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SASCHA MEIER

Advance sustainability and energy efficiency in the era of GenAI

Take a future-ready approach
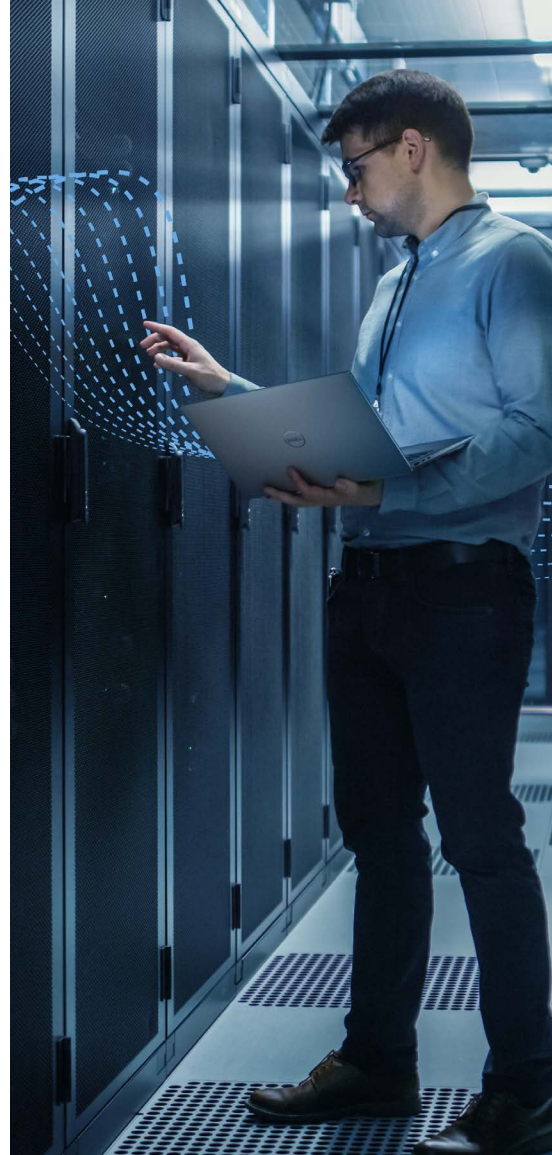with Dell Technologies and Intel

intel

Harness the power of AI without compromising your priorities

Artificial Intelligence is transforming the way we work and has already brought about a radical shift in how organisations across all industries approach innovation and growth. As generative AI (GenAI) starts delivering on its enormous potential to increase productivity and power more efficient processes, forward-thinking businesses are faced with the challenge of adopting energy-intensive AI capabilities without compromising vital sustainability and energy-efficiency objectives – all while maintaining data sovereignty and ensuring optimal return on investment.

This guide shows you where to start, and how to proceed, with overcoming this challenge by utilising the power of AI to help maintain energy efficiency, reduce your business's carbon footprint in line with regulations and carry out sustainability reporting.

**Visit Dell.com/Sustainability**

About the author

**Senior Director, Head of EMEA Presales
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Sascha has been with Dell Technologies since 2007 and is currently Head of EMEA Presales Solutions Architects. As CTO Ambassador, he is also responsible for discussing and defining the technology strategies of key customers and prospects. Sascha holds a BSc degree in Electro and Communication Technology (Dipl. Ing. FH) and is the proud father of a daughter.

Reach out to Sascha

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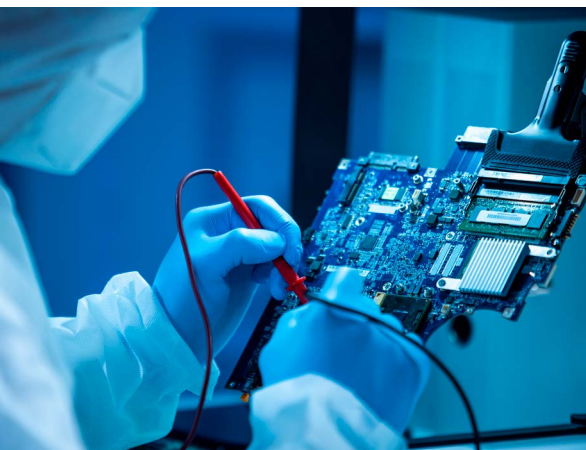
Advance sustainability and energy efficiency in the era of generative AI

Sustainability and energy-efficiency in the era of generative AI

Artificial Intelligence offers companies huge opportunities but, as it transforms the business landscape, AI is fast becoming an essential ingredient in fostering the innovation and growth required to stay competitive.

