Cloud Catalyst

Decarbonizing Data

Why cloud is an essential part of your sustainability strategy

Atos | aws

Balancing value and sustainability with cloud optimization

Reducing carbon emissions has become a critical boardroom issue for companies globally. 70% of companies worldwide have now committed themselves to a net-zero future, according to the 2022 Corporate Climate Reporting Performance Report[1]. But the role of data in generating emissions is often underestimated and subsequently not addressed.

Like Moore's Law, the world's data more than doubles every couple of years. Every second, more and more of it is created and accumulated, in amounts that defy comprehension. And every new giga-, peta- or zettabyte adds an energy cost. Today, data storage and processing generate at least 1% of all the world's greenhouse gas (GHG) emissions[2].

It's not only about data diversity, quantity, velocity, and granularity. Business performance depends on doing ever more innovative things with data: managing it, analyzing it, reporting it, and creating new services with it. And data innovation, too, costs energy: until recently, training a large AI model produced more CO2 emissions than five average motorcars would in their entire lifetime – including their manufacture[3].

We believe that moving your data storage to the cloud will not only make your organization more efficient, it can also reduce related emissions by 80% or more, as this insight guide will show.

1. The 2022 Corporate Climate Reporting Performance Report
2. Data Centres and Data Transmission Networks
3. Training a single AI model can emit as much carbon as five cars in their lifetimes

Cloud: a powerful generator of business value

From its original promise of cost-effective data storage, compute and the speed and flexibility of deployment, cloud has become an important competitive tool in **three key areas**:

1. Automation: cutting admin time, enabling developer productivity, remote working, and collaboration through intelligent platforms and SaaS services reduces staff costs.

2. Agility: pay-as-you-go agility enables organizations to ensure they only pay what they use and otherwise capture every dollar of customer demand.

3. Innovation: cloud-based innovation and constant upskilling, enables data workers to unlock more value from de-siloed data, with cutting-edge – often free-to-use – tools.

The huge range of cloud-based services and supplies, including AI-based services, have made cloud and hybrid as safe or often safer than dedicated on-premises solutions.

And now to these considerations and benefits we need to add sustainability. Read on to find out how.

Atos and AWS: tough on carbon emissions

When you partner with Atos, our consultants and engineers work with your stakeholders to optimize compute resources needed for each workload, to facilitate modernization and reduce emissions.

Measures Atos and AWS use to optimize cloud performance and carbon emissions include:

- **Workload optimization:** consultants and engineers work with your stakeholders to optimize workloads for the cloud.
- **Processor optimization:** the latest AWS processor delivers up to three times the machine learning performance, 25% better compute efficiency, and 60% improved energy efficiency.
- **Intelligent cooling:** in AWS data centers, next-generation intelligent cooling helps reduce energy consumption by 20%, helping cut carbon emissions and costs.

The latest AWS data centers are 3.6x more energy efficient than the average on-prem data center.

The Atos sustainability pillars

Atos implements three sustainability pillars across all its operations:

- **Sustainable IT:** embedding sustainability across services as standard such as service level carbon footprints, emission reduction roadmaps, and ongoing reporting.
- **IT Sustainability Advisory:** our expert consultants are on hand to help you devise and continually optimize sustainability strategies to fit your business needs.
- **IT for Sustainable Business:** leveraging digital twins, satellite imagery, and other advanced solutions to make your operations more sustainable.

> “Not only is an AWS data center 3.6x more efficient than on-premises on average, but additional carbon savings can also be achieved through the Atos managed service implementing a range of decarbonization levers. Perhaps most importantly though, Atos can support clients to leverage the new environment that will underpin the delivery of new sustainable operations, products, and services – for customers of every conceivable type.”

Ray Knight, Net Zero Lead for CloudCatalyst – Atos

Sustainability through intelligent workload management

Another key part of any strategy for achieving the best possible balance of cloud sustainability and performance is intelligent workload management. With the right approach and technology, providers can continuously monitor workload performance and optimize for sustainability.

