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The EED has arrived at Data Centers. Do you want to know how it affects you?

Sustainability in the Data Center

Sustainability in data centers has advanced significantly. In the 1960s and 70s, processing capacity was prioritized without much attention to energy efficiency.
With the rise in demand and environmental awareness in the 2000s, initiatives such as PUE were introduced in 2007, marking a turning point by providing a standardized way to assess and compare energy efficiency.

In recent years, the cloud, blockchain, artificial intelligence, machine learning, and virtual reality have driven innovation in the industry.

Over the past decade, a comprehensive approach has been adopted, including renewable energy, advanced cooling technologies, and improved waste management.

European regulations and other guidelines have driven sustainable practices, making sustainability a key component in the design and operation of data centers today.

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What is the EED?

The EED is the European Energy Efficiency Directive, which applies to most data centers with more than 100KW of power dedicated to IT.

What are its objectives?

The European Union has implemented a series of directives and regulations to improve the sustainability of data centers. These objectives include:

Estos objetivos incluyen:

- **Reduction of Energy Consumption:** Setting targets to decrease energy use in data centers.
- **Promotion of Renewable Energy Use:** Encouraging the use of renewable energy sources.

- **Promotion of Efficient Design:** Ongoing improvements in the design and operation efficiency of data centers.

How Does It Affect Data Centers?

- **Reporting Requirements:** Data centers must report their energy and water consumption, as well as their use of renewable energy and waste heat reuse.
- **Energy Efficiency:** Minimum energy efficiency standards are established, which must be met to operate within the EU.
- **Certifications and Audits:** Data centers must obtain certifications proving compliance with regulations and undergo regular audits.

And what indicators need to be presented?

1. **Power Usage Effectiveness (PUE):** Measures the energy efficiency of data centers.
2. **Cooling System Efficiency (CSE):** Evaluates the efficiency of cooling systems.
3. **Renewable Energy Factor (REF):** Assesses the proportion of renewable energy used.
4. **Energy Reuse Factor (ERF):** Measures the amount of reused energy, such as waste heat.
5. **Water Usage Effectiveness (WUE):** Quantifies the amount of water used in data center operations.
6. **Temperature Set Points (TSP):** Adjustments to temperature in IT equipment areas.
7. **Carbon Usage Effectiveness (CUE):** Evaluates overall sustainability in terms of CO_2 emissions.
8. **Airflow Efficiency (AFE):** Measures airflow efficiency to optimize cooling.
9. **Server Utilization Rate:** Percentage of server capacity utilized.
10. **Power Distribution Efficiency (PDE):** Efficiency of the power distribution system.
11. **E-waste Recycling Rate:** Proportion of electronic waste recycled.
12. **GHG Emissions per kWh:** Greenhouse gas emissions per kilowatt-hour consumed.

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How Should They Be Presented?

The data must **be collected and reported annually using standardized formats** to facilitate aggregation and comparison at the EU level.

The reports must include:

- Total Facility Energy
- IT Equipment Energy
- Water Usage
- Waste Heat Reuse
- Temperature Set Points
- Percentage of Renewable Energy

But that's not all! To comply with regulations and improve sustainability, data centers must adopt the following best practices (among others):

- **Continuous Monitoring:** Implement real-time monitoring systems to track energy and water usage.
- **Resource Optimization:** Use advanced technologies to optimize resource usage and reduce waste.
- **Education and Training:** Train staff on sustainable practices and the importance of complying with regulations.

Deep Dive into Sustainability Indicators in Data Centers

One of the most significant indicators within data centers is **PUE**, but

what exactly is PUE?

is a metric developed by The Green Grid in 2007 to measure the energy efficiency of a data center. **PUE is calculated as the ratio between the total facility energy and the energy consumed by the IT equipment.**

PUE Formula:

$$PUE = \frac{\text{Total Facility Energy}}{\text{IT Equipment Energy}}$$

A PUE of 1.0 indicates a perfectly efficient data center where all energy is used solely by the IT equipment, without any waste in cooling, lighting, or other overhead systems.

Importance of PUE

PUE helps to understand how energy-efficient a data center is. It allows administrators to set goals, compare efficiency across different sites, and make informed decisions to improve energy efficiency.

Some data centers with the best PUE include:

•**LinkedIn** (Hilltop OR): PUE de 1.06

•**Microsoft** (Project Natick Underwater): PUE de 1.07

•**Facebook** (global Data Centers): PUE de 1.11

•**United Airlines** (Chicago): PUE de 1.09

•**BitFury** (Tbilisi, Georgia): PUE de 1.02

•**NREL** (Golden, CO): PUE de 1.04

•**Verne Global** (Keflavik, Islandia): PUE de 1.06

•**Lefdal Mine Data Center** (Maloy, Noruega): PUE de 1.15

•**Green House Data** (Cheyenne, WY): PUE de 1.14

Best Practices to Improve PUE

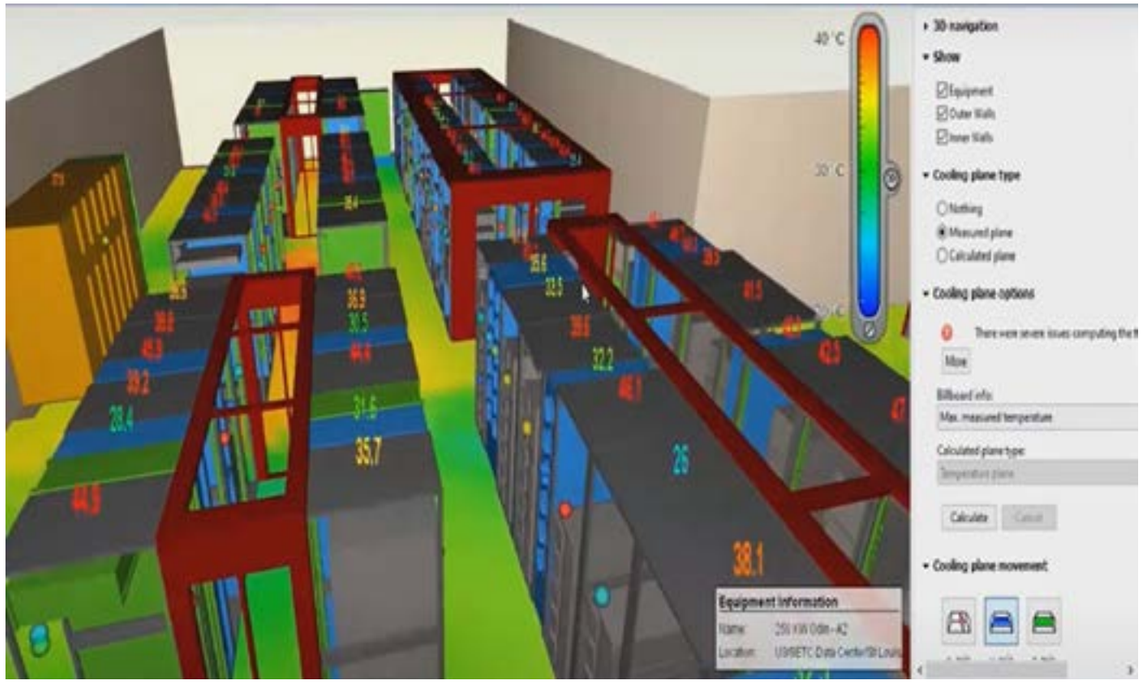
Here are the key steps to start improving PUE

Instrumentation of the Data Center
Install energy and environmental meters and sensors to obtain critical data on energy use and operational conditions.

Cooling Strategies
- Safely Increase Temperatures: Avoid overcooling to save energy..
- Implement Hot/Cold Aisle Containment: Separate hot and cold air to improve cooling system efficiency.

Consolidation and Virtualization of Equipment
Reduce Physical Assets decrease the number of physical assets to lower energy consumption and cooling needs.

Charge for Energy Consumption
Encourage Energy Awareness promote energy awareness and responsibility among internal or external clients by charging for the energy they consume, or at least by providing informative feedback.



Does DCiM Have the Answer to All These Measures?

Probably not, but it will certainly help in the proper use of resources to improve efficiency.

Today, automation in data centers has become crucial for administrators, as it provides real-time visibility into the data center environment, facilitating informed decision-making to enhance efficiency and reduce costs..

Benefits of Using DCiM

Continuous Monitoring:

DCiM enables real-time monitoring of energy consumption, temperature, humidity, and other critical parameters, helping to detect and resolve issues before they impact operations.

Resource Optimization:

By providing accurate data on resource utilization, DCiM helps identify opportunities to consolidate servers and optimize space and energy.

Process Automation:

DCiM automates routine tasks such as energy management and capacity planning, reducing the workload of staff and minimizing human errors.

Cost Reduction:

By improving operational efficiency and reducing energy waste, DCiM can lead to a significant reduction in operational costs.

Regulatory Compliance:

DCiM helps data centers comply with sustainability and energy efficiency regulations by generating accurate and detailed reports.

Examples of DCiM in Action

Energy Optimization:

A data center can use DCiM to automatically adjust cooling temperatures based on workload, reducing energy consumption.

Capacity Management:

DCiM can assist in planning and managing data center capacity, ensuring that resources are used optimally and avoiding overloading.

Alerts and Notifications:

Set up alerts to notify staff of any anomalies or potential issues, allowing for a quick and effective response.

How to Extract All the Information Required by the EED

While **DCiM** will provide much of the information required by the directive, we know that the EU requires a report in a specific format.o.

At Bjumper, we have analyzed the regulations and done the work for you!

We have created a specific report within ThinkData that allows you to:

1. Set your objectives.
2. Track compliance with these objectives.
3. Compare your current status with previous data.
4. Report the information as required by the EU.

To learn more about this, we have a video where you can see all the information and how the **ThinkData** tool can help you meet the requirements set by the European Union.

Watch the video

Relevant Data and Entry into Force of the Regulation

Publication in the Official State Bulletin (BOE) regarding the European regulation:

Article 48 of the Directive states:

- Member States must adopt and publish, by October 1, 2025, the necessary legal, regulatory, and administrative provisions to comply with the Directive.
- The adopted provisions must be applied starting January 1, 2026.

Therefore, the Directive specifies that **Spain** and other **EU member states have until October 1, 2025, to adopt the necessary measures and transpose the Directive into their national legislation.**

Go to the European Regulation

Go to the BOE Regulation