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AI Adoption is no longer a question of 'if' but 'when' and – most importantly – 'how'. In a recent Dell Technologies survey, 76% of IT leaders said they believe that GenAI will be significant or transformative for their organisations.[1] It has been estimated that workers are set for a massive 60–70% productivity boost from work automation using GenAI and other technologies.[2]

76%
of IT leaders said they believe that GenAI in particular will be significant or transformative for their organisations.[1]

Of course, adopting AI is not as simple as flicking a switch. One of the major challenges is the energy intensity of the technology. As Gartner® has recently predicted for 2024, 'increasing adoption of generative AI will lead to dramatic increases in energy use, with annual information and communication technology (ICT) electricity increases of 25% or more.'[3] Combined with the importance of maintaining energy efficiency, especially following recent volatility in the energy market, this appears to present companies with a problem. On current course, global energy demand is expected to increase by around half by 2050.[4] However, as this guide will show, the efficiencies on offer with AI adoption can help you avoid waste and reduce your organisation's physical footprint. As long as your investment is rightsized to fit your requirements, efficiency savings will go some way to reducing the energy demands of AI adoption. Advancing energy efficiency not only saves your organisation money but supports your wider sustainability strategy. Among other advantages, utilising AI can support increasingly important monitoring efforts. The growth of renewable energy will continue to accelerate but, as we lower our reliance on fossil fuels and move toward net zero, there is every reason to invest in energy-efficient solutions today. While energy efficiency and sustainability are often considered separately, they are actually interlinked. This is why developing a comprehensive strategy is your best bet for future-proofing your business.

The era of AI has begun – and there has never been a better time to advance your energy efficiency and sustainability priorities.

'Increasing adoption of generative AI will lead to dramatic increases in energy use'[3]

Adopt future-ready solutions today

Sustainability and energy efficiency are now firm boardroom priorities. To determine how AI adoption can form part of a holistic, future-ready strategy, you need to start by breaking things down.

Sustainability is multi-faceted: it might involve lowering carbon emissions, reducing e-waste, contributing to the circular economy, adopting a responsible approach to lifecycle management, using renewable electricity, increasing power-usage effectiveness and implementing responsible procurement policies. Greater energy efficiency can be achieved by reducing your physical footprint and utilising more energy-efficient devices across the enterprise.

Your strategy should prioritise what your business needs most right now and into the foreseeable future, rightsizing your investment to fit your needs. Developing a comprehensive approach therefore involves engaging with stakeholders from across your organisation.

Procurement

Source and select sustainable and energy-efficient AI-optimised hardware.

Facilities Management

Manage more efficient energy consumption and reduce your physical footprint.

