial intelligence (AI) is emerging as a key driver of innovation. Enterprise-wide, AI is enhancing operational efficiency, unlocking new opportunities and revolutionizing entire industries. However, as organizations increasingly evaluate their energy consumption and carbon footprint, AI also introduces environmental and budgetary concerns. It's possible to optimize AI models for efficiency, measuring and reporting on their environmental impact, but these models are challenging to implement. As organizations discover the extent of AI's potential, they face a crucial question: How can AI be deployed without compromising environmental sustainability goals?



Three-quarters of organizations now consider sustainability and circularity critical factors in IT procurement processes.[1]

Despite AI's potential, 60% of organizations' leaders worry that AI could negatively impact sustainability efforts.[2] This concern highlights the importance of responsible AI deployment — aligning AI innovation with sustainability initiatives to secure long-term business success while reducing environmental impact. Sustainability can't be an afterthought; it must be a core part of an AI strategy.

Achieve your goals sustainably with end-to-end AI solutions from Dell Technologies

As a leading, global company, Dell Technologies is at the forefront of sustainable innovation across the technology industry. Our end-to-end AI solutions support your business objectives while helping you meet your sustainability goals. By combining cutting-edge AI with our deep commitment to environmental and social responsibility, we deliver solutions that make a positive impact — on your business and the planet.

How sustainable solutions support long-term business success

Sustainability is a critical component of long-term resilience. Investing in sustainable technology helps businesses meet environmental goals, safeguard against operational disruptions, stay competitive and future-proof operations.

of organizations agree that sustainability investments protect them from disruptions such as supply chain issues and energy scarcity.[3]

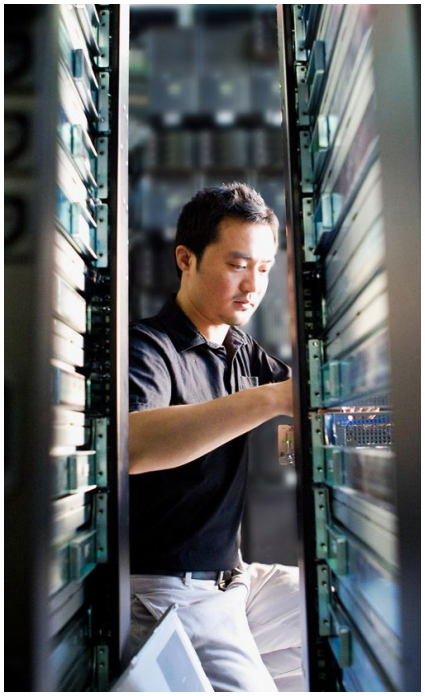
of organizations plan to increase their IT infrastructure budget to support and advance their sustainability initiatives.[4]

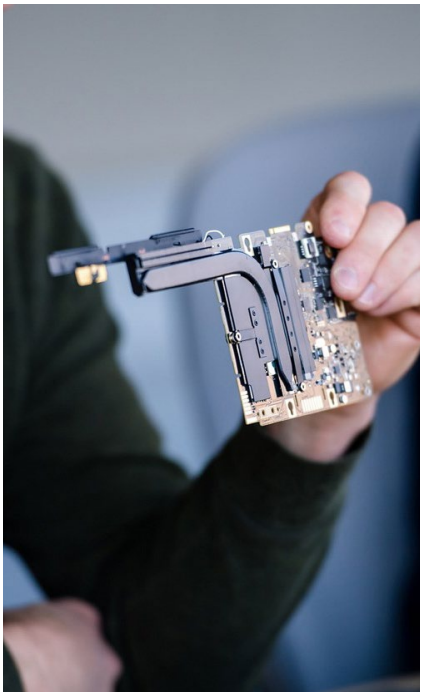
End-to-end sustainability in the AI era

Innovative and energy efficient AI

At Dell Technologies, sustainability is embedded throughout our operations — from our supply chain to product development and beyond. By integrating it from the start, we ensure our high-performance AI products meet the most stringent environmental standards. Our commitment is exemplified by the certifications we've received, which include industry standards like EPEAT Climate+, ENERGY STAR and TCO 9.

We are focused on driving innovation that makes the entire industry more energy efficient, from our own operations to the IT environments of our customers. We ensure that innovation and responsibility go hand in hand by embedding sustainability into every aspect of our business and working collectively.





