

Roadmap to a more sustainable data center future

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Sustainability trends & challenges

The data center industry is facing significant challenges that require a transformative change

Balancing demand growth ...



Energy consumption

Constant operation of servers, cooling systems, and other infrastructure in data centers to meet demand results in energy consumption akin to the aviation industry.



Heat management

Servers' heat waste must be reduced through future thermal management strategies to prevent overheating and maintain peak performance.



Lifecycle management

Operators prioritize the lifecycle of hardware components. Implementing an effective strategy is crucial to minimize e-waste.

... with **sustainability.**



Monitoring & reporting

Accurate measurement of energy consumption and carbon emissions will grow in importance as regulations tighten to achieve net-zero goals.

Sustainability trends & challenges

To adapt to new sustainability goals



Cloud Providers

Hyperscale's carbon emissions will drive cloud purchase decisions by 2025¹

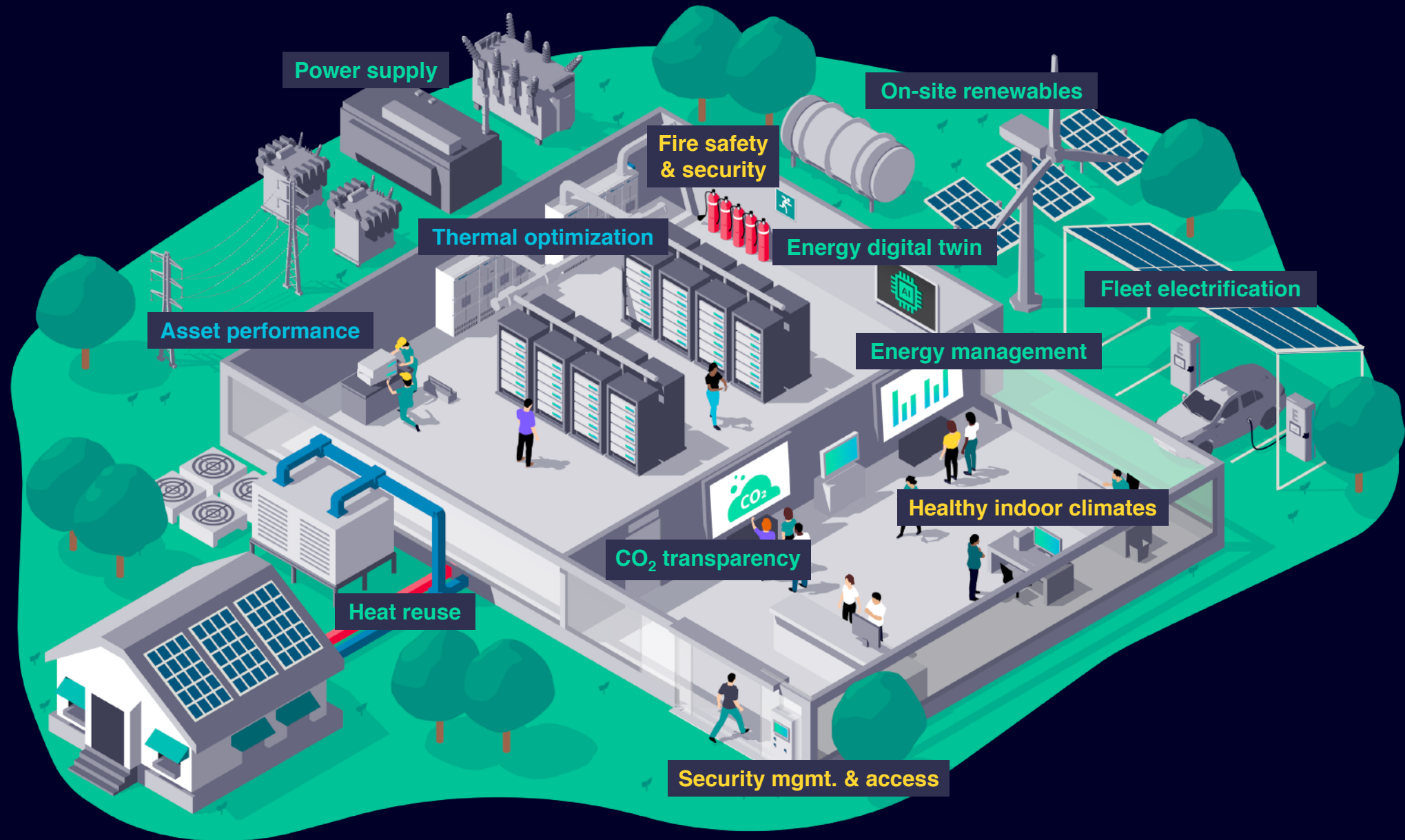
Colocation Providers

Almost 90% of the respondents said that overall efficiency and sustainability are key to select a colocation provider²

Enterprise/Gov




34% of the organizations planning to open new data-centers in the next two years, consider the improvement of the organization's carbon footprint the top driver²

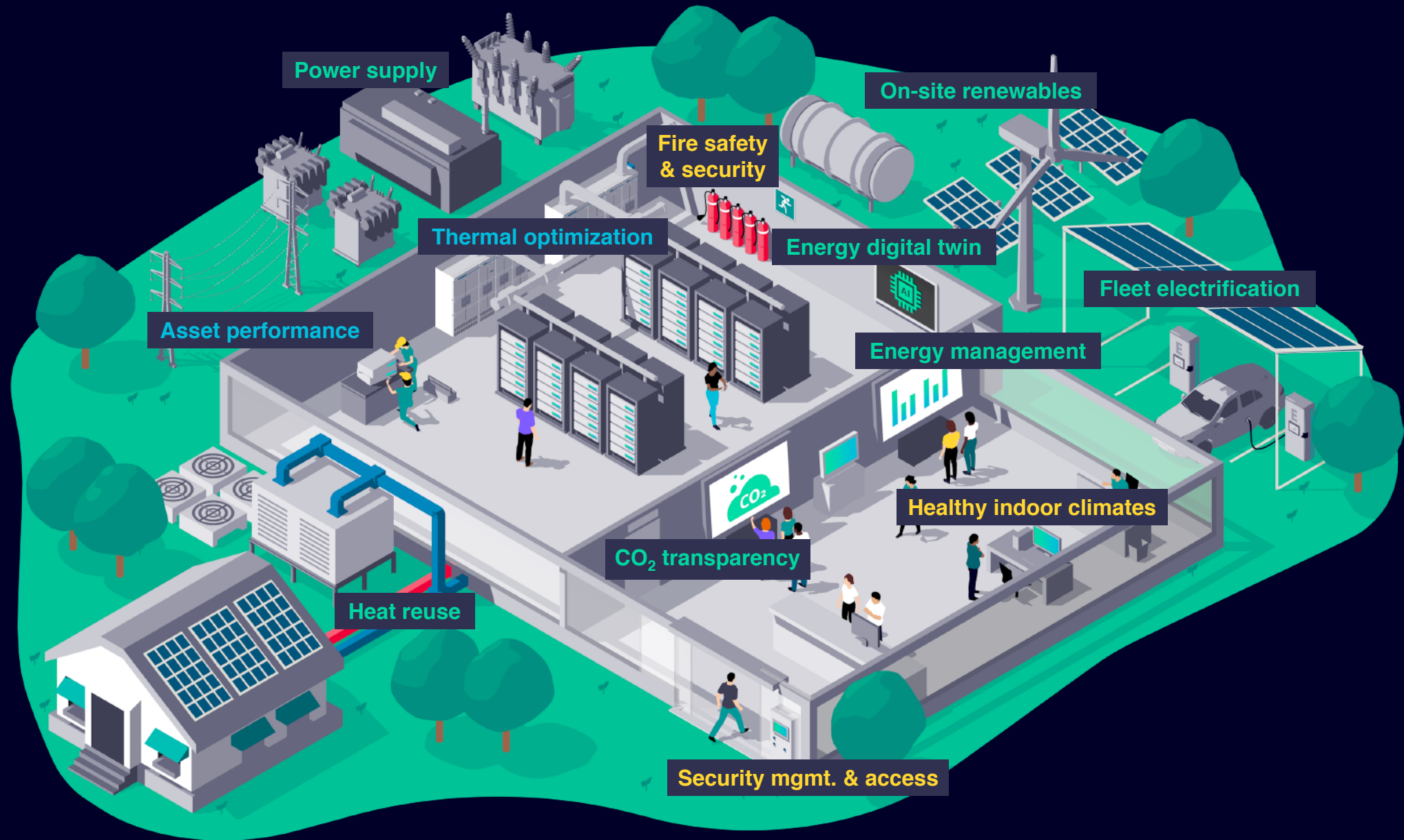
¹ Gartner's press release, 2022 | ² 451 Research's Voice of the Enterprise: Datacenters 2021