Talent Acquisition

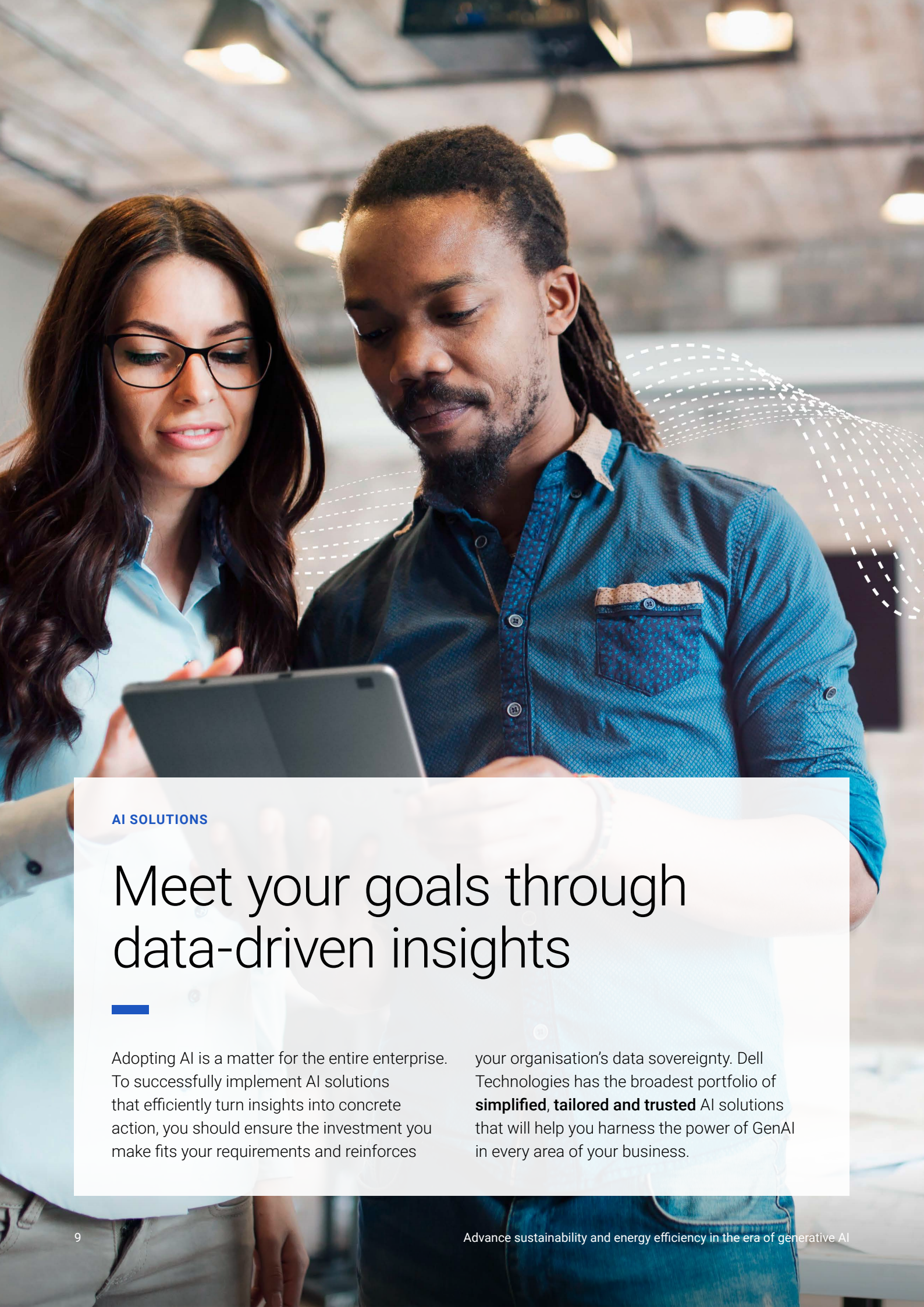Attract top talent and get the internal expertise you need for successful transformation.

Leadership

Strategic vision allows you to take a holistic, enterprise-wide approach.

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On current course, global energy demand is expected to increase by around half by 2050.[4]

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Meet your goals through data-driven insights

Adopting AI is a matter for the entire enterprise. To successfully implement AI solutions that efficiently turn insights into concrete action, you should ensure the investment you make fits your requirements and reinforces your organisation's data sovereignty. Dell Technologies has the broadest portfolio of **simplified**, **tailored and trusted** AI solutions that will help you harness the power of GenAI in every area of your business.

A comprehensive strategy for adopting AI as part of an enterprise-wide transformation geared toward sustainability and energy efficiency should encompass everything from the data centre to the home office.
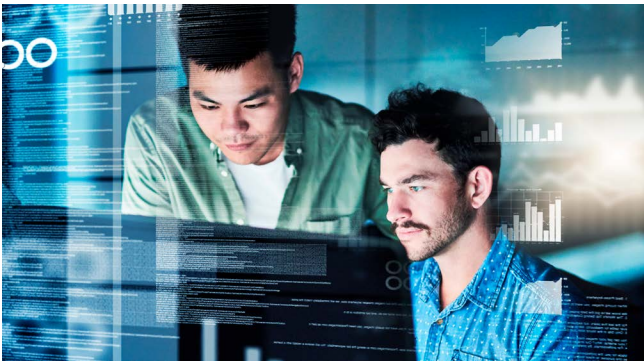
The data centre. Establish lean infrastructure for harnessing the power of AI by renewing hardware, replacing your historical base with AI-optimized solutions that increase efficiency through consolidated workloads and reduced cooling costs.

The modern workplace. Drive efficiencies wherever work happens by utilising intelligent features on secure, AI-ready PCs, building efficient workspaces and prioritising the latest devices designed for sustainability.

As-a-Service models. Consider a flexible solution to device lifecycle management that best fits your requirements, supports the circular economy and promotes responsible consumption.

79%

of business and IT decision makers believe 'bringing AI to my data creates more value for the organization because we control it, the data is fresh, and we have secure access'[6]

Accelerate efficiencies in the data centre

Adopting energy-efficient infrastructure solutions is a powerful way to advance sustainability and efficiency. AI can support this by both driving efficiencies and enhancing your ability to monitor and control your business's environmental impact.