Dell Technologies ...

delivers solutions that are scalable, efficient and sized to meet the needs of our customers.

leads with the industry's widest portfolio of products achieving EPEAT Climate+ and ENERGY STAR designation.

focuses on making products with extended lifecycles that are more sustainable, repairable and upgradable.

How Dell Technologies delivers end-to-end sustainability

Backend

We manage environmental and social risks by addressing energy use, emissions and energy-efficient AI production throughout our operations and supply chain. Our transparency in both governance and reporting allows us to guide customers toward similar sustainability goals.

Front End

We deliver more sustainable AI products and services by using recycled, renewable and low emissions materials, providing take-back programs to minimize e-waste, supporting sustainable data centers, and improving energy and operational efficiency.

Collective Impact

We leverage technology to address environmental and social challenges by bridging the digital divide, developing partnerships to equip communities with AI skills, and supporting initiatives like solar community hubs, digital assistants, and high performance computing (HPC) for healthcare.

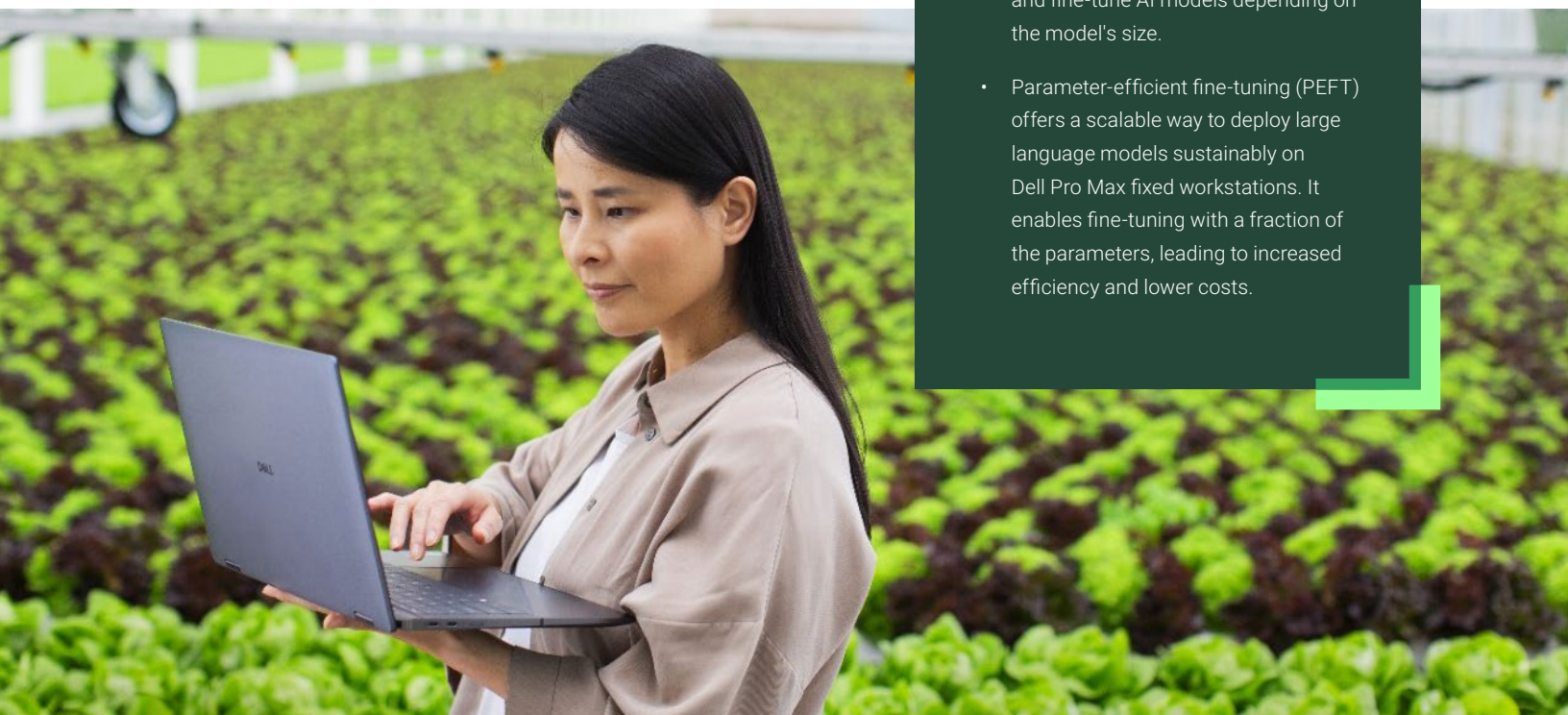
Solutions from Dell Technologies help optimize energy needs without compromising performance