■ Decarbonization & energy efficiency
 ■ Resource efficiency & circularity
 ■ People centricity & societal impact

Key imperatives for sustainability in Data Centers
Building a sustainable future for the Data Center industry

	Design & Build	Operations	Supply Chain
 <p>Decarbonization & energy efficiency</p>	Optimize infrastructure and integrate renewable energy	Decrease CO ₂ footprint & implement energy-efficiency improvements	Track & manage carbon footprints
 <p>Resource efficiency & circularity</p>	Increase capacity utilization, extend asset life-time & manage end-of-life	Reduce & reuse water, waste & resources	Collaborate with suppliers to minimize waste and increase recycling
 <p>People centricity & societal impact</p>	Ensure resilient infrastructure for societal impact	Ensure safety & security for employees	Create an ecosystem of vendors supporting your sustainability goals



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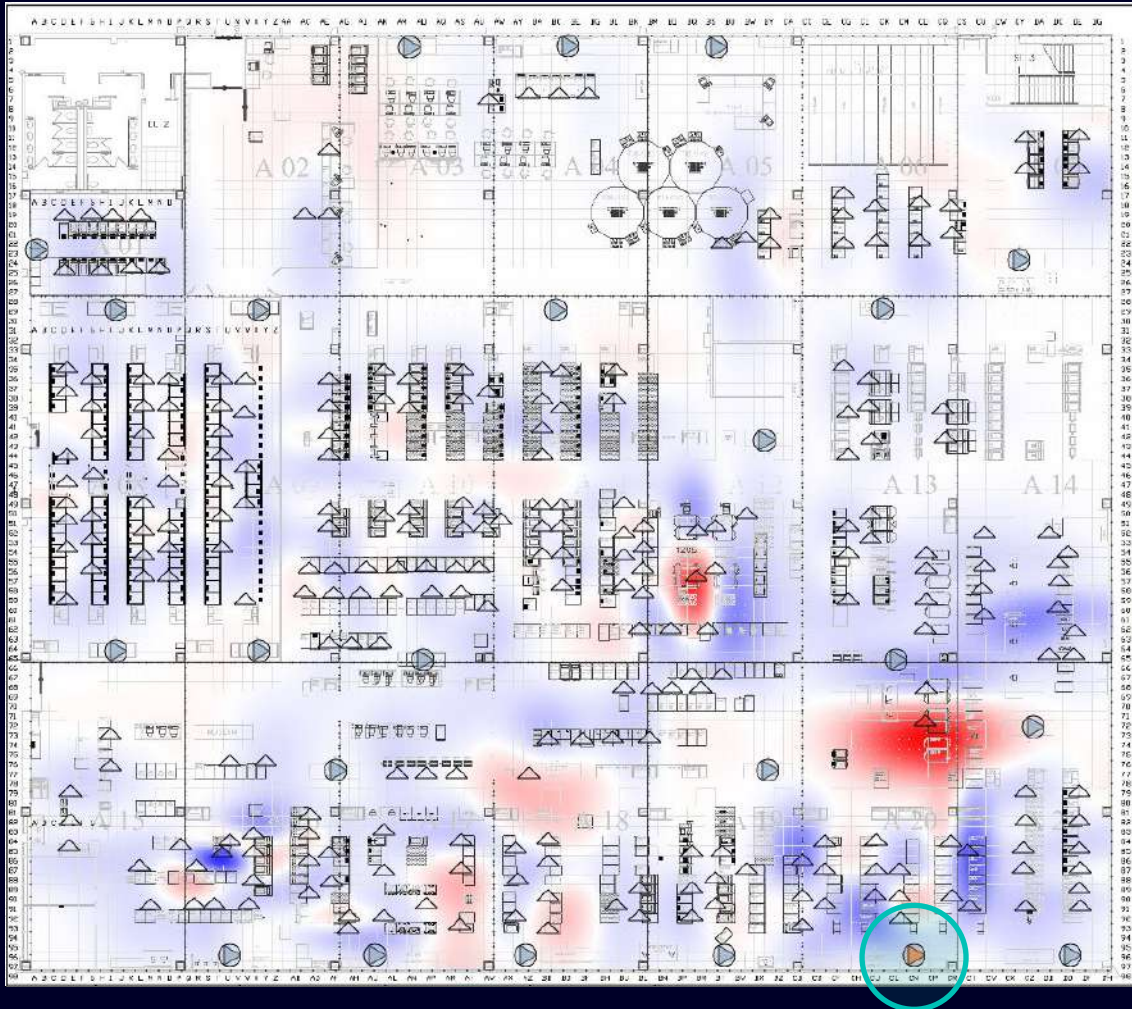
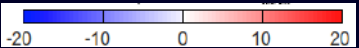
AI Driven Thermal Optimization

