

# Data Center Integrated Energy Management



## Overview

Data centres can support grid stability and efficiency by collaborating with local grids, managing load growth, and integrating advanced energy management systems for sustainable expansion. This will increasingly define their 'license to operate'. This research introduces a data-driven decision-making framework for DCs, grounded in the OODA (Observation, Orientation, Decision, and Action) loop and based on insights from an Ericsson-operated DC in Linköping, Sweden. The developed framework enables DCs to enhance energy efficiency effectively. This paper overviews some of the key past developments in cloud datacenter power and energy management, where we are today, and what the future could be. This topic is gaining enormous, renewed interest in the context of the conflicting needs of the AI revolution and the climate crisis.



## Article Content

Oct 11, 2025

Energy Management in Data Centers from Design to Operations and ...

Data centers are the information factories of the digital evolution. Creating, storing, processing, distributing, and analyzing data all need energy. Therefore, data center industry consumes energy

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Integrated management of workloads and energy system for data centers

To fully investigate the potential of workload transfer for sustainable and positive development in data centers, this study firstly clarifies the interaction between workload and energy.

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AI Datacenter Liquid Cooling Market

Primary Research: FMI analysts conducted interviews with datacenter infrastructure operators, liquid cooling system manufacturers, and thermal

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Data center integrated energy system for sustainability:

A concept of data center integrated energy system (DC-IES) is introduced in this paper, and its generalization, approaches, methods,

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Energy Management for an Integrated Energy System with Data Centers ...

The data center (DC) is a popular candidate for energy management due to its huge energy consumption and great flexibility potentials. In this paper, the energy management for an integrated

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How data centres can be better integrated into the energy ecosystem

This article explores how data centres can help build a more efficient energy system, better manage load growth, and create positive impacts for local communities.

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Modern battery systems are transforming how data centers manage energy. This session reveals how forward-looking operators are turning storage into a strategic

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Preparing for 800 VDC Data Centers: ABB, Eaton

ABB, Eaton, and NVIDIA are advancing the next phase of AI power infrastructure, collaborating on 800-V DC architectures to support megawatt-class racks and

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Carbon-Aware Workload Management in Data Centers: A Multi

Addressing this challenge requires integrated approaches to optimize energy use and reduce carbon footprints. This study presents a carbon-aware energy management model for data centers,

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Next-generation data center energy management: a

The developed framework enables DCs to enhance energy efficiency effectively. Rooted in the OODA loop and leveraging extensive datasets from

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Datacenter power and energy management: past, present, and future

The management of datacenter power and energy involves actively modulating power draw, eliminating inefficiencies, or introducing optimizations in software, hardware, and physical infrastructure.

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Mixed-signal and digital signal processing ICs | Analog

Solutions for autonomous system applications, which integrate high bandwidth low-latency connectivity, precision sensing, intelligent power management and LED

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Toward sustainable data center operation: A review on existing ...

This article provides a comprehensive review of various state-of-the-art DC architectures, operating challenges, and energy management frameworks that co-optimize the onsite energy

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Powering the Cloud: Strategic Energy Management in

Powering the Cloud: Strategic Energy Management in Modern Data Centers explores the evolving energy challenges and solutions in managing

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Next-generation data center energy management: a

Abstract In the era of society's ongoing digitization and the exponential growth in data volume, alongside a growing energy demand, energy

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Data center integrated energy system for sustainability:

Data center merges integrated energy system by establishing a cohesive energy chain. Data center integrated energy system exemplifies the

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Integrated Approach To Data Center Power Management

This paper takes an integrated approach to data center energy management to simultaneously address idle re-source energy consumption, and support-infrastructure energy consumption. We argue for a

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Data center integrated energy system for sustainability: Generalization ...

Data center integrated energy system for sustainability: Generalization, approaches, methods, techniques, and future perspectives. The Innovation Energy 1(1): 100014. The increasing prominence

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Real-Time Energy Management in Data Centers with Integrated

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