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The Road to Net Zero With Google Cloud

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The need to become carbon neutral (or "net zero" as it's commonly known) has evolved into a mantra for IT executives around the globe. While many have drawn up impressive plans to reduce their organization's carbon footprint, the path to reaching those goals isn't easy. But thanks to Google Cloud — which has emerged as a climate action leader in the IT industry — organizations can now access new tools to help them reduce their carbon dioxide emissions and do their part for climate protection.

Some may wonder: why is net zero so important? Why now? Despite being a part of our global consciousness for decades, sustainability — and more broadly, environmental, social, and corporate governance initiatives — have seen a recent surge in popularity among companies looking to foster innovation and gain loyalty with investors, employees, and the general public. A few recent numbers point to the urgency of investing in sustainability and why companies are prioritizing their net zero commitments.

The Current State of the Global Climate

> Greenhouse gas concentrations are at their highest levels in 2 million years and continue to rise. As a result, our planet is about 1.1˚C warmer than it was during the 19th century. In fact, the 2010s was the warmest decade on record.[1]

> One crucial step to lowering greenhouse emissions is industrialized countries fulfilling their commitment to providing $100 billion annually to developing countries, allowing them to adapt and move toward greener economies — a commitment that, as of 2022, has gone unfulfilled.[2]

> In May 2020, CO2 levels in the atmosphere reached record levels, hitting **417 parts per million**. For reference, CO2 levels last exceeded 400 parts per million approximately **four million years ago**.[3]

> To ensure our climate remains livable, we must reduce greenhouse emissions by 50% by 2030 and to net zero by 2050. [4]

Google Reached Net Zero Way Back in 2007 — But That Was Only the Beginning

When it comes to companies truly prioritizing sustainable practices, Google Cloud emerged early on as a leader. Long before carbon footprints were on many companies' radars, Google achieved net zero in 2007 through renewable energy purchases. By 2017, it became the first company of its size to match 100% of its annual global electricity consumption with renewable energy. Today, it is the largest annual corporate purchaser of renewable energy in the world.

But Google Cloud leaders didn't stop there.

In 2020, the company announced an ambitious goal to operate on 24/7 carbon-free energy at all of its data centers by 2030. To accomplish this goal, Google has implemented many important initiatives and changes — Google's AI algorithms among them, which safely and autonomously deliver a 30% energy savings to cooling systems in their data centers.

[1] https://www.un.org/sites/un2.un.org/files/fastfacts-what-is-climate-change.pdf

[2] https://www.wri.org/research/breakdown-developed-countries-public-climate-finance-contributions-towards-100-billion

[3] https://www.bbc.com/future/article/20210108-where-we-are-on-climate-change-in-five-charts

[4] https://www.un.org/en/actnow

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Sustainability Is Top of Mind for Business Leaders

Along with its own climate initiatives, Google Cloud has made helping customers achieve their sustainability goals part of its mission. According to a recent Google survey [5],IT leaders are increasingly interested in sustainability issues:

> 90% of respondents said sustainability is a priority and/ or a performance metric for their IT departments.

> 62% of respondents who have sustainability targets are assessing IT infrastructure and data centers to meet their sustainability goals.

> 67% have already put sustainability targets in place.

It's no wonder sustainability remains a hot topic in the IT community given the industry's significant energy consumption. According to a recent IEA report [6], approximately 2.5% of global energy is used to serve data centers and data transmission networks — and experts project this number to rise quickly.

Put simply, data and telecommunications consume a large amount of energy, and that amount will likely increase exponentially year over year unless the IT ecosystem makes significant efficiency gains to counter rising demands.

Case Study: How Pitchup.com Made Their Sustainability Goals a Reality With Google Cloud

By moving to Google Cloud, customers reap many benefits, such as enhanced infrastructure agility, efficiency, and scalability. But there's another major advantage: the opportunity to lower their carbon footprint by working with a sustainability-focused organization like Google Cloud.

A recent example is Pitchup.com, a market leader in outdoor vacation search and bookings. In 2021, the company decided to partner with Atos OneCloud, a global leader in cloud services, to migrate its in-house data center to Google Cloud.

Pitchup.com sought the move to better support its customer base following a surge in staycation bookings as a result of the COVID-19 pandemic. Company executives knew Google's advanced technologies — such as artificial intelligence (AI) and machine learning (ML) — would help them streamline their development process and improve their overall customer experience. But they also appreciated Google's concern for the environment and reputation as an IT sustainability leader.

"We feel that it's the responsibility of all businesses to do what they can to reduce their environmental impact in all areas of their business. We know that it is important to our customers, and it is important to us personally and professionally," said Dan Yates, Founder and Managing Director of Pitchup.com. "IT infrastructure is a big part of our business, and it can consume a surprising amount of energy. That is why we are partnering with Atos OneCloud and Google Cloud to eliminate the carbon footprint of our infrastructure."