Improve battery life and power consumption

- Up to 42% less power consumed when using AI-enhanced collaboration tools.[5]
- Up to 600 saved battery charge cycles.[6]

Optimize energy use with AI workstations

- New Dell Pro Max AI-ready workstations can prototype, develop and fine-tune AI models depending on the model's size.
- Parameter-efficient fine-tuning (PEFT) offers a scalable way to deploy large language models sustainably on Dell Pro Max fixed workstations. It enables fine-tuning with a fraction of the parameters, leading to increased efficiency and lower costs.



The Dell AI Factory: A model of sustainable innovation in the AI era

Creating a circular economy while advancing AI initiatives

At Dell Technologies, we understand the importance of achieving your AI goals sustainably. That's why we created the Dell AI Factory — a comprehensive suite of AI products, services and solutions designed to drive innovation while optimizing energy use.

Our approach goes beyond just minimizing energy consumption. We integrate sustainability into every aspect of our AI solutions, from data-driven insights and intelligent operations to innovative cooling methods and circular economy initiatives.

Dell Technologies complies with the highest environmental standards so that you can feel confident about the sustainability of your purchases.

The benefits of the Dell AI Factory

What if you could accelerate innovation while keeping costs under control and your data secure? The Dell AI Factory can help. Powered by cutting-edge infrastructure, an open ecosystem, and flexible solutions, the Dell AI Factory meets your needs across data centers, edge locations, workstations, PCs and public clouds — all while keeping energy efficiency and sustainability in mind. From promoting energy-efficient operations to offering a circular approach, including Asset Recovery Services, our comprehensive approach can support your AI ambitions.

Faster time to value

Optimize productivity

Transform insights

Deliver trusted outcomes

Learn how you can achieve your AI goals sustainably with the Dell AI Factory.

How Dell Technologies helps you achieve your AI and sustainability goals

Balancing AI innovation with sustainability

Dell Technologies offers a comprehensive portfolio of solutions to help you meet your AI innovation and sustainability goals. To accomplish this, we take a two-pronged approach that focuses on:

Climate action
Reduce carbon footprints through energy-efficient AI implementations and lower emissions.

Circularity
Keep materials in use longer through recycling, repair, reuse and sustainable product design.

Cutting-edge solutions, sustainability insights and assessments from Dell Technologies help organizations deploy right-sized AI models and reduce energy use. By partnering with Dell Technologies, you can better ensure your IT is more sustainably made, responsibly used and safely retired.

Climate action

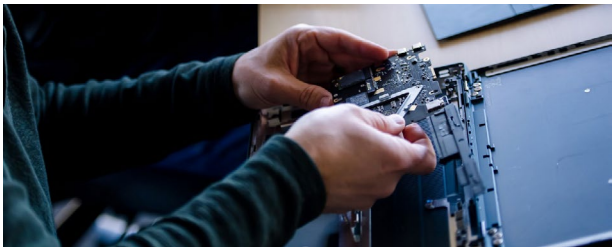
- Gain sustainability insights. Improve cost efficiency, lower emissions and deliver breakthrough innovations with data-driven, actionable reports and assessments.
- Lower energy and cooling costs. Streamline IT operations effectively with remote management, real-time insights and proactive support.

Circularity

- Transition to AI with circularity in mind. Ensure responsible technology use and retirement when upgrading to new and more sustainably made solutions.
- Refresh responsibly. Promote reuse and recycling of hardware to minimize waste and keep products and materials in the circular economy.
- Choose more sustainable devices. Minimize environmental impact and support sustainable IT practices with circular design, sustainable packaging, durability and serviceability.

How Dell Technologies advances circularity: From product design to responsible recycling

At Dell Technologies, we take an end-to-end approach to sustainability:



Deeply integrating sustainability into our backend operations and supply chains.

