Capgemini

The journey to
a sustainable
data center

Take the first steps toward energy efficiency,
cost savings, and compliance

Take control of data center sustainability

Across the globe, data centers are consuming more electricity than ever – with inevitable consequences. Costs are rising, carbon footprints are growing, and compliance with emerging environmental regulations is increasingly at risk.

For many large organizations, it can feel as if net-zero goals are moving out of reach. But those that can confidently reduce the environmental impact of their data centers will find ambitious targets easier to achieve.

Data center sustainability is the key to reducing costs and increasing efficiency. It's essential for meeting current regulatory mandates and being ready for the demands of future regulations. And it's a vital source of competitive advantage, attracting customers, investors, and talent through a commitment to sustainable IT operations.

This guide explores:

- Why improving IT infrastructure sustainability is a **critical business imperative**
- How a rigorous data center sustainability assessment provides **an essential first step**
- A comprehensive, strategic approach to assessment that **delivers measurable outcomes**

Data center power demand is rising fast

Data centers consume huge amounts of energy, and demand is growing as the rapid adoption of power-hungry AI continues.

The International Energy Agency (IEA) projects that data center *electricity demand will more than double* by 2030, reaching around 945 terawatt-hours. That's more than the electricity consumption of Japan today.

Other forecasts paint a similar picture. Goldman Sachs Research, for example, estimates electricity demand from global data centers will grow 160% by 2030, *accounting for 3-4% of the world's energy consumption*.

> Data center electricity demand will *more than double* by 2030

Typical data center cost distribution

- ☀ Power consumption: *30-40%*
- ❋ Cooling systems: *15-25%*
- 💻 Hardware: *20-30%*
- 🏢 Real estate and space: *10-15%*
- ⛑ Labor: *5-10%*
- 🎧 Redundancy and disaster recovery: *5-10%*

Aside from the potential environmental impact of this increasing consumption, there's also a risk that such rapid growth in demand may not be matched by utilities' capacity to supply sufficient power. Gartner predicts that, by 2027, power availability will constrain operations at *40% of existing AI data centers.*

These market dynamics are likely to increase the cost of power – a cost that already accounts for 30-40% of data center expenses. In this context, the savings from reducing consumption through energy-efficient technologies and IT infrastructure optimizations will become even more important.

Data centers face increasing sustainability regulation

As data centers' power consumption and costs increase, so does the regulatory pressure to reduce their environmental impact. There are a growing number of regulations worldwide on carbon emissions reduction and reporting:

In the **European Union,** the Energy Efficiency Directive (EED) requires data center operators to *report energy performance data*, and to have plans in place to utilize waste heat, integrate renewable energy, and optimize energy consumption. **Germany** has taken the EED requirements a step further, mandating that data centers use *100% renewable energy by 2027* and that new data centers must achieve a Power Usage Effectiveness (PUE) of 1.2.

The UK has also introduced initiatives such as the *Streamlined Energy and Carbon Reporting (SECR) framework* and the *Emissions Trading Scheme (ETS)*

that require data center operators to monitor, report, and reduce their energy use and carbon emissions.

In the Middle East, **Saudi Arabia's** Data Centers Regulation expects new-build data centers to have *energy management and sustainability plans*. And in Asia, **Japan** has recently issued its *first sustainability disclosure standards*, while **Singapore's** *Green Data Centre Roadmap* aims to accelerate data center energy efficiency and increase capacity by using renewables.

Australia is also leading the way, with data centers serving the government required to achieve five stars on its *NABERS rating system*, which includes a maximum PUE of 1.34.

Looking beyond compliance and costs

Aside from emissions reduction, cost savings, and regulatory compliance, improving data center sustainability can deliver other benefits:

- **Resilience and responsiveness:** Optimizing IT infrastructure for energy efficiency also improves performance and reliability.

- **Collaboration and innovation:** Sustainability initiatives require continuous engagement from

employees, partners, and other stakeholders, fostering a culture of collaboration, accountability, and innovation.

- **Competitive advantage:** Leading on sustainability can provide a vital competitive edge, enhancing an organization's brand reputation with customers, investors, and employees.

Growing technology landscapes make sustainability hard to monitor

Tracking and controlling sustainability throughout increasingly distributed technology landscapes isn't easy. Many organizations lack unified visibility across legacy systems, private clouds, and edge computing. Growing AI infrastructure adds to the sustainability challenge, with GPU-as-a-Service models driving extreme – and often untracked – energy consumption.

Before you can become a data center sustainability leader, you need to understand where you are today. That demands a rigorous assessment that pinpoints the areas to address that will have the biggest impact on your data center's carbon footprint.

Assessing and improving data center sustainability

A thorough sustainability assessment is a vital first step in optimizing your IT environment to reduce its climate impact.

An effective data center sustainability assessment shouldn't just report current performance. It should also offer insights to guide your sustainability strategy and deliver targeted sustainability optimizations. To do that, it must cover four key areas:

1 Discovery

Evaluate the entire data center to identify high-consumption devices and 'zombie' equipment that's using power unnecessarily. The initial assessment should also determine current energy sources to highlight opportunities to use more renewables.

Discovery should provide contextual intelligence on energy use, including workload criticality, business value, and carbon intensity. This enables leaders to prioritize sustainability optimization efforts based on their strategic impact, not just consumption levels.