Dynamically addresses the complexity of mission critical cooling

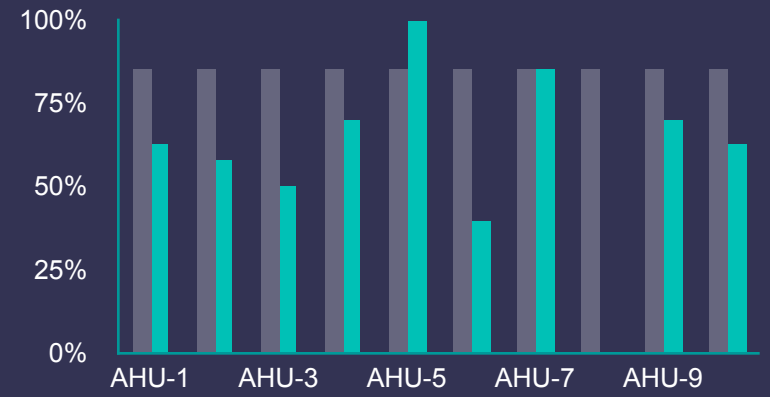
CRAH cooling unit

Cooling influence

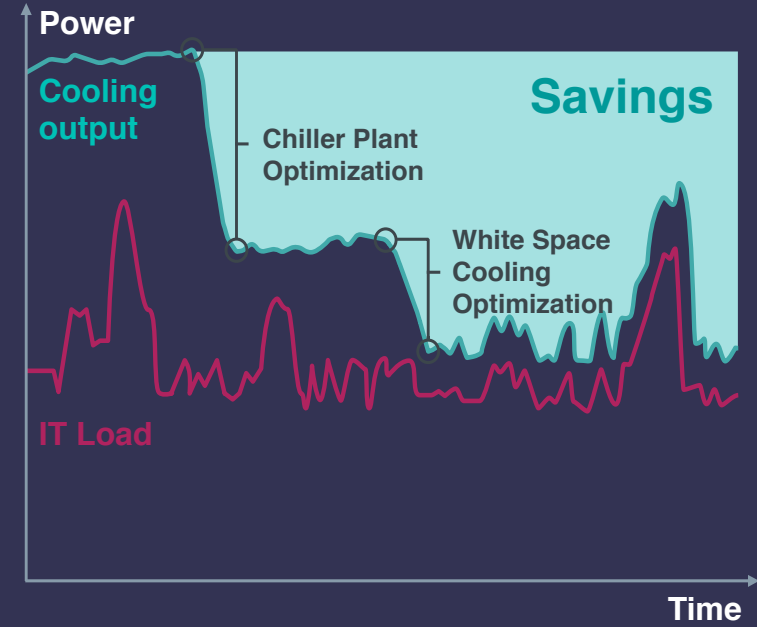
Heating influence



Fan Speed



Manual or Basic Control
Dynamic Control



Greenergy data center in Estonia: the Baltics' greenest and largest facility

In 2021, Greenergy operators embarked on an ambitious project with Siemens, aiming to establish a data center unparalleled in reliability, security, and sustainability, featuring world-class connectivity and scalability.