Collaborating closely with team members, partners and suppliers on the front end to tailor sustainable solutions.

Driving collective impact through technology, skill-building, community networks and innovation.

Partnering globally and locally to scale our positive effects on industries, communities and society.

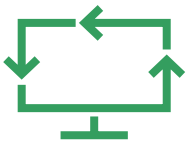
With solutions from Dell Technologies, you can achieve meaningful AI outcomes while reducing your environmental impact.

Maximize AI's energy and operational efficiency

Optimizing AI models and technology for greater energy efficiency

When it comes to AI models, bigger isn't always better. Rather than simply focusing on large-scale models, organizations are now turning to domain-specific AI models that better serve their unique needs while minimizing energy consumption. Dell Technologies has spearheaded this shift, optimizing AI models to be right-sized for efficiency without sacrificing performance.

More sustainable AI is achievable. By leveraging AI servers, cutting-edge storage solutions, and energy-efficient AI PCs, we help you reduce your energy consumption without compromising performance.



AI PCs provide a more sustainable alternative to traditional data centers for balancing appropriately sized AI workloads, saving energy while keeping things running smoothly.

With AIOps, we're making IT operations smarter and more efficient. AI seamlessly integrates to monitor, automate and optimize processes, helping you strike the perfect balance between performance and energy use.

How consolidated, high-performance infrastructure drives efficiency and sustainability

Maximizes performance at higher utilization

Handle more workloads with fewer high-performance devices, reducing redundancy.

Reduces footprint

Lower the physical footprint of your data center with more efficient solutions.

Lowers cooling needs

Fewer devices generate less heat, easing cooling demands and saving costs.

Simplifies management

Streamlined operations reduce the number of systems to monitor and maintain.

Decreases carbon emissions

Consolidated infrastructure consumes less energy, cutting overall emissions.

Increasing energy efficiency with revolutionary cooling technologies for data centers

Our most sustainable cooling solutions for AI-driven workloads

As AI adoption grows, so does the demand for energy-intensive computing infrastructure. Dell Technologies leverages advanced cooling techniques such as direct to chip liquid cooling to reduce energy consumption while enabling infrastructure to keep pace with business needs. By focusing on modular and efficient systems, sustainability is ingrained in the design, reducing the need for additional resources through improved efficiency.

Integrating direct liquid cooling into our systems allows for a 77%[7] reduction in the power to cool when compared with air cooling, making it ideal for today's AI-driven data centers. Dell Technologies develops tailored cooling solutions alongside our expansive partner ecosystem of leading cooling component manufacturers.

Meet sustainability goals with advanced DLC technology that reduces cooling energy use by over 60% annually.[8]

The industry-first **Dell PowerCool Enclosed Rear Door Heat Exchanger (eRDHx)** is a Dell-engineered, energy efficient alternative to standard rear door heat exchangers that sets a new standard for sustainable cooling in AI-intensive environments, contributing to the broader goal of reducing energy consumption in data centers globally.

Designed to reduce cooling energy costs by up to 60% compared to currently available solutions, the self-contained airflow system captures 100% of IT heat generated.[9] The eRDHx can operate at water temperatures warmer than traditional solutions (between 32 and 36 degrees Celsius), significantly cutting energy costs and eliminating reliance on expensive chillers.

The benefits of innovative cooling technologies from Dell Technologies

Advanced thermal controls & multi-vector cooling

Energy efficiency: Reduce energy consumption with optimized airflow for cooling, lowering carbon footprints.

Extended lifespan: Prolong component life with efficient thermal management, reducing waste and replacement frequency.

Dynamic adaptability: Minimize energy waste with components that adjust to workloads.

Liquid cooling solutions

Low energy use: Operate efficiently under varying workloads to reduce power consumption.

Superior cooling capacity for high-performance workloads: up to four times the cooling capacity of air cooling.[10]

Reduced energy use and operational costs: up to 11 percent lower energy use than air-cooling alone.[11]

Direct liquid cooling manifolds

Optimized cooling: Reduce energy use with high flow rate manifolds.

Future-proof design: Upgrade without full replacement with standard connectors.

Integrated systems management

Leak detection: Minimize cooling resource waste with proactive monitoring.

Resource conservation: Advance sustainability with intelligent monitoring.

Integrated rack scalable systems

Reduced cabling: Lower installation costs and material waste.