Net zero targets have come thick and fast in recent years. The European Union aims to cut GHG (greenhouse-gas emissions) 55% by 2030 compared to 1990, and the 'European Green Deal' has mandated climate neutrality in the EU by 2050.[7] With these ambitions, new corporate sustainability reporting standards have begun to come into force. More and more organisations operating in Europe are obliged to report on their ESG efforts, and these new standards may come to have significant global influence.[8]
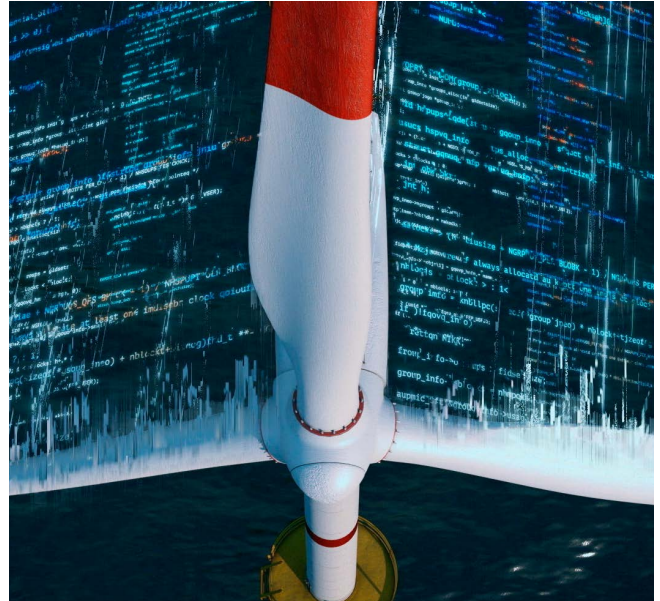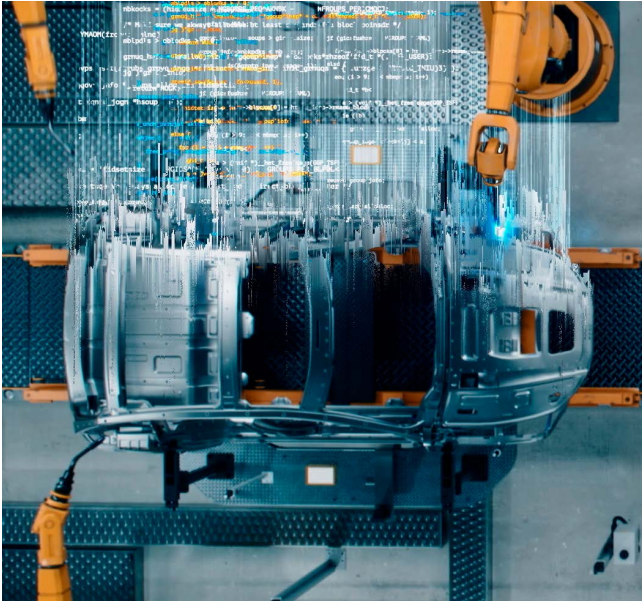
Go from insights to action in real time

Innovative software and remote management solutions can provide an overview of your organisation's energy usage and environmental impact. Dell OME OpenManage Power Manager is a convenient way to remotely manage server power and thermals, decrease power usage and comply with sustainability reporting requirements. With Dell CloudIQ, the AIOps platform for infrastructure insights that tracks and forecasts capacity requirements, you can resolve issues up to 10x faster, saving IT departments one day per week on average.[9]

☐ **Learn More about OpenManage**

☐ **Learn More about CloudIQ**

Invest in AI-ready server power

Energy efficiency technology has come on leaps and bounds in recent times, rendering old hardware a burden. What took six servers in 2013 takes just one today: Dell Technologies storage is up to 40% more energy-efficient than the previous generation. The AI-optimized Dell PowerEdge server portfolio – now powered by Intel's latest Intel® Xeon® Scalable processors – has reduced energy intensity by 83% over the last decade.[10, 11] Utilising built-in accelerators, these processors deliver a 2.9 times average performance per watt improvement over the previous generation.[12] With more built-in accelerators than any other CPU on the market, 5th Gen Intel® Xeon® processors deliver outsized performance and TCO for AI, database, networking and HPC workloads – delivering up to 10x higher performance per watt using built-in accelerators on targeted workloads.[13, 14]