There are six core components to any cloud workload management strategy:

1. **AWS region selection:** enable lower cost and less compute capacity by transiting data to geographies with a greener energy mix and better energy efficiency.
2. **Behavior analysis:** Atos continually analyzes how users consume workloads and services, looking for ways to sustainably optimize either cloud services.
3. **Optimized architecture:** by removing zombie VMs, optimizing for resource utilization, energy-efficient workload locations, and other factors, we minimize energy consumption.
4. **Hardware management:** we look for opportunities to reduce workload sustainability impacts by making changes to your hardware management practices.
5. **Intelligent data management:** using optimized data management to reduce the storage requirements for each workload's data.
6. **Smarter development and deployment:** reduce emissions by streamlining the development and deployment processes for the entire cloud environment.

Atos CloudCatalyst also supports the Carbon Data Lake, enabling transparent reporting with the help of data, AI, and machine-learning innovations in the AWS cloud.

Sustainably managing data growth

The increased efficiency and scalability of the cloud often leads to data volumes growing. Companies have the power and cost-efficiency to do more, and this generates more data.

Atos works with your stakeholders to make sure this doesn't cause a corresponding increase in energy use and emissions.

Through proactive data storage policies, removing obsolescence and redundancy; smart connectivity protocols that reduce energy usage by eliminating unnecessary connections; optimized storage policies that separate signal from noise and only store useful data.

Reducing carbon emissions across the supply chain

One of the biggest impacts a data center provider can have on sustainability, is by using renewable energy. Nearly four out of five AWS data centers already operate on renewable energy.

Thanks to greater server efficiency and higher utilization rates, a typical AWS workload now has an 88% smaller carbon footprint than average. By 2025, as AWS increase their use of renewables, that operating emissions is planned to shrink to zero.

Heat generated by the data center can also be recycled for more green gains. Amazon's Dublin data center is now channeling waste heat to nearby government buildings and college dorms[4].

4. Heat from an Amazon Data Center Is Warming Dublin's Buildings

Improving cloud carbon emissions' visibility

In 2022 44% of CEOs cited a lack of insights from data as a key challenge to achieving their sustainability objectives[5]. This is a problem, as only by reporting and minimizing their carbon emissions across the supply chain – scope 3 emissions – can companies meet their climate obligations.

Platforms such as AWS, and providers such as Atos, typically host, manage, and partner with many vendors in any supply chain.

Working with Atos and AWS, participants in any supply chain can more accurately map emissions across all their common activities. AWS customers with their ERP running on Atos have access to the technology they need to deploy advanced monitoring, tracking, reporting, and impact verification for greenhouse gas emissions, across the supply chain.

This is not the only way in which AWS and CloudCatalyst can support clients in understanding and reducing emissions. We also offer a range of emissions measurement and visibility services. At their most basic, these include expert consultants and engineers who will work with you to optimize how you use the AWS Carbon Dashboard.

They also include specialist emissions consultants who will work with you to estimate on-premises emissions and provide greater visibility across the supply chain.

5. IBM Study: Sustainability Ranks Among Highest Priorities on CEO Agendas, Yet Lack of Data Insights Hinders Progress
6. A look inside the AWS lab where retired data center hardware gets a second chance
7. Reducing carbon by moving to AWS
8. Is PUE actually going UP?

Carbon Reduction Opportunity of moving to AWS in numbers

88% When we factor in the carbon intensity of consumed electricity and renewable energy purchases, AWS performs the same task with an 88% lower carbon footprint[6]

72% Compared to the top 10% most efficient organizations, moving to AWS delivers a 72% average reduction in carbon footprint on average[7]

24% AWS has at least a 24% lower energy consumption than on-prem. This gap is not expected to close at any point in the foreseeable future[8]

Hardware, waste and energy

Cloud migration with Atos also helps reduce emissions through server virtualization. Allowing more than one virtual server to run on a single physical server means less hardware, reducing energy consumption.

And AWS runs a secure “de-manufacture and reuse” program, part of its drive to reach net-zero by 2046. This allows it to recycle its servers, cutting emissions, without compromising on security.

