Sunbird

World's Leading Data Center and Cloud Operators with Zero Carbon Goals

The data center industry loves efficiency. From 2010 to 2018, global computing output increased 600% while energy consumption only rose 6%.

Still, there is a lot of attention given to data center energy consumption as computing capacity only continues to increase for emerging technologies like AI, <u>machine learning, big data, and the Internet of Things</u>.

Dutou

However, the global data center industry has taken responsibility for its own carbon footprint and is making incredible strides in growing its capacity sustainably. Many organizations have set goals to dramatically improve efficiency, source clean energy, and purchase carbon offsets to neutralize remaining emissions. Others have gone so far as to target zero carbon emissions.

Here are some of the world's leading data center and cloud operators that deserve credit for paving the way for other data centers and power-hungry industries to follow.



Google

Goal: Zero carbon by 2030

How they will do it:

Carbon neutral since:

2012

2030 2007

Carbon neutral since:

600%

6%

- A system that can shift flexible computing tasks to times when power on the grid is cleanest
- One of the world's largest solar-plus-storage projects that can deliver energy at night or in the event of an outage
- Machine learning that will optimize how wind farms deliver power and can predict wind farm output 36 hours in advance

Microsoft

Zero carbon by 2030

Goal:

How they will do it:

- **ill do it:**
- Researching hydrogen as an alternative fuel for diesel backup power generation and liquid cooling for servers
- Data centers are currently supported by over 2 GW of operating renewable energy projects
- After reaching carbon zero, they will remove all the carbon from the atmosphere that the company has emitted since its founding in 1975

Microsoft

Amazon

Goal: Zero carbon by 2040

How they will do it:

- Using real-time sensor data to adapt to changing weather patterns and optimize cooling systems to reduce energy and water use
- Leveraging free air cooling in cool weather and evaporative cooling in warmer weather
- With renewable energy projects all across the globe, they are the largest corporate buyer of renewable energy in the world

Facebook

amazon



Carbon neutral since:

How they will do it:

- Machine learning model that will monitor, predict, and optimize efficiency based on seasonality, weather, and IT capacity
- StatePoint Liquid Cooling system that uses 50% less water and can be deployed in regions with environmental challenges like high levels of dust, extreme humidity, or elevated salinity that typically interfere with direct cooling

Hyper-efficient servers that can operate in high temperature environ-

- facebook

ments and be cooled by outdoor air



Apple

Goal: Ongoing carbon neutrality

How they will do it:



- Portporing with local range
- Partnering with local renewable utilities including a wind farm in Prineville, OR that generates 200 MW and a provider in Reno, NV that generates 320 MW of solar
- Constructing new data centers in Denmark that will run on 100% renewables from day one

IBM

Goal: Carbon neutral by 2030

How they will do it:

- Completed 299 cooling efficiency projects at 89 data centers in 1 year, reducing energy use by 20,000 MW and saving \$2.3 million
- Installed thousands of blanking panels, wall panels between racks, cable cutout plugs, and cold-aisle containment systems and shutting down 140 CRAC units
- Shut down 140 CRAC units and rebalanced air flow to increase average raised-floor temperature by more than 2.5 degrees Celsius





Equinix

Goal: Carbon neutral by 2030

How they will do it:

- Intelligent, distributed sensors and innovative control policies to reduce power consumption
- Hot/cold aisle containment to reduce the mixing of cold supply air with hot exhaust air
- Raising the temperature of chilled water

CyrusOne



How they will do it:

- High-efficiency UPSs that generate little waste heat and operate efficiently even at 50% of maximum capacity
- Ultrasonic humidification systems that maintain the necessary
- humidity using only 7% of the energy of traditional systems
- LED lighting and occupancy sensors so light is only delivered where and when it's needed
- Predictive cooling, free air cooling, and high-efficiency closed-loop chillers that remove heat without wasting water



Oracle

Goal: Carbon neutral by 2025

How they will do it:

- State-of-the-art intelligent energy management and cooling technologies
- Collaborating with colocation providers on energy efficiency initiatives
- Working with internal Oracle hardware and software engineering teams to help optimize them for efficiency

OVH

Goal: Carbon neutral by 2030

ORACLE

How they will do it:

- Cooling hubs behind servers to create autonomous racks that can be deployed anywhere and be fully isolated from external temperatures
- A proprietary water-cooling system removes 70% of the heat and outside air cools the remaining 30%

RIUS

CENTRES

- Enhancing measures already in place to monitor resource utilization patterns of their facilities
- Reusing industrial buildings 25 of 31 data centers are former industrial facilities



VIRTUS

Goal: Ongoing Zero Carbon Carbon neutral since: 2012

How they will do it:

- Excool evaporative cooling technology that adds moisture to outdoor air to cool the data center
- Procuring energy from a provider that only supplies 100% green wind, hydro, and solar power

Switch



How they will do it:

- Proprietary water processing technology that increases efficiency by 400%
- Two solar power stations that provide 179 MW of renewable energy and eliminates 250,000 tons of carbon emissions







Goal: Ongoing Zero Carbon



How they will do it:

- Air-to-air cooling systems that consume 70% less energy than traditional systems
- Reusing waste heat to warm nearby homes and buildings
- Consuming only energy that is certified 100% renewable, emitting zero CO2

Aligned

Goal: Carbon neutral by 2024

How they will do it:

- Delta3 cooling technology that dynamically adapts to the IT load and requires 80% less energy and 85% less water
- CACTUS air-cooled adiabatic assisted cooling system that offers a peak PUE of 1.15 even on the hottest day of the year and reduces water requirements by 50%



Tencent

Goal: Carbon neutral by 2030

How they will do it:

- Choosing regions with sufficient green energy such as Huailai that has abundant wind electricity and Qingyuan that has abundant hydro power
- "Tri-supply" technology that combines the supply of power, heating, and cooling to save 3,500 tons of coal and 23,300 tons of CO2 each year







Increase Data Center Energy Efficiency with DCIM Software

Increasing energy efficiency should be an objective for every data center and cloud operator. The benefits of improved efficiency include reducing operating costs, maximizing the value of existing capacity, and complying with corporate or governmental sustainability initiatives.



Leading data center managers leverage Data Center Infrastructure Management (DCIM) software to support their energy efficiency goals. DCIM software makes it easy to:

- Measure energy usage to have the data you need for better decision-making
- Report on energy KPIs like Power Usage Effectiveness (PUE) in real-time
- Create billback reports to drive more energy-efficient behaviors from customers
- Avoid overcooling and wasting energy while remaining compliant with ASHRAE guidelines
- Identify power hogs that can be replaced with more efficient equipment
- Virtually design your physical infrastructure for greater efficiency
- Track the data you need to intelligently consolidate resources via virtualization

Try it free

Take a free test drive of the world's best DCIM software to see how you can increase efficiency in your data center.

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