2 Strategy

Identify all the contributors to your carbon footprint to take a comprehensive approach to sustainability and operational efficiency. With clear visibility of PUE values, power consumption, and electricity sources, you can target the areas that will reduce emissions quickly.

Your sustainability strategy should also be based on what-if scenario modelling. By analyzing the potential impact of initiatives such as renewables integration, workload migration, and cooling retrofits, you can align them with your business continuity and growth plans.

3 Insights

A sustainability assessment should generate complete, accurate reports for regulatory compliance. But it shouldn't just be a box-ticking exercise. The most valuable assessments also offer actionable insights to inform sustainability optimization efforts.

Importantly, these insights should go beyond reporting to include predictive analytics, such as forecasting PUE drift. They should also offer prescriptive guidance, such as recommending optimal workload placements based on carbon intensity.

4 Outcomes

An effective sustainability assessment will establish baselines and benchmark your current performance against industry peers. The assessment outputs should include recommendations for the right energy-efficiency solutions to implement, and projections of the potential carbon and cost reductions you're likely to achieve.

The assessment should also provide continuous monitoring to evaluate sustainability performance, facilitate feedback loops for continuous improvement, and demonstrate the gains you make.

The business impact of sustainability assessments

This comprehensive approach to assessing data center sustainability enables you to:

- **Increase energy efficiency** with targeted optimization recommendations
- **Reduce environmental impact** to boost your brand's reputation
- **Lower costs** by reducing power consumption and increasing efficiency
- **Monitor third-party providers** to ensure energy consumption charges are accurate and get visibility of Scope 3 emissions
- **Streamline regulatory compliance** with accurate reporting and continuous monitoring that drives improvement
- **Take a strategic approach** to reducing emissions and driving operational efficiency

Data center sustainability at Capgemini

Capgemini's *Merlin data center* uses renewables, fresh air cooling, and flywheel energy storage to set the standard for IT infrastructure sustainability.

- **75%** less water consumption than a typical data center

- Market-leading energy efficiency with a **1.08 PUE**

- Estimated carbon savings of **53,000 metric tons** of CO_2e per module over 20 years

The Capgemini approach to data center sustainability assessments

At Capgemini, we've distilled our deep experience and expertise into a complete Data Center Sustainability Assessment offering to guide your journey to reduced environmental impact, cost savings, and simplified compliance.

Our strategic, end-to-end service helps you:

- Identify the sources of high-level emissions and power consumption
- Select the right energy efficiency and infrastructure optimization solutions
- Establish baseline metrics and project potential reduction
- Continuously monitor and analyze sustainability performance on intuitive dashboards
- Demonstrate and report on the efficiency and sustainability gains you realize

Real-time insights on electricity consumption, CO2 emissions, and heat distribution enable you to optimize data center efficiency and sustainability. This proactive, real-time monitoring approach transforms sustainability from a compliance exercise into a driver of strategic value. By continuously tracking power usage, thermal profiles, and carbon intensity, you can dynamically adjust workloads, cooling systems, and energy sourcing to achieve optimal results.

In addition, our close partnerships across the sustainability ecosystem help us deliver the right capabilities to maximize the effectiveness of your efforts at every stage.

Helping Siemens Corporate IT strengthen its sustainability leadership

Siemens aims to achieve a net-zero carbon footprint by 2030 and strengthen its market-leading position in ESG while meeting regulatory demands for increasing energy efficiency in data centers.

Our comprehensive Data Center Sustainability Assessment allowed Siemens Corporate IT to:

Identify data center energy and CO2 optimization measures

Improve data visibility to make informed decisions on emissions reduction and sustainability enhancements

Make ongoing improvements in sustainability practices – with less manual workload

Strengthen compliance with emerging national and European regulations

Read the full story

> " The sustainability expertise and commitment of Capgemini are remarkable. With excellent results, we create added value for all stakeholders and can meet regulatory requirements. With this project, we supported Siemens Corporate IT in consolidating its role as a frontrunner in data center sustainability."

Matthias Reinecke

Project Manager Sustainable Data Centers, Siemens IoT and Platform Services

Begin your data center sustainability journey

With data center power demands, operating costs, and climate regulations all set to increase, now is the time to create a strategic plan for enhancing sustainability across your IT infrastructure.

By taking the lead on data center sustainability, you can:

- Shrink data center costs and improve operational efficiency
- Hold third-party providers to account to limit your Scope 3 emissions
- Get ahead of emerging environmental regulations and reporting mandates
- Reduce your carbon footprint to help meet ambitious net-zero goals

It all starts with an honest and impartial evaluation of where you are today, and expert guidance on how to reach your destination. We're here to support you at every step.

To learn more about how we can help you accelerate your data center sustainability journey, *get in touch with our experts* for a strategic conversation about your opportunities.

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About Capgemini

Capgemini is an AI-powered global business and technology transformation partner, delivering tangible business value. We imagine the future of organisations and make it real with AI, technology and people. With our strong heritage of nearly 60 years, we are a responsible and diverse group of 420,000 team members in more than 50 countries. We deliver end-to-end services and solutions with our deep industry expertise and strong partner ecosystem, leveraging our capabilities across strategy, technology, design, engineering and business operations. The Group reported 2024 global revenues of €22.1 billion.

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