And when Atos prepares a cloud migration strategy, assessing and quantifying a carbon baseline is part of the process. A single-pane-of-glass view of their IT related emissions, with dashboards and measurement platforms backing it up, makes it easy for customers to view emissions across their own infrastructure as well as their supply chain.

Building decarbonization into your cloud SLA

To ensure we’re aligned on your decarbonization goals, the speed at which you want to progress, and the milestones you want to hit, Atos offers clients a Decarbonization Level Agreement.

This is a binding agreement to reduce cloud-related carbon emissions by up to 25%.

Decarbonization Level Agreement

1	**Measure: Readiness Assessment** Data collection and analysis to calculate an emission baseline
2	**Assess: Strategy Definition** Identification of decarbonization levers to define a decarbonization roadmap
3	**Target: Agree Ambition** Mutually agree on levers and options to calculate the target emission reduction (at least 10-25%)
4	**Reduce: DLA Execution** Dedicated subject-matter expert to drive decarbonization and report on emission and performance

Underpinned by our **Emission carbon data platform:** Track and quantify emissions including access to a real-time emission dashboard.

A binding contractual commitment to measure and reduce emissions of the service starting from 10-25%.

Benefits

Guaranteed emission reduction

Contractual commitment guarantees a 10-25% emission reduction from the service.

Transparent and auditable reporting

GHG protocol-aligned methodology and reporting ensures benefits are easily recognized and communicated.

Cost optimization

Energy-solving measures implemented also translate to financial savings.

The Shared Responsibility Model: sustainability of, in, and through the cloud

Keeping a lid on carbon emissions is the shared responsibility of both the cloud provider and the customer. The cloud provider is responsible for maximizing the sustainability of the cloud platform – including its construction and architecture, energy sources, efficiency, and cooling.

The user is responsible for sustainability in the cloud—optimizing workloads and the cloud resources required for them.

This optimization also ensures a reduction in storage and compute costs, which also reduces carbon emissions. This combination of financial optimization (FinOps) and optimization for sustainability is known as GreenOps.

No matter how efficient the cloud platform is itself, it takes best-practice workload management to maintain maximum decarbonization. That's where Atos can help customers.

Optimizing sustainability of the cloud

CloudCatalyst can help customers achieve sustainability goals through:

- **Power efficiency:** AWS-designed Graviton3 is AWS's most power-efficient general-purpose processor. Graviton3-based Elastic Compute Cloud (EC2) instances use up to 60% less energy for the same performance than non-Graviton EC2 instances.
- **Cooling:** The new cooling medium used by AWS data center provides twice the service life and allows air to pass through more easily, reducing the energy use of cooling equipment by 20%.
- **Predicting and tracking performance:** Customer modules built using AWS services and weather datasets from Amazon Sustainability Data Initiative (ASDI) to predict performance for sites and track performance against how they should be operating.
- **Renewable energy:** AWS is one its way to achieve the goal of powering its operations with 100% renewable energy by 2025 Amazon Contracts for renewable power from utility scale wind and solar projects that add clean energy to the grid.

Optimizing sustainability in the cloud

As data volumes continue to explode, Atos can help organizations manage cloud-based energy use by:

- **Architecting for sustainability:** designing and writing code to ensure apps are as energy efficient and sustainable as possible.
- **Assigning workloads to the right AWS region:** choosing the region that will have the optimal effect on carbon emissions, for instance using a data center when its energy is greenest.
- **Optimizing cloud usage:** analyze cloud data to identify inefficiencies and improvements, smoothing out usage spikes, for example.
- **Data-storage policies** that continually work to eliminate obsolescence and duplication.
- **Empowering sustainable decision making** through developing and integrating GreenOps into our already established FinOps practices.

Optimizing sustainability through the cloud

The final part of the shared model is sustainability through the cloud – where you use cloud-based technology to solve broader sustainability challenges. The data processing and storage sector urgently needs to find ways to cut energy consumption, optimize resource utilization, minimize waste, and switch to green energy, if it is to become more sustainable.

It's not enough just to migrate to the cloud. You need to migrate to the right cloud, in the right way – and stay on top of your data use and supply chain, optimizing workloads and resource utilization, and minimizing the total resources required for your workloads.