[5] https://inthecloud.withgoogle.com/it-leaders-research-21/sustainability-dl-cd.html

[6] https://www.iea.org/reports/data-centres-and-data-transmission-networks

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Rob Duffy, Head of Solutions Development at Atos OneCloud, also praised the relationship. "We're excited to be working with Pitchup.com on using the latest innovations from Google Cloud to help them quantify and reduce their carbon footprint," he said. "By migrating their on-premise data center to Google Cloud, Pitchup.com will save 1,932 tonnes of CO_2 over three years. That's the equivalent of removing 410 cars from the road or the home energy consumption of 231 homes."

Three Google Cloud Tools That Help Organizations Reduce Their Carbon Footprint

Google Cloud is helping more organizations like Pitchup.com every day and rolling out advanced tools to meet enterprise needs. During the October 2021 virtual Next conference, Google unveiled several new and upgraded tools to help customers make informed choices about reducing their carbon emissions while using Google Cloud.

The tools are part of Google's Carbon Sense Suite, which brings together features from multiple Google products to help users accurately measure carbon emissions from their Google Cloud usage and take action to reduce their carbon impact. The services include:

1. Carbon Footprint

This tool gives customers a high-level overview of the gross carbon emissions from electricity associated with their use of various Google Cloud services. Furthermore, it offers low-carbon options or alternatives to those services. Along with several other major organizations, Atos helped to build Carbon Footprint's reporting capabilities, which introduce a new standard of transparency to support customers in meeting their climate goals. (Atos, a Google Cloud partner, is also a leader in decarbonization efforts in the IT sector and is partnering with Google on several sustainability programs, which will be discussed later in this whitepaper).

Among its advantages, Carbon Footprint allows customers to measure and monitor their gross cloud emissions over time by project, product, and region. This information has provided eye-opening insights and enabled many customers to improve their carbon footprint by making different product selections within the Google Cloud infrastructure. For instance, when choosing regional data centers, the tool alerts customers to which centers have lower carbon footprints (along with traditional information like price and latency). By factoring in sustainability issues, customers can choose to make it central to their decision-making process.

2. Unattended Project Recommender

Using computer algorithms, the Unattended Project Recommender (UPR) finds code running on Google servers that hasn't been accessed for an extended period, suggesting the task is no longer needed. The UPR alerts customers and also provides estimates on the carbon emissions that would be reduced by eliminating the unnecessary task.

While such changes may seem small, Google Cloud has shown they can make a big difference. In a report last summer, the company calculated the aggregate monthly figure for all its users and found that 600,000 kilograms CO_2 equivalent — the same as a car driving 1.5 million miles — of emissions could be reduced by eliminating invalid tasks.

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3. Google Earth Engine

Long used by scientists to study and make progress on climate research, this represents the first version of the Google Earth Engine satellite imagery/geospatial data platform designed for business use. This tool shows regions with the lowest carbon impact inside Cloud Console location selectors. Currently, the Google Earth Engine is only available for users of Cloud Run and Datastream, but it will eventually become an option with more Google Cloud offerings over time.

According to Google Cloud, Google Earth's expansion will allow public sector organizations and businesses to use insights from this tool and solve sustainability-related problems, such as:

- building sustainable supply chains,
- committing to deforestation-free lending,
- preparing for recovery from weather-related events,
- and reducing operational water use.

One case study of the U.S. General Services Administration showed that by switching to Google Apps, they were able to reduce office computing costs, energy use, and carbon emissions by 70–90%[7]. For example, companies using Gmail have decreased the environmental impact of their email service by up to 98% when compared to businesses that run email on local servers.[8]

The Google / Atos Partnership Results in Even More Sustainability Tools

Additional partnerships between Google and companies like Atos, Maven Wave's parent company, present even more opportunities for companies to learn — like at the Google Cloud Sustainability Summit — and to benefit from additional sustainability tools. Atos sponsored the June 2022 Sustainability Summit where climate-action pioneers and change-makers shared strategies and best practices with attendees that advance sustainability efforts at their organizations.

During the summit, Atos hosted an on-demand session: "Achieving a Net Zero Future in the Cloud". During this session, speakers Jason Warren, VP Head of NetZero Transformation Portfolio at Atos, and Latifah Khan, Google Cloud Partner Sales Manager at Atos OneCloud, an Atos Company, discussed digital solutions with the potential to reduce emissions by as much as nine times the footprint of the entire digital sector.

Atos partners with Google Cloud to build sustainable cloud computing wrapped with unique decarbonization level agreements, committing to reduce clients' digital carbon emissions on their journey to net zero.

Embracing Sustainability by Harnessing the Cloud

While Google Cloud, Atos, and other major IT enterprise providers are developing valuable tools to help customers advance their carbon neutral journey, simply migrating to the cloud, in and of itself, is a major sustainability enhancer.

[7] https://static.googleusercontent.com/media/www.google.com/en//green/pdf/google-apps.pdf
[8] https://static.googleusercontent.com/media/www.google.com/en//green/pdfs/google-green-computing.pdf

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Although "the cloud" may have been officially coined in 1996, traces of the concept date back to the '50s when John McCarthy developed a theory of "time-sharing" computing time.

Today, the cloud is responsible for enabling remote and hybrid environments, which have significantly reduced the power and cooling needed to keep on-premises infrastructure running. This reduction in energy consumption and infrastructure is helping enterprises reduce their environmental impact and lower carbon dioxide emissions due to fewer large-scale corporate offices required for operation.