Opting for a unified vendor solution, Siemens delivered a comprehensive technological strategy, equipped with advanced hardware and software, positioning itself as the primary contractor for the Baltics' most expansive, secure, and sustainable data center.

Renewable energy

- Operates on 100% renewable power, procured through PPAs
- Also investing in a 3 MW Solar PV plant

Energy efficiency

- 30% improvement in overall performance
- Target Power Usage Effectiveness (PUE) is 1.2
- EN 50600 certified

Heat efficiency

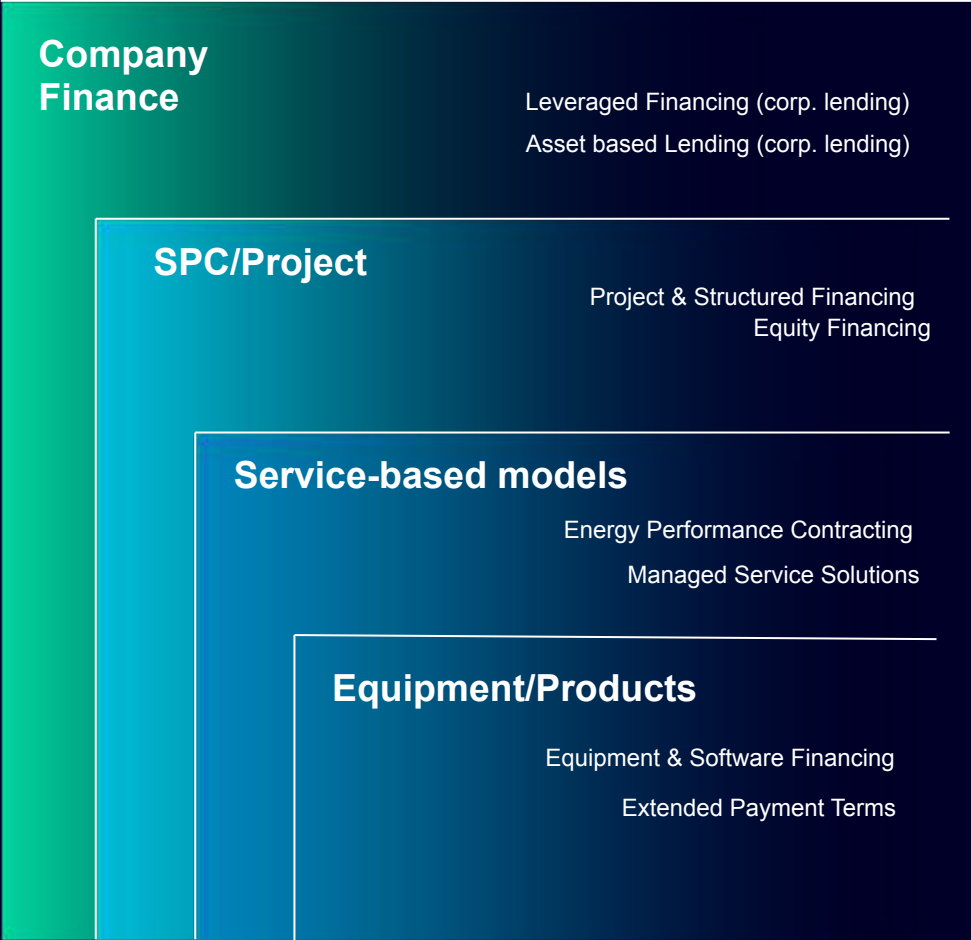
Waste heat from the data center is used to heat the Greenergy offices and nearby buildings in future.



