

Improve energy efficiency with HPC from AWS and NVIDIA

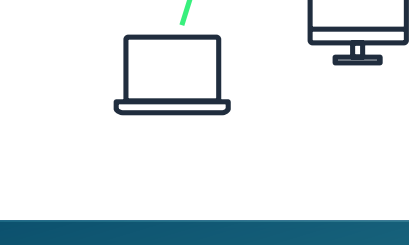
Energy prices and consumption are growing, while data centers are experiencing power limitations. At the same time the increasing dataset sizes and pressure to deliver results are driving the need for more higher-performance HPC clusters.

Growing importance of energy supply

By 2026, half of G20 members will experience monthly electricity rationing, turning energy-aware operations into either a competitive advantage or a major failure risk.¹



Sourcing enough power is of top priority among data center operators globally.²



47% forecasted increase in global energy demand by 2050.³

Growing focus on energy efficiency

The United Nations states that at least

\$4 trillion

a year needs to be invested in renewable energy until 2030 – including investments in technology and infrastructure – to reach net-zero emissions by 2050.⁴



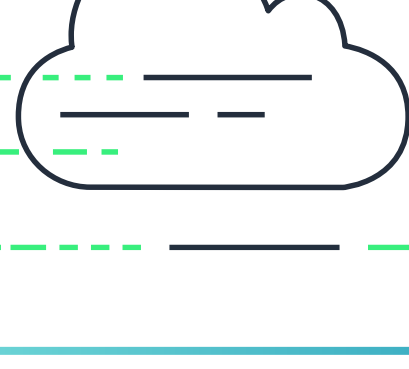
65% of organizations have goals to reduce carbon emissions.⁵

>2.3x expected increase in electricity generated from renewables by 2050.⁶

Growing need for cloud-based HPC

With AI and other data-intensive workloads being run at a higher rate in the cloud due to wider availability of GPUs, the HPC cloud market is predicted to grow twice as fast as that of on-premises.⁷

73% of HPC managers believe that HPC workloads will be mostly or entirely in the cloud by 2026.⁸



\$17.09bn is the size the cloud HPC market is expected to reach by 2029.⁹

Energy-efficient innovation from AWS and NVIDIA

Scale for faster insight

Run GPU-accelerated HPC workloads in the cloud to enable parallel processing and increase the number of computations done in the same amount of time with typically the same amount of energy.



Up to 80%

reduced carbon emissions and improved energy efficiency by moving business workloads to AWS.¹⁰

Minimize energy consumption

Reduce energy consumption by using energy-efficient infrastructure and tools. AWS helps align data center facility and IT teams, engineering expertise, and custom hardware with a cloud business model that helps drive compute utilization.



3.6 times more

energy efficient infrastructure from AWS, compared to the median of surveyed US enterprise data centers.¹¹

Save resources

Scale infrastructure dynamically to meet fluctuating demands and pause when no longer needed. Utilize GPU-accelerated infrastructure to do more jobs, faster.



40% cost savings

Achieved by an AWS customer when migrating from on-premises HPC to the cloud.¹²

Utilize compute powered by renewable energy

Advance your energy-efficiency journey with AWS—on path to powering its operations with 100 percent renewable energy by 2025.¹³



90%

of the electricity consumed by AWS in 2022 was attributable to renewable energy sources.¹⁴

Addressing HPC challenges across industries

Organizations can select GPU-accelerated infrastructure, from AWS and NVIDIA, based on specific memory, storage, throughput, and networking requirements to run HPC workloads according to demands and budgets while keeping an eye on meeting energy efficiency goals.



Healthcare and Life Sciences

GPU-accelerated Amazon EC2 instances, HPC services, and AI tools from AWS and NVIDIA can help speed up image analysis and genome sequencing and reduce data processing and drug development time and costs. Running HPC and AI-accelerated workloads on AWS enables scientists to perform more computation for typically the same energy unit and in the same amount of time.



Financial Services

Financial institutions can process data faster and feed it into sophisticated financial models. With GPU-accelerated EC2 instances and AI tools, financial firms can speed up financial algorithms and simulations to improve fraud detection, increase trading accuracy, and maximize client returns.



Energy

GPU-powered infrastructure and HPC tools can support energy efficiency goals by accelerating the computing time of data-heavy geophysical and engineering applications and achieve more accurate reservoir simulation and seismic processing for optimal exploration and production.



Industrial Manufacturing

Engineers can use purpose-built HPC services and accelerated EC2 instances, powered by NVIDIA GPUs, and AI tools on scalable infrastructure to identify product design irregularities with greater speed and accuracy. Energy-efficient and GPU-accelerated infrastructure help engineers run complex simulations for materials science, fluid dynamics, structural design, and robotics systems faster while reducing compute demands.



Automotive

Automotive organizations can continue to build models to solve problems in data curation, mapping, perception, prediction, and planning, as well as move to larger models to support new use cases. High-performance GPUs, fast storage, high-speed networking, and efficient batch processing reduce the time and energy consumed for complex computations.



Public Sector

Government institutions can build secure infrastructure to run HPC workloads, as well as optimize power consumption for AI workloads, with high throughput and low latency to fit within mandates to meet carbon emission rules.

Get started today

[Learn more about running HPC workloads on AWS](#)



1. "Energy Transition", Amazon Web Services, 2024.
 2. "Gartner's Top Strategic Predictions for 2024 and Beyond", Gartner, 2023.
 3. "CBRE Confirms Power Constraints Inhibit Record Data Center Demand", Data Center Frontier, 2023.
 4. "Energy Transition", Amazon Web Services, 2024.
 5. "Five ways to jump-start the renewable energy transition now", United Nations, 2024.
 6. "Saving Energy in Europe by Using Amazon Web Services", S&P Global Market Intelligence, 2021.
 7. "Worldwide HPC in the Cloud Forecast, 2020-2026", Hypetion Research, 2022.
 8. "2021 State of Cloud HPC Report", HPCwire, 2021.
 9. "HPC Cloud Market Size & Share Analysis - Growth Trends & Forecasts", Mordor Intelligence, 2023.
 10. "Saving Energy in Europe by Using Amazon Web Services", S&P Global Market Intelligence, 2021.
 11. "Energy Transition", Amazon Web Services, 2024.
 12. "Baker Hughes Reduces Time to Results, Carbon Footprint, and Cost Using AWS HPC", Amazon Web Services, 2022.
 13. "Building a Better Future Together: 2022 Amazon Sustainability Report", Amazon Web Services, 2022.
 14. "Building a Better Future Together: 2022 Amazon Sustainability Report", Amazon Web Services, 2022.