☐ **Learn More about PowerEdge**

One new PowerEdge can do the work of up to five previous-generation servers[15]
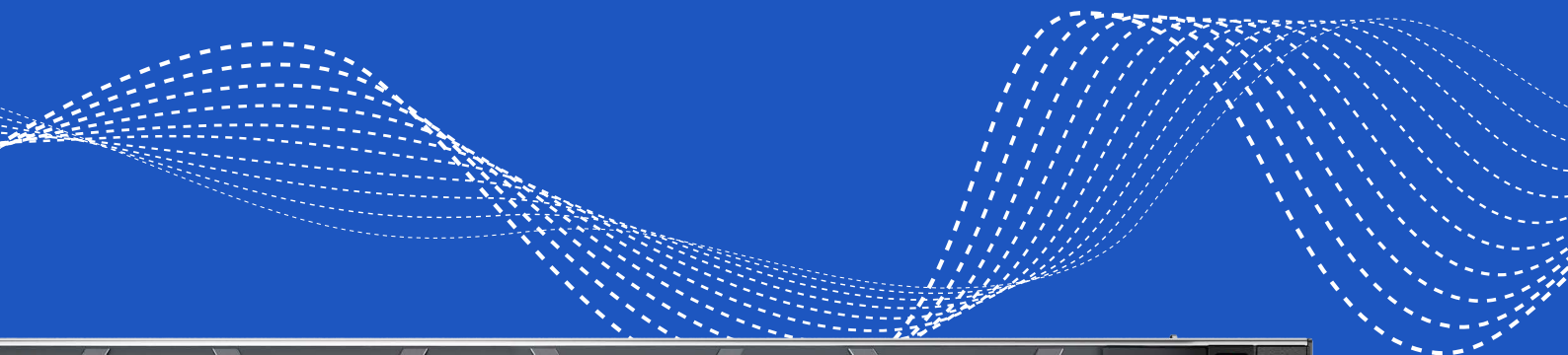
Modernise and downsize your infrastructure

Designing the data centre of the future begins today. By carefully designing your IT environment in line with your organisation's priorities, you can find a balance between reducing physical footprint, increasing efficiency and equipping your business with the capacity you need to grow.

However you approach IT transformation, what you do with your data will have implications for future growth. 37% of respondents to the 2023 Dell GenAI Pulse Survey indicated that their data and intellectual property are too valuable to be placed in a GenAI tool to which a third party might have access.[16] By bringing AI to your data you can maintain data sovereignty while embracing the benefits of GenAI.

Consolidate workloads and reduce your physical footprint

Overconsumption has become commonplace – Forrester has found that storage environments tend to be overprovisioned by an average of 37% – but modern solutions can remedy this.[17] Businesses have plenty of scope to increase data density, which frees up space and reduces the cost of maintaining excess physical hardware. Dell PowerScale and PowerStore storage and PowerProtect data-protection solutions can deliver significant reductions and allow for energy-efficient flash storage

+ **Learn More about PowerStore**

Storage environments
tend to be overprovisioned
by an average of

37%[17]

Reduce your impact through responsible procurement

It's important to remember that the greatest environmental impact occurs during the production phase. So finding a trusted partner to support your transformation helps you reduce your business's carbon footprint. Dell Technologies continues to be an industry leader in ENERGY STAR certification and the latest Intel® Xeon® platforms are made with 93% renewable electricity.[18] Intel collaborates throughout the ecosystem on improvements to circularity practices, green coding and sustainable product design.

One downside of modernising infrastructure is the cost burden of running two environments in parallel during the migration phase. Dell Payment Solutions offers a 'bridge' to support this process, meaning that you pay nothing for the first 6 months while also receiving free maintenance.

Learn More about Dell Payment Solutions

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Utilise as-a-Service models

Renewal, replacement and recycling are at the core of maintaining a sustainable IT environment. The as-a-service (aaS) business model is an increasingly popular solution for achieving successful transformation and advancing both sustainability and efficiency savings across the enterprise. 88% of businesses anticipate sustainability benefits from adopting an aaS model and 65% expect savings of more than 10% by doing so.[19] An aaS model supports the circular economy and can ensure your business continues to operate with the latest hardware that boasts the best energy efficiency and is produced to the highest sustainability standards.