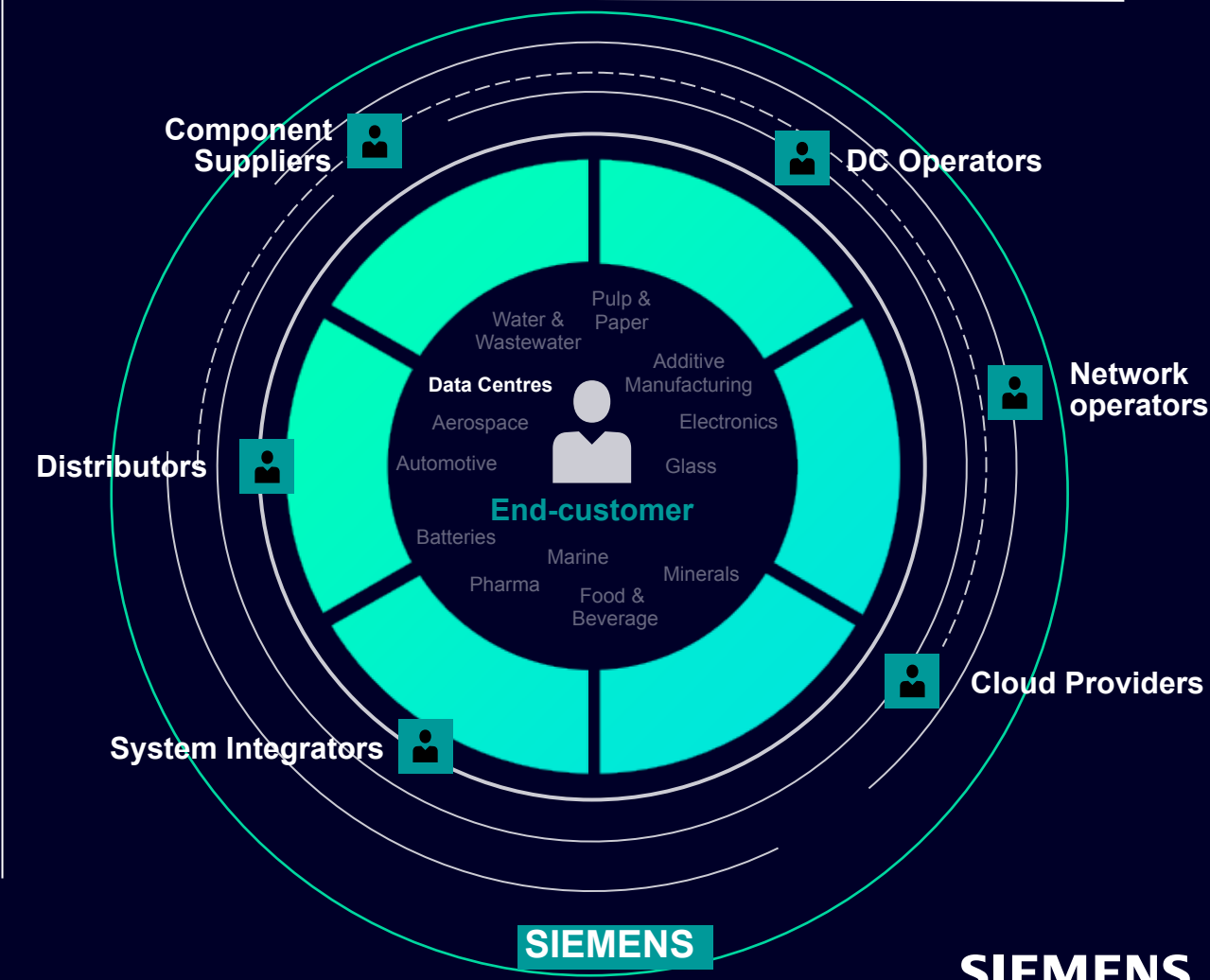
Siemens as a key supplier of the Datacenter ecosystem

