

Sustainable data center checklist

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Here are a few things to think about as you design and build your data center operations to accommodate ever-rising demand for computing performance more sustainably.



Consider hardware designed...

- ...to be **energy efficient** and certified under programs like Energy Star 4.0, Top Runner, EPEAT (Electronic Product Environmental Assessment Tool), TCO Certified, among others. These certifications can help ensure solutions are optimized to deliver energy savings and meet relevant standards and government regulations.
- ...with **recycled materials**, typically carrying a lower embodied carbon footprint and inherent waste reduction. Examples include external enclosures made with post-consumer plastic, hard drives made from reprocessed metals and rare earth elements, and packaging using recycled fibers.
- ...as a **modular system**, with easy to assemble/disassemble, interchangeable components. Modular designs offer easier component recycling and reuse, reduced e-waste, and carbon footprint advantages.



Double-down on best practices for server maintenance and management

Better understand and optimize system utilization, power, thermals, and more with applications like Intel® Platform Monitoring Technology (PMT). More comprehensive telemetry gives you deeper insights across your environment enabling improved energy efficiency, better diagnostics and failure prediction, and improved security and compliance monitoring. Ensure proper disposal of retired equipment to maximize reuse and return materials to a useful cycle.



Optimize cooling systems to improve airflow and reduce energy consumption

Assess opportunities to introduce more efficient liquid cooling systems—both cold plate and/or immersion—rather than relying only on air-cooling methods alone. Liquid cooling can reduce overall costs, increase energy efficiency, decrease water use, and extend the service life of your hardware.



Use power management tools to improve efficiency and reduce waste

Design systems to optimize power delivery using techniques like implementing trans-inductor voltage regulators and auto-phase shedding. Take advantage of platform power and efficiency management functions like Intel® PMT and Intel® Node Manager and maximize energy efficiency with system-on-a-chip (SoC) firmware performance tuning like Optimized power mode.



Implement virtualization and workload optimization to increase server utilization

Expand your usable performance capacity without increasing your footprint—physical or environmental—as you consolidate workloads to maximize your hardware resources. And get real-time, continuous resource management optimization with Intel® Granulate™. By learning your data flow and resource usage patterns, Granulate can create an application-aware and prioritized schedules for resources to improve performance, efficiency, and help reduce costs and carbon impact without editing code.