Increase agility and simplicity with consumption-based investment

Demand is growing for flexible consumption models, and the greater agility and simpler deployment they offer are well suited to optimization for deploying AI workloads. Increasingly popular solutions like Dell APEX allow customers to utilise the multicloud, helping them cut costs and reduce waste while gaining more control over their applications and data. As a single service delivering compute and storage resources for a consistent cloud infrastructure, Dell APEX allows you to rightsize your IT environment by scaling up when necessary.

Through Dell Flexible Consumption solutions, we can help you provision accurately, ensuring your data centre is optimally sized and that overall expenditure is minimised. Dell APEX reduces IT management and maintenance time by 42% and can reduce over-provisioned capacity by 34%, helping you cut costs while minimising e-waste and reducing your business's carbon footprint.[20, 21]

+ **Learn more about Dell APEX**

Reduce waste and boost circularity with lifecycle management services

The end of a device's lifecycle is critically important for sustainability and must be handled responsibly. Dell Technologies has over 25 years' experience in global recovery solutions, carried out according to NIST SP 800-88 r1 data-sanitisation standards. Recycling is fundamental to lessening the environmental impact of devices. On average, 70% of materials we recover through Dell Recovery Services and other channels are reused in the industry, supporting the circular economy.[22]
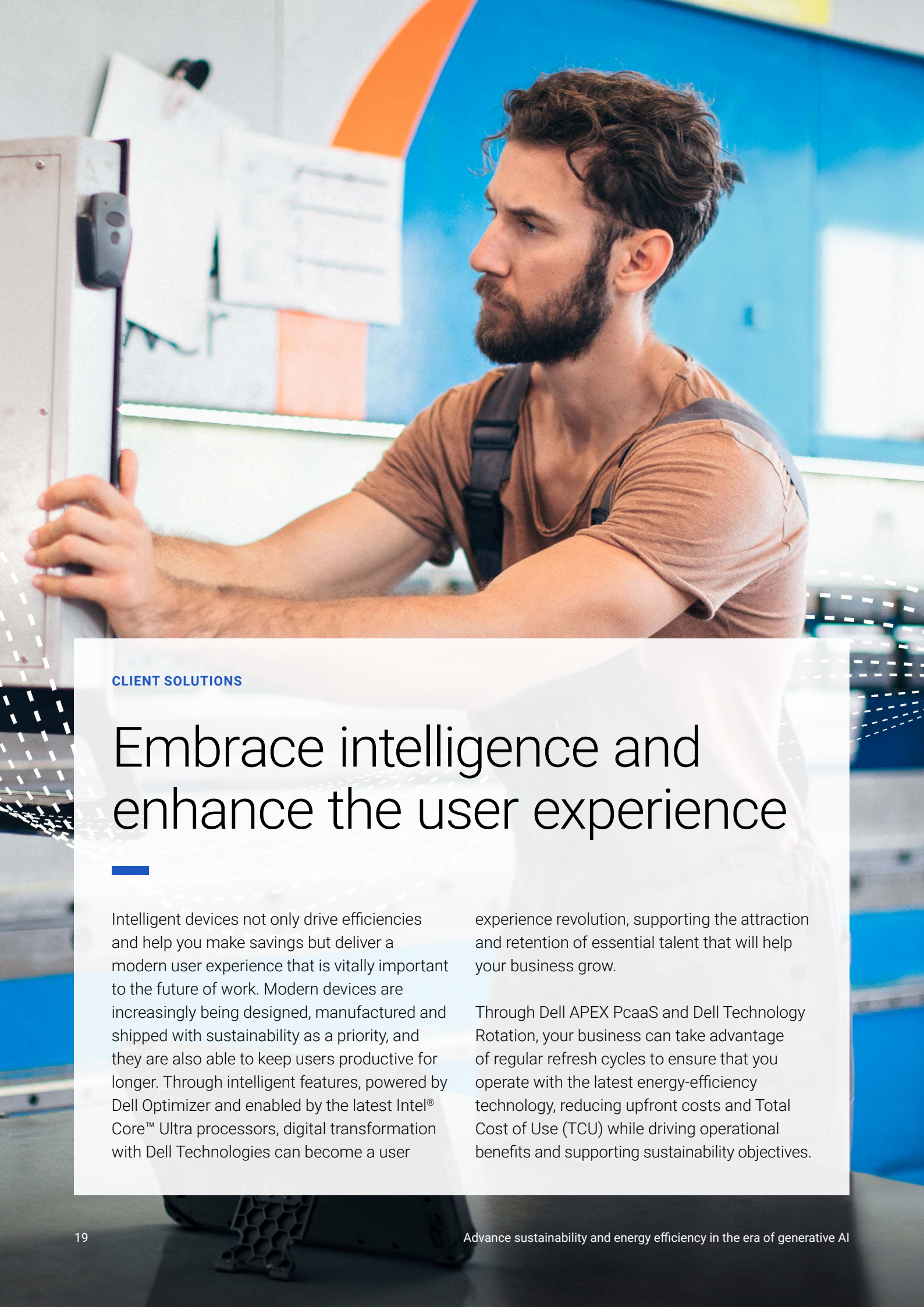
71%

of businesses say they need a partner to accelerate their programs and advance their sustainability goals[23]