Energy efficient: Integrated direct liquid cooling for optimized power utilization.

Unparalleled simplicity: Cable-free liquid and power delivery.

Future-ready design: Support up to 480kW in each rack. Multigenerational compute support.

Scalable: Grow as your compute demand grows. Disaggregated power for seamless scaling.

PowerCool enclosed rear door heat exchanger (eRDHx)

Maximize data center capacity: deploying up to 16% more racks of dense compute, without increasing power consumption.[12]

Meet sustainability goals: with advanced DLC technology that reduces cooling energy use by over 60% annually, freeing budgets for IT reinvestment.[12]

Enable air cooling capacity: up to 80 kW per rack for dense AI & HPC deployments.[13]

Dell services for sustainable data centers

Evaluate innovative cooling technologies such as Direct Liquid Cooling.

Assess, advise, and make recommendations regarding energy-efficient hardware and infrastructure.

Provide ongoing guidance and recommendations on how to improve data center sustainability.

Managing the IT lifecycle sustainably: The role of AI, telemetry and automation

Using AI-driven automation to manage and monitor sustainability efforts

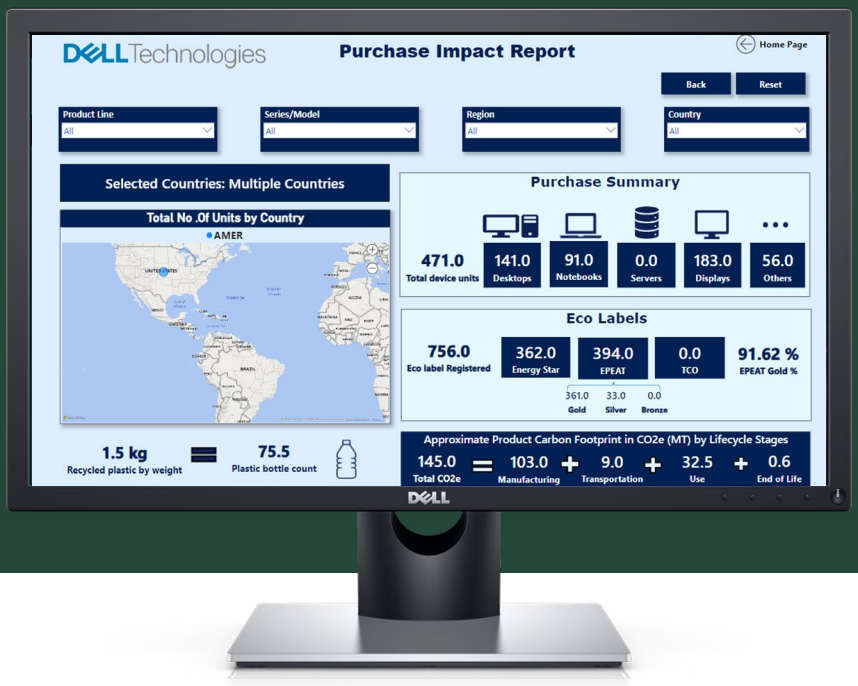
Managing energy consumption and emissions is a complex challenge, but Dell Technologies makes it easier through advanced AI, telemetry and automation tools. Solutions like AIOps provide real-time insights into energy usage, while Integrated Dell Remote Access Controller (iDRAC) allows for automated power management across the IT infrastructure.

These tools track emissions and energy consumption and enable organizations to forecast future energy needs, identify inefficiencies and automate sustainability efforts for ongoing improvements.

AI-powered tools allow for real-time energy management and optimization.

Unified AI-driven solutions for managing IT sustainability

Software solutions from Dell Technologies feature deep integration with one another and deliver a seamless workflow so you can use these tools together to operate better and more sustainably manage the lifecycle of your IT assets.



This unified software stack includes:

AIOps: Track global sustainability, take advantage of machine intelligence for smarter sustainability decisions and improve productivity with AI.

OpenManage Enterprise Power Manager: Mitigate operational risk and enhance server power consumption controls with power throttling and capping functionality.

Integrated Dell Remote Access Controller (iDRAC): Introduce automation and remotely manage and monitor Dell PowerEdge servers.

ProSupport Suite for PCs: Gain hyper-efficient resolution, self-heal before issues occur and improve productivity with SupportAssist, AI and a single dashboard with device telemetry data.