One case study found that moving software, such as email and CRM, to the cloud can save enough electricity to power Los Angeles for a year[9]. Continued adoption of cloud computing can prevent the emission of more than 1 billion metric tons of carbon dioxide between 2021 and 2024.[10]

The Cloud Isn't Really in the Sky — It's in Someone Else's Data Center

Of course, moving applications to the cloud doesn't eliminate the need for infrastructure entirely. The cloud, like the broader internet, is an intangible concept that's actually formed by a chain of physical infrastructure. But by migrating to the cloud, enterprises are able to leverage the most efficient and sustainable data centers owned and operated by hyperscalers (like Google Cloud) who have the resources to develop the most efficient and carbon-reducing infrastructure.

Google data centers use far less energy than average. And, as previously stated, the company's renewable energy use and carbon offsets are delivering a zero-carbon footprint.

The Evidence Is Clear: Cloud Is the New Normal

In the 2010s, many leading companies and industry disrupters were already migrating to the cloud. By 2020, the COVID-19 pandemic compelled businesses across all industries to support remote work overnight, meaning those who hadn't yet moved business operations to the cloud were rushing to catch up. Now, cloud technology is as ubiquitous in business settings as the internet and computers — and that's not likely to change.

Here's a look at a few recent eye-opening cloud statistics:

> The pandemic led to an increase in cloud infrastructure, which rose dramatically with a 37% rise in Q1 of 2020 compared to Q1 of 2019.[11]

> This continued throughout the year, with investment still 28% higher year-over-year for Q3.[12]

> Global spending on public cloud services is forecast to grow 18.4% by 2022 to $304.9 billion total — up from $257.5 billion in 2020.[13]

[9] https://www.osti.gov/servlets/purl/1171159

[10] https://www.idc.com/getdoc.jsp?containerId=prUS47513321

[11] https://www.srgresearch.com/articles/covid-19-fails-dent-aggressive-growth-cloud-spending-half-q1-market-belongs-amazon-microsoft

[12] https://www.srgresearch.com/articles/covid-19-boosts-cloud-service-spending-15-billion-third-quarter

[13] https://www.gartner.com/en/newsroom/press-releases/2020-11-17-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-grow-18-percent-in-2021

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> According to a recent report, the average number of cloud providers for US-based medium and large businesses is 3.1. About 30% of enterprise workloads are running in the cloud.[14]

> 83% of cloud users consider hybrid cloud to be their long-term strategic state.[15]

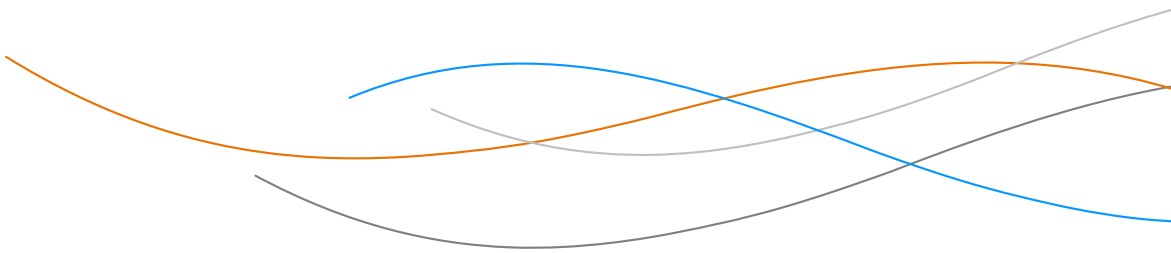
> A Forrester report commissioned by Atos found that 69% of enterprises deploy applications that span multiple clouds.[16]

Maven Wave and Atos' Commitment

Atos and Maven Wave are well known for their exemplary carbon neutral efforts. In fact, Atos leads the IT industry in decarbonization efforts, ranking **#1 in the digital sector worldwide by the Dow Jones Sustainability Index**.

Atos was also named "2020 Global Social Impact Partner of the Year" by Google Cloud for its dedication to helping organizations quickly and sustainably overcome the challenges related to COVID-19. The award also recognized Atos' ongoing commitment to decarbonization, embodied by its ambitious plan to reach "net zero" by 2028. The commitment puts Atos 22 years ahead of the 2050 Paris Agreement target to limit global warming to 2 degrees Celsius by 2050.

Along with its own sustainability efforts, Atos offers innovative tools to help customers quickly achieve their decarbonization goals. In this vein, the company launched an end-to-end portfolio of sustainability solutions in 2021 through its Global Net Zero Transformation Center of Excellence. The new offering is being distributed across nine hubs in Europe, North America, and Asia and will allow customers to leverage Atos' global skills, resources, and network of more than 200 experts to create their own path toward becoming a net-zero resilient business.



[14] https://technalysisresearch.com/downloads/TECHnalysis%20Research%20Hybrid%20and%20Multi-Cloud%20Study%20Highlights.pdf

[15, 16] https://atos.net/wp-content/uploads/2021/01/atos-vmware-orchestration-management-infographic.pdf