Embrace intelligence and enhance the user experience

Intelligent devices not only drive efficiencies and help you make savings but deliver a modern user experience that is vitally important to the future of work. Modern devices are increasingly being designed, manufactured and shipped with sustainability as a priority, and they are also able to keep users productive for longer. Through intelligent features, powered by Dell Optimizer and enabled by the latest Intel® Core™ Ultra processors, digital transformation with Dell Technologies can become a user experience revolution, supporting the attraction and retention of essential talent that will help your business grow.

Through Dell APEX PcaaS and Dell Technology Rotation, your business can take advantage of regular refresh cycles to ensure that you operate with the latest energy-efficiency technology, reducing upfront costs and Total Cost of Use (TCU) while driving operational benefits and supporting sustainability objectives.

Adopt modern, AI-ready devices for personalised performance

Intelligent features not only boost productivity but help you save energy. By using AI, Dell Optimizer learns and responds to how users work, adjusting performance to meet peak worktimes and extending battery life through intelligent power-saving features. With Intel's NPU technology, every device powered by an Intel® Core™ Ultra processor can handle AI workloads with greater efficiency.

With Optimizer, which utilises Intel® Core™ processing power and its unique hybrid architecture, users can achieve 18% power saving when thermal management features are set to Quiet Mode.[24] Dell PCs, powered by the Intel vPro® platform, are among the most energy-efficient on the market. They are optimized for 9+ hours of use with full high-definition displays and 4+ hours of life on a 30-minute charge.[25]

18% power saving

when thermal management features are set to Quiet Mode.[24]

☐ **Learn More about Dell Optimizer**

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Keep the whole product lifecycle in view

GHG emissions are produced at every stage in the product lifecycle. Sustainable procurement involves identifying a technology partner who minimises the environmental impact from production to packaging to end of life – and beyond. At Dell Technologies, sustainability is at the core of everything we do and we strive to design our products and packaging using recycled, renewable and low-emission materials.

Our Precision 3000 workstations and Latitude 5000 series notebooks, for example, are made with recycled plastics, recycled carbon fibre, renewable materials, ocean-bound plastics and recycled copper, and we have also adopted 100% recycled and renewable materials for our new commercial notebook packaging.[26, 27]

➕ **Learn More about Sustainable Devices**

5th gen. Intel® Xeon® scalable processors deliver up to 10x higher performance per watt using built-in accelerators[28]

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1.3B kg

Since 2007, Dell has recovered more 1.3 billion kilograms of used electronics[31]

Build the smart workplace of tomorrow

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PCs consume much less energy than infrastructure equipment on an individual basis but are far more numerous in a typical organisation. Before they reach you, devices have to be packaged and shipped. Once delivered, they are idle most of the time in a given 7-day week until replaced during the next refresh. When designing a modern workspace, ensure that your hardware is not only manufactured to the highest sustainably standards but that it is used, procured and retired responsibly.

Prioritise access over ownership and manage the product lifecycle responsibly

The principle of access over ownership is vital to the circular economy. This is because it optimises asset effectiveness and keeps assets in circulation longer, enabling better cost management. In 2023, 95% of systems returned to Dell Financial Services gained a second life by being refurbished and reused.[29] The remaining were recycled in adherence with all applicable international, regional, national and local laws and conventions.

Dell Technologies offers a range of innovative services to help you manage the procurement process and the whole product lifecycle. Deployment Services and Dell multipack provide the support you need to increase efficiency while cutting cost and waste during the shipping phase, while Asset Recovery Services and Dell Lifecycle Hub are end-to-end solutions that deliver simplified lifecycle management.