Gain real-time control for better IT operations with Dell Technologies

Our software stack delivers the real-time data and controls needed to observe your servers across all locations to:

- Track and forecast energy use and emissions at enterprise, fleet, server and workload levels.
- Identify and address high energy-consuming and emissions-generating servers.
- Automate real-time power and thermal management using telemetry data.
- Optimize power consumption by capping usage during off-peak times for servers with low or no sustained workloads and by workload type.
- Implement and enforce power policies by server, rack, group or location.
- Detect and resolve issues early, including shutting down or repurposing zombie servers.
- Identify performance bottlenecks and optimize resource allocation.

Making informed decisions with Dell Professional Services for Sustainable Data Centers

Strategic guidance to maximize efficiency and lower emissions

Dell Technologies Professional Services for Sustainable Data Centers guides organizations through their sustainability journey, offering detailed assessments to maximize efficiency. From evaluating your current infrastructure to developing actionable steps for sustainability improvements, Dell Technologies provides a clear pathway toward achieving your goals.

Professional Services for Sustainable Data Centers: From assessment to implementation

Assess current state

We assess your current state, align stakeholders, identify steps to close gaps and create actionable next steps.

Incorporate right-sized AI workloads

We ensure that resources are used judiciously and that the distinction between inferencing and training is managed to minimize energy consumption.

Track environmental data

We make it easier to monitor your usage and reach your desired future state with centralized reporting on energy use and emissions.

Responsibly retire your technology with Dell Technologies

We make it easy for our customers to retire legacy IT equipment securely and responsibly, unlocking value that can be put toward future innovation.

Asset Recovery Services

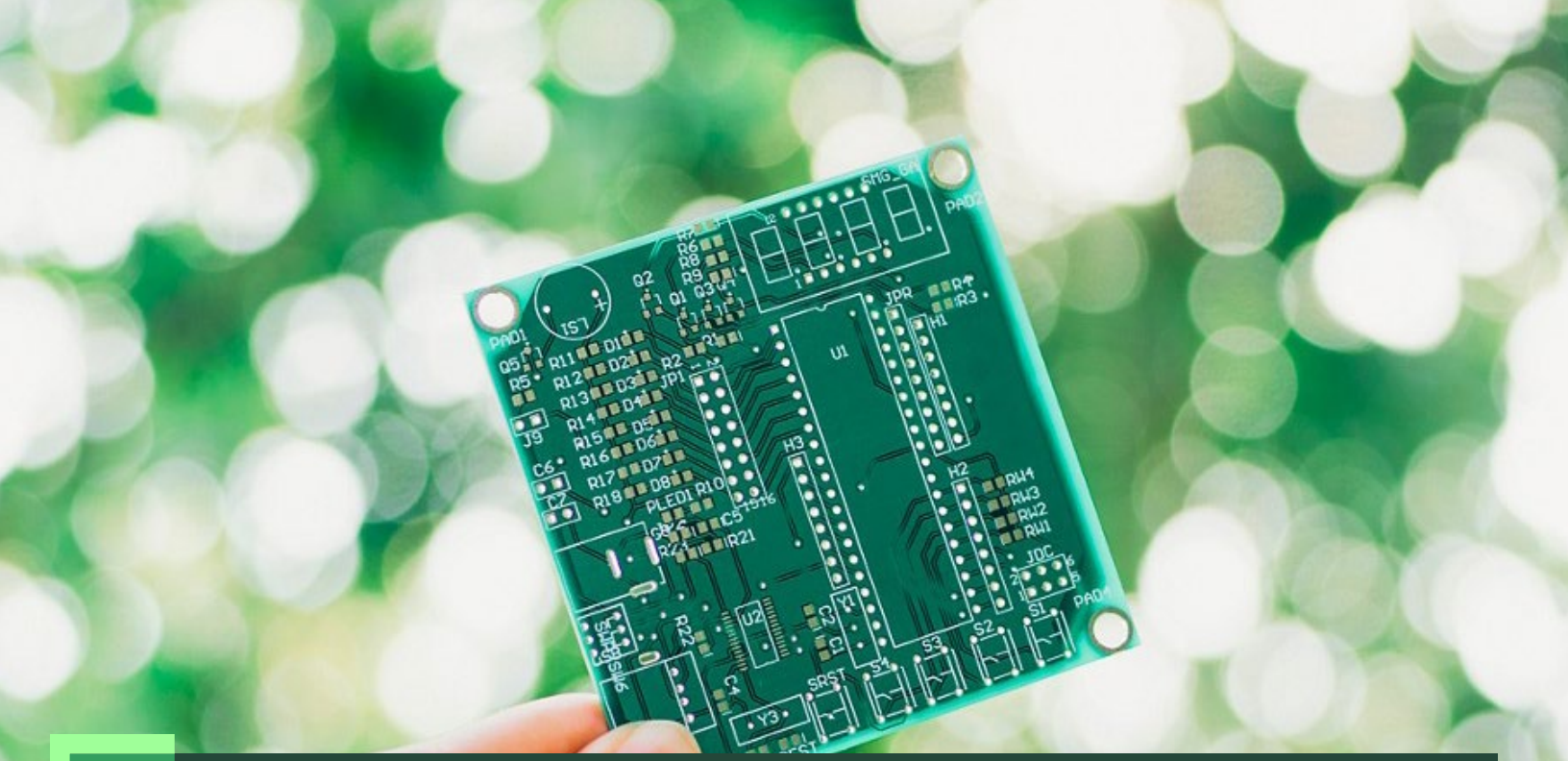
- Data protection & security
- Environmental compliance
- Value recovery
- Maintain control & insight

