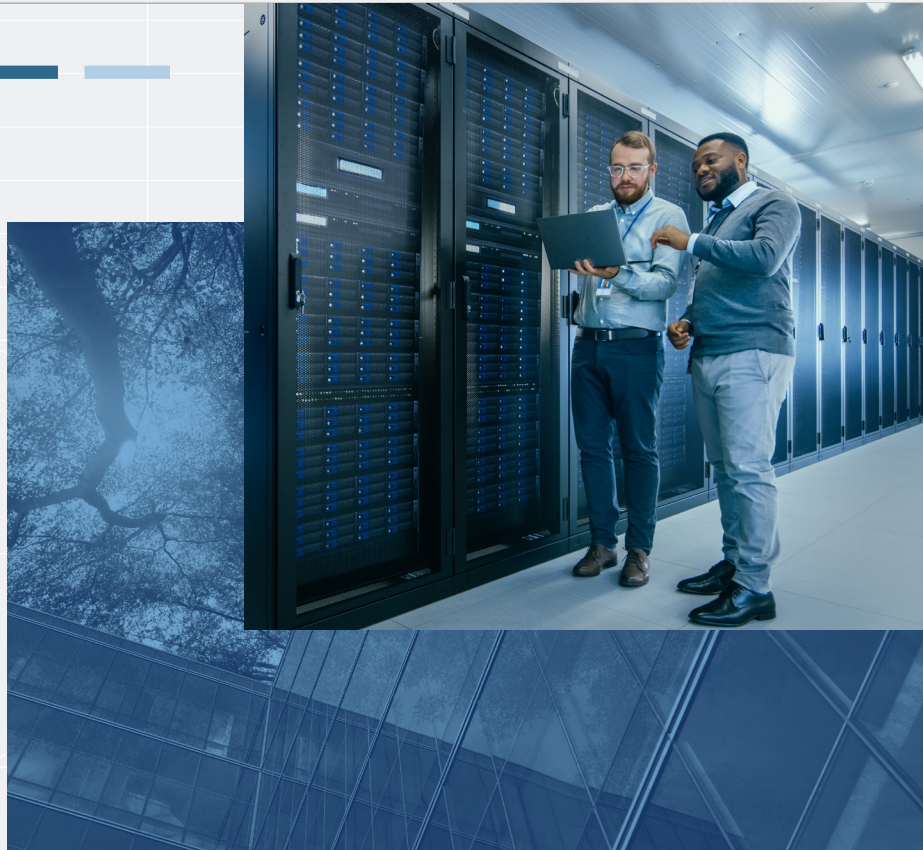


Reinvention of Sustainable Data Centers

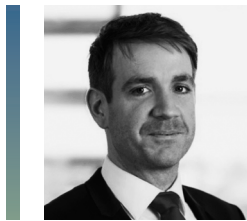


Leadership



Franco Castaldini

VP of Strategy,
Enlighted



Colm Nee

Head of Product
and CTO, Enlighted

Franco Castaldini, VP of Strategy for Enlighted, leads a conversation with Colm Nee, Head of Product and CTO, Enlighted, about the challenges facing data center managers and the opportunities to improve the energy profiles of their environments.

Colm, what do you see as the major concerns for data center managers today?

As digital changes have transformed so many IT processes and applications, the role of the data center has morphed as well to accommodate the shifting landscape of computing. Issues that concerned data center managers in prior years, such as security (physical, network and data) and uptime service levels persist today but are further complicated by new demands for energy conservation and requirements to create hybrid cloud infrastructures. New technology choices for service automation and standardizations across infrastructure components are helping, but I think it's fair to say that a data center manager's role today is exponentially more complex than ever.

How does energy consumption for data centers play a role in companies' efforts toward carbon neutrality?

Data centers account for 4 to 5% of global energy consumption and 1 to 2% of global CO₂ emissions.¹ Server operations constitute the main source of consumption, with 20% to 40% of a data center's energy use going towards cooling and ventilation. However, we see a global and concerted effort to reduce carbon emissions and integrate renewable energy sources into the mix for regional, corporate and hyperscale data centers, which provide large-scale cloud computing services.