"With cloud platforms, unlocking the entire value chain is now possible," explained an AWS executive. "For example, vendors and suppliers within the AWS Consortium, a network of around 300 companies, can work together to address industry-wide sustainability challenges. Customers can access more data and insights, facilitating the setting of more ambitious reduction goals."

Your organization doesn't have to face the challenge of cloud decarbonization on its own. Working with Atos and AWS gets you instant access to market-leading cloud decarbonization technology and expertise, without prohibitive upfront costs.

Combating the data rebound effect

To prevent a re-proliferation of data on the cloud, Atos will work with you to keep its inevitable energy implications in check. Data storage policies will help you remove obsolete, redundant, and duplicated data, and compress, where practical, what needs to be stored.

User behavior can be influenced to create more energy-efficient habits for working on cloud, and best-practice data capture techniques put in place to capture only valuable data and insights. As a result, you can set ambitious goals for reducing “source to end-user” data-related carbon emissions, with the help of that single-pane-of-glass visibility and specialist Atos talent on tap.

Becoming cloud native

The training involved in this process is another part of the cloud dividend, as Atos’s Ray Knight explains. “The Atos team is actively involved in transforming the skill sets of traditional on-premises data-center personnel into cloud-native experts.

This people-centric approach leads to a win-win situation, as employees benefit from up-skilling and increased career prospects, while the enterprise gains access to a talented workforce capable of driving a range of transformation initiatives.”

Introducing Atos CloudCatalyst

Atos CloudCatalyst is the result of a strategic collaboration between Atos and AWS, with the aim of providing an optimized, de-risked cloud migration experience.

Migration is carried out via a low risk and cost neutral "lift and optimize" migration path with an emphasis on automation, scalability, and compatibility. Where required, automated refactoring converts legacy systems into modern, agile platforms with minimal modifications to their interfaces.

The Atos/AWS collaboration is based on years of successful cloud migrations for major customers across consumer goods, ecommerce, technology, banking, government, and more.

Building on the sustainability credentials of both, CloudCatalyst is also the most predictable route to achieving significant carbon reductions and being able to provide visibility of these reductions through clear reporting.

Atos's prescription for sustainability

AWS, as we've seen, is on track to provide 100% carbon emissions-free cloud computing by 2025. Atos, in parallel, is committed to supporting its customers to decarbonize.

Atos wins EU award for data-center energy efficiency

On 6 September 2023, the EU bestowed its Data Centers Energy Efficiency Code of Conduct Annual Award 2023 on Atos. A recognition of energy and carbon emissions efficiency, the award acknowledged Atos's achievement in cutting data-center energy use by 32% since 2019.

When Atos prepares a cloud-migration strategy, assessing and quantifying a carbon baseline is built into the process. With a single-pane-of-glass, it's easy for customers to view carbon emissions across their own infrastructure as well as their supply chain.

While Atos is helping many customers migrate to AWS Cloud, we are not getting rid of our data centers completely – we will be in a hybrid mode for many years.

That's why, when it comes to sustainability, Atos's Data Center and Consolidation Program has also fueled the reduction of carbon emissions from our data center environment.

This has resulted in a 51% decrease in our data center carbon emissions since 2019 and a 32% reduction in our data center energy expenditure – for which Atos was recently recognized by the EU.

Learn more at atoscloudcatalyst.com

About Atos

Atos is a global leader in digital transformation with 105,000 employees and annual revenue of c. €11 billion. European number one in cybersecurity, cloud and high-performance computing, the Group provides tailored end-to-end solutions for all industries in 69 countries. A pioneer in decarbonization services and products, Atos is committed to a secure and decarbonized digital for its clients. Atos is a SE (Societas Europaea) and listed on Euronext Paris.

The purpose of Atos is to help design the future of the information space. Its expertise and services support the development of knowledge, education and research in a multicultural approach and contribute to the development of scientific and technological excellence. Across the world, the Group enables its customers and employees, and members of societies at large to live, work and develop sustainably, in a safe and secure information space.

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