Professional Services for Sustainable Data Centers can assess your data center and deliver a strategic plan to help you increase efficiency and lower emissions.

The Get Efficient Assessment

Offering directional insights rather than a full-fledged service, the Get Efficient Assessment is a great way to understand how your current energy consumption and subsequent costs can be reduced by leveraging the latest products in the Dell Technologies portfolio.

Let Dell Technologies help you design a more sustainable data center with tailored assessments and services. Learn more.



1. IDC, “Circular Economy Strategies Survey, 2023,” October 2023.
2. Dell Technologies, “Innovation Catalysts Study,” February 2024.
3. Gartner, “Top Strategic Technology Trends for 2024: Sustainable Technology,” October 2023.
4. IDC, “Market Snapshot: What Are the Key Trends Around Sustainable IT Infrastructure and Operations in 2023?” November 2023.
5. Based on Intel internal testing on generic devices, as measured by system on chip (SOC) package power during 1x1 Zoom call with background blur on NPU on Intel® Core™ Ultra 7 165H processor comparing to 13th Gen Intel® Core™ i7 1370P processor. Learn more here: Intel® Core™ Ultra Processors - 1 | Performance Index.
6. Based on internal analysis, May 2024. Assumes device runs Zoom call with background blur over a 40-hour work week and three-year product lifecycle. Battery life tested by third party on Latitude 7450 running Core Ultra 7, 32GB memory and 512GB SSD vs. Latitude 7440 running Core i7-1365U vPro, 32GB memory, 512GB SSD.
7. Based on internal Dell analysis using direct liquid cooled systems with rear door heat exchanger, June 2024.
8. Based on Dell analysis in April 2025. Assumes 36°C facility water supply and ASHRAE A3 inlet server air compared to 20°C facility water supply and ASHRAE A3 inlet server air. Actual savings will vary.
9. Based on Dell analysis in April 2025. Assumes 36°C facility water supply and ASHRAE A3 inlet server air compared to 20°C facility water supply and ASHRAE A3 inlet server air. Actual savings will vary.
10. Dell Technologies. “6 Benefits of Direct Liquid Cooling.” Accessed October 2024. https://www.delltechnologies.com/asset/en-us/products/servers/briefs-summaries/dell-direct-liquid-cooling-six-advantages-infographic.pdf.
11. Dell Technologies. “Diving Deep into the Liquid Server Cooling Choices.” May 2024. https://www.dell.com/en-us/blog/diving-deep-into-the-liquid-server-cooling-choices/.
12. Based on Dell analysis in April 2025. Assumes 36°C facility water supply and ASHRAE A3 inlet server air compared to 20°C facility water supply and ASHRAE A3 inlet server air. Actual results will vary.
13. Based on Dell analysis in April 2025. Assumes 36°C facility water supply and ASHRAE A3 inlet server air. Actual results may vary.

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