+ **Learn More about Dell APEX PCaaS**

Equip your teams with modern devices

It is vital that office space is used efficiently and users are equipped with more sustainable modern devices designed for working anywhere. We have achieved a 60% reduction in energy intensity across our commercial monitor portfolio since 2014, and our latest accessories are designed to improve user experience and enhance collaboration wherever work happens.[30]

Applying energy settings appropriate to performance requirements, powering down at the end of the day and using rechargeable and USB-powered peripherals – ideally, connected through a docking station or USB-C hub display – can also help advance energy efficiency and sustainability. Dell is the first in the industry to achieve EPEAT Silver status and our latest intelligent devices increase efficiency through smart features and AI-based personalisation.

+ **Learn More about Dell Sustainability Services**

Find your path to future growth

Adopting AI without compromising energy efficiency and sustainability

How will you embrace the potential of AI while adapting your business to new regulatory requirements and continued energy-price volatility?

How you answer this question will determine your company's future. This guide has offered you strategic guidance to help you control costs and advance sustainability while adopting transformational AI capabilities. IT transformation is key to your future growth prospects. But only through a holistic approach, bringing together leaders from across the enterprise, can we make the most of the opportunities before us in the era of AI.

Dell offers a range of products, services and solutions that leverage Intel technology to help your business meet vital sustainability and energy-efficiency targets and efficiently carry out ESG reporting. By partnering with us, you can take advantage of the broadest portfolio of AI solutions as well as flexible payment and consumption models designed to help you transition into circular practices, reduce costs and increase operational efficiencies.

Your business is unique and needs a strategy tailored to fit its needs. I hope this guide conveys the importance of this process and helps you to start developing a unified vision for enterprise-wide change.

Reach out to a Dell representative today

Notes & citations

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2   **McKinsey**, The economic potential of generative AI: The next productivity frontier (June, 2023).

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6   **Dell Technologies**, Innovation Catalysts study (February, 2024). 6,600 respondents from organizations with 100+ employees in both public and private sectors from across North America, LATAM, EMEA, APJ and Greater China..

7   **European Commission**, '2023 Report on energy subsidies in the EU' (October, 2023).

8   **European Commission**, 'Corporate sustainability reporting' (Corporate sustainability reporting - European Commission (europa.eu)).

9   **Based on a Dell Technologies survey of CloudIQ users conducted** (May–June, 2021). Actual results may vary.

10 **Dell Technologies internal analysis** (August, 2020).

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12 **[E1]** at intel.com/processorclaims for 4th Gen Intel® Xeon® Scalable processors. Results may vary.

13 As measured by performance per watt on a range of AI, database, networking and HPC workloads compared to 4th Gen Intel® Xeon® processor. See A2, A19-A25, D1, D2, D5, H1, N16 at intel.com/processorclaims for 5th Gen Intel Xeon Scalable processors. Results may vary.

14 Based on performance per watt gains of 1.46x to 10.6x with built-in accelerators on a range of AI, database and networking workloads. See A19-A25, D1, D2, D5, N16 at intel.com/processorclaims for 5th Gen Intel Xeon Scalable processors. Results may vary.

15 **Based on internal analysis** (March, 2023). Applies to: PowerEdge C6620, PowerEdge R660, PowerEdge R6615, PowerEdge 6625, PowerEdge R760, PowerEdge 7615, PowerEdge 7625, PowerEdge XR4000r, PowerEdge XR4000.

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20 **IDC** (commissioned by Dell technologies and Intel), 'The Business Value of Storage Solutions from Dell Technologies' (February, 2021). Actual results may vary.

21 **IDC** (commissioned by Dell Technologies and Intel), 'The Business Value of Dell APEX as-a-Service Solutions' (August, 2021). Estimates based on survey of 17 organizations using Dell APEX as-a-Service solutions, aggregated and combined. Actual results may vary.

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24 **Dell Technologies internal analysis** (November, 2022).

25 **Dell Technologies**, 'Sustainable Devices for Impact'.

26 **Based on Dell analysis**: Precision 3000 MWS (October, 2023) and Latitude 5000 series (Nov., 2021). For a breakdown of the materials used in these products visit this webpage.

27 **Based on internal analysis of publicly available data** (April, 2023). For a breakdown of the materials used in our packaging visit this webpage.

28 Based on performance per watt gains of 1.46x to 10.6x with built-in accelerators on a range of AI, database and networking workloads. See A19-A25, D1, D2, D5, N16 at intel.com/processorclaims: 5th Gen Intel Xeon Scalable processors. Results may vary.

29 **Based on Dell Financial Services global data**, (February, 2023–January, 2024). Systems include desktops, notebooks, workstations, servers and storage equipment.

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intel.