**Green Computing: Harnessing AI for a Sustainable Future**

In today’s world it’s hard to imagine running a business without cloud computing. Whether it’s storing data or powering advanced AI tools, the cloud makes it possible to scale, innovate, and stay secure in ways that other options just can’t provide. However, this growing reliance on cloud services comes at an environmental cost. Cloud computing contributes about 2.5 to 3.7% of global greenhouse gas emissions – a figure even exceeding the commercial flights industry (about 2.4%)**[1](https://www.climatiq.io/blog/measure-greenhouse-gas-emissions-carbon-data-centres-cloud-computing)**!

Traditional cloud computing practices often overlook the carbon intensity of the electricity powering data centres, meaning that even efficient facilities can have a substantial carbon footprint if fuelled by fossil energy sources. As demand for cloud computing continues to grow, addressing its environmental impact becomes ever more important.

This is where carbon-aware computing comes in. It’s an approach that uses real-time data to lower the carbon emissions tied to your cloud use. By scheduling computing tasks based on the availability of low-carbon energy sources, businesses can significantly reduce their carbon footprint without sacrificing performance. Embracing this strategy not only contributes to global sustainability efforts but also positions companies as leaders in responsible technology use, meeting the growing expectations of customers, regulators, and stakeholders.

**Understanding carbon-aware computing**

Carbon-aware computing involves optimising cloud operations by considering the carbon intensity of energy sources in real time. Here’s how it works:

* **Energy mixes:**Different regions have varying energy mixes – the combination of coal, natural gas, nuclear, and renewable energy sources that supply electricity. By understanding these mixes, businesses can choose to run computing tasks in locations and at times when clean energy makes up a higher percentage of the energy mix.
* **Real-time data utilisation:**Leveraging real-time data on energy grids allows companies to make these informed decisions about where and when to process data, aligning computing tasks with periods of low carbon intensity. Tools such as **[ElectricityMaps](https://app.electricitymaps.com/map)**, an open-source platform, provide real-time information on the carbon intensity of electricity grids worldwide, enabling businesses to optimise their operations accordingly.

Countries like Iceland and Norway, which benefit from huge availability of renewable energy, are perfect examples of where you can run cloud processes with a lower environmental impact. Additionally, renewable energy availability fluctuates throughout the day, depending on factors like sunlight and wind. By scheduling computing tasks during these periods when renewable energy production peaks, such as sunny afternoons for solar power or windy days for wind energy—businesses can further reduce their carbon footprint.

**Practical steps to implement carbon-aware computing**

Implementing carbon-aware computing involves taking actions that can significantly reduce your cloud-related carbon emissions. Here are four practical steps:

1. **Assess your current carbon footprint:**Begin by evaluating your existing computing operations to understand their energy consumption and associated carbon emissions. This assessment will help identify areas where carbon-aware strategies can have the most impact.
2. **Choose times and locations with cleaner energy:** Use tools like ElectricityMaps to find out when and where electricity is generated from renewable sources. By knowing this, you can run your computing tasks at times and in locations that rely more on green energy, helping you reduce your environmental impact.
3. **Use cloud provider tools:** AWS, Google Cloud, and others offer tools that let you estimate emissions and pick cloud regions based on factors like carbon intensity, cost, and latency (quality of connection). Leveraging these tools enables you to make informed decisions that give you control over your impact and take targeted action.
4. **Automate with Artificial Intelligence:** Implement AI-driven solutions to automate the scheduling and load balancing of computing tasks based on carbon intensity data. This helps ensure your computing tasks are automatically optimised for lower emissions without the need for manual intervention.

**The business case for carbon-aware computing**

As sustainability becomes a key differentiator in the marketplace, companies that proactively reduce their carbon footprint can enhance their brand reputation, attract environmentally conscious customers, and potentially benefit from government incentives aimed at promoting green practices. Moreover, optimising cloud usage in line with carbon intensity can lead to cost savings, as running compute tasks during periods of lower demand in greener regions often correlates with lower energy and cloud costs.

This approach aligns with emerging regulatory demands for carbon reporting and reduction, positioning businesses to stay ahead of compliance requirements. Moreover, companies that prioritise carbon-aware strategies may gain a competitive edge, appealing to investors, clients, and partners who value sustainability.

**Addressing implementation challenges:**

We recognise that transitioning to carbon-aware computing can present challenges. Organisational change often requires a shift in culture, processes, and mindset, which can lead to resistance and slow progress. Performance trade-offs are another challenge, as optimising for sustainability is often perceived as sacrificing operational efficiency. At IRIS, by Argon & Co, we specialise in guiding businesses through this transition:

* We combine our extensive experience in operations and sustainability with our data and AI capabilities to develop tailored solutions. These solutions not only provide a true reflection of your carbon impact but also identify a roadmap and levers to improve it.
* **Technical support:** Our experts assist in integrating the necessary tools and automations to simplify implementation, ensuring that the change is visible and impactful within your company.
* **Financial planning:** We help quantify the long-term savings and environmental benefits to justify the initial investment, highlighting that whilst benefits may not be immediate, they accumulate over time.

Implementing carbon-aware computing isn’t just a step toward environmental responsibility, it’s also a smart business move. By taking simple, practical steps, you can reduce your cloud’s carbon footprint, save on costs, and position your business as a leader in sustainability. As the cloud computing landscape continues to evolve, embracing carbon-aware practices will be crucial for businesses looking to thrive in a future increasingly defined by sustainability.

Interested in learning more about how carbon-aware computing can benefit your business? Contact us to schedule a consultation and explore the sustainable future of cloud computing.

Cloud datacenters already consume ~2% of the world’s electricity. With the exponential increase in compute and data, especially given the recent explosion of generative AI, the world’s computing infrastructure has become a significant source of carbon emissions. In order to avoid an exponential rise in computing-related carbon emissions, we must rethink and retool cloud hardware, system software and web applications to become energy and carbon aware. The sustainable cloud computing and AI session at the NYC climate week will feature talks and a panel with researchers from industry and academia who are actively working on solving these hard and pressing problems.