



Mulder-Hardenberg Deep dive

Meeting Energy Efficiency Regulations with Advanced and Smart PDU Solutions for Data Centers

The Growing Pressure for Energy Efficiency

Data centers are among the most energy-intensive infrastructures globally, accounting for 2.8% of electricity use within the EU—a figure that continues to rise with the growth of data-driven technologies such as **AI**, **5G**, and **cloud computing**. In light of this, the EED Recast (2023/1791) was introduced to drive energy efficiency and sustainability in data centers. The directive requires operators to monitor and report energy consumption and encourages the adoption of renewable energy and best practices.



Key Provisions of the EED Recast (2023/1791)

1 Energy Reduction Targets:

The EED sets binding energy reduction targets of 11.7% by 2030 for all EU member states. Data centers, as energy-intensive facilities, play a significant role in achieving this goal.

2 Mandatory Energy Audits:

Data centers exceeding 1 MW in energy consumption must conduct regular energy audits and report key metrics such as Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE), and renewable energy usage.

3 Transparency and Public Reporting:

Energy performance data, including sustainability metrics, must be reported to an EU database and made publicly available. This level of transparency aims to push data centers towards more environmentally responsible operations.

4 Encouragement of Renewable Energy:

The directive promotes the use of renewable energy sources, including wind and solar power, as part of a comprehensive strategy to reduce the carbon footprint of data centers.

Challenges for Data Centers

Data centers are faced with several hurdles in meeting the stringent requirements set by the EED Recast:

1 Energy Demand and Consumption:

As data centers continue to scale up their operations to meet growing demand from AI, blockchain, and cloud services, their energy consumption increases. This puts pressure on operators to meet energy efficiency standards without sacrificing performance.

2 Cost of Compliance:

Implementing energy audits, upgrading infrastructure, and integrating renewable energy solutions will require significant investment, particularly for smaller data centers.

3 Infrastructure Upgrades:

Many facilities will need to overhaul their energy distribution systems and cooling mechanisms to comply with the new performance benchmarks.

4 Real-Time Monitoring and Reporting:

Compliance with the EED Recast requires accurate and real-time tracking of energy use and sustainability metrics. Aggregating this data across multiple facilities for public disclosure presents an operational challenge for global operators.



Leveraging Advanced PDUs for Compliance and Optimization

To overcome these challenges, data centers can implement advanced Power Distribution Units (PDUs) as a key component of their energy management strategy. PDUs offer comprehensive solutions for monitoring, managing, and optimizing energy usage, helping data centers comply with the EED Recast's requirements.

How Advanced PDUs Address Key Challenges:

1 Real-Time Energy Monitoring:

Advanced PDUs provide real-time monitoring of energy consumption at both the rack and outlet levels. This allows operators to track power usage with greater granularity, helping them calculate key metrics like PUE and WUE. Such detailed insight makes it easier to comply with the EED's reporting requirements.

2 Remote Management and Automation:

Intelligent PDUs offer remote management capabilities, allowing operators to control individual outlets and perform energy audits without needing to be physically present at the facility. This not only reduces operational costs but also ensures continuous monitoring and quick adjustments as energy demands fluctuate.

3 Energy Efficiency and Load Balancing:

PDUs equipped with load-balancing features optimize energy distribution across the data center. By preventing energy spikes and distributing power more efficiently, they contribute to overall energy savings and better PUE scores, aligning with the EED's efficiency goals.

4 Renewable Energy Integration:

Many advanced PDUs are designed to integrate seamlessly with renewable energy sources, enabling data centers to transition to cleaner power options. Some PDUs are even capable of handling dynamic power loads from renewable sources, ensuring a stable and sustainable energy supply.

5 Hot-Swappable Monitoring Units:

Features like Interchangeable Monitoring Devices (IMDs) in PDUs allow data centers to upgrade their energy monitoring systems without shutting down critical infrastructure. This ensures minimal downtime and reduces costs associated with compliance.

6 Predictive Analytics and Energy Forecasting:

With built-in analytics tools, advanced PDUs can predict future energy usage patterns and identify inefficiencies in real-time. This allows data centers to proactively address energy spikes or underutilization, contributing to more effective energy management and cost savings.

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Advanced PDUs in Action

A mid-size data center in Germany, subject to national energy efficiency standards, implemented advanced PDUs with remote management and real-time monitoring. The PDUs enabled the center to reduce energy consumption by **15%** through better load balancing and automation. This not only helped the facility meet the EED's targets but also resulted in significant operational savings. Moreover, the seamless integration of renewable energy sources allowed the data center to reduce its reliance on grid electricity by **20%**, directly contributing to its sustainability goals.

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A Path Forward with Advanced PDUs

The Energy Efficiency Directive Recast (2023/1791) presents both challenges and opportunities for data centers. While the need for compliance with energy efficiency and sustainability metrics may require significant changes in infrastructure, advanced PDUs offer a practical solution to these challenges. By implementing intelligent power management systems, data centers can not only meet the requirements of the EED Recast but also optimize their energy usage, reduce costs, and improve their environmental impact.

In a world where energy efficiency is becoming a business imperative, advanced PDUs are a critical tool for data centers aiming to remain competitive and sustainable. Through enhanced monitoring, management, and integration with renewable energy, they pave the way for a more energy-efficient future in the digital age.



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About us

We specialize in providing data centers with cutting-edge energy management solutions, including advanced PDUs, designed to help operators optimize their power usage and comply with the latest regulations. Contact us for more information on how we can help your facility meet the requirements of the EED Recast.

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References

- 1 **European Commission:** Energy Efficiency Directive Recast, 2023
- 2 **Inside Energy & Environment:** Sustainability Reporting for Data Centers in the EU (Inside Energy & Environment)
- 3 **Covington & Burling LLP:** Energy Efficiency Directive and Taxonomy Regulation(Energy)