Another factor driving the need for more astute power management is the trend towards increasing power density for every data center square foot. From some estimates the power density of a typical server rack in a data center is up 150% from a decade ago, due to the pressure to provide more efficient and cost-effective operations and increased compute demands.² With such new power requirements, the need for improve overall energy management has become critical.

With most organizations making 2030 carbon neutrality commitments, data center operations are a natural

target to drive significant impacts, but that's easier said than done, given the incredible energy demands of a typical center. Couple this with the need for continuous operation, the work of introducing change to the data center energy systems without interruption poses real challenges. Certainly, for those centers being designed and built today, it's imperative to carefully consider every energy-saving opportunity from the get-go.

How does the trend around smart buildings impact data centers in particular?

Data centers represent a microcosm of building needs and possibilities for intelligent IoT modernization, albeit with very specialized needs. From tracking and managing a range of assets with sensors and IoT technologies to refined security needs to leveraging innovations for energy management, these environments are ripe for transformation. However, they face the same challenges as others attempting to construct an efficiently operating smart building - integration and interoperability of solutions and technologies.

Data centers consume a significant amount of energy, which leads to high operational costs and environmental impact. Managers are always looking at implementing energy-efficient technologies to reduce power consumption and optimize cooling systems. Gaining visibility into the energy performance of your data center is a potential competitive advantage.

One use case that Enlighted is exploring with our customers is the requirement to strictly track servers and other network equipment within the data center - when they're deployed and when decommissioned and removed. By tagging and tracking with an [RTLS solution](#), a clear audit trail is created on the movement of every asset within the center, which can be correlated to security access information via API data, with the opportunity to create visualizations with standard business intelligence (BI) tools. This is especially useful for audit requirements with historic, time-stamped data.

How is the move toward cloud computing and AI impacting data center operations?

With an increasing trend towards cloud-based applications and computing, most corporate data center managers are being forced to integrate outsourced cloud configurations into a hybrid topology design. This introduces a new set of complexities and security requirements that strains already burdened resources. Further, with the exponential growth of [Artificial intelligence \(AI\) and machine learning \(ML\)](#) (data center owners) might need three times the power density of conventional data processing, necessitating a shift in data center architecture. This is also predicated on sophisticated cooling systems to accommodate the higher output.³

However, according to Gartner Research, organizations will choose to retain some applications on-premises for a variety of reasons including:

- Security concerns
- Custom-built application with architecture that is not cloud-compatible
- Data sovereignty and regulatory demands
- Legal concerns
- Data residency for latency concerns
- Protecting intellectual property (IP) from transfer⁴

Therefore, complete outsourcing for some industries, such as highly sensitive financial services or patient information for healthcare operations, seems unrealistic, as data center owners continue to grapple with hybrid infrastructure and ongoing management issues.

What are some of the ways that companies should consider modernizing their data center infrastructures to be more sustainable?

Certainly, there are opportunities to introduce renewable energy sources to reduce costs, carbon output and stress on utility grids. Additionally, coupling these efforts with energy optimization technologies can further help companies both reduce costly energy line items while they contribute to the ESG goals of the company. Some of those technologies offered by Enlighted and our parent company, Siemens, include:

- [Advanced lighting control systems](#) that allow for configurations that minimize energy use based on movement and occupancy.
- [Refined HVAC controls](#) that do the job of requisite cooling, without overburdening heating/cooling systems to capture energy savings.
- [White Space Cooling Optimization \(WSCO\)](#) uses artificial intelligence and predictive machine learning technologies to eliminate the manual effort involved for cooling management and hot spot mitigation.
- [Comprehensive energy monitoring and power quality for data centers](#), designed for high reliability, flexibility, and maximum efficiency.

Bottom line, data center managers have their work cut out for them. Adding the requirement to responsibly address ESG goals with real action plans might feel daunting, but new technologies have made strides on optimizing and reducing energy use. At Enlighted, we understand the balance of continuous operations and energy efficiency - creating a seamless way to automate these gains while ensuring proper data center operations.



Building Robotics, Inc.,
a **Siemens Company**

Turn Everyday Spaces into Extraordinary Places

Wherever space, people and work meet, Enlighted empowers organizations with the technology to transform real estate spaces into regenerative places that fuel positive impact for people, portfolio, and our planet.

Email: info@enlightedinc.com | **Website:** www.enlightedinc.com