Technology & Finance out of one hand

How we can finance



... the datacenter ecosystem



Download our whitepaper for a Roadmap to Sustainability 'Leading with sustainability: Transform data centers with smart infrastructure'



03 Incorporate Siemens capabilities for the data center lifecycle

Despite strong drivers, the planning and execution is highly challenging given the requirements around resources, internal buy-in and finding a holistic solution provider which can provide strategic as well as technical expertise.

Implementing Siemens end-to-end sustainability solutions across the data center value chain, as explained in our framework approach, allows you to tailor our solutions bespoke to your needs across – design and build, operations, and supply chain management.

04 Turn sustainability goals into strategic advantage

As the C-Suite executive, it is crucial to lead with a commitment to sustainable practices. This involves transparency in communication to building trust and credibility with your stakeholders. This means openly sharing information about your sustainability goals, progress, and challenges while also empowering your workforce to contribute to sustainable initiatives.

Our solutions provide you to champion these practices which not only contribute to environmental preservation but also enhance the reputation of your organization.

01 Maximize your impact with a long-term, holistic strategy

Move beyond one-off initiatives and adopt a comprehensive, data-driven sustainability strategy based on your Net-Zero ambitions and business goals. Align your sustainability strategy with three key pillars of our framework:

1. **Decarbonization and energy efficiency**
2. **Resource efficiency**
3. **People centricity and societal impact**

This ensures a comprehensive approach across your portfolio that avoids piecemeal solutions.

02 Execute your sustainability strategy with a systematic approach

This must take a phased approach, comprising of the following key steps:

Assessment and development phase

a. Value discovery audit: Conduct a thorough evaluation of your infrastructure and production systems, focusing on their carbon footprint reduction, enhancement of energy utilization efficiency, optimization of resource usage, implementation of circular economy principles, and overall performance. Examine your company's operational methodologies and compliance with pertinent legal and regulatory mandates. Develop a preliminary blueprint for the execution of these strategies.

The expected result of this process is an in-depth understanding of the potential for energy conservation and cost reduction opportunities.

b. Investment grade audit: Perform an in-depth cost-benefit analysis, with an optional assurance of savings. Formulate a comprehensive plan for seamless, ready-to-implement solutions. Establish a foundational baseline and methodologies for Monitoring and Verification (M&V).

The primary outcome will be a well-defined implementation strategy and innovative business models.

Execution and service phase

a. Implementation: Execute complete implementation and commissioning of measures. Provide various service options, including guaranteed performance and savings, as well as financing solutions. Offer project management and support.

Results → enhanced performance, cost reductions, and minimized risk.

b. Guarantee phase: Continuously monitor and optimize to secure savings and amplify benefits. Deliver necessary measurement and verification services. Present additional options for digital services.

Results → guaranteed performance and maximized cost savings.



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